



COMMITTEE OF THE WHOLE

Regular Meeting Agenda

October 20, 2022
5:30 PM
6738 Dixon Street
Milton, FL 32570

- 1. Open Meeting**
- 2. Invocation**
- 3. Pledge of Allegiance**
- 4. Approval of Agenda for Additional Items**
 - Recommendation for Additional Items from Staff
 - Recommendation for Additional Items from Council

5. Invited Speakers

Richard Delp,
Baskerville-Donovan Inc.

6. Persons to Appear

7. Agenda Items

Administration

Councilwoman Shari Sebastiao

Item # 2022-791

Discussion of Bid for 2022.11 Fire Training Facility Site Work

Item # 2022-805

Discussion of purchase of Sweeper

Item # 2022-806

Discussion of purchase of a Side Loader Garbage Truck

Economic Development

Councilwoman Shannon Rice

Item # 2022-483

Business Improvement Program FY 2023 Cycle 1

Emerald Coast Regional Council

Councilman Vernon Compton

Finance

Councilman Casey Powell

LEAP

Councilman Vernon Compton

Parks & Recreation

Councilman Jeff Snow

Public Safety

Mayor Heather Lindsay

Item # 2022-796

Basic Traffic Homicide Investigation Training

Public Works

Councilman Robert Leek

Item # 2022-798

Sidewalks 2022-2023

Stormwater

Councilman Matt Jarrett

8. Board & Committee Reports

Community Improvement Board

Councilman Vernon Compton

Historic Preservation Board

Councilwoman Roxanne Meiss

Pensacola Perdido Bay Estuary Program

Councilman Vernon Compton

Item # 2022-721

Blackwater River Water Quality and Solutions to Closure of Oyster Harvest Area

Christian Wagley

Coastal Organizer, Florida-Alabama Healthy Gulf

Item # 2022-722

Blackwater River and Invasive Species Public Education Opportunity

Tourist Development Council
Councilman Jeff Snow

Transportation Planning Organization
Councilman Vernon Compton

Item # 2022-651

MIO-Vision

Item # 2022-730

Complete Streets Discussion for Design Collaboration with FDOT

9. Council Reports

10. City Attorney's Report

11. City Manager's Report

1. Annual Christmas Luncheon
2. Pace Water System
3. WWTP Expandability

12. Public Input

13. Adjournment

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting is asked to advise the City at least 48 hours before the meeting by contacting City Hall, 6738 Dixon Street, Milton, or by calling 983-5410.

"If any person decides to appeal any decision made by the board, agency, or commission, with respect to any matter considered at such meeting or hearing, he or she will need a record of the proceedings, and that for such purpose, he or she may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based." FS 286.0105



Agenda Item # 2022-791

Discussion of Bid for 2022.11 Fire Training Facility Site Work

MEETING DATE

October 20, 2022

PREPARED BY

Diane Ebentheuer, Purchasing
Agent/Risk Manager

BACKGROUND

The City solicited bids for the Fire Training Facility Site Work.

SUMMARY

Bid opening was held 10/05/2022. 5 bids were received ranging in pricing from \$392,712.85 to 746,498.60.

RECOMMENDATION

Staff reviewed the 5 submitted bids and recommends awarding to Three Trade Consultants in the amount of \$392,712.85.

ATTACHMENTS

1. 2022.11 Fire Training Site Work Bid Tab links are attached



BID TABULATION

10/05/2022 2:00 p.m.

Present for the City of Milton:

Diane Ebentheuer	Purchasing Officer
Michele Williams	Purchasing Assistant
Curtis Krebs	Chief Financial Officer
Joe Cook	Public Works Director
Chief John Reble	Fire Chief

Others in attendance:

Site & Utility LLC.	Craig Helms
Three Trade Consultants, Inc.	Rachel Houser
Bear General Contractors	Dave Clark
Eamon Chase	Patricia Favless

Bid opening was held at 2:00 p.m. The purpose of the meeting was to receive bids for the following 2 solicitations:

ITB 2022.11 Fire Training Facility Site Work (links are attached)

1	Three Trade Consultants, Inc.	\$	392,712.85
2	Site and Utility, LLC	\$	395,682.50
3	Sessions Contractors Group, Inc.		352,356.00
Add: additional costs			
		74,976.00	\$ 427,332.00
4	Eamon Chase, Inc.	\$	495,999.00
5	Bear General Contractors, LLC	\$	746,498.60

ITB 2022.10 Concrete Curbing, Driveways, Sidewalks Annual Contract

(links are attached)

1	Eagle Environmental Consulting Services of FL, Inc.	Various Pricing
2	Bear General Contractors, LLC	Various Pricing
3	LAM construction, LLC	Various Pricing
4	Eamon Chase	Various Pricing



Agenda Item # 2022-805

Discussion of purchase of Sweeper

MEETING DATE

October 20, 2022

PREPARED BY

Diane Ebentheuer, Purchasing
Agent/Risk Manager

BACKGROUND

The City purchasing policy allows Council to waive the bid process and use "Other Contracts" that have gone through the review processes and have been approved by another government entity. The City needs a Sweeper.

SUMMARY

Sourcewell Contract #34560 Sanson Equipment Company \$272,022.20 Sweeper

RECOMMENDATION

Request Council waive the bid process and approve using Sourcewell Cooperative contracts for purchase of following:
#34560 Sanson Equipment Company \$272,022.20 Sweeper

ATTACHMENTS

1. STREET SWEEPER QUOTE



QUOTE

QUOTE # SECQ4745

DATE Oct 4, 2022

CONTRACT CUSTOMER ID # 34560

CONTRACT # 093021-ELG

To: David Archer
City of Milton
6731 Magnolia St.
Milton, FL 32570
United States

Sales Contact: Jeff Bodiford
251-298-9398
jeffb@secequip.com

(850) 983-5751
darcher@miltonfl.org

QUOTE STATUS	SHIPPING TERMS	DELIVERY IN DAYS	PAYMENT TERMS
Budgetary	Customer Location	180 - 270 Days	Net Delivery

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	Elgin Pelican NP Dual Mechanical Broom Sweeper - Standard Equipment Includes: Dual Steer & Gutter brooms, Hydraulically Driven, Tier 4F John Deere 4045TF Low Emission Diesel Engine w/ 74 Horsepower, Hydrostatic Drive System and Steering, Chassis and Wheels Powder Coated Standard White, Broom Measurement Ruler, Pelican Manuals (operator, parts, service and safety).		
1	LED Flood Lights		
1	Radio w/ In-Cab Flood Lights		
1	Safety Strobe Lights - A+ Package #6		
1	Auto Lube System		
1	Freight - FOB City of Milton		
1	Lower Conveyor Wash Out		
1	Conveyor Stall Alarm		
1	Battery Disconnect Switch		
1	Engine Block Heater		
1	Low Hydraulic Fluid Level / High Hydraulic Fluid Temperature Safety Shutdown System		
1	Hydrant Wrench		
1	Dual Cab Limb Guards		

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	Left Hand Gutter Broom Tilt w/ In-Cab Control		
1	Right Hand Gutter Broom Tilt w/ In-Cab Control		
1	In-Cab Engine Air Filter Restriction Gauge		
1	LED Body Lights (stop, tail and turn)		
1	Strip Style Main Center Broom		
	SubTotal		\$284,840.00
	Less Sourcewell discount 3%		-\$8,545.20
	Less Sansom Equipment local customer discount 1.5%		-\$4,272.60

This quote does not include any federal, state, or local taxes.
 * In stock equipment are subject to prior sale. *

This Quote is valid for 30 Days.

Please contact me if I can be of further assistance.

TOTAL	\$272,022.20
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BIRMINGHAM OFFICE

2800 Powell Avenue
 Birmingham, AL 35233
 Ph: (205) 324-3104
 Fax: (205) 324-2679

MOBILE OFFICE

2025 West I-65 Service Road North
 Mobile, AL 36618
 Ph: (251) 631-3766
 Fax: (251) 631-3768

SHELBYVILLE OFFICE

3196 Highway 231 North
 Shelbyville, TN 37160
 Ph: (615) 696-7066
 Fax: (615) 413-5323

STONECREST OFFICE

2601 South Stone Mountain Lithonia Road
 Stonecrest, Georgia 30058
 Ph: (706) 685-6900
 Fax: (706) 609-3491





Agenda Item # 2022-806

Discussion of purchase of a Side Loader Garbage Truck

MEETING DATE

October 20, 2022

PREPARED BY

Diane Ebentheuer, Purchasing
Agent/Risk Manager

BACKGROUND

The City purchasing policy allows Council to waive the bid process and use "Other Contracts" that have gone through the review processes and have been approved by a another government entity. The City needs a Side Loader Garbage Truck.

SUMMARY

Sourcewell Contract #091219-THC Ingram Equipment Company \$374,627.78 Side Loader Garbage Truck

RECOMMENDATION

Request Council waive the bid process and approve using Sourcewell Cooperative contracts for purchase of following:
#091219-THC Ingram Equipment Company \$374,627.78 Side Loader Garbage Truck

ATTACHMENTS

1. GARBAGE TRUCK QUOTE



CONTRACT PRICING WORKSHEET
for MUNICIPAL REFUSE AND SERVICE EQUIPMENT

This Form must be prepared by Contractor, and provided to End User.

Buying Agency:	CITY OF MILTON	Contractor:	INGRAM EQUIPMENT COMPANY, LLC
Contact Person:	DAVID ARCHER	Prepared By:	JEFF MARTIN
Phone/Fax:		Phone/Fax:	205-663-3946/205-663-4816
Location City, State:	MINTON, FLORIDA	SourceWell Contract:	091219-THC
Date:	10/5/22	QUOTE SUBJECT TO CHANGE WITHOUT NOTICE	Product Code:
Quote No.:	Q1425		DPYTHON
			(Includes Installation & 12 Month Warranty)

A. Item Base Unit Price SW Contract:	HEIL DP PYTHON 22YD AUTOMATED SIDE LOADER
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B. Options (Itemize below and attach additional sheet(s) if necessary)					
	Description	Cost		Description	Cost
1	TRI-CUFF GRABBERS	INCLUDED			
1	FRONT MOUNT HYDRAULIC PUMP	INCLUDED			
1	HOPPER & LIFT WORK LIGHTS	INCLUDED			
1	MULTI-FUNCTION SMART LIGHTS	INCLUDED			
1	BODY SIDE BACK ASSIST LIGHTS	INCLUDED			
1	HOPPER HOOD	INCLUDED			
1	INFINITY EJECT CYLINDER (5YR WARRANTY)	INCLUDED			
1	MUD FLAPS AHEAD OF REAR TIRES	INCLUDED			
1	20LB. FIRE EXTINGUISHER	INCLUDED			
1	3RD EYE CAMERA SYSTEM W/GRABBER GUIDELINES	INCLUDED			
	**REAR, GRABBER & HOPPER VIEWS				
1	AUTOLUBE SYSTEM	INCLUDED			
1	AUXILIARY LIFT CONTROLS UNDER RH SEATS	INCLUDED			
1	PAINT: WHITE	INCLUDED			

C: CHASSIS & UNPUBLISHED OPTIONS					
QTY	Description	Cost	QTY	Description	Cost
1	2023 AUTOCAR ACX64 RH ONLY STEER, DIESEL	INCLUDED			
1	5YR/150K MILE ENGINE & AT WARRANTY	INCLUDED			
1	5YR/UNLIM. MILE TRANSMISSION WARRANTY	INCLUDED			
1	PAINT: WHITE	INCLUDED			

D. FREIGHT	INCLUDED
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E. Non-Equipment Charges/Discounts/Credits (Trade-in, Extended Warranty, etc.)	
Subtotal E:	

G. Unit Cost of Item (A+B+C+D)	\$	374,627.78
Quantity Ordered	X	1

H.	Total Purchase Price (E+F+G):	\$	374,627.78
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SW Member Signature:	Comments:
SW Membership Number:	Terms: Net at Delivery
SW Member PO#:	FET, STATE & LOCAL TAXES NOT INCLUDED



Agenda Item # 2022-483

Business Improvement Program FY 2023 Cycle 1

MEETING DATE

October 20, 2022

PREPARED BY

Ed Spears, Director of
Economic Development

BACKGROUND

With the approval of the FY 2023 budget and the start of the new fiscal year, the City's Business Improvement Program has funds available for allocation. The program is available to businesses city-wide, on a first come, first serve, which can accept applications at any time. Grants are available to assist with business signage, the purchase of business equipment to allow necessary to allow a business to grow and add employees and for the improvement to the exterior of buildings.

Since inception in 2018, the Business Improvement program has provided 35 grants to 28 different businesses totaling \$137,642.68. The program has generated a match from the private sector totaling \$700,458.03. For every \$1 invested by the City, businesses have invested \$5.09. The program is advertised on a continuous basis. At this time, one application has been received From Lindsay & Lindsay, PA DBA Lindsay & Andrews. They are requesting \$5,000 to purchase new technology and work stations to allow the addition of new employees. They are expanding the company from four (4) to eleven (11) employees. The application requires a 100% match. If approved, \$35,000 will remain in FY 2023 grant funding for additional grants, which will be forwarded to Council as received.

SUMMARY

Staff received one eligible grant application totalling \$5,000. \$40,000 is available for new applications. If awarded, \$35,000 will be available for additional grants.

RECOMMENDATION

Staff recommends approval of one grant in the amount of \$5,000.

ATTACHMENTS

1. Lindsay & Andrews BIP Application FY 2023 Cycle 1
2. 2023 Cycle 1 Business Improvement Program Spreadsheet
3. BIP Financial Report - All Time



City of Milton
Office of Economic Development
6738 Dixon Street
Milton, FL 32572
www.miltonfl.org

**APPLICATIONS ARE
RECEIVED ON A
CONTINUOUS BASIS AS
LONG AS FUNDS ARE
AVAILABLE**

2022 Business Improvement Program

This program provides commercial and not-for-profit property owners and business owners façade, sign, infrastructure, and business equipment grants. A 100% match may be required depending on the grant requested.

Program Intent

The Business Improvement Program (BIP) is intended to provide funding to upgrade the visual and aesthetic appearance of structures and property, increase property value, and stimulate economic activity within the City of Milton. Grants may be used for façade improvements, signage, landscaping, infrastructure, and business equipment expenses. The BIP is available to commercial and not-for-profit property owners and/or business tenants only.

Eligibility

- ❑ Property must be located within the corporate limits of the City of Milton.
- ❑ Applicants must have all necessary business licenses/permits/inspections. Any outstanding legal issues that could encumber the property or prohibit immediate use as a commercial or not-for-profit venture must be resolved or explained. Any proposed business/tenant must document zoning and land-use eligibility at the proposed location as part of this application. All projects must comply with the City's Comprehensive Plan, Unified Development Code, Life Safety Code and Florida Building Code. Applicant/owner must be up to date on all property taxes.
- ❑ Unoccupied properties are eligible to receive the grant, but must be actively, continually, and publicly marketed on a verifiable source (CMLS, Zillow, FSBO, etc.) from the date of application until leased.
- ❑ Applicants must sign the program application and other related documents. Tenants may apply only with property owner's consent. Owners may apply only with tenant's consent.
- ❑ Applications are accepted continuously, on a first come, first serve basis, as long as fund is available.
- ❑ Preference will be given based on the following criteria: first-time applicants; applicants with projects on Caroline Street Historic District, Willing and Stewart Streets; projects in historically significant structures; applicants with an existing active business entity; and/or projects creating a minimum of 5 full-time positions within the first year.
- ❑ Applicants may be eligible in multiple categories, depending upon need, priority status, and level of demand. However, applicants must clearly specify which category they are applying in and identify a preferred category.
- ❑ The BIP is based on availability of funds. Grants are awarded until all funds are exhausted each fiscal year.
- ❑ Exterior improvements must be approved by staff for appropriateness. The applicant must meet with applicable City/County departments to determine required permits, if any.

- Once the project has been completed, the property must be eligible to obtain, or already have a certificate of occupancy, and have received the final inspection from the appropriate agency.

Eligible Improvements

Examples of **eligible** items include:

- | | |
|---|---|
| ➤ ADA Handicapped Access to a building | ➤ Tuckpointing |
| ➤ New/replacement windows and doors | ➤ Equipment necessary for business expansion |
| ➤ Restoration/preservation of windows/doors | ➤ Parking improvements |
| ➤ Visible portions of roofing | ➤ Screening/fencing |
| ➤ New or replacement shutters/awnings | ➤ Sprinkler systems |
| ➤ Electrical rewiring | ➤ Signage |
| ➤ Exterior lighting | ➤ Business equipment |
| ➤ Exterior painting | ➤ Soft costs (licenses, permits, impact fees, architect/engineer cost, etc.)* |
| ➤ Restoration of architectural features | ➤ Landscaping** |
| ➤ Exterior structural walls | |

***Soft costs are limited to 20%.**

****Minor landscaping in conjunction with other improvements is eligible. The maximum amount of grant that may be spent on landscaping is 25%. Landscaping must be native to Northwest Florida, perennials and/or evergreens or other hardy species. The proposed landscaping cannot be a State of Florida invasive species or noxious weed. All landscaping aspects must be reviewed and approved by the City.**

Ineligible Improvements

Examples of **ineligible** items include:

- Rent
- Interior modifications and/or rehabilitation not required for a change in occupancy or expansion*
- Removal or covering of historical or significant architectural detailing
- Regular/routine maintenance and repair
- Refinancing existing debt
- Owner performed labor (unless the owner is a duly licensed contractor)

***Matching funds may be used for interior project costs**

Business Improvement Program Grant Categories

1. Sign Grant – Up to \$1,000 to be used exclusively for new or replacement business exterior signage. No match is required. This grant is paid directly to the vendor providing the signage or paid as a reimbursement to the owner upon completion of the project and receipt of proper documentation. The Sign Grant must be approved prior to the commissioning of signage and all signage must be properly permitted in conformance with the City of Milton Sign Ordinance. Any cost above and beyond \$1,000 will be the responsibility of the applicant. A scale drawing of the sign is required. A sign permit must be obtained with 60 days of award of the grant.

2. Commercial Façade Grant – Up to \$5,000 to be used exclusively for improvements to the exterior façade of a building. A 100% match is required. For corner lots, applicants may apply for up to \$10,000 with a 100% required match. Matching funds may be used anywhere in the proposed renovation project, including interior renovations. New signage may be included as a component of a Commercial Façade Grant Application, but may not be the entire project. The grant may be paid directly to a vendor, or paid as draws. The Commercial Façade Grant must be approved prior to commencement of any work proposed to be completed with grant proceeds. All necessary project approvals and permits, if required, must be obtained within 90 days of award of the grant. A scale drawing of the project is required, along with material and color samples.

3. Business Expansion Grant – Up to \$5,000 to be used to acquire equipment necessary to allow expansion of a businesses. A 100% match is required. Grants may be used for, but not limited to; required equipment/infrastructure for a change-in-use, equipment for business expansion, safety equipment, and other furniture, fixtures and equipment as approved by the City.

Additional Information

1. Buildings with multiple units under one roof may combine grant funds provided that units have separate entrances, and have been previously subdivided or partitioned such that:
 - a. There are separate primary entrances for each business
 - b. Each of the businesses has separate and distinct business tax receipts and sales tax licenses
 - c. Permanent interior walls must have been in place to be considered as multiple facades, under one roof
2. Grantees must provide the required match. For example, for a commercial façade grant of the maximum \$5,000, an owner match of \$5,000 is required, resulting in a total project of at least \$10,000.
3. Any applicant not meeting the eligibility criteria may request consideration for an exception from the City Council, depending on the intent of the renovation.
4. The grant application must be completed and submitted to the City with the following items:
 - a. A detailed written explanation of the project, what funds are requested, where the match will be obtained and the total expenditure for the project.
 - b. Photographs of the existing building and the proposed project area.
 - c. Schematic drawings illustrating all proposed work, or pictures with project description outlined.
 - d. A description of materials and methods to be used
 - e. Material samples or color swatches should be provided for approval.
 - f. Cost estimates for each aspect of the project.
5. The applicant is advised that this grant is given at the sole discretion of the City Council of the City of Milton and the criteria are used as a basis to evaluate the Applicant's project, and does not create entitlement to funding. The application shall be reviewed by the City for completeness and eligibility prior to any approvals. The City reserves the right to waive any technical irregularity, award in-mass, partial fund, split fund, or reject all submittals. Additional, post-award requirements may be added by City Council at their sole discretion.
6. All projects must be completed within 180 days (6 months) or by the contracted date after receiving approval from the City of Milton staff and any required building permits, unless otherwise approved by the City. All work must be completed by the completion date assigned according to the contract. Incomplete projects may require reimbursement to the City, according to contract requirements.
7. If a grant is awarded, the City of Milton will determine, in coordination with the Grantee, the most appropriate method for payment. The maximum payout prior to project completion and final inspection is 75% regardless of payment type. Verification of payments, release of lien, etc. from a vendor or contractor must be presented, (canceled checks, paid invoice from vendors) prior to issuing final grant payment.
8. Grants may not be transferred to any party other than the Grantee without approval of City Council in advance.

9. Applicants maybe requested to make a presentation of their project to staff and/or City Council.

10. ANY COST FOR WORK PREVIOUSLY COMPLETED PRIOR TO AN APPROVED APPLICATION CANNOT BE REIMBURSED UNDER ANY CIRCUMSTANCE. DO NOT START ANY PHYSICAL RENOVATIONS UNTIL **AFTER** FINAL APPROVAL BY THE CITY, COMPLETION OF THE CONTRACT WITH THE CITY & NOTICE TO PROCEED HAS BEEN ISSUED.

Historic Structures

Buildings will be evaluated based on historical/architectural significance, with priority given to buildings with inappropriately applied facades that cover original details (architectural features/details, windows, doors) or are unsightly, and/or out-of-scale. For historic structures, the goal of the City is to either partially or fully restore the original appearance of the building; or create an appearance that is consistent with its historic character. Proposed changes to the building's façade to be funded by this program will not remove, alter, damage, or cover up significant architectural or historical feature(s) of the building that either are original, or reflect a major alteration that has historic architectural value.

Default

Default of the Grant shall occur if one or more of the following takes place:

- Funded Improvements are altered, modified, removed, or demolished following project completion.
- Property is sold, transferred, or converted to 100% non-commercial use within one (1) year.
- The commercial business applicant has ceased operations for a period of forty-five (45) consecutive days or longer.
- The commercial business applicant abandons the project site.

If any of the above-referred activities occur within one (1) year of the project completion date without receiving prior City approval, grant funds shall be repaid to the City.

Business Improvement Program Process

1. Applicant must submit a complete application packet, including the following:
 - Complete application form
 - Detailed project narrative
 - Legal description of property
 - Proof of property ownership or notarized letter from owner consenting to the project
 - Proof of property insurance
 - Certification of sign ordinance, zoning, and future land use compliance
 - Scaled drawing of improvements involving building changes
 - Accurate color mock-ups and/or paint chips
 - Original color photographs of existing property conditions
 - Three cost estimates from qualified contractors (labor and materials for entire project). If the owner of the property is a licensed contractor and is qualified to do the work, then two additional cost estimates from qualified contractors will be required.
 - Final cost estimate including name of licensed contractor chosen to perform work
 - Copy of the chosen contractor's license (if licensure is required for the work)
 - Copy of City of Milton Business License
2. If requested, meeting with staff to review the project. Applicants may be requested to provide additional information.

3. Applications are forward to City Council for review and approval.
4. Project presentation (if necessary)
5. If approved, staff will prepare a grant agreement for the applicant's signature.
6. After approval and execution of all documents, the applicant is provided with a notice to proceed.
7. Copy of all permits (if necessary)
8. Upon project completion, signed off permit from City/County Building Inspections (if necessary), receipt of the final invoice(s) from contractor(s), proof of payment, inspection by City Staff, and sign off by the property owner; the final invoice will be submitted for payment.
9. City will issue a reimbursement check to the applicant or directly pay to the vendor.

FOR MORE INFORMATION,
PLEASE CONTACT THE CITY OF MILTON
OFFICE OF ECONOMIC DEVELOPMENT
AT 850-983-5400
OR EMAIL ECONDEV@MILTONFL.ORG.



City of Milton
Office of Economic
Development

Business Improvement Program

DATE OF APPLICATION: September 12, 2022

NAME OF BUSINESS (Legal and DBA, if Different): Lindsay and Lindsay PA dba Lindsay and Andrews

BUSINESS OWNER(S): Allen W. Lindsay, Jr. and Roy Andrews

PROPERTY OWNER(S) (IF DIFFERENT): L and A Land

GRANT CATEGORY: Business Expansion Grant

TOTAL AMOUNT REQUESTED (MAXIMUM \$5,000): \$ 5,000.00

TOTAL AMOUNT OF MATCH (MINIMUM 100%): \$ 5,000.00

TOTAL AMOUNT OF PROJECT (ALL ASPECTS): \$ 10,000.00

ADDRESS OF PROJECT: 5218 Willing Street, Milton, FL 32570

PROJECT NAME: Lindsay and Andrews Expansion and Upgrade

ATTACH REQUIRED ADDITIONAL INFORMATION:

- Complete application form
- Detailed project narrative
- Legal description of property
- Proof of property ownership or letter from owner consenting to the project
- Proof of property insurance
- Certification of sign ordinance, zoning, and future land use compliance
- Scaled drawing of improvements involving building changes
- Accurate color mock-ups and/or paint chips
- Original color photographs of existing property conditions
- Three cost estimates from qualified contractors (labor and materials for entire project).
- Final cost estimate including name of licensed contractor chosen to perform work
- Copy of the chosen contractor's license (if licensure is required for the work)
- Copy of City of Milton Business License.

NAME & MAILING ADDRESS OF OWNER/APPLICANT (PLEASE PRINT):

Lindsay and Lindsay PA dba Lindsay and Andrews

5218 Willing Street, Milton, FL 32570

SIGNATURE(S) OF BUSINESS AND PROPERTY OWNER(S) (IF DIFFERENT)

[Signature]
[Signature]

TELEPHONE # (850) 623-3200 CELL # _____ EMAIL mla@lal-law.com

For official use only:

DATE & TIME APPLICATION RECEIVED: _____ RECEIVED BY: _____



City of Milton
Office of Economic Development

Page 2 of 2

2022 Business Improvement Program

Memorandum of Understanding

I, the grantee, understand that work cannot commence on any portion of the Business Improvement Project prior to receiving approval of the grant funds by the City of Milton. A written notification to proceed will be provided. I, the grantee, have read, understand, and accept the terms and conditions of the grant. I have read and understand the actions which will trigger a default. In the event of a default, I, the grantee, do hereby guarantee the repayment of the principal amount of the grant in accordance with the terms of the Commercial Façade Program application and guidelines. If the grantee is not the property owner, as shown in the Santa Rosa County Property Appraiser's Database, the property owner must also execute this Memorandum of Understanding.

Allen W. Lindsay, Jr.

Grantee Name (Please Print)

Allen W. Lindsay, Jr.

Grantee Signature

9-19-2022

Date

L and A Land (Roy Andrews)

Property Owner Name (Please Print)

Roy Andrews

Property Owner Signature

9/19/22

Date

City of Milton (Please Print)

City Manager Signature

Date

Request for Taxpayer Identification Number and Certification

Give Form to the
requester. Do not
send to the IRS.

► Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type.
See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

LINDSAY & LINDSAY, P.A.

2 Business name/disregarded entity name, if different from above

LINDSAY & ANDREWS

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☒ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ► _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ► _____

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

5218 WILLING STREET

6 City, state, and ZIP code

MILTON, FLORIDA 32570

7 List account number(s) here (optional)

Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

____ - ____ - ____

or

Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign
Here

Signature of
U.S. person

Date

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
 - Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
 - Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
 - Form 1099-S (proceeds from real estate transactions)
 - Form 1099-K (merchant card and third party network transactions)
 - Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
 - Form 1099-C (canceled debt)
 - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.

LINDSAY & ANDREWS

ATTORNEYS AT LAW
5218 WILLING STREET
MILTON, FLORIDA 32570

ALLEN W. LINDSAY, JR. *
ROY V. ANDREWS
MARISA ANDREWS

*ALSO ADMITTED IN ALABAMA

(850) 623-3200
FAX (850) 623-0104
www.lal-law.com

REPLY TO:
POST OFFICE BOX 586
MILTON, FLORIDA 32572

LINDSAY & ANDREWS

Business Expansion and Upgrade Business Expansion Grant Proposal – 2022

Location of Project: 5218 Willing Street, Milton, FL 32570

Legal Description:

Parcel ID#: 031N282530020000060

Lot Number Six (6) in Block Number Twenty (20) of the Town of Milton as per map of said Town of Milton made by W.J. Stephens, surveyor, now on file in the public records of Santa Rosa County, Florida. As is more particularly described as follows: Commencing at the Northeastern intersection of Grace and Willing Streets of said town and run in a Northerly direction along the East line of said Willing Street sixty-eight (68) feet to the Northwest corner of said Lot Six (6) in Block Twenty (20), the point of beginning, thence run Easterly at right angles with said Willing Street, Eighty-five (85) feet, thence Southerly and parallel with the East boundary line of said Willing Street twenty-three (23) feet and four and one-half (4½) inches, thence Westerly through the said Lot six and parallel with the Northern boundary line thereof, Eighty-five (85) feet to the East boundary line of said Willing Street, thence Northerly along said East boundary line of said Willing Street Twenty-three (23) feet and four and one-half (4½) inches to point of beginning.

Scope of Work:

In the past year we have expanded from a one attorney and three staff member firm to a three attorney and eight staff member firm. We will also be on-boarding a new paralegal on October 3, 2022. This expansion has stressed our current business technologies and equipment beyond their abilities. At this time, we are in dire need of new and upgraded computers for our new staff as well as some furniture to handle the increased in office personnel. We also may need to be looking into additional furniture to handle the storage of the increased amounts of files that we are handling now.

Needed Equipment:

Office Wide Upgrades:

- One network switch to handle the increased amount of computers and equipment.
 - Our current switch is too small to handle the additional personnel
- Upgraded ethernet router and network expander
 - We recently upgraded to a faster internet service to hopefully eliminate some of the lag in our system, but our old router cannot handle the increased bandwidth of the multiple users and needs to be replaced.

Individual Needed Equipment:

- One Surface device
- One iPad device
- One new laptop
- Two new computers
- Six new monitors
- New chair

Estimated Costs:

Device Type	Device Name	Cost	Estimated Max Total
Network Switch	20 Port POE Switch	\$300.00	\$300.00
Ethernet Mesh Router	Eero Pro 6E	\$559	\$559.00
Surface Device	Surface 8 Pro with Dock	\$2,140	\$2,140.00
iPad	iPad Pro with Keyboard	\$2,348.00	\$2,348.00
Laptop	Surface Laptop	\$1,800	\$1,800.00
Computers	Dell	\$699/computer	\$1,398.00
Monitors	Asus	\$219/Monitor	\$1,314.00
Chair	GL Chair	\$150.00	\$150.00
Total			\$10,009.00

*These are merely estimates (based on current pricing). Technology prices can be very volatile and final cost cannot be determined until time of purchase. It is our intention to shop around and get the best option at the best price at that time.

Final Request:

As stated above, these costs are merely estimates and the amount may vary. However, it is our intention to get the best product for the best cost and we will be shopping around to ensure that what we purchase will last us for as long as possible.

We thank you for your consideration, and for this program in general. The ability to improve our business will greatly affect our ability to continue to work and thrive in the Downtown Milton area. We look forward to working with the city on this project and hopefully many others in the future.

City of Milton
2023 Business Improvement Program
Cycle 1 Applications

10/20/2022

	NAME	ADDRESS	REQUEST	MATCH	PROJECT	FIRST TIME APPLICANT	TARGET LOCATION	HISTORIC STRUCTURE
	CYCLE 1 Applicant							
1	Lindsay & Adnrews, PA	5218 Willing Street	\$ 5,000.00	\$ 5,009.00	Business Equipment - Technology	No	Yes	Yes
	TOTAL REQUEST		\$ 5,000.00	\$ 5,009.00	Match Ratio	\$ 1.00		
	AVAILABLE FUNDING	CRA	\$ 20,000.00					
		General Revenue	\$ 20,000.00					
		TOTAL	\$ 40,000.00					
		BALANCE	\$ 35,000.00					

City of Milton
Business Improvement Program
Complete History

<u>CYCLE</u>	<u>PROJECTS</u>	<u>BUSINESSES</u>	<u>GRANTEE</u>	<u>ADDRESS</u>	<u>PROJECT</u>	<u>REQUEST</u>	<u>AWARD</u>	<u>REQUIRED</u> <u>MATCH</u>	<u>EST. TOTAL</u> <u>MATCH</u>	<u>CRA</u>	<u>CITY</u>	<u>PAYMENT</u>	<u>NOTES</u>
<u>2018 Cycle 1</u>	1	1	Visible Changes Barber Shop	5154 Santa Rosa Street	Code required upgrades, signage, painting	\$ 2,500.00	\$ 2,500.00	\$ 2,500.00	\$ 7,500.00		\$ 2,500.00	\$ 2,500.00	Completed
	2	2	LilPax's Boat Rental	5142 Willing Street	Business Signage	\$ 500.00	\$ 500.00	\$ -	\$ 2,500.00	\$ 369.82		\$ 369.82	Completed
	3	3	Man Cave Barber Shop	5176 Stewart Street	Signage, exterior awning	\$ 500.00	\$ 500.00	\$ -	\$ -		\$ 500.00	\$ 500.00	Completed
	4	4	Beardless Brewhaus	6820 Caroline Street	Roll-up garage door	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 5,000.00		\$ 5,000.00	Completed
	5	5	Corner Shack	5168 Stewart Street	Business equipment, fire suppression, painting, doors	\$ 3,250.00	\$ 3,250.00	\$ 3,250.00	\$ 12,500.00		\$ 3,250.00	\$ 3,250.00	Completed
	6	6	Boomerang Pizza	5227 Willing Street	Exterior Painting & Lighting	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 5,000.00		\$ 5,000.00	Completed
<u>2019 Cycle 1</u>	7	7	Elliott & Cunningham, CPA	5235 Willing Street	Exterior Façade, interior ceiling replacement, painting	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 50,000.00	\$ 5,000.00		\$ -	Awarded
	8	8	CD Properties	6821 Caroline Street	Repair Historic Windows and surrounds	\$ 5,000.00	\$ 4,450.00	\$ 4,450.00	\$ 5,000.00	\$ 4,450.00		\$ -	Awarded
	9	9	Brew Angels Brewery	6821 Caroline Street	Equipment Upgrade	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 35,000.00		\$ 5,000.00	\$ 5,000.00	Completed
	10		Brew Angels Brewery	6821 Caroline Street	New business sign	\$ 500.00	\$ 500.00	\$ -	\$ 1,153.15	\$ 500.00		\$ 500.00	Completed
	11	10	Janet Coulter Realty Office	5241 Willing Street	Exterior awning and painting	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00		\$ 4,943.12	\$ 4,943.12	Completed
	12	11	Milton Revival, LLC	5237 Willing Street	Exterior awning, painting and drainage system	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 20,000.00	\$ 5,000.00		\$ 5,000.00	Completed
<u>2019 Cycle 2</u>	13	12	Blackwater Bistro	5147 Elmira Street	ADA Ramp, Painting, Siding	\$ 2,500.00	\$ 2,500.00	\$ 2,500.00	\$ 10,000.00	\$ 2,125.00		\$ 2,125.00	Completed
	14	13	Brooks, Warrick & Assoc.	6867 Oak Street	Sign	\$ 500.00	\$ 500.00	\$ -	\$ 1,000.00	\$ 485.78		\$ 485.78	Completed
	15		Boomerang Pizza	5227 Willing Street	Exterior Painting	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 4,876.20		\$ 4,876.20	Completed
	16		Beardless Brewhaus	6820 Caroline Street	Equipment Upgrade	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 7,000.00		\$ 5,000.00	\$ 5,000.00	Completed
	17	14	Wacked Out Weiner	5271 Stewart Street	Doors and Code Required Plumbing	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 104,270.00		\$ 5,000.00	\$ 5,000.00	Completed
	18	15	Spencer's Second Hand Shop	5707 Stewart Street	Window Replacement	\$ 668.89	\$ 668.89	\$ 668.88	\$ 668.88	\$ 668.88		\$ 668.88	Completed
<u>2020 Cycle</u>	19		Brooks, Warrick & Assoc.	6867 Oak Street	Roof	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 16,210.00		\$ 5,000.00	\$ 5,000.00	Completed
	20	16	Sport & Wheat, CPA	5247 Stewart Street	Exterior Doors, Windows & Painting	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 10,000.00		\$ 5,000.00	\$ 5,000.00	Completed
	21	17	Saver Self Storage	6586 Caroline Street	Painting	\$ 4,750.00	\$ 4,750.00	\$ 4,750.00	\$ 4,750.00		\$ 4,750.00	\$ 4,750.00	Completed
<u>2021 Cycle</u>	22	18	Cohen Innovation, LLC	5739 Stewart Street	New Roof	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00		\$ 5,000.00	\$ 5,000.00	Completed
	23	19	Lindsay & Andrews	5218 Willing Street	New Signage, Front Door Replacement, Railing, Stairs	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 7,575.00	\$ 5,000.00		\$ 4,566.54	Completed
	24	20	RaeJean, LLC, DBA Mason's	5141 Dogwood Drive	New Road Sign	\$ 530.00	\$ 530.00	\$ 530.00	\$ 530.00		\$ 530.00	\$ 530.00	Completed
	25		Boomerang USA, Inc.	5227 Willing Street	Paint and Awning	\$ 1,999.00	\$ 1,999.00	\$ 1,999.00	\$ 1,999.00		\$ 1,999.00	\$ 1,999.00	Completed
	26	21	John C. Allen	6825 Oak Street	Windows and Shutters	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00		\$ -	Awarded
	27	23	Resource Real Estate (Scoops Ice Cream)	6835 Caroline Street	Paint, Awning, Signage & Doors	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00		\$ -	Awarded
<u>2022 Cycle 1</u>	28		Cohen Innovation, LLC	5739 Stewart Street	Facia and Soffet Replacement	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 20,000.00		\$ 10,000.00	\$ -	Awarded
	29		CD Properties	6821 Caroline Street	Window and Door Wood Rot Replacement/Repair	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 20,000.00	\$ 10,000.00		\$ -	Awarded
	30	24	Santa Rosa Historical Society - Imogene	6866 Caroline Street	Window Wood Rot Replacement/Repair	\$ 2,500.00	\$ 2,500.00	\$ 2,500.00	\$ 2,802.00	\$ 2,500.00		\$ 2,500.00	Completed
<u>2022 Cycle 2</u>	31	25	Bar Strength & Conditioning, LLC	5436 Dogwood Drive	Signage & Building Renovations for new location	\$ 6,000.00	\$ 6,000.00	\$ 5,000.00	\$ 150,000.00		\$ 6,000.00	\$ 6,000.00	Completed
	32	26	Oh Sugar, LLC, DBA The Sweet Greek	5237 Willing Street	Commercial Chiller	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 50,000.00	\$ 5,000.00			Awarded
<u>2022 Cycle 3</u>	33	27	Just Two Guys, LLC DBA The Country Gym	5198 Willing Street	Kitchen Hood	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 100,000.00	\$ 2,500.00	\$ 2,500.00	\$ 5,000.00	Completed
	34		Man Cave Barber Shop	5438 Dgwood Drive	Signage	\$ 617.39	\$ 617.39	\$ -	\$ -		\$ 617.39	\$ 617.39	Completed
	35	28	Primerica	5205 Dogwood Drive	Signage	\$ 877.40	\$ 877.40	\$ -	\$ -		\$ 877.40	\$ 877.40	Completed
<u>2023 Cycle 1</u>	36		Lindsay & Andrews	5218 Willing Street	New Business Equipment - Technology	\$ 5,000.00		\$ 5,009.00	\$ 5,000.00				
					TOTALS	\$ 143,192.68	\$ 137,642.68	\$ 138,156.88	\$ 705,458.03	\$ 68,475.68	\$ 68,466.91	\$ 92,059.13	
								ROI Ratio	\$ 5.13				
		Budget	\$ 10,000.00		FY 2018	3/29/2018							
			\$ 10,000.00		FY 2018	8/20/2018							
			\$ 20,000.00		FY 2019	12/12/2018	50% CRA/50% GR						
			\$ 20,000.00		FY 2019	4/9/2019	50% CRA/50% GR						
			\$ 40,000.00		FY2020	Program Returned to City - In City Budget				\$15,414.50 Refund from MSM			
			\$ 30,000.00		FY 2021	In City Budget							
			\$ 40,000.00		FY 2022	In City Budget							
			\$ 40,000.00		FY 2023	In City Budget							
		Total	\$ 210,000.00										
		Allocated	\$ 137,642.68										
		Expended	\$ 92,059.13										
		Open Projects	\$ 44,450.00										



Agenda Item # 2022-796

Basic Traffic Homicide Investigation Training

MEETING DATE

October 20, 2022

PREPARED BY

Tony Tindell, Police Chief

BACKGROUND

This is a request to send Officer Trent Barber and Officer Benjamin Gauntlett to the Basic Traffic Homicide Investigation training. This is an 80 hour course that will be held at the Tarpon Springs Police Department located at 444 South Huey Avenue in Tarpon Springs, FL. Course dates are January 17 - 26, 2023. Tuition is paid by a FDOT grant. Lodging is \$128 per night for 10 nights (\$1,280) at the Quality Inn & Suites US Hwy 19 North Tarpon Springs, FL 34689. Per Diem is \$454 per Officer (\$908). The total cost of this training is \$2,188 plus gas.

SUMMARY

Staff recommends approval to send Officers Trent Barber and Benjamin Gauntlett to the Traffic Homicide Investigation training on January 17 - 26, 2023 at the Tarpon Springs Police Department.

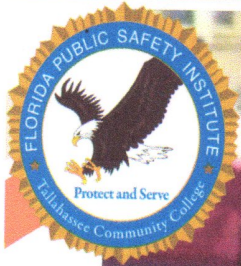
RECOMMENDATION

Staff recommends approval.

ATTACHMENTS

1. THI class

Basic Traffic Homicide Investigation (098)



CLASS DATES AND LOCATION:

January 17-26, 2023 (Tues-Fri & Mon-Thurs)

8:00 AM - 7:00 PM

**Tarpon Springs Police Department
444 S Huey Ave
Tarpon Springs, FL 34689**

Instructors: Steve Gassen & Frank Ruggiero

COURSE DESCRIPTION.

The student will be refreshed on their duties and responsibilities at the scene of a crash. The student will learn how to identify evidence found on the roadway and from the vehicle. An introduction to some of the important mathematical calculations and physical laws will be given. Also, the student will learn how to measure and diagram, and how to use photography and video to document the scene. The student will also participate in practical exercises involving measuring and diagramming.

Course topics will include:

- Physical evidence from the roadway
- Physical evidence from the vehicle
- Frictional forces and acceleration
- Determining speeds from skid mark evidence
- Crash scene photography
- Methods of measuring crash scenes
- Diagramming scenes and use of traffic templates
- Case preparation

CLASS INFORMATION

PREREQUISITES:

To attend this training the participant must be a Florida Law Enforcement Officer or Assistant State Attorney. Participants should have an aptitude towards mathematics. This class is 80 hours and is a salary incentive course. Salary incentive forms must be signed by agency representative authorizing incentive pay.

WHAT SHOULD I BRING?

All materials will be provided by the Florida Public Safety Institute.

WHAT ARE THE EXPENSES TO ATTEND?

Tuition for FDOT grant funded classes is covered fully by the grant. Housing and meals are covered ONLY for classes held at the Florida Public Safety Institute where the student is traveling over 50 miles to attend.

ENROLLMENT

To enroll in a class, or view classes available, go to the Tallahassee Community College website and follow the registration instructions. The link to that page is: <https://www.tcc.fl.edu/about/locations/florida-public-safety-institute/training/dui-and-traffic-safety/>.



For questions about registration or services we offer, contact the current program coordinator at:

Coordinator: Therese Willis

Email: traffsafe@tcc.fl.edu

Ph: (850) 201-7739

Florida Public Safety Institute

75 College Drive

Havana, FL 32333



Agenda Item # 2022-798

Sidewalks 2022-2023

MEETING DATE

October 20, 2022

PREPARED BY

Joe Cook, Public Works
Director

BACKGROUND

New sidewalks to be installed in FY 2022-2023.

1. Munson Hwy and Stewart St. \$19,500
 2. Park Ave & Stokes St., \$14,400
 3. Conecuh St & Berryhill St. \$6,450
 4. Conecuh St & Monroe St., \$2,300
 5. Willing St., \$15,100
 6. Santa Rosa St., \$26,600
 7. Mary St. \$ 51,000
 8. Henry St from Municiple St to City Limit Sign \$54,778.64
- Councilman Leek would like to include Lark Ave at a cost of \$75,820.40.
Grand Total of \$265,949.04

SUMMARY

New sidewalks to be installed in FY 2022-2023.

1. Munson Hwy and Stewart St. \$19,500
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- Councilman Leek would like to include Lark Ave at a cost of \$75,820.40.
Grand Total of \$265,949.04

RECOMMENDATION

Staff recommends approval

ATTACHMENTS

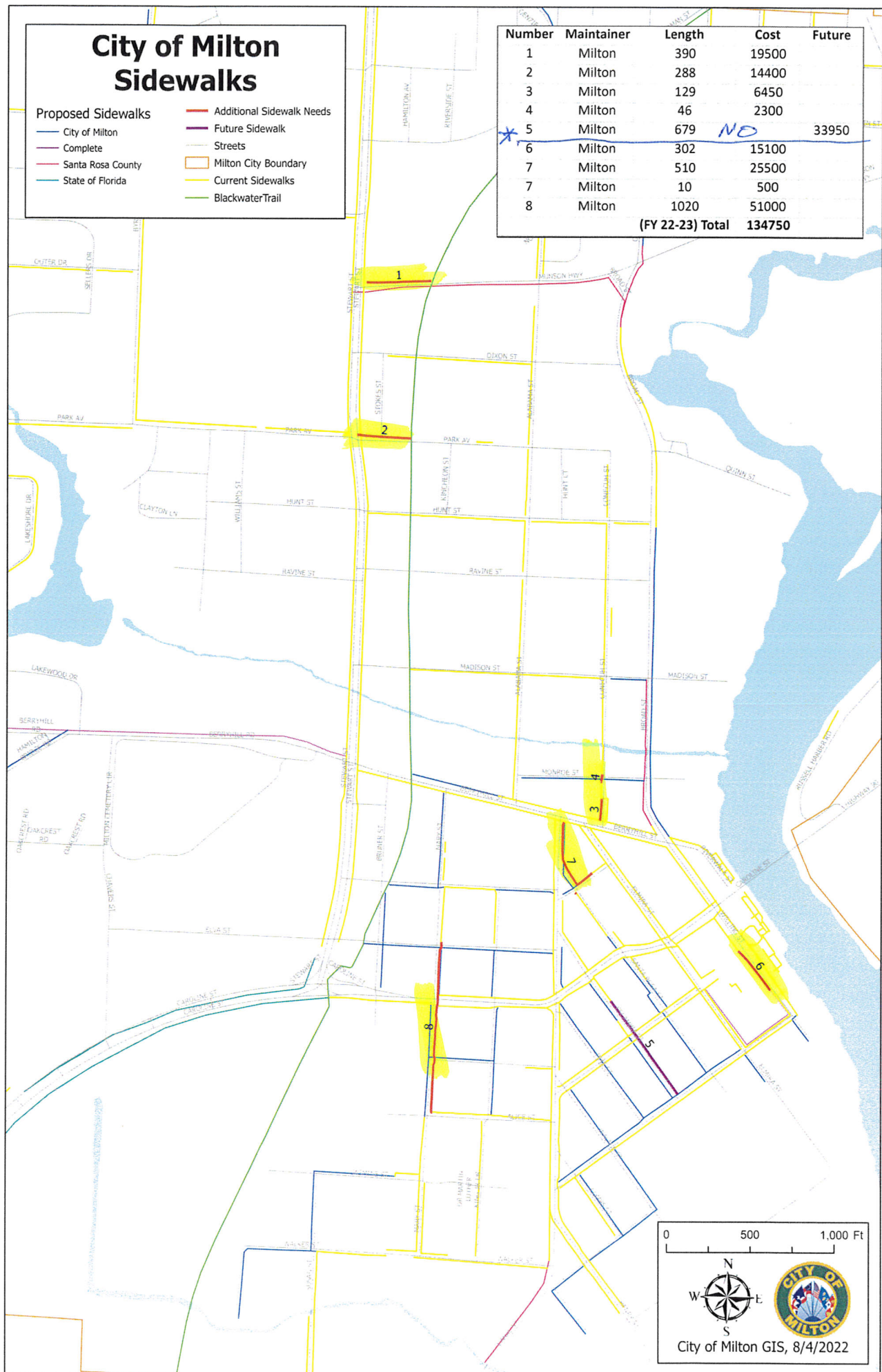
1. FY2022-2023 Sidewalks

City of Milton Sidewalks

Proposed Sidewalks

- City of Milton
- Complete
- Santa Rosa County
- State of Florida
- Additional Sidewalk Needs
- Future Sidewalk
- Streets
- Milton City Boundary
- Current Sidewalks
- Blackwater Trail

Number	Maintainer	Length	Cost	Future
1	Milton	390	19500	
2	Milton	288	14400	
3	Milton	129	6450	
4	Milton	46	2300	
5	Milton	679	33950	
6	Milton	302	15100	
7	Milton	510	25500	
7	Milton	10	500	
8	Milton	1020	51000	
(FY 22-23) Total			134750	



Agenda Item # 2022-721

Blackwater River Water Quality and Solutions to Closure of Oyster Harvest Area



Christian Wagley
Coastal Organizer, Florida-Alabama Healthy
Gulf

MEETING DATE

October 20, 2022

PREPARED BY

Dawn Molinero, City Clerk

BACKGROUND

Organizations and businesses call on local and state officials to identify solutions to increased bacterial contamination causing the State of Florida to close additional areas of the Pensacola Bay system to the harvest of oysters. These new closed areas are triggering the relocation of an existing oyster farm in East Bay, significantly reducing the areas available for the harvest of oysters and come as millions of dollars are being spent to restore oyster reefs and establish shellfish aquaculture in local bays.

SUMMARY

Organizations and businesses call on local and state officials to identify solutions to increased bacterial contamination causing the State of Florida to close additional areas of the Pensacola Bay system to the harvest of oysters. These new closed areas are triggering the relocation of an existing oyster farm in East Bay, significantly reducing the areas available for the harvest of oysters and come as millions of dollars are being spent to restore oyster reefs and establish shellfish aquaculture in local bays.

Christian Wagley
P. O. Box 13412
Pensacola, FL 32591
healthygulf.org

RECOMMENDATION

Discussion item

ATTACHMENTS

1. statement on new closed areas in bays Aug. 2022
2. 2017 swim plan
3. oyster slides for Milton City Council 10-20-22

August 30, 2022

FOR IMMEDIATE RELEASE

Contact: Christian Wagley, christian@healthygulf.org (850) 687-9968

******MEDIA ADVISORY******

Local organizations call for solutions to closure of oyster harvest areas

The undersigned organizations and businesses call on local and state officials to identify solutions to increased bacterial contamination causing the State of Florida to close additional areas of the Pensacola Bay system to the harvest of oysters. These new closed areas are triggering the relocation of an existing oyster farm in East Bay, significantly reducing the areas available for the harvest of oysters, and come as millions of dollars are being spent to restore oyster reefs and establish shellfish aquaculture in local bays.

The Florida Department of Agriculture and Consumer Services (FDACS) recently announced that water quality monitoring indicates that bacterial contamination in areas of Escambia and East Bays requires the expansion of prohibited areas where the harvest of oysters and other shellfish is no longer allowed. As elevated levels of certain bacteria can indicate the presence of disease-causing organisms, this action is being taken in order to “protect the health of shellfish consumers,” according to FDACS. The Department is currently undergoing the state rulemaking process to expand these prohibited areas, with the designation made final this fall.

We call on Santa Rosa and Escambia Counties, the State of Florida and the local community to take the following steps to help remedy this issue:

- 1) To fund and initiate additional research to pinpoint the specific sources of elevated bacteria levels in these areas;
- 2) To dedicate staff and other resources toward identifying the most cost-effective solutions for reducing bacteria levels. That could include the expansion of sewer service to low-lying and waterfront areas and better stormwater controls, among other solutions;
- 3) FDACS should continue to monitor bacteria levels inside the new prohibited areas. Such monitoring could reveal future improvements in water quality that could allow these areas to reopen to shellfish harvest.

In the spirit of finding solutions, our respective organizations pledge to convene a meeting this fall to bring together stakeholders to identify the best ways to reduce bacterial contamination in local bays and to eventually allow these newly-closed areas to reopen to oyster harvest.

We've asked a few stakeholders to share their thoughts on the expansion of prohibited shellfish harvest areas and its impact on our waterways and the oyster industry:

"In my educated/experienced opinion this new closure is due to the increased population density along and near our miles of pristine coast with no infrastructure to support the growth (sewer systems). The mound system septic systems that have been used and are still being permitted today are only leaching sewage into our rivers and bays.

Our bays have been on the decline for several years now and now we are seeing a reduction not only with oyster harvest but finfish harvest in recent years has been decreasing, as evidenced by FWC trip reports.

If action to correct this problem is not taken immediately, we stand to lose a great ecological asset that this county has been blessed with."

--Capt. Pasco Gibson, lifelong waterman, Santa Rosa County

"As a small business owner and a first-year start-up, in the already difficult oyster aquaculture industry, the closing of historic oyster harvest area has affected me adversely not only from a monetary standpoint (having to come up with startup cost a second time) but as an environmentalist. Watching my home and what was once considered pristine turn into dead and barren waterways is heart wrenching. We should be looking at unorthodox, natural solutions to water quality issues such as living shorelines, wetland filtration for sewage plants and stormwater runoff, and buffer zones and ordinances for preserving existing vegetation in subdivisions/developments. The continued degradation of the bays and estuaries will only continue to harm all who live, work and recreate here for generations. If something isn't done on a bigger scale to improve the damage or stop the progression of pollution, the area will close permanently to harvest and what was the second largest producing area of oyster (next to Apalachicola Bay) will no longer be harvestable at all."

--Shana Alford, Founder and Owner, Avalon Aquaculture

"Save our Soundside, Inc., started as a grass-roots organization whose goal was to prevent the clear cutting of large tracts of land on the peninsula due to the results we observed first hand, including the degradation of our land and waterways. The official position of the FDACS is that they have no role in managing coastal natural resources with respect to upland development. Nor do our local leaders have the political will to increase buffers or decrease clear cutting for fear of hampering development. While we are convinced that leaching septic tanks are contributing to higher bacterial counts in our waterways, SOS also believes that stormwater and sediment runoff, clear cutting, destruction of wetlands, and run-away development causes collateral damage that degrades the overall health of our waterways. Thus, we need research to pinpoint sources of bacterial contamination and other factors that contribute to the deterioration of our waterways."

--Dara Lynn Hartigan, President, Save our Soundside, Inc.

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Coalition 4 Santa Rosa's Water Future

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Additional information to include official FDACS rulemaking documents and a map of the proposed prohibited harvest areas are attached. Questions for FDACS should be directed to the Department's Communications point of contact--Erin Moffet--erin.moffet@fdacs.gov (850) 766-7358

Pensacola Bay System Surface Water Improvement and Management Plan



October 2017

Program Development Series 17-06

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Executive Summary

The Pensacola Bay system covers over 6,800 square miles of northwest Florida and southern Alabama. This system includes the combined drainage areas of the Escambia, Blackwater, and Yellow river watersheds together with those of Escambia, Pensacola, East, and Blackwater bays and Santa Rosa Sound. The overall watershed includes the Florida Panhandle's largest metropolitan area, a number of other inland and coastal communities, and conservation lands that protect and sustain natural resources. Ecologically diverse, this watershed includes alluvial and blackwater rivers, floodplain swamps, tidal marshes, seagrasses, and oyster beds, among other types of natural communities. The water resources that comprise the Pensacola Bay system provide numerous functions critical to human quality of life. The watershed's wetlands and floodplains store and regulate stormwater runoff, protecting water quality, protecting against floodwaters, and recharging aquifers and potable water supplies. Its rivers, streams, and coastal waters sustain numerous species of fish, shellfish, and wildlife, and its wetlands and coastal barriers provide resiliency against storms and coastal change.

This is the third update to the Pensacola Bay system Surface Water Improvement and Management (SWIM) plan. The purpose of the plan is to provide a framework for surface water resource management, protection, and restoration using a watershed approach. Protecting and restoring watershed resources are shared responsibilities of numerous stakeholders, including local governments, state and federal agencies, private businesses, and the public. They require building upon past accomplishments to encompass a range of management approaches.

Since 1997, when the Pensacola Bay system SWIM plan was last updated, significant progress and noteworthy accomplishments have been achieved. Cooperative efforts have included multiple stormwater retrofit projects to reduce nonpoint source pollution. Project Greenshores, northwest Florida's largest estuarine restoration project, was constructed in Pensacola Bay, and public and private initiatives have spearheaded efforts to raise awareness of resources and challenges and to expand access to data and information about resource quality. Additionally, the Emerald Coast Utilities Authority replaced the Main Street Wastewater Treatment Plant with the new Central Water Reclamation Facility, eliminating a 20 million gallon per day discharge into Pensacola Bay.

Nevertheless, significant challenges continue to affect water quality, natural systems, and public benefits provided by the Pensacola Bay system and the individual waterbodies within it. Historical point source and nonpoint source pollution, for example, have degraded benthic habitat conditions and caused seagrasses within the main body of the estuary to be substantially lost. Population in the Florida portion of the watershed has steadily increased over the last several decades: from 311,720 in 1990 to 424,486 in 2010, a 36 percent increase over 20 years. Population over the next twenty years (2010-2030) is projected to increase by perhaps 22 percent, with continuing changes in land use and increasing demands on wastewater and stormwater management systems.

Addressing such challenges requires a wide range of strategies. Among these are additional improvements in the treatment and management of stormwater runoff; implementation of best management practices for agriculture, silviculture, and construction activities; and continued advances in wastewater treatment and management. To complement these efforts, long-term protection of critical habitats and associated buffer areas is needed. Public outreach and education, monitoring, and analysis are needed in support of all of these. Management options and strategies are described in Chapter four of the plan, and projects identified are listed in the table below:

Recommended Projects: Pensacola Bay System SWIM Plan

Stormwater Planning and Retrofit
Septic Tank Abatement
Advanced Onsite Treatment Systems
Agriculture and Silviculture BMPs
Basinwide Sedimentation Abatement
Riparian Buffer Zones
Aquatic, Hydrologic and Wetland Restoration
Estuarine Habitat Restoration
Strategic Land Conservation
Watershed Stewardship Initiative
Sub-basin Restoration Plans
Wastewater Treatment and Management Improvements
Interstate Coordination
Analytical Program Support
Comprehensive Monitoring Program

To further implementation of priority projects, the plan outlines a range of available funding resources. Because these change over time, the plan is intended to be adaptable to evolving programs and resources.

Addressing the issues outlined in this plan and implementation of the strategies described requires a long-term, comprehensive approach with continuing collaboration between state and federal agencies, local governments, nonprofit initiatives, regional agencies, private businesses, and members of the public. In August 2017, the U.S. Environmental Protection Agency announced that Escambia County's proposal for the Pensacola and Perdido Bays Estuary Program was selected for funding from the RESTORE program. This program may build upon past efforts to engage stakeholders across the region and further advance both the protection and restoration of the Pensacola Bay system and its public benefits.

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Abbreviations and Acronyms

AFB	Air Force Base	NPS	nonpoint source (pollution)
BARC	Bay Area Resource Council	NRC	National Research Council
BFA	Bream Fishermen Association	NRCS	Natural Resources Conservation Service
BMAP	Basin Management Action Plan	NOAA	National Oceanic and Atmospheric Administration
BMP	best management practice	NPDES	National Pollutant Discharge Elimination System
cfs	cubic feet per second	NRDA	Natural Resource Damage Assessment
CWA	Clean Water Act	NWFWMD	Northwest Florida Water Management District
DO	dissolved oxygen	OFWs	Outstanding Florida Waters
ECUA	Emerald Coast Utilities Authority	OSTDS	onsite sewage treatment and disposal systems
EECT	Environmental Education Coordination Team	PERCH	Partnership for Environmental Research and Community Environmental Health
EPA	U.S. Environmental Protection Agency	RESTORE	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (Act)
ERP	Environmental Resource Permitting	SAV	submerged aquatic vegetation
ESA	Endangered Species Act	SEAS	Shellfish Environmental Assessment Section
°F	Degree Fahrenheit (temperature)	SHCA	Strategic Habitat Conservation Area
F.A.C.	Florida Administrative Code	SIMM	Seagrass Integrated Mapping and Monitoring
FDACS	Florida Department of Agriculture and Consumer Services	SMZs	Special Management Zones
FDEP	Florida Department of Environmental Protection	SWIM	Surface Water Improvement and Management
FDOH	Florida Department of Health	SWTV	Surface Water Temporal Variability
FDOT	Florida Department of Transportation	TMDL	total maximum daily load
FEMA	Federal Emergency Management Agency	TNC	The Nature Conservancy
FGS	Florida Geological Survey	UF-IFAS	University of Florida Institute of Food and Agricultural Sciences
FNAI	Florida Natural Areas Inventory	USACE	U.S. Army Corps of Engineers
F.S.	Florida Statutes	USDA	U.S. Department of Agriculture
FWC	Florida Fish and Wildlife Conservation Commission	USFWS	U.S. Fish and Wildlife Service
FWRI	Fish and Wildlife Research Institute	USGS	U.S. Geological Survey
GEBF	Gulf Environmental Benefit Fund	WBID	Waterbody identification number
GEMS	Gulf Ecological Management Site	WFRPC	West Florida Regional Planning Council
GIS	Geographic Information Systems	WMA	water management area
GSA	Geological Survey of Alabama	WWTF	wastewater treatment facility
I-10	Interstate 10	WWTP	wastewater treatment plant
INRMP	Integrated Natural Resources Management Plan		
IWR	Impaired Surface Waters Rule		
LOST	local option sales tax		
MFLs	minimum flows and minimum water levels		
mgd	million gallons per day		
MS4s	municipal separate storm sewer systems		
NAS	Naval Air Station		
NFWF	National Fish and Wildlife Foundation		

1.0 Introduction

The Pensacola Bay system is inclusive of the interconnected estuarine waterbodies of Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay and Santa Rosa Sound; the Escambia, Blackwater, East Bay Yellow, and Shoal rivers; and the greater contributing watershed. The watershed extends from southern Alabama south to the Gulf of Mexico. Within Florida, it includes portions of Escambia, Santa Rosa, Okaloosa, and Walton counties. Although about two-thirds of the contributing watershed is within Alabama, the scope of this plan for implementation purposes is limited to the Florida portion.

The Pensacola Bay system provides important environmental functions with numerous benefits and services for surrounding communities. Among watershed services are water storage and flood attenuation, groundwater recharge, regulation of discharge to receiving waters, water quality protection, cycling of energy and nutrients, erosion control, and stream bank stabilization. Additional human benefits are usable surface and ground waters, fish and wildlife resources, recreational opportunities, aesthetic characteristics, and associated economic benefits.

1.1 Purpose and Scope

The Surface Water Improvement and Management (SWIM) plan for the Pensacola Bay system is intended to provide a framework for resource management, protection, and restoration using a watershed approach. The SWIM Program is administered through the Northwest Florida Water Management District (NFWMD or District) and includes management actions to address water quality, natural systems, and watershed functions and benefits. This plan is an update to the original plan developed in 1990 and updated in 1997.

Development of the 2017 Pensacola Bay System SWIM Plan update (hereafter the 2017 SWIM Plan) is funded by a grant from the National Fish and Wildlife Foundation's (NFWF) Gulf Environmental Benefit Fund (GEBF), with the intent to further the purpose of the GEBF to remedy harm and eliminate or reduce the risk to Gulf resources affected by the Deepwater Horizon oil spill.

In the Pensacola Bay system, major stakeholders include:

- Northwest Florida Water Management District
- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission
- Florida Department of Agriculture and Consumer Services
- Florida Department of Economic Opportunity
- West Florida Regional Planning Council
- The Bay Area Resource Council
- Escambia, Santa Rosa, Okaloosa, and Walton counties
- Municipalities including Pensacola, Jay, Gulf Breeze, Milton, Paxton, Mary Esther, Laurel Hill, Century, and Crestview
- Emerald Coast Utilities Authority
- Unincorporated communities, including Pace, Ferry Pass, Bagdad, Holley, Navarre, Holt, and Allentown
- The Bream Fisherman Association
- The Bayou Chico Association
- U.S. Environmental Protection Agency
- U. S. Department of Agriculture
- U.S. Department of the Interior
- U.S. Fish and Wildlife Service
- The Nature Conservancy
- The National Fish and Wildlife Foundation
- National Wildlife Federation
- And many others within Florida and Alabama

The 1997 Pensacola Bay System SWIM identified four objectives to improve watershed conditions:

- Water and Sediment Quality Program, to reduce nonpoint source (NPS) pollution and point source pollution, and to mitigate impacts from contaminated sediments;
- Habitat Quality Program, to protect and restore aquatic and wetland habitats, facilitate restoration of seagrasses and fisheries, and research biological status and trends for the system;
- Administration, Planning and Coordination Program, to coordinate long-range planning, provide technical information, participate in management efforts and measure successes; and
- Public Education and Awareness Program, to promote understanding and awareness of issues, watershed management concepts, and remedies to educators and the public Program.

This 2017 SWIM Plan continues support for actions identified in the 1997 Plan, while also addressing new issues, ongoing challenges, and opportunities for achieving watershed protection and restoration. Further, the 2017 SWIM Plan describes the watershed's physical characteristics and natural resources, provides an assessment of the watershed's current condition, and identifies priority challenges affecting watershed resources and functions. The 2017 SWIM Plan also prescribes a set of management actions and projects to meet those challenges and needs. Management actions are generally limited to those within the mission and scope of the NFWFMD SWIM program, recognizing the ongoing initiatives and needs of local communities and other agencies. The projects outlined are intended to leverage funding from many sources; integrating the efforts of local governments, state and federal agencies, and private entities to achieve mutual objectives and goals; and to present innovative solutions to watershed issues.

1.2 SWIM Program Background, Goals, and Objectives

Surface Water Improvement and Management plans have been developed pursuant to the SWIM Act, enacted by the Florida Legislature in 1987 and amended in 1989 through sections 373.451-373.459, Florida Statutes (F.S.). Through this Act, the Legislature recognized threats to the quality and function of the state's surface water resources. The Act authorized the state's five water management districts to

- Develop plans and programs to improve management of surface waters and associated resources;
- Identify current conditions and processes affecting the quality of surface waters;
- Develop strategies and management actions to restore and protect waterbodies; and
- Conduct research to improve scientific understanding of the causes and effects of the degradation of surface waters and associated natural systems.

In addition to the SWIM Act of 1987, the following Florida Statutes and administrative codes support and complement the SWIM program:

- Chapter 259, F.S.: Florida Forever Act: Land Acquisitions and Capital Improvements for Conservation or Recreation
- Chapter 375, F.S.: Land Acquisition Trust Fund
- Section 403.067(7)(A)4, F.S.: Total Maximum Daily Loads (TMDLs)
- Section 373.042, F.S.: Minimum Flows and Minimum Water Levels
- Chapter 62-43, Florida Administrative Code (F.A.C.): Surface Water Improvement and Management Act
- Chapter 62-302, F.A.C.: Surface Water Quality Standards
- Chapter 62-303, F.A.C.: Identification of Impaired Surface Waters
- Chapter 62-304, F.A.C.: TMDLs

For the purposes of SWIM, watersheds are the hydrological, ecological, and geographical units for planning and managing restoration efforts along Florida's Gulf Coast. Successful watershed management

requires coordination and implementation of complementary programs and projects with jurisdictions, agencies, and other stakeholders across the watershed. Among these are local, state, and federal agencies; conservation land management organizations; non-governmental organizations; and other interested stakeholders.

The SWIM program addresses watershed priorities by identifying management options and supporting cooperative project implementation. Projects may include stormwater retrofits for water quality improvement, wetland and aquatic habitat restoration, resource assessments, and wastewater management improvements, among others.

Surface Water Improvement and Management plans integrate complementary programs and activities to protect and restore watershed resources and functions. They are also designed to address water quality and natural systems challenges to achieve the District's goal and strategic priorities outlined in the District's strategic plan.

2.0 Watershed Description

2.1 Geographic and Geological Characteristics

The contributing watershed of the Pensacola Bay system covers approximately 4,371,534 acres extending from southern Alabama through the western Florida Panhandle. The watershed includes three major rivers: the Escambia, Blackwater, and Yellow rivers, as well as the smaller East Bay River. These, in turn, discharge into the estuarine component of the watershed, which includes Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and Santa Rosa Sound. The Escambia River, the largest in the watershed, begins as the Conecuh River in Alabama. The Blackwater and Yellow rivers also have their origins in southern Alabama.

Within Florida, the watershed encompasses the majority of Escambia, Santa Rosa, and Okaloosa counties and the northwest quadrant of Walton County (Figure 2-1). In Alabama, the watershed is mostly located in Covington, Escambia, and Conecuh counties; with smaller areas in Butler, Crenshaw, Pike, Montgomery, and Bullock counties.

Florida municipalities in the watershed include the cities of Pensacola, Gulf Breeze, Milton, Crestview, Century, Jay, Paxton, Laurel Hill, and Mary Esther. Unincorporated communities include Pensacola Beach, Warrington, Pace, Navarre, Navarre Beach, and Holt. The watershed also includes Naval Air Station (NAS) Pensacola and NAS Whiting Field, and a portion of the Eglin Air Force Base (AFB) reservation.

Pensacola Bay system watershed attributes:

- Two states: Alabama and Florida
- Four Florida counties
- Three major river systems
- Five interconnected estuarine waterbodies
- 31 distinct natural communities
- 6,831 square miles

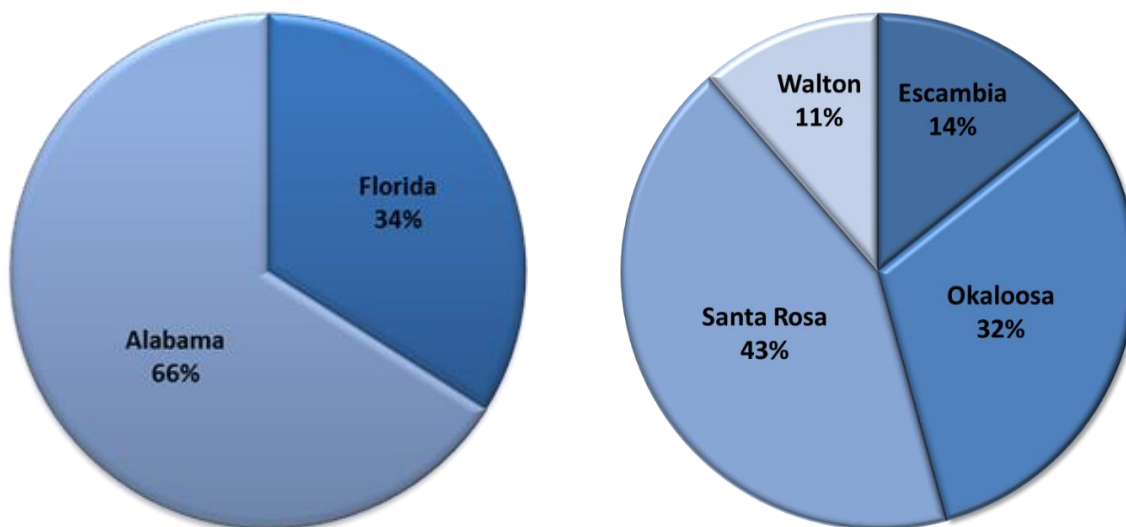


Figure 2-1 Proportion of the Pensacola Bay Watershed by State and Florida Counties

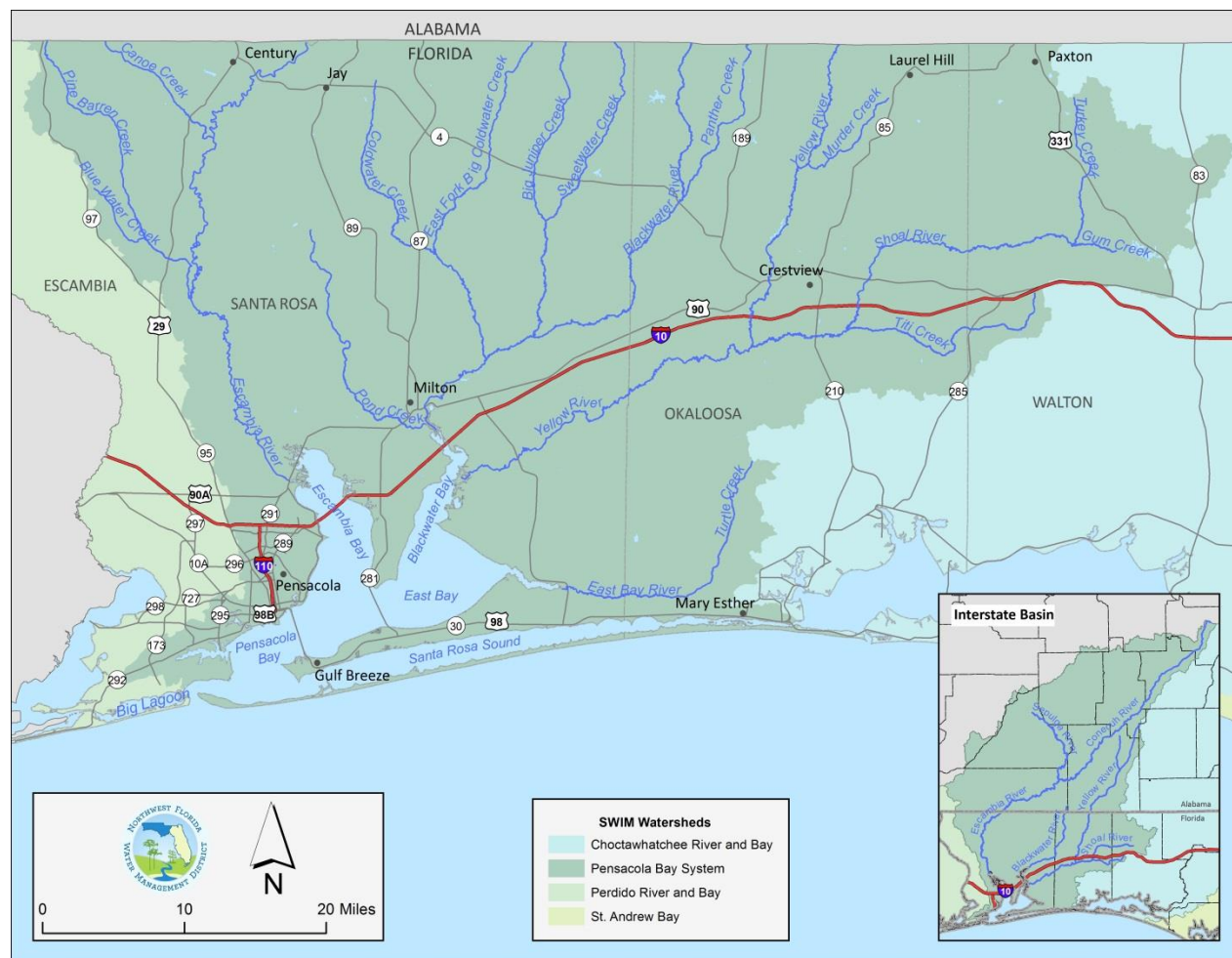


Figure 2-2 Features of the Pensacola Bay Watershed

The overall watershed, including Alabama's portion, lies within the Gulf Coastal Plain physiographic region, which is characterized by gently rolling hills, sharp ridges, prairies, and alluvial floodplains underlain by sediments of sand, gravel, porous limestone, chalk, marl, and clay. Within this greater physiographic region, the Florida portion of the watershed contains two localized physiographic regions: the Western Highlands and the Gulf Coastal Lowlands (USGS 2013).

The Escambia, Blackwater, and Yellow river basins are within the Western Highlands subsection of the Northern Highlands, which spans the northern Panhandle. The Northern Highlands region is characterized by greater topographic relief than the Gulf Coastal Lowlands and contains extensive clay deposits overlying limestone bedrock of the Citronelle formations, ancient delta deposits of clays, clayey sands, and gravel. The Western Highlands extend from 378 feet in elevation in Alabama down to a relict marine terrace of approximately 100 feet (Rupert 1993). The rolling hills of the Western Highlands have sandy soils and generally dry conditions, with groundwater emerging from lower slopes to create hillside seepage bogs (Wolfe *et al.* 1988).

The estuarine embayments are within the Gulf Coastal Lowlands; a region of successively higher, parallel terraces rising from the coast. Terraces of the Gulf Coastal Lowlands formed during the Pleistocene Epoch when fluctuating sea levels were associated with the growth and melting of ice caps. Dunes, barrier islands, beach ridges, and other topographical features were stranded inland as seas receded. Land surfaces are generally level and less than 100 feet above sea level. Substantial areas are less than 30 feet

above sea level and are characterized by extensive wetlands. Higher elevations are present in the general area of Pensacola, on the west side of Escambia Bay and the north side of Pensacola Bay.

The watershed of the Pensacola Bay system follows much of the general stratigraphy of the western Florida Panhandle. Many of the watershed's geologic features are a product of prehistoric marine deposition during periods when sea level was higher than the present. Near-surface formations within Florida's portion of the watershed include dolomitic limestones, sandy clayey limestones, shell beds, clayey sands, and sands (Scott 2001). Overlying most geologic formations are unconsolidated Holocene (11,700 years ago to the present) siliciclastic sediments (nearly pure quartz sands with minor heavy mineral sands) (Scott 2001). These were deposited during sea level fluctuations and are presently found on the barrier islands.

In the upper portion of the watershed, the Citronelle Formation forms the stream-incised hills of the Western Highlands and forms a distinct bluff at Bay Bluff, along the western shore of Escambia Bay (USDA 2004). Additionally, the Miocene (origins 23.3 to 5.3 million years before present) Alum Bluff Group is found along the upper reaches of the Yellow and Shoal rivers.

Most of the southern boundary of Escambia and East bays is formed by the Fairpoint Peninsula, a sandy coastal barrier feature. The southern boundary of the system is formed by Santa Rosa Island, which is approximately 50 miles long and varying between approximately 1,000-1,500 feet wide (Morang 1992). The island is made up of Holocene quartz sands, between 15 and 30 feet thick, overlying a Pleistocene (2.6 million years to 11,000 years before present) core.

Soils in the southern portion of the watershed, in the vicinity of the estuary are predominantly of sandy composition. Soils in the northern reaches typically contain more organic matter and are of moderate permeability. Hydric soils are predominantly found along the floodplains of the major rivers and tributaries and other wetland systems. Detailed information about the watershed's physiography, geology, and soils is provided in Appendix C.

2.2 Hydrologic Characteristics

2.2.1 Major Streams and Tributaries

The three major river systems of the watershed begin as blackwater streams in southern Alabama. Of these, the Escambia River is the largest, extending 240 miles from Escambia Bay to Pike County, Alabama, draining over 4,200 square miles across both states (90 percent within Alabama). The Yellow River extends approximately 110 miles from the eastern shore of Blackwater Bay to a point northeast of Andalusia, Alabama. The Yellow River is joined by its major tributary, the 33-mile Shoal River, near the City of Crestview. The Yellow River drainage basin covers 1,365 square miles, with 64 percent within Florida. The Blackwater River flows approximately 60 miles and drains 860 square miles, of which 81 percent is in Santa Rosa and Okaloosa counties. East Bay River, a smaller 15-mile river located in coastal Santa Rosa and Okaloosa counties, enters East Bay near Navarre and Eglin AFB. Average annual flows of the major river systems discharging into the Pensacola Bay system are listed in Table 2-1. Surface water features are shown in Figure 2-3.

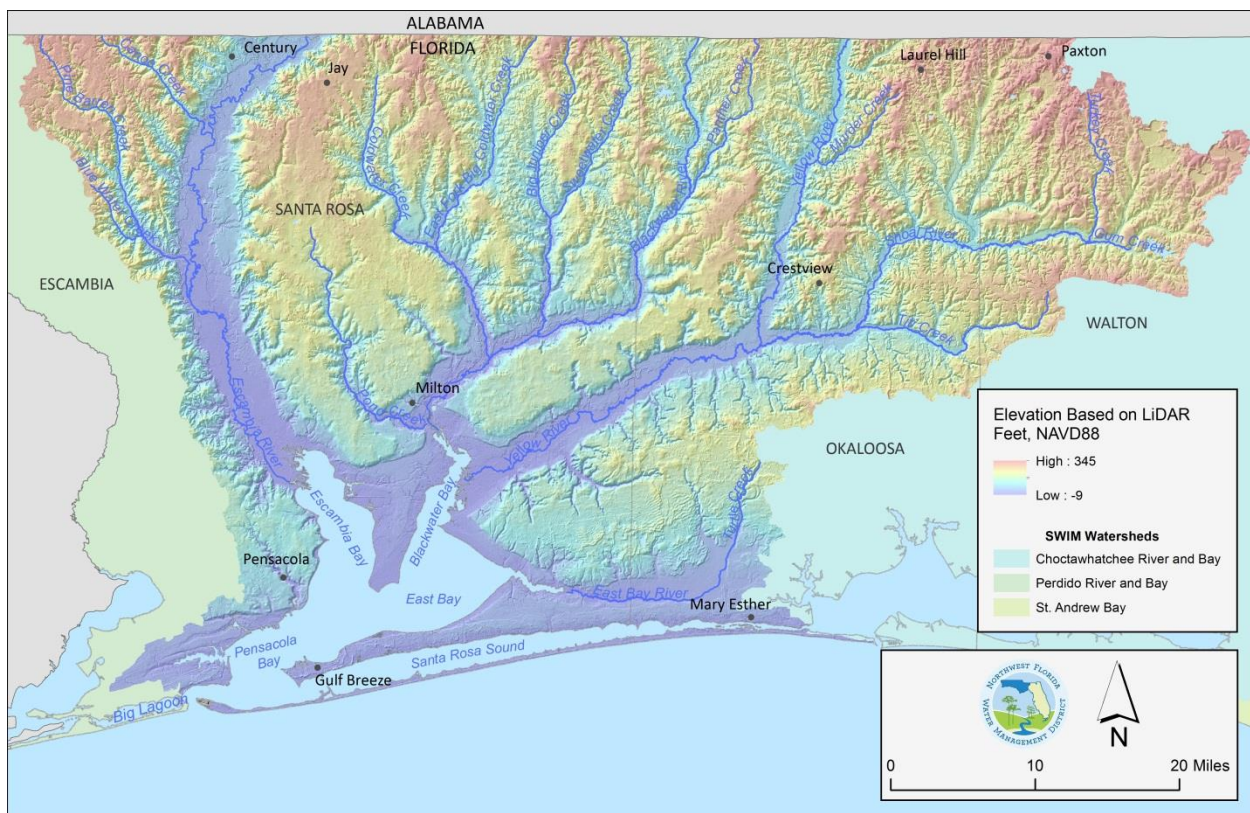
Table 2-1 Average Annual Flow of the Major Rivers

River	Period of Record	Average Annual Discharge*
Escambia River near Century	1935-2016	6,070
Yellow River near Milligan	1938-2016	1,147
Shoal River near Crestview	1938-2017	1,094
Blackwater River near Baker	1950-2016	348

* Cubic feet per second

Source: U.S. Geological Survey, National Water Information System

In addition to the major rivers, there are numerous smaller tributaries of the rivers and estuary. Among these are Carpenter Creek, Pond Creek, Big Coldwater Creek, Pine Barren Creek, and Titi Creek, as well as drainages through numerous smaller embayments (bayous) along Pensacola, Escambia, East, and Blackwater bays.

**Figure 2-3 Topography and Major Waterbodies**

The hydrogeology of the Pensacola Bay system watershed is characterized by considerable interaction between surface water and groundwater. The surficial aquifer, locally referred to as the sand-and-gravel aquifer, is the primary source of potable water in the region and is primarily recharged by localized rainfall. Water in the sand-and-gravel aquifer is recharged through direct infiltration of rainwater and therefore fluctuates in elevation reflecting seasonal differences in rainfall (NFWMD 2014). Groundwater from this aquifer discharges to the Escambia River and other major tributaries, as well as to smaller inland streams within the watershed.

2.2.2 Floodplains and Wetlands

As illustrated by Figure 2-4, extensive floodplains encompass the lengths of the Escambia and Yellow Rivers. Major wetland systems are also within the Garcon Point and Fairpoint peninsulas, and within the headwaters of the East Bay River. Most of the floodplains within the watershed correspond with wetlands. Wetland communities are described further in Section 2.4.

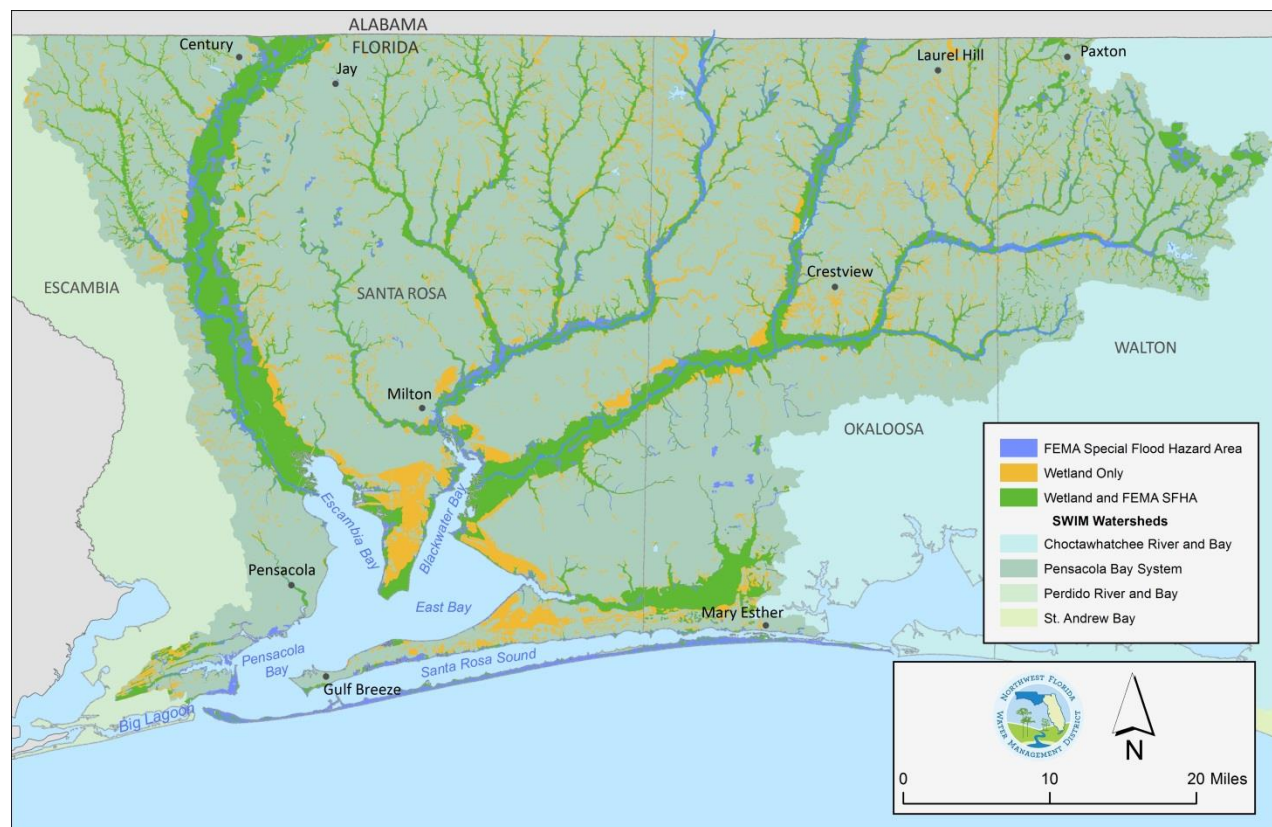


Figure 2-4 Floodplains and Wetlands

2.2.3 Coastal Waterbodies

Estuarine waters of the Pensacola Bay system, including Pensacola Bay, Escambia Bay, Blackwater Bay, East Bay, and Santa Rosa Sound, encompass approximately 187 square miles. The estuary exhibits a low tidal range with limited flushing and circulation and vertical salinity stratification (Olinger *et al.* 1975). Conditions in Escambia, Pensacola, Blackwater, and East bays are heavily influenced by riverine inflow.

Pensacola Bay is located in Escambia and Santa Rosa counties and has an approximately one-half mile wide pass to the Gulf of Mexico. Escambia and East Bays adjoin Pensacola Bay, along with bayous Texar, Chico, and Grande. Escambia Bay is immediately north of Pensacola Bay and covers roughly 36 square miles between Garcon Point on the east and Magnolia Point to the west. The primary source of fresh water inflow to Escambia and Pensacola bays is the Escambia River. Additional freshwater sources are Pace Mill Creek, Carpenter Creek, and Jones Creek, as well as the contributing basins of several bayous.

Located at the mouth of the Blackwater River, Blackwater Bay covers approximately 10 square miles and is influenced by inflow from the Blackwater and Yellow rivers. East Bay adjoins Blackwater Bay at

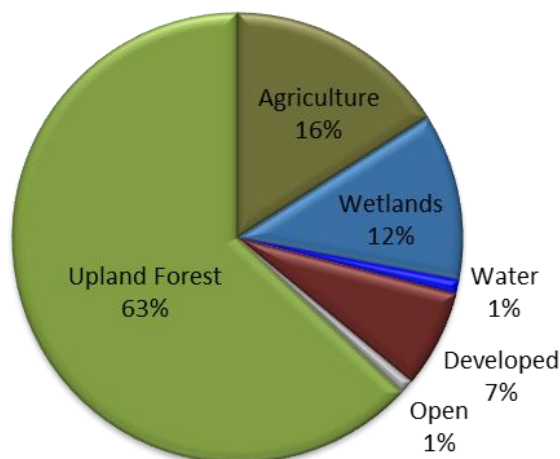
Escribano Point and Pensacola Bay between Garcon Point and Redfish Cove. The shoreline along Escribano Point and areas of Garcon Point are largely undeveloped.

Santa Rosa Sound is a 42-square-mile lagoon extending from Pensacola Bay and Gulf Breeze in the west to its confluence with Choctawhatchee Bay. The Sound is bordered to the north by the Fairpoint Peninsula and Santa Rosa Island to the south.

A prominent characteristic of the Pensacola Bay system estuary is a series of bayous that define much of the littoral zone. Bayous Grande, Chico, and Texar intersect with the City of Pensacola and NAS Pensacola. The drainage basins contributing to these bayous include Jones Swamp and Creek and Carpenter Creek. Major bayous on Escambia Bay in Santa Rosa County are Mulatto Bayou and Indian Bayou. The City of Gulf Breeze also has large bayous on the south shore of Pensacola Bay.

2.3 Land Use and Population

Land use and land cover across the greater Pensacola Bay system watershed, including Alabama, is predominantly upland forest, with substantial portions also consisting of wetlands, agricultural lands, and developed areas (Figure 2-5).



Source: FDEP 2015a, USGS 2011

Figure 2-5 Interstate Land Cover: Pensacola Bay Watershed

Within Florida, upland forest encompasses nearly half of the watershed. Wetlands encompass nearly 20 percent of the watershed, with agricultural and developed lands each comprising approximately 14 percent of the watershed (Table 2-2).

Table 2-2 2012-2013 Land Use and Land Cover in the Pensacola Bay System Watershed (within Florida)

General Land Use Category	Approximate Area ¹	Percent of Basin
Agriculture	330.5	14.2
Developed	315.4	13.5
Open Land	38.1	1.6
Upland Forests	1161.0	49.7
Water	27.3	1.2
Wetlands	462.5	19.8

Source: FDEP 2015a

¹Square miles

Urban development is concentrated in the southern and southwestern portion of the watershed, mostly within the Pensacola metropolitan area. This development extends south and east from the City of Pensacola to include Navarre, Pace, Pensacola Beach, Milton, and Gulf Breeze. Urban development in the northern portion of the watershed is mostly localized around the City of Crestview in Okaloosa County. Agricultural lands are concentrated in northern Escambia County, central and northern Santa Rosa and Okaloosa counties, and northern Walton County. Floodplains and wetlands are concentrated along the Escambia and Yellow Rivers, Garcon Point, and the East Bay River and Jones Creek basins. Generalized land use and land cover within Florida are presented in Figure 2-6.

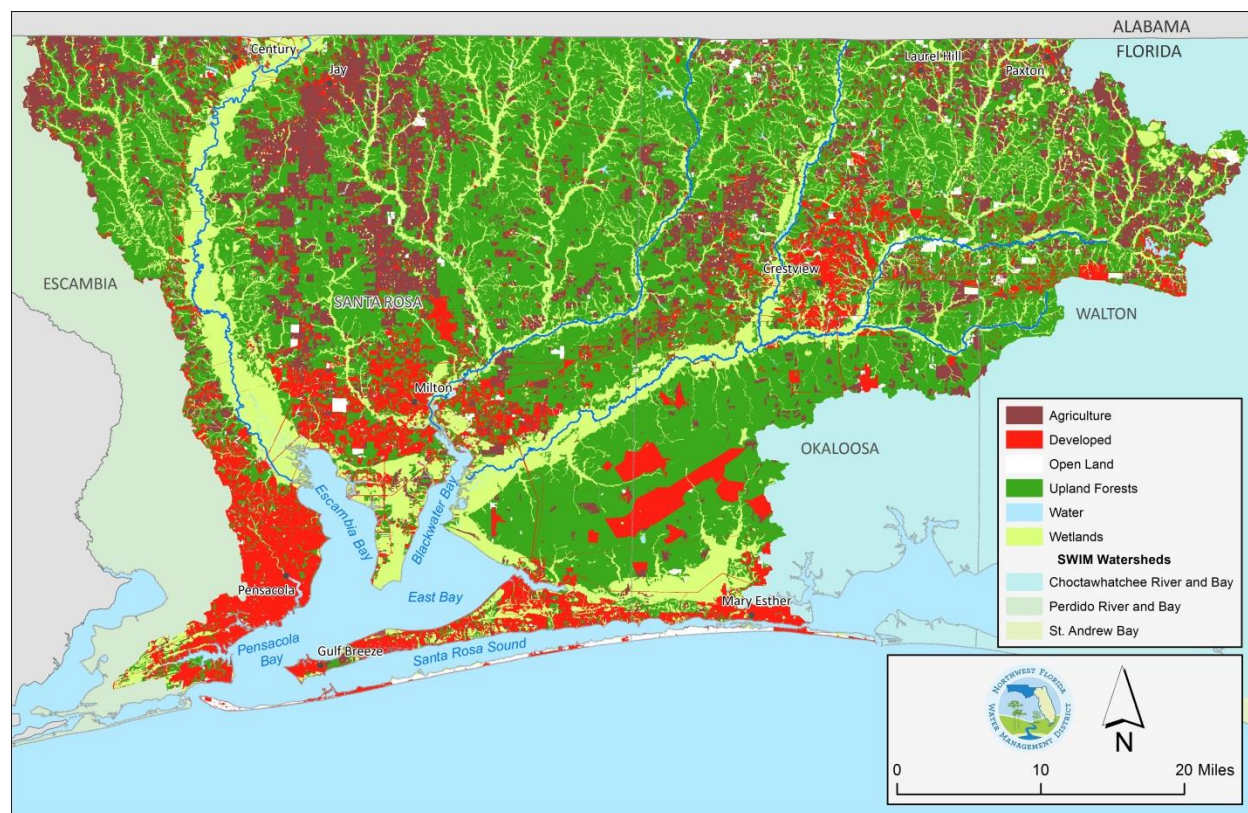


Figure 2-6 2012-2013 Land Use and Land Cover

Public lands in the watershed include the Blackwater, Escambia, and Yellow River water management areas (WMAs), Gulf Islands National Seashore, Blackwater River State Forest, several state parks, and

U.S. Department of Defense lands (Figure 2-7). These lands provide a buffer system that helps protect water quality, provide flood protection, and sustain integrated terrestrial and aquatic ecosystems. The District's WMA lands cover approximately 55,592 acres along the Escambia, Blackwater, and Yellow rivers and the Garcon Point peninsula. Gulf Islands National Seashore encompasses approximately 3,000 acres on Santa Rosa Island. Among state lands in the watershed are the Escribano Point Wildlife Management Area, Blackwater River State Forest, and the Blackwater River and Yellow River Marsh Preserve state parks. Public and conservation lands are discussed in more detail in Appendix G.



Figure 2-7 Conservation Lands in the Pensacola Bay System Watershed

The largest concentrations of population in the watershed are within Escambia and Santa Rosa counties. Table 2-3 displays population estimates for the watershed, based on spatial analysis of 2010 U.S. Census data, together with projections to 2030 calculated based on countywide population growth projections from the University of Florida's Bureau of Economic and Business Research (UF BEBR 2016).

Table 2-3 Watershed Population Estimates: 2010-2030

County	2010	2020	2030
Escambia	178,766	188,743	196,279
Santa Rosa	151,372	178,731	205,142
Okaloosa	84,867	94,431	100,580
Walton	9,481	11,937	14,538
Total	424,486	473,842	516,538

2.4 Natural Communities

This section provides a summary of habitats and natural communities found in the watershed, particularly those most-influenced by surface water management activities, as well as information about some of the more important biological resources associated with them. More detailed information on the habitats and natural communities observed in the Pensacola Bay watershed, as well as the species those habitats support, are described in Appendices D and E.

Lewis *et al.* (2016) estimate that the Pensacola Bay system supports at least 1,400 estuarine plant and animal species, in addition to migratory species. Aquatic habitats within the watershed include salt marshes, seagrass beds, and oyster reefs. These habitats support wintering migratory waterfowl and many marine organisms, including juvenile sea turtles and commercially and recreationally important fish and shellfish. More than 200 species of fish and shellfish have been reported in the waters of the Pensacola Bay system, including five diadromous species: Alabama shad (*Alosa alabamae*), skipjack herring (*Alosa chrysochloris*), hogchoker (*Trinectes maculatus*), Gulf sturgeon (*Acipenser oxyrinchus desotoi*), and American eel (*Anguilla rostrata*) (FDACS 2013b).

2.4.1 Terrestrial Communities

Terrestrial habitats within the Pensacola Bay watershed include bluffs, longleaf pine-wiregrass forests, mesic flatwoods, sandhill and scrub communities, scrubby flatwoods, slope forests, upland hardwood forests, wet flatwoods, and xeric hammock. The conditions of these habitats vary widely across the watershed, depending on land use, land management, and other factors.

Many of the native pine forests have been cut for timber, cleared for agriculture, or intensively managed for silviculture. As a result, the watershed's uplands are now a mosaic of natural regeneration forests, pine plantations, agricultural lands, and developed areas (NFWMD 1990). Terrestrial communities also support a number of threatened and endangered species. Listed species within the watershed include the gopher tortoise (*Gopherus polyphemus*), gopher frogs (*Rana capito*), the reticulated flatwoods salamander (*Ambystoma bishopi*), the eastern indigo snake (*Drymarchon corais couperi*), and the red-cockaded woodpecker (*Picoides borealis*). All have been documented on the watershed's conservation lands including the Blackwater River State Park (FDEP 2016a). The Blackwater River State Forest is part of a series of contiguous conservation lands, including the Conecuh National Forest and Eglin AFB. Together, these lands constitute the largest remaining contiguous area of the mature longleaf pine forest ecosystem in the world and support one of the largest populations of red-cockaded woodpecker habitat on public lands (FDACS 2013b).

2.4.2 Major Rivers

The Escambia River is a large alluvial river that carries a heavy sediment load and has substantial variation in flows and a diversity of aquatic and wetland habitat types. The upper river (within Florida) is sand-bottomed, with sand bars and beaches forming along the inside arcs of river bends. According to Bass (1990), in-stream vegetation tends to be lacking, with habitat primarily provided by snags, exposed tree roots, and undercut banks. Bottomland hardwood forest and oxbow lakes border the main river, and pine forest occupies much of the riparian zone.

The Blackwater River and its tributaries are relatively shallow sand-bottomed streams. The lower river is tidally influenced, with large basins that provide additional habitat diversity. The Yellow River intersects the Western Highlands Region, creating substantial bluffs, prior to discharging into Blackwater Bay from the east. The Yellow River is described as a sand bottom river and is characterized by shallow clear-tan

waters. Its primary tributary, the Shoal River, originates in Walton County. Titi Creek is the major tributary of the Shoal River.

The Escambia and Conecuh rivers, as well as several tributaries, are designated as critical habitat for the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*). Additional critical habitat area is within the lower Blackwater River, the Yellow River, and the Shoal River from its confluence with the Yellow River to the U.S. Highway 85 overpass. Within the critical habitat are discrete areas that serve as potential spawning locations during the spring high flow events, and as summertime holding areas. These summertime holding areas are extremely important to the survival of the sturgeon, since the fish do not migrate to the estuary and gulf until the fall. The quality of the holding areas is also thought to be a significant factor in the reproductive health of the female sturgeon.

The main channel holding areas are often moderately deep to deep (~3-7 meters) runs, glides, gradual bends, or pool tail-outs. Main channel areas occurring immediately downstream of springs, tributaries, or distributary confluences are sometimes selected as holding areas, perhaps due to the water depth, water velocity, cool water influences of the tributary, or water chemistry. The second primary river habitat where sturgeon can be found are off-channel areas that are sheltered from the primary current of the main channel. These mesohabitats are often described as sloughs, bowls, or basins and typically have a deep and open connection to the main channel (Kaesler, 2016). Estuarine waters within the Pensacola Bay system are also designated critical habitat for the Gulf sturgeon, providing important winter habitat.

The Escambia, Yellow, and Shoal rivers provide critical habitat for several species of threatened and endangered freshwater mussels. The Escambia River includes critical habitat for the Round ebonyshell (*Fusconaia rotulata*), Choctaw bean (*Villosa choctawensis*), fuzzy pigtoe (*Pleurobema strodeanum*), southern kidneyshell (*Ptychobranhus jonesi*), southern sandshell (*Hamiota australis*), and narrow pigtoe (*Fusconaia burkei*). The Escambia River in Alabama also includes critical habitat for the Alabama Pearlshell (*Margaritifera marrianae*). The Yellow River system includes critical habitat for the Choctaw bean, narrow pigtoe, southern sandshell, and fuzzy pigtoe.

2.4.3 Riparian, Palustrine, and Floodplain Habitats

Riparian habitats include those areas along waterbodies that serve as an interface between terrestrial and aquatic ecosystems. Riparian areas are important fish and wildlife habitats that promote ecological diversity and assist in mitigating or controlling NPS pollution. Riparian vegetation can be effective in removing excess nutrients and sediment from surface runoff and shallow groundwater and in shading streams to optimize light and temperature conditions for aquatic plants and animals. Riparian vegetation, especially trees, is also effective in stabilizing streambanks and slowing flood flows, resulting in reduced downstream flood peaks. Major floodplains within the watershed are found along the Escambia, Yellow, Shoal, and Blackwater rivers.

Pitcher plant bogs can be found scattered throughout the Blackwater River State Forest, Yellow River Marsh Preserve State Park, and Garcon Point Water Management Area (FDACS 2013b; Florida Division of Recreation and Parks 2016c; FNAI 2010). They occur in isolated depressions of somewhat poorly drained soils and contain a high diversity of rare plants. American chaffseed (*Schwalbaea americana*), a federally endangered species, has been documented at one of the seepage slopes in the Blackwater State River Forest (FDACS 2013b).

The Yellow River Marsh Preserve State Park includes tracts of wet prairie classified by the FNAI as imperiled habitats in the State of Florida because of their rarity (Florida Division of Recreation and Parks 2016c; FNAI 2010). Nearly 20 rare and endangered species of plants and animals make their homes in the wet prairies, dome swamps, and flatwoods of the park. Wet prairies support some of the most diverse

plant communities in the southeast including a population of unique carnivorous plants (Florida Division of Recreation and Parks 2016c).

2.4.4 Emergent Marsh

In the salt marshes and nearshore tidal areas, species are adapted to the highly variable temperatures and salinities. Some species migrate in and out as necessary to take advantage of the food and shelter derived from the primary coastal habitats such as oyster reefs, marshes, and seagrasses (Lewis *et al.* 2016). Salt marsh communities within the Pensacola Bay watershed include both tidal marsh and floodplain marsh. Marsh species composition is influenced by a combination of salinity tolerance and differences in soil type, elevations, and competitive interactions. Salt marshes are similar to brackish marshes in that they serve as a transition between terrestrial and marine systems. Generally, salt marshes are intertidal and develop along relatively low energy shorelines. Unlike brackish marshes, they may be found under significantly more saline conditions. Salt marshes in the Florida Panhandle are usually characterized by large, fairly homogeneous expanses of dense black needlerush (*Juncus roemerianus*). Often, they are accompanied on the water-ward side by smooth cordgrass (*Spartina alterniflora*). The *Juncus* and *Spartina* zones are distinctive and can be separated easily by elevation.

Salt marshes are among the most productive plant communities on Earth (Fernald and Purdum 1998). Among the species found in salt marshes are mussels, oysters, fiddler crabs (*Uca sp.*), marsh periwinkles (*Littoraria irrorata*), crown conchs (*Melogenia corona*), mullet, and blue crabs. Emergent freshwater and brackish marshes are dominated by sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), giant cutgrass (*Zizaniopsis miliacea*), and cattails (*Typha spp.*), but may contain large interspersed patches of black needlerush. In contrast with more coastal salt marshes, these sites lack the extensive salt flats of saltgrass (*Distichlis spicata*), glasswort (*Salicornia spp.*), and salt barrens. Thirteen species of common waterfowl also winter in Pensacola Bay salt marshes (Lewis 1986).

Floodplain marsh occurs in the floodplains of the watershed's major river systems. These marshes are seasonally inundated and are dominated by maidencane, pickerelweed (*Pontederia cordata*), sagittaria, buttonbush (*Cephalanthus occidentalis*), wax myrtle (*Myrica spp.*), and other mixed emergent vegetation. Floodplain marsh covers approximately 2,400 acres at the mouth of the Yellow River. In addition to the marsh species, patchy stands of hardwoods and water tolerant pine trees have become established on small "islands" of higher elevation in the marsh (Gardner 1991).

2.4.5 Estuarine Habitat

Seagrass beds in the Pensacola Bay watershed (Figure 2-8) provide protective and foraging habitat for many marine species and are critical to the spawning cycle of many fish and invertebrate species, some of which are of great commercial and recreational significance. Among these are shrimp, spotted seatrout, Gulf menhaden, red drum or redfish, blue crab, Gulf flounder (*Paralichthys albigutta*), striped mullet (*Mugil cephalus*), and white mullet (Lewis *et al.* 2016). Seagrass meadows are largely limited to Santa Rosa Sound (Lewis *et al.* 2016). Seagrass beds are a protected habitat recognized by both the state and federal agencies. Five species of submerged aquatic vegetation have been found in Pensacola Bay and include: widgeon grass (*Ruppia maritima*), shoal grass (*Halodule wrightii*), manatee grass (*Syringodium filiforme*), star grass (*Halophila engelmannii*), and turtle grass (*Thalassia testudinum*) (Schwenning *et al.* 2002).

The availability of hard substrate for colonization is a determining factor for the establishment of oyster reefs. Although hard substrate is not particularly common in the Pensacola Bay system, East Bay has historically supported healthy oyster populations. Oyster reefs have been widely demonstrated to improve water quality, protect shorelines by abating wave energy, stabilize bottom sediments, and provide habitat

for fish, crab, and other invertebrates (Lewis *et al.* 2016). The most current assessments report approximately 235 to 245 acres of oyster reef habitat within the Pensacola Bay system, including reefs that are closed for harvesting. Of this total area, it is estimated that approximately 75 percent of oyster reefs occur in East Bay (Lewis *et al.* 2016).



Figure 2-8 Coastal Natural Features in the Watershed

2.4.6 Coastal Barrier System

The Pensacola Bay watershed has a coastal barrier system consisting of Santa Rosa Island. The barrier system consists of many unique habitats and natural systems including beaches, foredune and relic dunes habitat, tidal marsh, brackish ponds and lagoons, coastal grasslands, and upland forest and scrub communities (National Park Service 2014). Barrier islands and peninsulas buffer adjacent bays and coastal areas from storm impacts and create calm saline conditions in landward waters, which promotes seagrass establishment. The majority of Santa Rosa Island is managed by the National Park Service as part of the Gulf Islands National Seashore. Pensacola Beach and Navarre Beach divide tracts of National Park Service land on the island.

3.0 Watershed Assessment and Water Resource Issues

3.1 Water Quality

The Pensacola Bay System experiences water quality challenges across both Alabama and Florida. Surface water quality varies by stream reach. Tributaries in both states are affected by NPS pollution and alterations associated with land use practices, including urban land uses including construction sites, silviculture, agriculture, landscape erosion, mining activities, and unpaved roads.

3.1.1 Impaired Waters

The FDEP has identified 23 segments within the Pensacola Bay watershed as impaired (Figure 3-1). Nearly all segments are impaired for bacteria (five for fecal coliforms, six for beach advisories, seven for shellfish harvesting classification, two for enterococci, one for *Escherichia coli*, and one for bacteria in shellfish), two segments for nutrients, and two segments for metals (FDEP 2017). Most estuarine waters have been listed as impaired for bacteria and Escambia Bay has been listed for nutrients. Additional bacteria impairments are concentrated in the Yellow River and Blackwater River basins. The overall list of impaired waters may be found in Appendix F.

The FDEP identified seven waterbody segments as impaired for bacteria in the Pensacola Bay watershed, based on shellfish classifications issued by the FDACS (FDEP 2017):

- Escambia Bay North (waterbody identification number [WBID] 548AC;
- Escambia Bay (South Segment) (WBID 548B;
- Pensacola Bay (North Segment) (WBID 548C);
- Blackwater Bay (South Segment) (WBID 548GB);
- East Bay (WBID 548H);
- East Bay River (Marine Portion) (WBID 701A);
- Tom King Bayou (WBID 833A); and

County health departments monitor recreational beaches for bacterial contamination and issue health advisories closing beaches when bacterial counts are too high. Beaches with more than 21 closures in a year are identified as impaired by FDEP. Beach segments identified as impaired for bacteria in the Pensacola Bay system, based on closures by local health departments (FDEP 2014a), include the following:

- Navy Point (WBID 548FB)
- Bayview Park Pier (WBID 738AB)
- Emerald Promenade Beachwalk (WBID 8007A)
- Navarre Park Highway 98 (WBID 915B)
- Liza Jackson Park (WBIB 915C);

Total Maximum Daily Loads (TMDLs) adopted by FDEP for the Pensacola Bay system include 12 for fecal coliform, four for nutrients, one for DO, and 81 for mercury (Figure 3-1; Table 3-1) (FDEP 2016b). A TMDL represents the maximum amount of a given pollutant a waterbody can assimilate and still meet water quality standards, including applicable water quality criteria and designated uses. Established TMDLs identify specific reductions in pollutant loading required to restore water quality and meet restoration goals. A full list of EPA established TMDLs can be found in Appendix F.

Table 3-1 Adopted TMDLs¹

Waterbody	WBID(s) ²	Waterbody	WBID(s)
Bacteria		Nutrients	
Bayou Chico	846	North Escambia Bay	548AA
Jones Creek	846A	Judges Bayou	493B
Jackson Creek	846B	Bayou Chico	846
Bayou Chico Beach	846CB	Bayou Chico	846C
Sanders Beach	848DA	Dissolved Oxygen	
Escambia River	10F	Judges Bayou	493A
Texar Bayou	738		
Carpenter Creek	676		
Blackwater River (Tidal)	24AB		
Yellow River	30		
Turkey Creek	117		
East Bay River (Marine)	701A		

¹Not including mercury²Waterbody Identification Number

Total Maximum Daily Loads are implemented through Basin Management Action Plans (BMAPs), which identify specific management actions necessary to accomplish required pollutant reductions. Basin Management Action Plans are developed by local stakeholders (public and private) in close coordination with FDEP. A BMAP was adopted by FDEP in 2011 to implement five fecal coliform TMDLs and restore water quality in Bayou Chico located in the southern end of Escambia County (FDEP 2011a, 2016d). The waterbodies addressed by the BMAP include Bayou Chico, which adjoins Pensacola Bay, and five additional waterbody segments that drain to Bayou Chico and the bay: Jones Creek, Jackson Creek, Bayou Chico Drain, Bayou Chico Beach (at Lakewood Park), and Sanders Beach (FDEP 2008, 2011b).

The BMAP was developed by FDEP in partnership with the City of Pensacola, Escambia County; the Escambia County Health Department, the Emerald Coast Utilities Authority (ECUA); the Florida Department of Transportation (FDOT); the Bayou Chico Association; the U.S. Navy, and the Bay Area Resource Council.

The FDEP has adopted a statewide TMDL for reducing human health risks associated with consuming fish taken from waters impaired for mercury. Mercury impairments are based on potential human health risks, not exceedances of water quality criteria. The primary source of mercury depositions in the environment is atmospheric deposition. It is estimated that about 70 percent of deposited mercury comes from anthropogenic sources (FDEP 2013). Approximately 0.5 percent of the mercury load in Florida waters has been identified as being discharged directly to surface waters by permitted industrial and domestic wastewater facilities (FDEP 2013). Only a small part of mercury in the environment is in the form of methylated mercury, which is biologically available to the food chain. The statewide TMDL for mercury includes a reduction target for fish consumption by humans and by wildlife and an 86 percent reduction in mercury from mercury sources in Florida by humans and by wildlife (FDEP 2013).

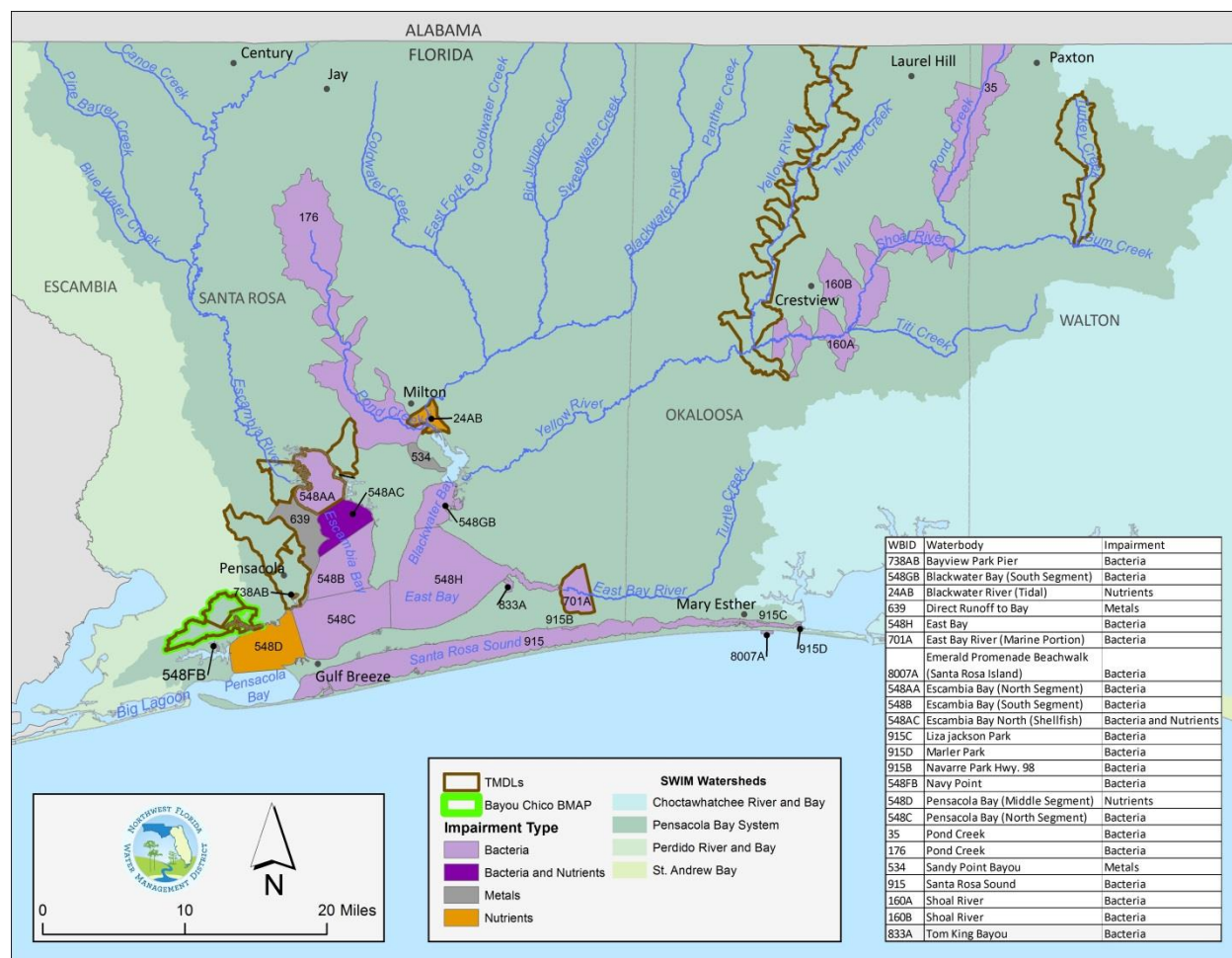


Figure 3-1 Impaired Waters and TMDLs

In addition to State-listed impaired waters, TMDLs established by the U.S. EPA are listed in Appendix F.

3.1.2 Pollution Sources

Nonpoint source (NPS) pollution is generated when stormwater runoff collects pollutants from across the landscape (lawns, pavement, highways, dirt roads, buildings, farms, forestry operations, and construction sites, etc.) and carries them into receiving waters. Pollutants entering the water in this way include nutrients, microbial pathogens, sediment, petroleum products, metals, pesticides, and other contaminants. Typical sources of NPS pollution include stormwater runoff from urban and agricultural lands and erosion and sedimentation from construction sites, unpaved roads, and destabilized stream banks. Atmospheric deposition of nitrogen, sulfur, mercury, and other substances via fossil fuel combustion also contribute to NPS pollution.

Stormwater runoff is the primary source of NPS pollution, and it is closely associated with land use. Urban land use, especially medium- to high-density residential, commercial, and industrial, generates the greatest NPS pollution per acre due to impervious surfaces that increase runoff. In urban areas, lawns, roadways, buildings, parking lots, and commercial and institutional properties all contribute to NPS pollution. Urban areas are largely concentrated within the coastal area, including the Pensacola metropolitan area, as well as the vicinity of Milton, the Fairpoint peninsula, portions of Santa Rosa Island, and nearby unincorporated communities. In addition to these established areas, the urban-rural fringe

hosts new development and construction sites, introducing new NPS pollution sources impervious surface area within the watershed.

In the Pensacola Bay system watershed, a number of entities currently hold Municipal Separate Storm Sewer System ([MS4] NPDES Stormwater) permits for stormwater conveyances that discharge to waters of the state. These include the following:

- Hurlburt Field
- Eglin AFB
- University of West Florida
- NAS Pensacola
- City of Ft. Walton Beach
- Santa Rosa County
- Okaloosa County
- City of Mary Esther
- Walton County
- City of Gulf Breeze
- City of Milton
- Escambia County
- City of Pensacola
- Town of Century

Escambia County, the City of Pensacola, the Town of Century, and FDOT are co-permittees under the NPDES program.

In 1991, Escambia County established a Stormwater Master Plan Program to reduce the frequency and severity of flooding and to improve water quality in receiving surface waters (Curb 2011). Among the project needs identified were road paving, restoring streams, and installing stormwater retrofits in established neighborhoods. Projects have been funded primarily through the county's local option sales tax (LOST). The City of Pensacola has also prioritized needed stormwater improvements, including within such areas as Piedmont Road area, Aragon Court, downtown Pensacola, Long Hollow Basin, and others.

Fertilizer application, ditching, road construction, and harvesting associated with agriculture and silviculture can also cause NPS pollution, erosion, sedimentation, and physical impacts to streams and lakes (Stanhope *et al.* 2008). Within the watershed, agricultural lands are concentrated most prominently in northern Escambia County, central and northern Santa Rosa and Okaloosa counties, and northern Walton County (Figure 2-6). Silviculture is widespread across all non-urban areas of the watershed.

Erosion and sedimentation are natural phenomena that can be accelerated by human activities, with resulting water quality impacts, including habitat smothering, elevated turbidity and suspended solids, and hydrologic impacts. Factors such as highly erodible soils, steep unstable slopes, and high rainfall intensities, are important factors in erosion and sedimentation (Reckendorf 1995).

Onsite sewage treatment and disposal systems are widespread sources of nutrients and other pollutants. Concentrations of OSTDS can degrade the quality of groundwater and proximate surface waters. While conventional OSTDS can control pathogens, surfactants, metals, and phosphorus, mobility in the soil prevents complete treatment and removal of nitrogen. Dissolved nitrogen is frequently exported from drainfields through the groundwater (NRC 2000). Additionally, OSTDS in areas with high water tables or soil limitations may not effectively treat other pollutants. Pollutants can enter surface waters as seepage into drainage ditches, streams, lakes, and estuaries (EPA 2015d; NRC 2000).

In the Pensacola Bay watershed, most rural and unincorporated communities and a number of suburban communities rely on OSTDS for wastewater treatment. Florida Water Management Inventory data indicate approximately 54,000 known or likely septic systems in the watershed (FDOH 2016). Known septic is based on permit data combined with inspection records. Likely septic is based on results of the review of nine criteria, but without inspection verification. Figure 3-2 shows the approximate locations of septic tanks as of 2015 (FDOH 2015b).

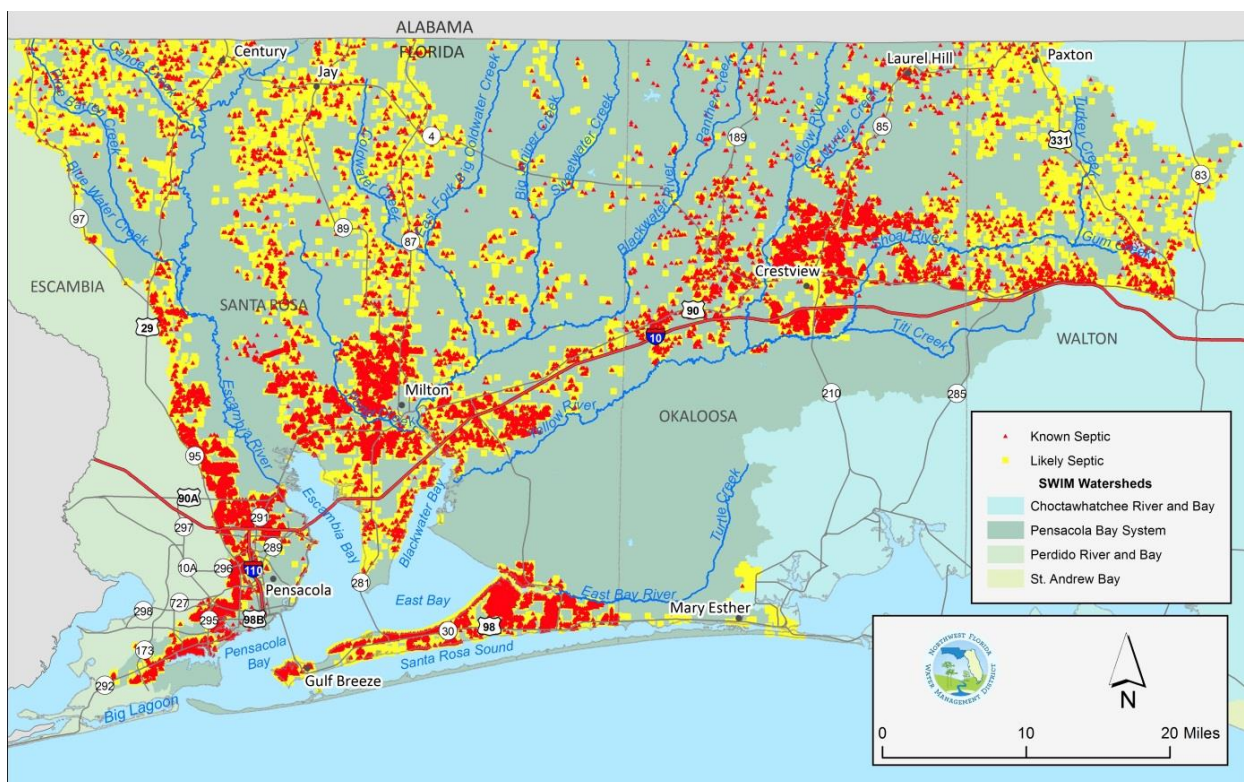


Figure 3-2 Septic Tank Locations in the Pensacola Bay Watershed

Marinas may be a source of NPS pollution from typical activities, such as boat maintenance, fueling, and marine sewage discharge, and due to runoff from parking lots. Pollution from marinas can depend on the availability of pump-out facilities and the level and consistency of marina BMP implementation. As of 2017, there are nine FDEP-certified Clean Marinas in the watershed.

Some pollutants, such as nitrogen and mercury, are also contributed to the landscape and waterbodies by atmospheric deposition. Most oxidized-nitrogen emissions are deposited close to the emission source and can especially impact surface water proximate to urban areas (Howarth *et al.* 2002a, 2002b, 2002c; NRC 2000).

There are 26 permitted domestic wastewater facilities and 33 industrial wastewater facilities within the watershed, as well as one power plant (Figure 3-3). Since completion of the previous SWIM plan update, a major accomplishment has been the relocation of the ECUA's Main Street WWTF in downtown Pensacola to its current location as the Central Water Reclamation Facility, located near Cantonment. The previous facility had a permitted surface water discharge of 20 million gallons per day. With the new facility, all surface water discharge into the bay has been eliminated, and 100% water reclamation is being achieved. The majority of the reclaimed water is being reused for beneficial purposes. Domestic wastewater facilities in the Pensacola Bay system watershed are listed in Table 3-2.

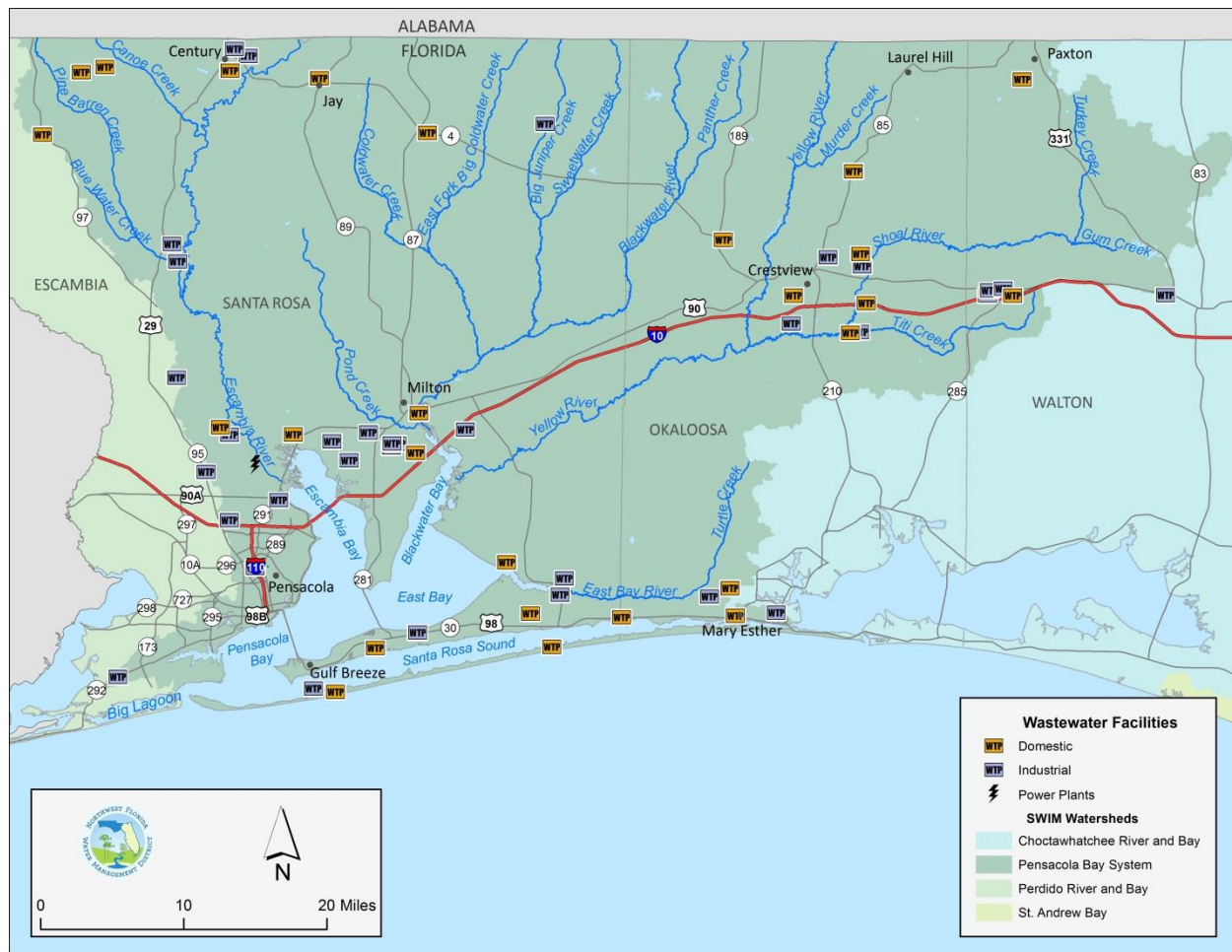


Figure 3-3 Permitted Wastewater Facilities within the Pensacola Bay Watershed

Table 3-2 Domestic Wastewater Facilities

Facility Name	County	Permitted Flow (mgd)	2015 Flow (mgd)	Discharge Type*
Bratt Elementary School WWTP	Escambia	0.01	0.002	Rapid Infiltration Basin (RIB)
Century WWTF	Escambia	0.68	0.44	Surface Water
ECUA Central WRF	Escambia	22.5	14.351	Sprayfield; industrial reuse; reuse at WRF
ECUA Pensacola Beach WWTP	Escambia	2.40	0.88	Surface water; landscape irrigation; reuse at WWTP
Ernest Ward Middle School WWTP	Escambia	0.01	0.002	RIB
Northview High School WWTP	Escambia	0.03	0.005	RIB
Berrydale Forest Camp WWTF	Santa Rosa	0.05	0.02	Sprayfield
Holley WRF	Santa Rosa	0.25	0.08	RIB
Holley-Navarre WWTF	Santa Rosa	2.99	1.11	Golf course irrigation; other landscape irrigation
Jay WWTP	Santa Rosa	0.12	0.06	RIB

Facility Name	County	Permitted Flow (mgd)	2015 Flow (mgd)	Discharge Type*
Navarre Beach WWTP	Santa Rosa	0.93	0.29	Surface water; reuse at WWTP
Milton WWTF	Santa Rosa	2.50	1.62	Surface water
Pace Water System, Inc. WWTP	Santa Rosa	2.00	1.49	Wetlands; residential and other landscape irrigation
South Santa Rosa Utilities System WWTF	Santa Rosa	2.00	1.49	Sprayfield; golf course, residential, other landscape irrigation; reuse at WWTF
Sundial Utilities WWTP	Santa Rosa	0.25	0.08	RIB
Baker High School WWTP	Okaloosa	0.02	0.005	RIB
Bob Sikes WRF	Okaloosa	1.00	0.09	RIB
Crestview WWTF	Okaloosa	2.75	1.48	Sprayfield; RIB; reuse at WWTF
FDOT Okaloosa I-10 Rest Area WWTP	Okaloosa	0.20	0.03	RIB
Hurlburt Field AWTP	Okaloosa	1.00	0.59	Wetlands; residential and other landscape irrigation; reuse at AWTP
Mary Esther WWTP	Okaloosa	1.10	0.40	Sprayfield
North Okaloosa WRF	Okaloosa	0.03	**	RIB
Okaloosa Correctional Institution WWTF	Okaloosa	0.23	0.17	RIB
Russell F.W. Stephenson WWTF	Okaloosa	0.98	0.39	RIB
Paxton WWTP	Walton	0.08	0.02	Sprayfield
Walton County Commerce Park at Mossy Head WWTF	Walton	0.02	**	Absorption fields

Mining and extraction activities near waterbodies have the potential to cause turbidity, sedimentation, and smothering. Mining activities within the watershed are concentrated in the vicinity of the Town of Century, in the Pensacola metropolitan area, and south of Milton. The USGS recognizes nine major mining operations within the watershed, including one perlite mine, two sulfur mines, and six sand and gravel mines. FDEP identifies 59 mines and borrow pits within the watershed; many are located near streams, creeks, tributaries, and other waterbodies (FDEP 2014d, 2015c). Of these, there are 42 sand mines, four clay mines, and 13 sand and clay mines.

The extensive and historical industrial and manufacturing facilities in the Pensacola urban area have had a profound effect on the bay system. Degradation of water and/or sediment by toxic chemicals, such as those used in industrial and manufacturing processes, can impact surface water quality and the health of associated upland and aquatic habitats and generate contaminated food chains in which top predators are most significantly harmed. Chemical contaminants can also be harmful to humans, particularly through consumption of seafood containing elevated quantities of mercury, polychlorinated biphenyls, dioxin, and other harmful chemicals.

There are currently five U.S. EPA National Priority List (NPL) Superfund sites within the Pensacola Bay watershed:

- Agrico Chemical Co.;
- American Creosote Works, Inc.;
- Escambia Treating Co.;
- NAS Pensacola; and
- NAS Whiting Field.

The Agrico Chemical Company and Escambia Wood-Pensacola sites are about one mile west of Bayou Texar. Contaminated groundwater from these sites appears to be migrating into Bayou Texar (Mohrher *et al.* 2005). The American Creosote Works site covers 1.5 acres in Pensacola, Florida, about 0.3 miles north of where Bayou Chico joins with Pensacola Bay. The USGS identified phenols in groundwater associated with American Creosote Works (USGS 1986). Efforts to identify, evaluate, and clean up contaminant sites at NAS Pensacola and NAS Whiting field are outlined by EPA (2016d).

In Florida's portion of the watershed, there are 28 hazardous waste facilities registered as EPA Biennial Reporter facilities. Of these, 14 are in Pensacola. Biennial Reporter facilities handle hazardous waste and are required to report to the EPA at least once every two years (EPA 2016c). Additionally, 757 active petroleum contamination tracking sites within the watershed are registered with the state's Storage Tank and Petroleum Contamination Monitoring (STCM) database. There are 34 contaminated dry cleaning sites within the basin eligible for the state-funded Dry Cleaning Solvent Cleanup Program. The majority of STCM and dry cleaning sites are located in historically developed areas in Pensacola and Milton, with additional sites in other developed areas, including Crestview, Jay, Gulf Breeze, Baker, and other unincorporated communities.

There are also 19 non-NPL Superfund sites located within the basin, 14 are located in Pensacola. A non-NPL site is a Superfund site that has not been placed on the NPL list through the EPA's formal process for assessing hazardous waste sites; however, the EPA can take short-term cleanup actions on non-NPL sites under the emergency removal program.

3.2 Natural Systems

Eutrophication has been documented in several waterbodies across the Pensacola Bay watershed, primarily in the bays and estuaries of the watershed. Compared to other eutrophic estuaries, concentrations of nutrients within Pensacola Bay are relatively low (Bricker *et al.* 1999). Some nutrient concentrations have been declining within the Pensacola Bay system, reaching levels below the concentrations of concern for aquatic vegetation (FDEP 2012). The State of Florida water quality criterion for chlorophyll-*a* and aquatic life designated use is ≤ 20 micrograms per liter, which is well above most measured concentrations for the Pensacola Bay system (FDEP 2010). However, despite relatively low nutrient concentrations, Pensacola Bay exhibits some classic eutrophication symptoms, including summer hypoxia, significant loss of sea grass habitat, and phytoplankton dynamics indicative of variations in freshwater flows (Caffrey and Murrell 2015).

Hypoxia commonly occurs within the Pensacola Bay estuarine system, particularly in stratified waters in Escambia and East bays (Hagy and Murrell 2007). The extent of this condition, at times affecting up to 30% of the estuary, suggests it could be a significant factor structuring biological communities and habitat. Contributing factors may include salinity stratification associated with tidal and freshwater inflow and nutrient enrichment of plankton and sediments (Murrell *et al.* 2009).

Chemical contaminants within the sediments have been observed in many areas of the estuary, particularly within bayous Chico and Texar and in Escambia Bay. DeBusk, *et al.* (2002) details compiled monitoring results, describing fairly consistent patterns of contaminant distribution. Shuba (2012) describes monitoring and recommendations related to polychlorinated biphenyl (PCB) enrichment. Metals, polycyclic aromatic hydrocarbons (PAHs), and dichlorodiphenyltrichloroethane (DDT)-related compounds were consistently found to be elevated in bayous Chico and Texar and in Escambia Bay, and to a lesser extent in Bayou Grande and East Bay. Polychlorinated biphenyls, which entered the system apparently through a spill in 1969 (NFWMD 1997), have continued to be found in the sediments of the lower Escambia River and Escambia Bay. Lewis *et al.* (2016) and U.S. EPA (1993), further describe sediment contaminants and toxicity in bayous Texar and Chico, Escambia Bay, and elsewhere within the Pensacola Bay estuary. Pensacola's urbanized bayous have long been subject to extensive stormwater runoff and NPS pollution, as well as historical point source discharges and industrial development. As a result, water and sediment quality in these areas have been significantly impacted. These contaminants, substantially representing historical pollutant discharges, represent a source of legacy pollutants that may continue to degrade benthic habitats and be subject to resuspension with availability to the water column.

In 2010, portions of Pensacola Bay, particularly near Pensacola Pass and proximate locations in Santa Rosa Sound and Big Lagoon, were repeatedly exposed to crude oil and weathered residue from the Deepwater Horizon oil spill.

Sedimentation more broadly affects benthic habitats in portions of the watershed due to poor flushing and the input of large sediment loads from the river basins and from stormwater runoff. George (1988) concluded that the percentage of fine-grained sediments (clays and silts) increased since the 1960s, with the percentage of fine-grained sediments in East Bay doubling between 1968 and 1988. Another example is Carpenter Creek, which suffers from streambank erosion and channelization, thus impact in receiving waters in Bayou Texar.

Between 1950 and 1980, about 95 percent of seagrass habitat disappeared from the Pensacola Bay system (Yarbro and Carlson 2016). Recognizing the importance of seagrasses for fisheries and for human benefits, Lewis *et al.* (2016) estimated that losses in seagrass habitat from 1960-2010 equate to an economic loss of approximately \$104 million per year (1991 dollars) in ecosystem services.

Yarbro and Carlson (2016) report that from 2003 to 2010 and found that coverage in Pensacola Bay in 2010 was approximately 1,053 acres, an increase of approximately 51 percent from 2003. An increase was noted in Pensacola Bay, in particular. Losses of about five percent, however, were reported from Santa Rosa Sound. Ongoing stressors of seagrasses in the Pensacola Bay system may include effects of hypoxia, salinity changes, and burial from sediments (Yarbro and Carlson 2016).

Central and southern East Bay and shoreline areas of Escambia Bay suffered nearly complete losses of seagrasses since the 1940s (Olinger *et al.* 1975; Yarbro and 2016). In some areas, water quality may have recovered sufficiently to support seagrasses; thus, additional efforts to identify barriers and strategies for recovery are warranted.

Estimates of recent oyster reef coverage (approximately 245 acres) in the Pensacola Bay system are lower than published estimates from the 1970s-1990s, which report coverage of several thousands of acres (Lewis *et al.* 2016). From the 1960s-1980s, shellfish (primarily oysters) reportedly experienced significant declines, attributed to fungal parasites, poor water quality, heavy rainfall, and dredging. The Florida Department of Natural Resources, now FDEP, reported periodic crashes in oyster populations within the Yellow River Marsh Aquatic Preserve, with near 100 percent mortality rate (Gardner 1991).

Lewis *et al.* (2016) estimated 2014 salt marsh area at 6,697 acres. Portions of the bay system have experienced increases in salt marsh coverage. Salt marsh coverage increased from 1,400 to 1,794 acres in Blackwater Bay, 3,750 to 4,519 acres in Escambia Bay and from 59 to 103 acres in Pensacola Bay. Coverage has remained relatively stable for East Bay. Total salt marsh coverage across the basin has increased 19 percent (1995-2010) and is expected to further increase due to sea level rise if not restricted by anthropogenic barriers such as roadways, and armored shorelines (Lewis *et al.* 2016).

In rural areas, land clearing associated with agriculture, silviculture, and recreation, as well as dirt road erosion, have increased sedimentation in the Blackwater River basin. The heavy use of vehicles on unpaved roads in Blackwater River State Forest has increased soil erosion, leading to higher turbidity in streams and smothered aquatic habitat (FDACS 2013b). Agricultural land use, unpaved roads, and heavy rain events have also caused turbidity in Yellow river (FDEP 2016d).

3.3 Floodplains and Floodplain Management

Floodplains protect water quality by allowing storage of floodwaters, reducing runoff velocity and preventing erosion and sedimentation. Floodplains in their natural state also attenuate potential flood effects while providing an ecological link between aquatic and upland ecosystems and habitat for many terrestrial and aquatic species. Development of and encroachment into floodplains can reduce water storage capacity, increases flood heights and velocities, and degrades natural systems in areas beyond the encroachment itself.

Flood protection needs are closely related with stormwater management, as well as land use planning and land development regulation. Riparian wetlands, marshes, and floodplain forests help to slow stormwater runoff, protecting water quality and regulating the release of water into streams and aquifers. Optimally, stormwater management systems provide both flood protection and water quality treatment.

Riverine floods are common along the watershed's major rivers and tributaries. Wetlands, low-lying areas, and coastal areas are also subject to significant flooding. Federal Emergency Management Agency flood maps delineate 269,577 acres (approximately 18 percent) of the Pensacola Bay watershed as Special Flood Hazard Area (Figure 2-4). Lands most prone to flooding are predominantly on Santa Rosa Island, Garcon Point, Escribano Point, and along the major rivers.

The coastline within the Pensacola Bay watershed is protected by offshore barrier islands and peninsulas; however, the coastal areas of Santa Rosa, Escambia, and Okaloosa counties are subject to flooding from coastal surges associated with hurricanes (FEMA 2006). Another flooding source is the East Bay River. Flooding in the Blackwater River Basin is caused by stream overbank flow and hurricane storm surges, and sometimes a combination of both. Riverine flooding occurs frequently and is prevalent throughout the reach of the river where the riverbanks are low and the floodplain is wide. The coastline in Santa Rosa County is subject to widespread flooding resulting from storm surges that accompany hurricanes and other severe storms from one or more of the following flooding sources: the Gulf of Mexico, East Bay, Escambia Bay, Pensacola Bay, Blackwater Bay, and Santa Rosa Sound (FEMA 2014).

4.0 Watershed Protection and Restoration

4.1 Management Practices

Watershed protection and restoration is inherently a collaborative effort on the part of state, regional, and federal agencies; local governments; nongovernment organizations; the business community; and the public. Implementation is conducted at the watershed, sub-watershed, and local scale. Recommended management strategies are described below.

4.1.1 Nonpoint Source Pollution Abatement

Addressing NPS pollution is a vital part of watershed management in the Pensacola Bay system. As described above, stormwater runoff carries pollutants from the landscape that diminish water quality, and it can physically impact streams and aquatic habitats. Multiple strategies can be employed to collectively reduce NPS pollution and protect and improve water quality and watershed resources.

Stormwater Retrofit

Among the most effective means of reducing NPS pollution is to retrofit existing stormwater management systems to add treatment and restore or approximate natural hydrology. In addition to improving water quality, appropriately designed retrofit projects improve flood protection, reduce physical disturbance from erosion and sedimentation, and provide aesthetic and recreational use benefits.

Implementation may include a mixture of traditional and nonstructural approaches. There are numerous methods of stormwater management and treatment, among which are wet and dry detention ponds, infiltration systems, stormwater harvesting, wetland treatment systems, stormwater separator units, vegetated swales and buffers, pervious pavement, bioretention, ditch blocks, green roofs, and chemical (alum) treatment. Specific measures employed depend on site conditions, including soils, water table conditions, flow, intended uses, and available land area. Optimally, a treatment train approach is employed, addressing hydrology and water quality treatment across a basin. Implementation is best accomplished within a wider, watershed context that incorporates initiatives such as Florida Friendly Landscaping (section 373.185, F.S.) and public outreach and awareness.

Within the Pensacola Bay watershed, the greatest need and potential for stormwater retrofit efforts is within municipal and fringe areas with relatively dense development and significant areas of impervious surface. Examples include the Pensacola metropolitan area, Gulf Breeze, Navarre, Mary Esther, Milton, and Crestview. Local governments normally take the lead in implementing stormwater retrofit projects, as they most commonly own, operate, and maintain stormwater management systems.

Agricultural Best Management Practices

Best management practices are individual or combined practices determined through research, field-testing, and expert review to be effective and practicable means for improving water quality, considering economic and technological constraints. Such measures can promote water use efficiency and protect fish and wildlife habitat. Such practices were pioneered for agriculture but have also been developed and effectively applied to silvicultural and urban land uses. Best management practices reduce soil loss, nutrient enrichment, sedimentation, discharge of chemical pollutants, and other adverse impacts (see, for example, Wallace *et al.* 2017, among many others). Implementation also often provides benefits for stream bank stability and fish and wildlife habitat. In addition to protecting water and habitat quality and

conserving water, BMPs may reduce costs to producers by increasing operational efficiency and effectiveness.

Agricultural BMPs generally fall into two categories – structural and management. Structural BMPs, e.g., water-control structures and fencing, involve the installation of structures or changes to the land and are usually costlier than management BMPs. Management BMPs, such as nutrient and irrigation management, comprise the majority of the practices but may not be readily observable. Nutrient management addresses fertilizer type, amount, placement, and application timing, and it includes practices such as soil and tissue testing, application methods and rates, correct fertilizer formulations, and setbacks from water resources. Irrigation management addresses system maintenance, scheduling, and other measures that improve the overall efficiency of irrigation systems.

The Florida Department of Agriculture and Consumer Services has developed, evaluated, and approved BMPs that are specific to individual agricultural operations within Florida watersheds. As of August 2017, the DACS has adopted manuals for cow/calf, statewide citrus, vegetable and agronomic crops, nurseries, equine operations, specialty fruit and nut, sod, dairy, and poultry operations. A small farms manual is under development and adoption is expected in 2017. The sod and cow/calf manuals are currently under review and revision. Guidance for and assistance in enrolling in approved BMPs are provided by FDACS. Cost share programs are also conducted both by FDACS and the District. Additionally, FWC provides technical assistance to private landowners through its Landowner Assistance Program.

Implementation of approved BMPs or water quality monitoring is required in basins with adopted BMAPs. Whether required or not, however, implementation of BMPs are effective means of protecting and restoring watershed resources and functions and are recommended land use practices for implementation of this plan.

Within the Pensacola Bay watershed, the most extensive and concentrated areas of agricultural land use are within northern Escambia and Santa Rosa counties, notably including the Pine Barren Creek, Moore Creek, and Coldwater Creek sub-basins (Figure 2-6). Within these areas in particular, application of agricultural BMPs have significant potential to further protect and improve water quality and aquatic habitat conditions.

Silviculture Best Management Practices

The Florida Forest Service (FDACS 2008) defines silviculture BMPs as “the minimum standards necessary for protecting and maintaining the State’s water quality as well as certain wildlife habitat values, during forestry activities.” These practices are protective of water resources, including streams, downstream receiving waters, sinkholes, lakes, and wetlands. The FFS provides specific guidance on BMPs and has established compliance monitoring requirements and procedures. FDEP (1997) evaluated the effectiveness of silviculture BMPs and concluded that forestry operations conducted in accordance with the BMP manual resulted in no major adverse habitat alterations.

The primary BMPs established for forestry are special management zones (SMZs). These zones provide buffering, shade, bank stability and erosion-control, as well as detritus and woody debris. They are intended to protect water quality by reducing or eliminating sediment, nutrients, logging debris, chemicals, and water temperature fluctuations. They also maintain forest attributes that provide wildlife habitat. Widths of SMZs vary depending on the type and size of the waterbody, soils, and slope. Specific SMZs are described as follows.

- 1) The **Primary Zone** varies between 35 and 200 feet and applies to perennial streams, lakes, and sinkholes, OFWs, Outstanding Natural Resource Waters (ONRW), Class I Waters, and, in some

cases, wetlands. A primary zone generally prohibits clear-cut harvesting within 35 feet of perennial waters and within 50 feet of waters designated OFW, ONRW, or Class I. Other operational prescriptions also apply to forestry practices to protect water and natural resources.

- 2) The **Secondary Zone** applies to intermittent streams, lakes, and sinkholes. Unrestricted selective and clear-cut harvesting is allowable, but mechanical site preparation, operational fertilization, and aerial application or mist blowing of pesticide, are not. Loading decks or landings, log bunching points, road construction other than to cross a waterbody, and site preparation burning on slopes exceeding 18 percent are also prohibited. These zones vary in width between 0 and 300 feet.
- 3) The **Stringer** provides for trees to be left on or near both banks of intermittent streams, lakes, and sinkholes to provide food, cover, nesting, and travel corridors for wildlife.

Other BMPs detailed in the Florida silviculture BMP manual include practices for forest road planning, construction, drainage, and maintenance; stream crossings; timber harvesting; site preparation and planting; fire line construction and use; pesticide and fertilizer use; waste disposal; and wet weather operations. The BMP manual further includes specific provisions to protect wetlands, sinkholes, and canals. Associated with the BMP manual are separate forestry wildlife best management practices for state imperiled species (FDACS 2014).

Given that the Pensacola Bay watershed is substantially forested, silviculture BMPs are some of the most important tools for protecting water quality and wetland and aquatic habitat quality within the watershed. The significant relief that exists within the upper watershed (Figure 2-3) suggests application of SMZs may be particularly useful for protecting downstream aquatic habitats from further impacts.

Low Impact Development

Inclusive of green infrastructure, urban best management practices, and Florida Friendly landscaping, low impact development represents a framework for implementing innovative stormwater management, water use efficiency, and other conservation practices during site planning and development. Benefits include reduced runoff and NPS pollution, improved flood protection, and reduced erosion and sedimentation. Some specific practices include the following.

- Minimized effective impervious area
- Vegetated swales and buffers
- Bioretention cells
- Rain gardens
- Infiltration and exfiltration systems
- Community greenways
- Green roofs
- Certification programs, such as Florida Water StarSM, and the Florida Green Building Coalition

For transportation infrastructure, practices recommended to protect water quality and floodplain and wetland functions include incorporating bridge spans that accommodate bank-full stream flows while maintaining intact floodplain, wetland, and wildlife passage functions. Minimizing structural alteration of low-lying, flood-prone lands is also an important strategy for protecting water quality and providing flood protection. Such properties can be used for other purposes, such as passive parks and other public use areas.

Riparian Buffers

A riparian buffer zone is an overlay that protects an adjoining waterbody from effects of adjacent development, such as runoff, NPS pollution, erosion, and sedimentation. A buffer zone in this context refers to an area along the shoreline that is maintained in or restored to generally natural vegetation and habitat. In this condition, an intact buffer zone helps to simultaneously achieve three important goals:

water quality protection, shoreline stability, and fish and wildlife habitat. Associated with these are other benefits, including aesthetic improvements and public access and recreation. These benefits are achievable for riparian areas along all types of waterbodies: stream/riverine, estuarine, lacustrine, and wetland.

In general, the wider the buffer zone, the better these goals may be achieved, although specific requirements are defined based on community goals. Limited areas, for example, might be developed into recreational sites, trails, or other access points. Table 4-1 is a representation of generalized buffer zones, adapted from USFWS documentation, listing benefits provided by buffers of successively larger widths. Complicating buffer zone design is the fact that different sites have different ecological and physical characteristics. These characteristics (type of vegetation, slope, soils, etc.), when accounted for, would lead to different buffer widths for any given purpose. Alternatives to fixed-width buffer policies include tiered systems that can be adapted to multiple goals and site-specific characteristics and uses. Wenger (1999) and Wenger and Fowler (2000) provide additional background, detail, and guidance for the design of buffer zone systems and policies.

Table 4-1 Generalized Buffer Zone Dimensions

Benefit Provided:	Buffer Width:					
	30 ft	50 ft	100 ft	300 ft	1,000 ft	1,500 ft
Sediment Removal - Minimum						
Maintain Stream Temperature						
Nitrogen Removal - Minimum						
Contaminant Removal						
Large Woody Debris for Stream Habitat						
Effective Sediment Removal						
Short-Term Phosphorus Control						
Effective Nitrogen Removal						
Maintain Diverse Stream Invertebrates						
Bird Corridors						
Reptile and Amphibian Habitat						
Habitat for Interior Forest Species						
Flatwoods Salamander Habitat – Protected Species						
Key Water quality protection  Terrestrial riparian habitat  Aquatic habitat enhancement  Vulnerable species protection 						

Adapted from USFWS 2001.

Basinwide Sedimentation Abatement

Unpaved roads frequently intersect and interact with streams, creating erosion and runoff conditions that transport roadway materials directly into streams, smothering habitats and impacting water quality and the physical structure of the waterbodies. Borrow pits have also caused progressive erosion conditions that

smother streams, severely damaging or destroying habitats and diminishing water quality. Existing impacts and future risks are most pronounced in the upper portion of the Pensacola Bay watershed, given the slopes and prevalent soils.

Given the site specific and physical nature of the impacts, efforts taken at the local and regional level can lead to significant restoration of aquatic habitat conditions and improved water quality. Corrective actions may include replacing inadequate culverts with bridge spans maintain floodplains and flows, hilltop-to-hilltop paving, use of pervious pavement, establishment of catch basins to treat and manage stormwater, and establishment of vegetated or terraced basins to eliminate gulley erosion.

In addition to addressing unpaved roads and gully erosion sites, application of construction BMPs, to include sediment and erosion controls, protects water and habitat quality, as well as the physical structure of streams and other waterbodies. Extremely heavy and sustained precipitation events are common in northwest Florida; thus, for large-scale construction and transportation projects, protective BMPs are ideally capable of accommodating and preventing erosion and sedimentation during large storm systems, which frequently overwhelm conventional erosion controls.

4.1.2 Ecological Restoration

A wide array of measures may be employed to restore natural and historic functions to former or degraded wetland, aquatic, stream, riparian, and estuarine habitats. Enhancement actions, such as improving vegetation conditions, invasive exotic plant removal, and prescribed fire, are also often discussed in the context of restoration. Wetland, hydrologic, floodplain, shoreline, and stream restoration are discussed further below.

Wetland, Hydrologic and Floodplain Restoration

Wetland restoration includes actions to reestablish wetland habitats, functions, and hydrology. It frequently involves substrate composition and profile restoration and vegetation community reestablishment, including shrub reduction, exotic species removal, application of prescribed fire, and replanting.

Hydrologic and floodplain restoration include actions to reestablish pathways and the timing of surface water flow. Actions include removing fill, replacing bridges and culverts with appropriate designs, establishing low-water crossings, restoring pre-impact topography and vegetation, and abandoning unneeded roads through fill removal and replanting. Restoration activities can have broad water resource benefits, including improved water quality, enhanced fish and wildlife habitat, and other restored wetland functions.

Hydrologic restoration is important for altered wetlands and waterbodies in urbanized areas, as well as for riverine systems and for larger wetland systems. Wetland restoration, including habitat enhancements and vegetation restoration, is broadly applicable at both large and smaller scales throughout the watershed.

Shoreline Restoration

Shoreline restoration refers to measures taken to restore previously altered shorelines and to protect eroding or threatened shorelines. Such restoration is accomplished using “living shorelines” techniques, which are a set of evolving practices that incorporate intertidal and shoreline habitats to protect shorelines while also enhancing or restoring natural communities, processes, and productivity. When planned and implemented appropriately, such efforts result in direct and tangible benefits for residents and the larger community, including fish and wildlife, improved water quality, shoreline protection, and aesthetic

improvements. Including biodiversity-building habitats and incorporating adjacent transitional and floodplain areas within restoration planning can increase resiliency and adaptability to anticipated changes in climate, sea levels, and shoreline configuration, as well as potential future occurrences of impacts from invasive species.

Shoreline restoration in this context is particularly applicable as a strategy along altered and/or eroding estuarine shorelines along Pensacola Bay, Escambia Bay, and East Bay. Some of the urbanized bayous may offer restoration opportunities along relatively low-energy shorelines.

Stream Restoration

Stream restoration includes actions to restore the hydrology and aquatic and riparian habitat that may have been impacted by inadequate culverts, road crossings, instream impoundments, erosion and sedimentation, runoff or other hydrologic effects of adjacent or upstream developments. This may also include developing more natural hydrology, wetlands, storage/treatment, and riparian vegetation along stormwater conveyances. In-stream restoration may include efforts to reestablish natural channel and floodplain process and should accompany efforts to address offsite processes (erosion, sedimentation, etc.) that created the original impacts.

The topographic relief within the upper watershed, as well as surrounding land uses, suggests that stream restoration may be a particularly appropriate strategy within this area. Additionally the Carpenter Creek basin and other urban drainages offer opportunities for stream restoration, often in association with stormwater retrofit and other actions.

Estuarine Habitat Restoration

Implementation of wetland and shoreline restoration, as described above, as well as aquatic habitat restoration and enhancement can be implemented in a complementary manner to improve and restore estuarine habitat and productivity. Well-established, contiguous marshes; seagrass beds; and oyster reefs provide habitat for a wide range of marine species, including recreational and commercially valuable seafood species.

Emergent marshes and oyster reefs serve as an important buffer between uplands and estuaries, filtering pollutants and consuming nutrients before they enter the water and reducing waves before they reach land. These communities promote sediment accumulation and shoreline stabilization, attenuate wave energy, protect marsh habitat, and buffer upland areas against wind and wave activity that expedite erosion. Each oyster can filter vast quantities of water, removing suspended particles that would otherwise reduce sunlight penetration needed for healthy seagrass beds.

While some recovery of seagrasses in Pensacola Bay have been observed, extensive areas of East Bay and Escambia Bay, which formerly supported seagrass, have had no recovery. Approaches to restoring seagrass habitat in the Pensacola Bay system, as identified by Yarbrow and Carlson (2016), include restoration of shoreline vegetation on Santa Rosa Sound to prevent further burial of vegetation, as well as investigating the extent and effects of hypoxia in the estuary and evaluating long-term effects of salinity changes on submerged aquatic vegetation in the upper reaches of the estuarine system. Results of the ongoing Roadblocks to Seagrass Recovery project may help identify strategies to facilitate recovery in these areas.

4.1.3 Wastewater Management and Treatment Improvements

Septic to Sewer Connections

Among the promising approaches for correcting impacts and impairments are actions to improve the management and treatment of domestic wastewater. While expensive and engineering-intensive, such actions are technically feasible, proven approaches to improving water quality and aquatic habitat conditions, as well as public uses and benefits.

Extending sewer service to areas that currently rely on conventional onsite treatment and disposal systems for wastewater treatment and disposal is effective in reducing nutrient loading to ground and surface water source. As outlined above, there are over 54,000 known or likely conventional septic systems in the Pensacola Bay watershed. As illustrated by Figure 3-4, these are particularly concentrated around Pensacola Bay and Santa Rosa Sound, and within their contributing basins; within the vicinities of the Blackwater, Yellow, Shoal, and Escambia Rivers; and within the Bayou Chico BMAP area. Connecting residences and businesses in these areas to centralized wastewater treatment systems has the potential to substantially improve wastewater treatment and reduce loading of nutrients and other pollutants to these waterbodies and to downstream receiving waters.

Advanced Onsite Systems

Where extension of sewer service is not economically feasible due to the spatial distribution of rural populations, there is potential for installation of advanced onsite systems that achieve water quality treatment that exceeds that provided by conventional systems. In particular, advanced passive systems are being developed to provide cost-effective and practical systems for reducing nitrogen and other pollutants from onsite sewage systems (FDOH 2015b). Pilot projects are underway in different regions of the state.

Water Reclamation and Reuse

For the purposes of this plan, water reuse refers to the application of reclaimed water for a beneficial purpose, with reclaimed water receiving at least secondary treatment and basic disinfection (Chapter 62-10, F.A.C.; Section 373.019, F.S.). Beneficial purposes include reusing reclaimed water to offset a current or known future potable water demand or other documented watershed and water resource challenges. Specific purposes include landscape and golf course irrigation, industrial uses, and other applications (FDEP 2015f). Water reuse can be a key strategy in reducing or eliminating wastewater discharges and associated pollution of surface waters.

Centralized Wastewater Treatment Upgrade and Retrofit

For centralized wastewater treatment systems, conversion to advanced wastewater treatment has proven to be an effective means of reducing the discharge of nutrients and other pollutants into surface and ground waters. Specific treatment or process upgrades may also help improve treatment of contaminants of emerging concern, such as pharmaceuticals, surfactants, and unregulated trace chemicals. Additionally, in many areas there is a need to rehabilitate existing sewer systems, including to correct inflow and infiltration problems and to reduce the number and severity of sanitary sewer overflow incidents. Accomplishing these actions can be expensive, given the need to retrofit existing systems in often highly developed areas. Upon completion, however, notable improvements can be achieved for water quality, public recreational uses, and fisheries.

4.1.4 Land Conservation

As demonstrated through the Florida Forever program and other state, federal, local, and private initiatives, preserving sensitive lands can be an effective part of protecting water quality and habitat, as well as preserving floodplain and wetland functions. Where land is acquired fee simple by public agencies, other benefits, such as public access and recreation, are also achieved. Conservation can be achieved through less than fee, as well as fee simple acquisition. In addition to land acquisition programs, local planning initiatives, such as overlay zones and transfer of development rights programs, can further protect sensitive resources while maintaining private ownership and compatible development.

While the Pensacola Bay watershed benefits from extensive public land areas that protect water quality and wetland and aquatic habitats and provide for public access and use, there are still opportunities to further protect water resources through the conservation of sensitive areas, including riverine, stream-front, and estuarine shorelines.

Additionally resource conservation can be accomplished at a sub-basin or project-level scale to augment other strategies, including stormwater retrofit and hydrologic restoration, and to provide for compatible public access and recreation.

4.1.5 Public Awareness and Education

Public awareness and education efforts span multiple purposes and are an essential component of many of the other actions described here. Among the purposes of awareness and education efforts are:

- Technical outreach to assist in implementing specific programs (for example, best management practices);
- Informing members of the public about the purpose and progress of implementation efforts;
- Providing opportunities for public engagement and participation, as well as public feedback and program accountability; and
- Providing broad-based educational efforts to inform members of the public and specific user groups about watershed resources, their benefits, and personal practices to ensure their protection.

Examples of educational activities include technical training for BMPs, school programs (e.g., Grasses in Classes), public events, citizen science and volunteer programs, and project site visits.

Watershed stewardship initiatives can bring together multiple partners such as federal, state, and local agencies; non-profit groups; and citizen volunteers by identifying common program goals and intended outcomes. Having a variety of participants may offer important insight and expertise, shared experiences through lessons learned, and pooling of available resources to implement projects. Specific program examples include, but are not limited to: Walk the WBIDs; Grasses in Classes; homeowner oyster gardening program; rain garden/rain barrel workshops; storm drain labeling; marina BMPs; landowner cost-share assistance programs for living shorelines; elected official information and training sessions; spring break restoration projects; and messaging through outlets such as public service announcements, social media, events, and festivals.

4.1.6 Options for Further Study and Analysis

Additional work is needed to further advance the scientific understanding of resource conditions and restoration needs and opportunities. Additional analytical work can also support improved project planning and application of innovative methods for improved resource management.

- Develop improved and more detailed assessments of environmental conditions and trends, to include water quality, biology, and habitat.
- Develop a watershed-wide NPS pollution potential assessment at the 12-digit HUC level, to include analysis of land uses, applied loading rates, and potential BMP application.
- Evaluate altered shorelines across the estuarine system; identify opportunities for habitat restoration.
- Conduct an analysis of stream buffer conditions and restoration options.
- Conduct a long-term assessment of streamflow trends to better inform and identify options for water quality and aquatic habitat protection and restoration.
- Identify estuarine sites with the potential for seagrass or other benthic habitat restoration through improved water quality treatment and water management within specific contributing basins.
- Complete a current, basin-wide analysis and prioritization of sedimentation sources and sites, to include unpaved road stream crossings, borrow pits, gulley erosion sites, and other erosion and sedimentation sources.
- Develop a spatial analysis of OSTDS, to include pollutant loading estimates and estimates of potential pollutant load reduction and average receiving waterbody pollutant concentrations following connection to central sewer and/or conversion to advanced onsite systems. Delineate target areas for central sewer connections and for advanced onsite systems.
- Develop a hydrodynamic model to improve the understanding of estuarine circulation, with application for estuarine and littoral restoration planning.
- Evaluate planning models (e.g., Goldstein et al. n.d.) to inform comprehensive and coordinated project and implementation planning.
- Develop updated, regionally specific storm surge, floodplain, and sea level rise models to support project planning, floodplain protection, and adaptation planning, and to further the understanding of drivers of coastal habitat change.
- Evaluate the feasibility and potential benefits of proposed innovative and large-scale projects. Also identify and evaluate the potential for unintended adverse effects. Examples of such projects may include, but are not limited to:
 - Pumped and tidal flow-through circulation systems
 - Regional-scale shoreline habitat development proposals
 - Stream channel reconfiguration
 - Dredged material removal and disposal
 - Benthic dredging
- Develop improved metrics for monitoring and evaluating projects, programs, and environmental conditions and trends.
- Develop proposed scope of work, for multi-agency and peer evaluation, to address PCB contamination within Escambia Bay.

- Evaluate integrated water resource management approaches with application to specific water resource challenges in northwest Florida, potentially further developing plans for the reuse of reclaimed water and stormwater harvesting.
- Evaluate the extent and effects of seasonal hypoxia and the long-term effects of salinity change on submersed aquatic vegetation in the upper portions of the estuary.
- Develop analysis of oyster/shellfish habitat, conditions, and trends.
- Establish a framework for detecting the effects of climate change and ocean acidification on coastal marine resources in the region.
- Conduct monitoring and evaluate potential effects of herbicides, pharmaceuticals, endocrine disruptors, and other contaminants that have received relatively little historical attention in the Pensacola Bay system.
- Review past projects completed, identifying specific outcomes and lessons learned.
- Identify locally sensitive indicators of biological condition (biocriteria) for dominant diversity-building habitats (tidal wetlands, oyster reefs, and seagrass).
- Conduct future analysis within areas of the bay system with more limited environmental databases, such as East and Blackwater bays and Bayou Grande.
- Develop updated baseline study of current environmental conditions by conducting a one-time, multi-seasonal, multi-metric, and system-wide environmental analysis.
- Develop online consolidation of past and present environmental information, including natural resource coverages, research activities, restoration progress, monitoring results, TMDL updates, and regulatory actions.

4.2 Implementation

Table 4-2 outlines the planning progression of priorities, objectives, and selected management options and approaches for the Pensacola Bay system. These, in turn, inform and guide specific SWIM projects listed in Section 4.3. Following the discussion of watershed issues provided above, priorities and objectives are organized by major priority areas: water quality, floodplain functions, and natural systems. Education and outreach is included as well, since it is applicable to all priority areas.

Table 4-2 Watershed Priorities, Objectives, and Management Options

Watershed Priorities		Objectives	Management Options
Water Quality			
Degraded Water Quality			
Water quality impairments for listed stream and estuarine waters, to include nutrients, dissolved oxygen, and bacteria	Restore water quality in impaired riverine, stream, and estuarine waters.		• Stormwater retrofit projects • Comprehensive and integrated stormwater management plans • Conversion of septic systems to central sewer • Evaluation and deployment of advanced passive onsite systems • Upgrades to wastewater infrastructure • Agricultural and silvicultural BMPs • Fee simple and less-than-fee protection of floodplains, riparian habitats, and other sensitive lands • Floodplain and wetland restoration • Riparian buffer zones • Water reclamation and reuse • Urban BMPs, including limiting new effective impervious surface area and implementing other LID practices in developing and redeveloping areas • Evaluate, prioritize, and address unpaved roads and associated erosion at stream crossings. • Evaluate and address other erosion sites, such as borrow pits and gullies • Continued monitoring and analytical efforts to further establish conditions and trends
Long-term degradation of water quality in urban bayous and Escambia Bay	Protect and, as needed, restore water quality in impacted or designated priority areas: - Urban bayous - Escambia Bay - OFWs		
Vulnerability of seagrasses, bayous, and other estuarine habitats	Develop updated analyses of conditions and trends in East Bay and Blackwater Bay.		
Historic losses of seagrass and oyster beds			
Wastewater Management			
Needs and opportunities for improved wastewater collection and treatment	Restore water quality in impaired riverine, stream, and estuarine waters.		
Point source discharges	Reduce loading of nutrients and other pollutants from OSTDS.		
Inadequate treatment from conventional OSTDS			
Aging infrastructure (leaky pipes, inflow and infiltration, etc.)			
Nonpoint Source Pollution			
Stormwater runoff	Improve treatment of urban stormwater, including from: - Urban bayou basins - Carpenter Creek and Jones Creek basins - Pensacola metropolitan area - Municipalities and fringe areas		
Sedimentation and turbidity from unpaved roads and other erosion sources	Reduce basinwide NPS pollution from agricultural areas and erosion sites.		
	Reduce sedimentation from unpaved roads, borrow pits, and landscape erosion, and construction sites.		

Watershed Priorities	Objectives	Management Options
Natural Systems		
Wetland Systems		
Wetland loss and degradation	Protect and as necessary restore major wetlands and floodplains, including: - Major river floodplains - Littoral marsh habitat - Jones Swamp and Jones Creek basin - Garcon and Fairpoint peninsulas - Carpenter Creek Protect and restore riparian and littoral habitats along rivers, streams, and estuaries. Where needed, restore wetland and stream hydrology.	• Restoration of wetland hydrology and vegetation • Restoration of riparian habitats • Shoreline habitat restoration, integrated across multiple habitats where possible • Restoration of impacted seagrasses and tidal marsh areas • Oyster reef restoration • Fee simple and less-than-fee protection of floodplains, riparian habitats, and other sensitive lands • Development of modeling tools (such as suitability models for estuarine habitat restoration and enhancement)
Estuarine and Coastal Habitat		
Vulnerability of estuarine habitats Legacy pollutants within estuarine substrate Shoreline destabilization and erosion Need for improved understanding of current and potential effects of sea level rise Saltwater intrusion that could alter brackish and freshwater habitats	Protect and restore riparian and littoral habitats along streams and estuarine shorelines. Restore and enhance estuarine benthic habitats. Restore seagrass beds, including through water quality improvement. Ensure restoration projects are compatible with coastal change.	• Coastal infrastructure retrofits to enhance adaptation capacity and habitat resiliency • Development and dissemination of detailed elevation (LiDAR) data • Coastal adaptation and land use planning • Water quality improvement actions described above • Agricultural, forestry, and construction best management practices • Enhanced monitoring of hydrologic and water quality data
Riverine and Stream Habitats		
Physically altered and impacted tributary streams	Evaluate and correct hydrological alterations as necessary. Reduce sedimentation from unpaved roads, borrow pits, and landscape erosion. Protect and restore riparian habitats. Restore tributary stream channels and floodplain connection, including bayou drainages, tidal creeks, and tributaries in agricultural areas	• Prioritization and abatement of sedimentation from unpaved road stream crossings and other sources

Watershed Priorities	Objectives	Management Options
Floodplain Functions		
Impacts to Floodplains		
Headwater degradation and channelization Diminished or disconnected floodplain area Riparian buffer loss	Protect and reestablish functional floodplain area. Evaluate and correct hydrological alterations where necessary. Continue to make publicly available data and information to enable communities to reduce flood risk.	• Natural channel stream restoration • Fee simple and less-than-fee protection of floodplains, riparian habitats, and other sensitive lands • Protection and enhancement of riparian buffer zones • Development and dissemination of detailed elevation (LiDAR) data • Stormwater retrofit • Continued flood map updates and detailed flood risk studies • Hydrologic restoration
Education and Outreach		
Public Education and Outreach		
Expanded public understanding of practices to protect water resources Expanded opportunities for public participation Enhanced BMP technical support opportunities	Create long-term partnerships among stakeholders, including government, academic institutions, non-governmental organizations, businesses, residents, and others, to maximize effectiveness of project implementation. Expand education and outreach about watershed resources and personal practices to protect water and habitat quality. Build the capacity of landowners, agricultural producers, and others to protect watershed resources, functions, and benefits. Support agricultural, silvicultural, and urban BMPs. Continue to make publicly available data and information to enable communities to reduce flood risk.	• Disseminate information about watershed resources and benefits via multiple approaches – Internet, publications, school programs, and workshops • Disseminate information about resource programs, outcomes, and opportunities for participation • Demonstration projects • Opportunities for volunteer participation in data collection and project implementation • Technical BMP education and training • Collaborative community initiatives, with opportunities for business participation and sponsorship • Internet applications for public participation and to make program information and resource data continually available • Classroom programs, including hands-on restoration activities • Community awareness and education events and programs • Hands-on, citizen science, including volunteer participation monitoring and restoration programs • Education and technical training workshops and resources for local government officials

4.3 Priority Projects

Projects proposed to address above-described priorities and objectives are listed below and described in more detail on the following pages. Priority projects, as described herein, comprise strategies intended to address identified issues that affect watershed resources, functions, and benefits. These are intended to support numerous site-specific tasks and activities, implemented by governmental and nongovernmental stakeholders for years to come. Most address multiple priorities, as indicated in Table 4-3. The projects included are generally limited to those within the scope and purview of the SWIM program. With each project, conceptual scopes of work are presented, as are planning level cost estimates. Specific details, tasks, and costs will be developed and additional actions may be defined to achieve intended outcomes as projects are implemented. No prioritization or ranking is implied by the order of listing. Project evaluation and ranking will occur in multiple iterations in the future and will vary based on funding availability, specific funding source eligibility criteria, and cooperative participation.

Table 4-3 Recommended Projects: Pensacola Bay System SWIM Plan

PROJECT	WATERSHED PRIORITIES			
	WQ	FLO	NS	EDU
Stormwater Planning and Retrofit	✓	✓	✓	
Septic Tank Abatement	✓			
Advanced Onsite Treatment Systems	✓			
Agriculture and Silviculture BMPs	✓	✓	✓	✓
Basinwide Sedimentation Abatement	✓	✓	✓	
Riparian Buffer Zones	✓	✓	✓	✓
Aquatic, Hydrologic and Wetland Restoration	✓	✓	✓	
Estuarine Habitat Restoration	✓		✓	✓
Strategic Land Conservation	✓	✓	✓	✓
Watershed Stewardship Initiative	✓	✓	✓	✓
Sub-basin Restoration Plans	✓	✓	✓	✓
Wastewater Treatment and Management Improvements	✓		✓	
Interstate Coordination	✓			
Analytical Program Support	✓	✓	✓	✓
Comprehensive Monitoring Program	✓	✓	✓	✓
WQ – Water Quality	NS – Natural Systems			
FLO – Floodplain Functions	EDU – Education and Outreach			

Stormwater Planning and Retrofit

Description:

This strategy consists of planning and retrofitting stormwater management systems to improve water quality, as well as to improve flood protection and accomplish other associated benefits. In addition to constructing new facilities, the project includes evaluation and improvement of existing systems and adding additional BMPs within a treatment train to improve overall performance within a given basin.

Scope of Work:

1. Prioritize basins and sites based on water quality, hydrologic, and land use data, together with consideration of local priorities, opportunities for partnerships, and other factors.
2. Support stormwater master planning at the local and regional level.
3. Develop project-specific implementation targets and criteria, to include pollutant load reductions, success criteria, and measurable milestones.
4. Develop a public outreach and involvement plan to engage citizens in the project's purposes, designs, and intended outcomes. The plan should include immediate neighbors that would be affected by the proposed project and other interested citizens and organizations.
5. Develop detailed engineering designs, with consideration of regional and multipurpose facilities, innovative treatment systems where applicable, and treatment train approaches for basin-level stormwater management and treatment.
6. Install/construct individual retrofit facilities.
7. Monitor local water quality, including upstream/downstream and/or before and after implementation, as well as trends in receiving waters.
8. Analyze data to identify water quality trends in receiving waters.

Outcomes/Products:

1. Comprehensive stormwater management plans
2. Completed stormwater retrofit facilities
3. Improved water quality and flood protection
4. Data evaluation and system validation, with lessons applicable to future projects

Strategic Priorities:

- ✓ Water Quality
- ✓ Floodplain Functions
- ✓ Natural Systems

Supporting Priorities:

- ✓ Stormwater runoff and NPS pollution
- ✓ Water quality impairments for listed stream and estuarine waters
- ✓ Vulnerability of estuarine habitats

Objectives:

- ✓ Improve treatment of urban stormwater.
- ✓ Protect and, as needed, restore water quality in impacted or designated priority areas.
- ✓ Restore water quality in impaired riverine, stream, and estuarine waters.

Lead Entities:

- ✓ Local governments
- ✓ Estuary Program

Geographic Focus Areas:

veloped areas of the watershed, including but not limited to:

- ✓ Basins of urbanized and developing bayous
- ✓ Escambia, Pensacola, Blackwater, and East bays
- ✓ Carpenter Creek
- ✓ Santa Rosa Sound

Planning Level Cost Estimate:

>\$50,000,000

Septic Tank Abatement

Description:

This strategy consists of converting OSTDS to central sewer to reduce pollutant export and improve surface and ground water quality. To facilitate accomplishment, among the project goals is to reduce or eliminate connection costs to homeowners.

Scope of Work:

1. Prioritize areas of need through spatial analysis of OSTDS distribution, proximity to other sensitive resources, proximity to existing infrastructure, and resource monitoring data.
2. In cooperation with local governments and utilities, complete alternatives analysis, considering sewer extension, advanced onsite systems, and other approaches as appropriate.
3. Develop project-specific implementation targets and criteria, to include pollutant load reductions, success criteria, and measurable milestones.
4. Initiate a public outreach and involvement plan to engage the public in the project's purposes, designs, and intended outcomes.
5. Work with directly affected residents throughout the project; coordinate with neighborhoods and individual homeowners.
6. Install sewer line extensions, connect residences and businesses, and abandon septic tanks.
7. Monitor bacteria, nutrients, and other parameters in nearby groundwater and surface waterbodies.
8. Analyze data to identify changes in trends of target pollutants.

Outcomes/Products:

1. Completed implementation plans, prioritizing areas for septic-to-sewer conversion
2. Improved surface and groundwater quality

Strategic priority:

- ✓ Water Quality
- ✓ Natural Systems

Supporting Priorities:

- ✓ Inadequate treatment from conventional OSTDS
- ✓ Aging infrastructure
- ✓ Needs and opportunities for improved wastewater collection and treatment
- ✓ Water quality impairments for listed stream and estuarine waters
- ✓ Vulnerability of estuarine habitats

Objectives:

- ✓ Protect and, as needed, restore water quality in impacted or designated priority areas.
- ✓ Reduce loading of nutrients and other pollutants from OSTDS.
- ✓ Restore water quality in impaired riverine, stream, and estuarine waters.
- ✓ Reduce pollutant loading from aging infrastructure.

Lead Entities:

- ✓ Utilities, local governments

Geographic Focus Areas:

- ✓ Bayou Grande basin
- ✓ City of Pensacola fringe areas
- ✓ Santa Rosa Sound
- ✓ Fairpoint Peninsula
- ✓ Yellow River basin
- ✓ Residential lands widely distributed across the northern watershed

Planning Level Cost Estimate:

>\$20,000,000

Advanced Onsite OSTDS*Description:*

This strategy consists of installation of advanced OSTDS to reduce pollutant loading. This approach is most appropriate in areas remote from existing central sewer infrastructure or likely extensions. It may be considered an adjunct to the Septic Tank Abatement project.

Scope of Work:

1. Prioritize areas of need through spatial analysis of OSTDS distribution, proximity to sensitive resources, proximity to existing infrastructure, and resource monitoring data.
2. In cooperation with FDOH and FDEP, evaluate passive technology onsite systems.
3. In cooperation with local governments, conduct outreach to property owners to facilitate installation of advanced onsite systems as an alternative to conventional OSTDS.
4. Develop project-specific implementation targets and criteria, to include pollutant load reductions, success criteria, and measurable milestones.
5. Install/construct advanced OSTDS based on prioritization of sites and funding availability.
6. Monitor bacteria, nutrients, and other parameters in nearby groundwater and surface waterbodies.
7. Analyze data to identify changes in trends of target pollutants.

Outcomes/Products:

1. Improved surface and groundwater quality

Strategic priority:

- ✓ Water Quality
- ✓ Natural Systems

Supporting Priorities:

- ✓ Inadequate treatment from conventional OSTDS
- ✓ Needs and opportunities for improved wastewater collection and treatment
- ✓ Water quality impairments for listed stream and estuarine waters
- ✓ Vulnerability of estuarine habitats

Objectives:

- ✓ Protect and, as needed, restore water quality in impacted or designated priority areas.
- ✓ Reduce loading of nutrients and other pollutants from OSTDS.
- ✓ Restore water quality in impaired riverine, stream, and estuarine waters.
- ✓ Reduce pollutant loading from aging infrastructure

Lead Entities:

- ✓ Utilities, local governments

Geographic Focus Areas:

- ✓ Escambia River Basin
- ✓ Blackwater River Basin
- ✓ Yellow River basin
- ✓ Residential lands widely distributed across the northern watershed

Planning Level Cost Estimate:

\$15,000,000 (initial implementation)

Agriculture and Silviculture BMPs

Description:

This strategy consists of development and implementation of agriculture and silviculture BMPs to reduce basinwide NPS pollution, protect habitat, and promote water use efficiency.

Scope of Work:

1. In consultation with FDACS, FWC, and NRCS, develop a comprehensive inventory of employed agriculture and silviculture BMPs and identify potential gaps and/or potential improvements for implementation in the watershed.
2. In cooperation with FDACS FFS, evaluate relationships between forest management practices and hydrologic and water quality effects.
3. Based on funding resources, develop plans for cost-share or other assistance for implementation.
4. Develop an outreach plan to engage agricultural producers and forestry practitioners; supporting technical training and participation in developing implementation strategies.
5. Conduct program outreach to support implementation of property-specific approved BMPs, potentially including annual cost-share grant cycles as defined by funding sources.
6. Work with FDACS to offer free technical assistance in the design and implementation of property- and resource-specific BMPs.
7. Monitor local water quality, including upstream/downstream and/or before and after project implementation, as well as trends in receiving waters. Additionally, conduct monitoring of participant experiences, encouraging feedback throughout and following implementation.
8. Analyze data to identify water quality trends.

Outcomes/Products:

1. Improved water quality
2. Improved capacity on the part of landowners to implement practices protective of water quality and watershed resources

Strategic Priorities:

- ✓ All identified program priorities

Supporting Priorities:

- ✓ Stormwater runoff and NPS pollution
- ✓ Sedimentation and turbidity from unpaved roads and other erosion sources
- ✓ Water quality impairments for listed stream and estuarine waters, to include nutrients, dissolved oxygen, and bacteria
- ✓ Headwater degradation and channelization
- ✓ Riparian buffer loss

Objectives:

- ✓ Protect and, as needed, restore water quality in priority areas.
- ✓ Restore water quality in impaired waters.
- ✓ Reduce basinwide NPS pollution from agricultural areas and erosion sites.
- ✓ Reduce sedimentation from unpaved roads, borrow pits, and landscape erosion.
- ✓ Protect and restore riparian habitats.

Lead Entities:

- | | |
|---------|----------------------|
| ✓ FDACS | ✓ Private landowners |
| ✓ NRCS | ✓ IFAS Extension |
| ✓ FWC | ✓ NWFWMMD |

Geographic Focus Areas:

For agriculture, the primary focus is within the northern watershed. For silviculture BMPs, the focus is basinwide.

Planning Level Cost Estimate:

\$1,000,000 annually

Basinwide Sediment Abatement

Description:

This strategy consists of development and implementation of activities related to sedimentation abatement to improve surface water quality and aquatic habitat quality. It may include any or all activities aimed at preventing and mitigating sedimentation and restoring impacted sites.

Scope of Work:

1. Review inventories of sedimentation sites, including the Yellow River Threats Assessment and subsequent evaluations, and identify gaps.
2. Prioritize sites based on inventory and site evaluation, as well as consideration of water quality, other resource data, severity of impacts, and cumulative sub-basin effects.
3. Consider annual grant program for local governments to address high priority sites.
4. Develop individual site plans; detail proposed improvements and cost estimates.
5. Execute on-the-ground construction projects.
6. Implement complementary initiatives that may include education and outreach, development of new/improved BMPs, inspection programs, cost-share programs, training, demonstration projects, and maintenance.
7. Incorporate individual site improvements within geodatabase.
8. Monitor local water quality and habitat quality, including upstream/downstream and/or before and after implementation.
9. Analyze data to identify water quality trends.

Outcomes/Products:

1. Improved water quality, both onsite and in receiving riverine and estuarine waters
2. Improved aquatic habitat quality, including for sensitive species such as Gulf Sturgeon and freshwater mussels

Strategic Priorities:

- ✓ Water Quality
- ✓ Floodplain Functions
- ✓ Natural Systems

Supporting Priorities:

- ✓ Stormwater runoff and NPS pollution
- ✓ Sedimentation and turbidity from unpaved roads and other erosion sources

Objectives:

- ✓ Protect and, as needed, restore water quality in impacted or designated priority areas
- ✓ Restore water quality in impaired riverine, stream, and estuarine waters.
- ✓ Reduce basinwide NPS pollution from agricultural areas and erosion sites basin-wide.
- ✓ Reduce sedimentation from unpaved roads, borrow pits, and landscape erosion.

Lead Entities:

- ✓ Local governments
- ✓ State and federal agencies
- ✓ Estuary Program

Geographic Focus Areas:

- ✓ Watershed-wide, particularly within rural areas
- ✓ Major erosion sites, including:
 - Julian Mill Creek
 - Clear Creek
 - Ferry Pass Bayou

Planning Level Cost Estimate:

\$3,000,000 annual cost

Riparian Buffer Zones

Description:

This strategy consists of protection and restoration of riparian buffers to protect or improve water quality, habitat, and shoreline stability.

Scope of Work:

1. Coordinate planning and implementation with other projects to achieve overarching objectives.
2. Conduct screening evaluation of riparian areas; classify sites based on character and function and geomorphologic stresses.
3. Prioritize sites based on potential for protection or restoration of riparian habitat and function. Also consider such factors as geomorphologic stresses, land use objectives, habitat fragmentation risk, and documented occurrence of listed species.
4. Conduct outreach to local governments and private landowners to identify sites for implementation. Develop site specific implementation options, including streamside enhancements, overlay zones and vegetation restoration.
5. Develop individual site plans, which detail proposed improvements and cost estimates.
6. Coordinate and support implementation by property owners and local governments.
7. Implement complementary initiatives that may include education and outreach, inspection programs, training, demonstration projects, and maintenance.
8. Conduct outreach by providing signage, tours, public access amenities, or similar for specific sites.
9. Monitor local water quality and habitat quality, including upstream/downstream and/or before and after project implementation.
10. Analyze data to identify water quality trends.

Strategic Priorities

- ✓ All identified program priorities

Supporting Priorities:

- ✓ Stormwater runoff and NPS pollution
- ✓ Sedimentation and turbidity of unpaved roads and other erosion sources
- ✓ Headwater degradation and channelization
- ✓ Riparian buffer loss
- ✓ Vulnerability of estuarine habitats
- ✓ Shoreline destabilization and erosion

Objectives:

- ✓ Protect and, as needed, restore water quality in impacted or designated priority areas
- ✓ Protect and if necessary restore major wetlands and floodplains.
- ✓ Protect and restore riparian and littoral habitats along streams and estuarine shorelines.
- ✓ Support agricultural, silvicultural, and urban BMPs.
- ✓ Ensure restoration projects are compatible with coastal change.
- ✓ Restore and enhance estuarine benthic habitats.

Lead Entities:

- ✓ Private landowners
- ✓ Local governments
- ✓ USFWS (Partners for Fish and Wildlife)
- ✓ FWC
- ✓ Southeast Aquatic Resources Partnership
- ✓ Estuary Program
- ✓ Bay Area Resource Council

Geographic Focus Areas:

- ✓ Moore Creek basin
- ✓ Bayou Grande
- ✓ Santa Rosa Sound
- ✓ Carpenter Creek
- ✓ Headwater streams
- ✓ Shoal River basin
- ✓ Holding/staging areas or spawning areas for Gulf sturgeon

Planning Level Cost Estimate:

TBD*

*Variable; includes passive implementation by property owners.

Outcomes/Products:

1. Improved protection of water quality, habitat, and shoreline stability
2. Establishment of demonstration sites to promote additional implementation of buffer zone concepts by private landowners, local governments, and state and federal agencies

Aquatic, Hydrologic and Wetland Restoration

Description:

This strategy consists of implementation of a broad array of hydrologic and wetland protection and restoration measures to improve and protect surface water quality and to restore aquatic and wetland habitats. Such measures include but are not limited to vegetation reestablishment, restoration and enhancement of hydrologic connectivity, stream channel restoration, and floodplain reconnection and restoration.

Target areas include sites where floodplain storage has been diminished or where wetland hydrology has been disrupted. Additional focus areas include sites containing impediments to hydrological function such as culverts, dikes, levees, barriers to tidal flow, and barriers to freshwater exchange.

Scope of Work:

1. Conduct a site inventory and evaluation, to include channelized streams, drained/filled wetlands, road fill, and other areas conveying water. Evaluate freshwater and tidal drainage patterns and any restrictions in tidal flow.
2. Identify restoration options, to include hydrologic reconnection (e.g., fill removal, low water crossings), tidal creek restoration, natural channel stream restoration, floodplain reestablishment, vegetation community reestablishment, tidal and riparian marsh restoration, and other options based on site characteristics and historic habitats.
3. Prioritize sites based on inventory and site evaluation, as well as consideration of water quality, other site and resource data (e.g., listed species occurrence, potential functional lift), severity of impacts, cumulative effects, land ownership, and accessibility.
4. Conduct public outreach adaptable to specific project sites. Characterize individual projects with a list of stakeholders for each site. For project sites adjacent to communities or private property, as well as those with significant public visibility, consider demonstration sites, public meetings, site visits, project website, and other forms of engagement.

Strategic Priorities:

- ✓ Water Quality
- ✓ Floodplain Functions
- ✓ Natural Systems

Supporting Priorities:

- ✓ Water quality impairments for listed stream and estuarine waters, to include nutrients, dissolved oxygen, and bacteria
- ✓ Headwater degradation and channelization
- ✓ Diminished or disconnected floodplain area
- ✓ Wetland loss and degradation
- ✓ Physically altered and impacted tributary streams

Objectives:

- ✓ Restore water quality in impaired riverine, stream, and estuarine waters.
- ✓ Protect and reestablish functional floodplain area.
- ✓ Prioritize and correct hydrological alterations, including channelized streams.
- ✓ Protect and if necessary restore major wetlands and floodplains.
- ✓ Ensure restoration projects are compatible with coastal change.

Lead Entities:

- | | |
|----------|-------------------|
| ✓ FWC | ✓ USFWS |
| ✓ NFWFMD | ✓ Estuary Program |
| ✓ FDEP | |

Geographic Focus Areas:

- ✓ Jones Swamp
- ✓ Bayou Chico basin
- ✓ Bayou Texar basin
- ✓ Carpenter Creek
- ✓ Tributary streams affected by road crossings and channelization
- ✓ Urbanized drainage basins
- ✓ Major erosion sites (e.g., Julian Mill Creek, Clear Creek, and Ferry Pass Bayou)
- ✓ Holding/staging areas or spawning areas for Gulf sturgeon

Planning Level Cost Estimate:

TBD*

*Costs variable depending on specific sites.

5. Develop detailed site restoration designs for priority sites, taking into account public input and preferences.
6. Execute on-the-ground restoration projects.
7. Monitor local water quality and physical and biological site characteristics, including before and after implementation.
8. Analyze data to identify water quality trends.
9. Communicate results to watershed stakeholders and participating agencies.

Outcomes/Products:

1. Restored wetland, aquatic, and floodplain habitats and functions
2. Improved protection of water quality and natural systems
3. Established demonstration sites to promote additional implementation by private landowners and local governments

Estuarine Habitat Restoration

Description:

This strategy consists of activities related to estuarine habitat restoration to improve surface water quality, aquatic habitats, and coastal resiliency. Implementation should be coordinated with other project options, to include stormwater retrofits and other NPS pollution abatement, and upstream wetland and hydrologic restoration.

Scope of Work:

1. Conduct a site inventory and evaluation, to include evaluation of such factors as need for stabilization, habitat stability, stressors impacting shorelines, projected sea level rise, shoreline profile, ecosystem benefits, property ownership, public acceptance, and feasibility.
2. Identify project options, which may include, but are not limited to:
 - a) Restoration/establishment of riparian and littoral vegetation communities
 - b) On previously altered shorelines, establishment of integrated living shorelines and estuarine habitats;
 - c) Restoration/reconnection of tidal marsh;
 - d) Integrated restoration of multiple shoreline/estuarine habitats;
 - e) Restoration of seagrass beds;
 - f) Restoration/creation of oyster reefs or other benthic habitats.
 - g) Develop and implement system-wide oyster management plans that address sustained provision of historic ecological services.
3. Prioritize sites based on inventory and site evaluation, as well as consideration of water quality, other site and resource data, modeling tools, habitat requirements for fish and wildlife, listed species occurrences, severity of impacts, cumulative effects, land ownership, and accessibility. Coordinate directly with riparian landowners.
4. Develop of demonstration projects on public lands.
5. Conduct public outreach adaptable to specific project sites. For project sites adjacent to communities or private property, as well as those with significant public visibility, consider

Strategic priorities:

- ✓ Water Quality
- ✓ Floodplain Functions
- ✓ Natural Systems

Supporting Priorities:

- ✓ Stormwater runoff and NPS pollution
- ✓ Inadequate treatment from conventional OSTDS
- ✓ Needs and opportunities for improved wastewater collection and treatment
- ✓ Sedimentation and turbidity from unpaved roads and other erosion sources
- ✓ Historic losses of seagrass and oyster beds
- ✓ Vulnerability of seagrasses, bayous, and other estuarine habitats

Objectives:

- ✓ Protect and restore water quality in impacted or designated priority areas.
- ✓ Improve treatment of urban stormwater.
- ✓ Ensure restoration projects are compatible with coastal change.
- ✓ Restore and enhance estuarine benthic habitats.
- ✓ Protect and restore riparian and littoral habitats along streams and estuarine shorelines.
- ✓ Restore seagrass beds, including through water quality improvement.
- ✓ Reduce sedimentation from unpaved roads, borrow pits, and landscape erosion.

Lead Entities:

- ✓ FWC
- ✓ FDEP
- ✓ USFWS
- ✓ Estuary Program

Geographic Focus Areas:

- ✓ Pensacola Bay system and tidal tributaries
- ✓ Bayou Chico
- ✓ East Bay
- ✓ Bayou Texar
- ✓ Escambia Bay

Planning Level Cost Estimate:

TBD*

*Cost estimates will await completion of site inventory and evaluation.

demonstration sites, public meetings, site visits, volunteer participation, project website, and other forms of engagement. Extend opportunities for participation to property owners, local governments, and other stakeholders.

6. Develop detailed site restoration designs for priority sites, taking into account public input and preferences.
7. Execute on-the-ground restoration projects as identified under Paragraph 2 above.
8. Monitor and evaluate habitat coverage, water quality, and habitat conditions before and after implementation
9. Compile and evaluate data to determine trends and to objectively measure project benefits and outcomes.
10. Communicate results to watershed stakeholders and participating agencies.

Outcomes/Products:

1. Restored wetland and estuarine habitats and functions
2. Improved protection of water quality and natural systems
3. Increased resiliency of estuarine habitats to anticipated sea level rise and extreme weather events
4. Establishment of demonstration sites to promote additional implementation by private landowners and local governments

Strategic Land Conservation

Description:

This strategy supports protection of floodplains, riparian areas, and other lands with water resource value to protect and improve surface water quality, with additional benefits for floodplain function and fish and wildlife habitat.

Scope of Work:

1. Use approved management plans and lists (such as the Florida Forever Work Plan) to complete an inventory of potential acquisition projects.
2. Evaluate whether potential sites augment other projects.
3. Evaluate resource benefits, including potential for restoration, listed species, other fish and wildlife resources, aquifer recharge, buffer zone functions, etc.
4. Identify potential funding sources that allow land acquisition as a component of achieving stated goals.
5. Where landowners have expressed interest, conduct a site analysis to include potential for achieving intended outcomes and potential for augmenting other projects.
6. Accomplish acquisition in accordance with statutory requirements.
7. Develop and implement restoration/enhancement plans if appropriate.
8. Implement long-term monitoring program for conservation easements.

Outcomes/Products:

1. Improved long-term protection of water quality, habitat, and floodplain functions

Strategic priorities:

- ✓ Water Quality
- ✓ Floodplain Functions
- ✓ Natural Systems

Supporting Priorities:

- ✓ Stormwater runoff and NPS pollution
- ✓ Sedimentation and turbidity from unpaved roads and other erosion sources
- ✓ Water quality impairments for listed stream and estuarine waters, to include nutrients, dissolved oxygen, and bacteria
- ✓ Headwater degradation and channelization
- ✓ Diminished or disconnected floodplain
- ✓ Riparian buffer loss
- ✓ Wetland loss and degradation
- ✓ Vulnerability of estuarine habitats
- ✓ Shoreline destabilization and erosion

Objectives:

- ✓ Protect and, as needed, restore water quality in impacted or designated priority areas.
- ✓ Protect and if necessary restore major wetlands and floodplains.
- ✓ Protect and restore riparian and littoral habitats along streams and estuarine shorelines.

Lead Entities:

- ✓ FDEP
- ✓ Private landowners and working forests
- ✓ Local governments

Geographic Focus Areas:

- ✓ Jones Swamp/Perdido Pitcher Plant Prairie
- ✓ Coastal Headwaters Longleaf Forest
- ✓ Clear Creek – Whiting Field
- ✓ Upper Shoal River
- ✓ Garcon Ecosystem
- ✓ Wolfe Creek Forest
- ✓ Holding/staging areas or spawning areas for Gulf sturgeon
- ✓ Priority recharge areas for the sand-and-gravel aquifer

Planning Level Cost Estimate:

\$33,000,000 (Generally 50% of DEP-estimated land value for designated projects)

Watershed Stewardship Initiative

Description:

The purpose of the watershed stewardship initiative is to create experiences that result in action-oriented tasks leading to improvements in water quality, habitat quality, and public knowledge of and appreciation of watershed resources and functions. Outreach activities should be well structured, project-oriented, and include hands-on activities, as well as education about personal practices to protect watershed resources.

Scope of Work:

1. Develop a comprehensive inventory of current watershed stewardship and education efforts underway within the watershed, including funding sources for each.
2. Evaluate initiatives ongoing elsewhere within the state and the country.
3. Analyze the feasibility of combining efforts and resources, where practical and beneficial, with existing community-based initiatives.
4. Identify potential gaps and/or additional areas of focus.
5. Continue existing programs and implement new individual programs based on availability of funding.
6. Include hands-on activities, such as vegetation planting, invasive species removal, site tours, project demonstrations, and monitoring.
7. Implement technical training for landowners, including for implementation of agricultural and silvicultural BMPs, as well as urban BMPs and pollution prevention practices.
8. Monitor program accomplishments and outcomes, including through feedback from participant and citizen surveys.

Outcomes/Products:

1. Improved long-term protection of water quality, habitat, and floodplain functions
2. Improved capability on the part of property owners to implement BMPs
3. Improved public understanding of watershed resources, functions, and public benefits
4. Improved public understanding of, and participation in, resource programs and projects

Strategic priorities:

- ✓ All identified program priorities

Supporting Priorities:

- ✓ Water quality impairments for listed stream and estuarine waters
- ✓ Vulnerability of estuarine habitats
- ✓ Needs for improved public understanding and participation; as well as for improved BMP technical support
- ✓ Expanded opportunities for public participation
- ✓ Enhanced BMP technical support opportunities

Objectives:

- ✓ Restore water quality in impaired riverine, stream, and estuarine waters.
- ✓ Expand education and outreach about watershed resources and personal practices to protect water and habitat quality
- ✓ Create long-term partnerships among stakeholders, including government, academic institutions, non-governmental organizations, businesses, residents, and others, to maximize effectiveness of project implementation.
- ✓ Build the capacity of landowners, agricultural producers, and others to protect watershed resources, functions, and benefits.
- ✓ Continue to make publicly available data and information to enable communities to reduce flood risk.

Lead Entities:

- | | |
|---------------------|----------|
| ✓ Estuary Program | ✓ FDACS |
| ✓ Local governments | ✓ NFWFMD |
| ✓ FDEP | ✓ FWC |
| ✓ BARC | ✓ IFAS |
| ✓ USFWS | |

Geographic Focus Areas:

- ✓ Watershed-wide

Planning Level Cost Estimate:

\$200,000 annually

Sub-basin Restoration Plans

Description:

This strategy consists of development of comprehensive restoration plans for discrete sub-basins or waterbodies. This work should incorporate aspects of other separate strategies described herein.

Scope of Work:

1. Evaluate and identify priority sub-basins in cooperation with local initiatives, state and federal agencies, and local governments.
2. Develop a scoping document outlining actions to be undertaken, customized for specific areas and needs.
3. Develop a public outreach and engagement plan to facilitate participation by affected neighborhoods and stakeholders.
4. With public and agency participation, identify specific goals for waterbody protection and restoration.
5. Incorporate separate strategies, including stormwater retrofit planning; OSTDS abatement; floodplain, wetland and hydrologic restoration; monitoring; and public outreach and engagement.
6. Identify separate actions and project types that can cumulatively achieve identified goals.
7. Implement public outreach and engagement by conducting field visits, public meetings, and providing innovative hands-on engagement opportunities. Coordinate with established watershed groups.
8. Implement selected actions.
9. Monitor program accomplishments and outcomes, including through feedback from participants and surveys of affected residents. Conduct monitoring pre- and post-implementation and of environmental trends within affected waterbodies.

Outcomes/Products:

1. Focused restoration plans, specific to priority waterbodies and basins
2. Improved water quality and aquatic and wetland habitat quality

Strategic priorities:

- ✓ All identified program priorities

Supporting Priorities:

- ✓ All supporting priorities

Objectives:

- ✓ All identified objectives

Lead Entities:

- ✓ Local governments
- ✓ Estuary Program
- ✓ Bay Area Resource Council
- ✓ FDEP
- ✓ FWC
- ✓ NFWFMD

Geographic Focus Areas:

Targeted sub-basins within the watershed, including, but not limited to:

- ✓ Bayou Chico/Jones Creek
- ✓ Bayou Texar/Carpenter Creek
- ✓ All urban bayou sub-basins
- ✓ Santa Rosa Sound
- ✓ Shoal River
- ✓ Blackwater River

Planning Level Cost Estimate:

TBD*

*Costs depend on specific projects included

Wastewater Treatment and Management Improvements

Description:

This strategy consists of development and implementation of upgrades to centralized wastewater treatment collection systems to reduce pollutant loading within the watershed. Additional opportunities exist for water reclamation and reuse.

Scope of Work:

1. In cooperation with utilities and local governments, evaluate existing wastewater systems to identify areas and components with upgrade opportunities, as well as sewer service extension needs.
2. Prioritize systems based on factors such as age, pollutant discharge, apparent leakage, capacity, and access.
3. Develop detailed cost estimates. Show cost estimates for areas with outdated sewer systems that need to be upgraded, areas with a high density of septic tanks that can connect to a central water system, and areas where upgrades are needed, but are determined to be lower in priority.
4. Implement/construct enhanced wastewater treatment and water reclamation and reuse systems.
5. In accordance with wastewater permits, monitor water quality in proximate surface and ground waters.
6. Evaluate data to identify trends of target pollutants.

Outcomes/Products:

1. Improved water and aquatic habitat quality
2. Reduced wastewater discharges into the environment, coupled with improved conservation of potable water resources

Strategic priorities:

- ✓ Water Quality

Supporting Priorities:

- ✓ Inadequate treatment from conventional OSTDS
- ✓ Point source discharges
- ✓ Needs and opportunities for improved wastewater collection and treatment

Objectives:

- ✓ Protect and, as needed, restore water quality in impacted or designated priority areas.
- ✓ Restore water quality in impaired riverine, stream, and estuarine waters.

Lead Entities:

- ✓ Local governments
- ✓ Utilities

Geographic Focus Areas:

- ✓ Watershed-wide
- ✓ Wastewater utilities with opportunities for water reclamation and reuse and integrated water resource management Systems proximate to coastal drainages
- ✓ Pensacola metropolitan area
- ✓ Milton area
- ✓ Pensacola Beach
- ✓ Santa Rosa Sound

Planning Level Cost Estimate:

>\$100,000,000

Interstate Coordination

Description:

This strategy consists of activities related to interstate coordination to improve and protect surface water quality in the basin

Scope of Work:

1. Develop a comprehensive plan for coordination between interstate agencies within the watershed. Evaluate case studies of successful interstate programs.
2. Develop a comprehensive list that contains contact information for the various jurisdictions within the watershed. Develop an email distribution list, SharePoint group, and/or website to foster easy file and information sharing. Agencies should include USDA, Alabama Department of Economic and Community Affairs Office of Water Resources, other federal and state agencies, local governments (counties and cities), and non-profit organizations.
3. Compare areas of study and possible gaps in information.
4. Coordinate with Covington, Escambia, and Conecuh counties in Alabama on development of sub-basin plans, agricultural/silvicultural BMPs, and sediment abatement issues.
5. Continually inform and engage all stakeholders during progress or discussions of watershed issues. Hold regular open joint meetings between stakeholders from both states.
6. Coordinate closely on all implementation projects for stormwater management, hydrologic alteration/restoration, sedimentation, agricultural BMPs, etc. Utilize a publicly shared file and discussion tool (such as a website) to house the status and outcome(s) of all implementation projects within the watershed (within both states).

Outcomes/Products:

1. Progress toward basin approach to watershed protection
2. Expanded public participation and knowledge of watershed resources and management needs

Strategic priorities:

- ✓ Water Quality
- ✓ Natural Systems
- ✓ Education and Outreach

Supporting Priorities:

- ✓ Stormwater runoff and NPS pollution
- ✓ Sedimentation and turbidity from unpaved roads and other erosion sources
- ✓ Needs for improved BMP technical support, opportunities for public participation, and public understanding of practices to protect water resources

Objectives:

- ✓ Reduce basinwide NPS pollution from agricultural areas and erosion sites basin-wide.
- ✓ Reduce sedimentation from unpaved roads, borrow pits, and landscape erosion.
- ✓ Create long-term partnerships among stakeholders, including government, academic institutions, non-governmental organizations, businesses, residents, and others, to maximize effectiveness of project implementation.

Lead Entities:

- ✓ NFWFMD
- ✓ FDEP
- ✓ Estuary Program

Geographic Focus Areas:

Watershed-wide with focus on northern extents of the watershed where Florida and Alabama interface

Planning Level Cost Estimate:

\$25,000 annually

Analytical Program Support

Description:

This strategy is intended to support dedicated scientific assessment and analysis to improve watershed management, protection, and restoration. The tasks involved are inherently progressive and will therefore change and be redefined as information is developed and in response to ongoing and future conditions and management actions.

Scope of Work:

Integral components of this strategy include but are not limited to the actions presented below.

1. For specific resource functions and at the sub-basin level, develop and refine metrics for evaluating conditions and guiding implementation.
2. In support of Urban Stormwater Retrofits, develop a stormwater pollutant loading analysis to include NPS pollutant loading estimates at the sub-basin level and pollutant load reduction estimates based on proposed or potential BMPs and facilities. Develop planning level estimates of potential water quality effects (pollutant concentrations) for receiving waterbodies.
3. Also in support of Urban Stormwater Retrofits, evaluate existing stormwater management systems to identify potential or needed improvements.
4. Evaluate innovative methods and designs to improve stormwater treatment, wastewater treatment and management, and ecological restoration.
5. In support of Septic Tank Abatement and implementation of Advanced Onsite Systems, develop a spatial analysis of OSTDS to include pollutant loading estimates and estimates of potential pollutant load reduction following connection to central sewer and/or conversion to advanced onsite systems. In cooperation with local governments and utilities, delineate proposed target areas for central sewer connections and for advanced onsite systems.
6. In support of Agricultural and Silvicultural BMPs, develop an agricultural NPS pollution abatement plan. For this purpose, develop nonpoint source pollutant loading estimates at the sub-basin level for watershed areas that are substantially agricultural in land use, and develop pollutant load reduction estimates and targets based on application of proposed or potential BMPs. Develop planning level estimates of water quality effects (pollutant concentrations) for receiving waterbodies.
7. Identify research needs that would quantify the water quality benefits of BMP implementation, provide outreach and training, and strategies for implementing BMPs.
8. Inventory, evaluate, and prioritize unpaved road stream crossings and other sedimentation sites in support of Basinwide Sedimentation Abatement.
9. Evaluate the site-specific feasibility and potential benefits and impacts of proposed innovative and/or large-scale projects, which may include but are not necessarily limited to:
 - a. Regional-scale shoreline habitat development proposals
 - b. Passive and/or pumped estuarine flushing systems

Strategic Priorities:

- ✓ All identified program priorities

Supporting Priorities:

- ✓ All identified program priorities

Objectives Addressed:

- ✓ All watershed objectives

Lead Entities:

- ✓ FWC
- ✓ FDEP
- ✓ US EPA
- ✓ USFWS
- ✓ NFWFMD
- ✓ Educational and research institutions
- ✓ Estuary Program

Geographic Focus Areas:

Watershed-wide, including across jurisdictional boundaries

Planning Level Cost Estimate:

TBD*

*Costs highly variable

- c. Proposals for major hydrologic alterations, such as causeway alterations, locks and dams, and barrier island pass alteration and maintenance
 - d. Stream channel reconfiguration
 - e. Benthic dredging
 - f. Dredged material removal and disposal
10. Identify estuarine sites with the potential for seagrass or other benthic habitat restoration through improved water quality treatment and water management within specific contributing basins.
11. Identify and describe the conditions, status, and trends of oyster and shellfish habitat within the bay.
12. Develop proposed scope of work, for multi-agency and peer evaluation, to address PCB contamination within Escambia Bay
13. Develop and refine hydrodynamic and water quality modeling tools. Develop specific management applications in cooperation with resource agencies and other public and nonprofit initiatives.
14. Evaluate effects of land use and management, to include forest management practices, on water quality. Identify and/or refine management options to protect and improve water quality.
15. Identify and describe long-term trends with respect to wetland and aquatic habitats, aquatic plants, and water chemistry. Identify management implications and recommendations.
16. Develop improved quantitative and qualitative metrics, to include biocriteria, for evaluating conditions and guiding program and project implementation.
17. Conduct a review of past projects completed, identifying specific project outcomes and lessons learned.
18. Develop an updated baseline study of current environmental conditions by conducting a one-time, multi-seasonal, multi-metric, and system-wide environmental analysis. Include evaluation of areas and metrics for which current information is lacking, inadequate or outdated.
19. Establish a research and monitoring framework for detecting the effects of climate change and ocean acidification on coastal marine resources in the region.

Outcomes/Products:

1. Improved understanding of watershed challenges and opportunities
2. Updated project priorities
3. Innovative project planning
4. Improvement in scientific basis for management strategies and actions
5. Improved understanding of quantitative potential of and expectations for environmental change in response to resource management
6. Improved metrics for evaluating conditions and guiding and tracking program implementation
7. Reduced risks of unintended adverse environmental or economic effects

Comprehensive Monitoring Program

Description:

This strategy provides for monitoring of program and project implementation, project outcomes, water quality, and habitat quality.

Scope of Work:

1. Identify appropriate parameters, to include environmental conditions and trends, and program parameters.
2. Establish a comprehensive and cumulative geodatabase of projects.
3. Further clarify and incorporate indicators at the watershed and subwatershed level.
4. Delineate sensitive/priority areas.
5. Develop public outreach application/website to communicate program implementation, outcomes, and trend data.
6. Develop updated inventory of organizations (and associated contacts) that currently or previously conducted field monitoring within the watershed, including funding sources for each. Evaluate the feasibility of combining efforts and resources, where practical and beneficial.
7. Identify potential gaps and/or additional areas of focus.
8. Develop core sampling designs for field monitoring. Determine optimal site distribution.
9. If appropriate, develop and implement a volunteer pool and volunteer training program.
10. Establish cooperative efforts with existing community initiatives and state and local agencies.
11. Support equipment acquisition where needed.
12. Where existing initiatives are not in place, consider developing a citizen water quality monitoring volunteer pool for target areas within the watershed.
13. Periodically conduct a comprehensive evaluation, at the watershed level, of program implementation, outcomes, and resource trends.

Outcomes/Products:

1. Improved long-term protection of water quality, habitat, and floodplain functions
2. Evaluations of project and program effectiveness, facilitating feedback and adaptive management
3. Improved public understanding of watershed resources, functions, and public benefits
4. Communication of program accomplishments to the public, elected officials, and stakeholders
5. Improved program accountability to the public and stakeholders
6. Improved public understanding of, and participation in, resource programs and projects

Strategic priorities:

- ✓ All identified program priorities

Supporting Priorities:

- ✓ All identified program priorities

Objectives:

- ✓ All watershed objectives

Lead Entities:

- ✓ State resource agencies
- ✓ NFWFMD
- ✓ Federal resource agencies
- ✓ Local governments
- ✓ Bream Fishermen Association and other Community-based watershed monitoring initiatives
- ✓ Estuary Program or other cooperative, public-private initiatives
- ✓ Institutions of higher education; other environmental and watershed organizations

Geographic Focus Areas:

- ✓ Watershed-wide

Planning Level Cost Estimate:

\$300,000 annually

4.4 Project Criteria and Guidelines

This section outlines recommended guidelines to be applied to project development and prioritization. These items are not intended to be pass-fail for projects, but rather identify provisions that should receive consideration in project development and evaluation. Criteria specific to any given prioritization or funding decision are often defined, at least in part, by the funding resources under consideration. Individual sources of funding often are guided by criteria and guidelines established by statute or program documentation.

Generally suggested criteria include the following:

1. Projects with responsible parties that will implement, operate, and maintain the completed facilities;
2. Projects that achieve multiple, complementary objectives;
3. Restoration that is substantially self-sustaining;
4. Responsible parties that support long-term monitoring to facilitate verification, lessons learned, and adaptive management;
5. Sites and systems that reflect and are adaptable to natural variability; and
6. Cost effectiveness, technical feasibility, and regulatory factors are criteria to be considered in prioritization and funding.

Natural variability, for example, would apply to habitat restoration projects to ensure adaptability to cyclic climatic conditions (e.g., seasonal, hydrologic), discrete events (e.g., coastal storms), and long-term changes in the environment (e.g., climate change and sea level rise).

4.5 Funding Sources

Funding sources change over time. An outline of current funding sources, including descriptions of eligibility and project types contemplated, is provided in Table 4-4. These include Deepwater Horizon related sources and state, federal, and local government programs. Private funding sources, including from nonprofit organizations and private grant programs, may also be available.

Table 4-4 Funding Sources and Eligibility

Funding Source	Eligibility	Project Types
RESTORE Act		
Equal State Allocation (also known as Direct Component or Bucket/Pot 1)	75% of funds allocated to the eight disproportionately affected Panhandle coastal counties: Bay, Escambia, Franklin, Gulf, Okaloosa, Santa Rosa, Wakulla, and Walton. Remainder of funds allocated to the 15 non-disproportionately affected Gulf Coast counties, including Jefferson County in northwest Florida.	- Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands; - Mitigation of damage to fish, wildlife and natural resources; - Implementation of a federally-approved conservation management plan; - Workforce development and job creation; - Improvements to state parks located in coastal areas affected by the <i>Deepwater Horizon</i> oil spill; - Infrastructure projects benefitting the economy or ecological resources; including port infrastructure; - Coastal flood protection and related infrastructure; - Promotion of tourism and Gulf seafood consumption; or - Administrative costs and planning assistance.
Gulf Coast Ecosystem Restoration Council (also known as The RESTORE Council or Bucket/Pot 2)	Project selection based on Comprehensive Plan developed by the RESTORE Council with input from the public.	The Initial Comprehensive Plan adopts five goals: - Restore and Conserve Habitat; - Restore Water Quality; - Replenish and Protect Living Coastal and Marine Resources; - Enhance Community Resilience; or - Restore and Revitalize the Gulf Economy.
Oil Spill Restoration Impact Allocation (also known as The Gulf Consortium, or Bucket/Pot 3)	The Gulf Consortium, consisting of 23 Gulf Coast counties, is developing the State Expenditure Plan for Florida that must be submitted by the Governor to the RESTORE Council for its review and approval.	All projects, programs, and activities in the State Expenditure Plan that contribute to the overall ecological and economic recovery of the Gulf Coast (same project types as listed under the Equal State Allocation above).
NOAA RESTORE Act Science Program (also known as Bucket/Pot 4)	- Institutions of higher education - Non-profit organizations - Federal, state, local and tribal governments - Commercial organizations; - U.S. territories.	Research, observation, and monitoring to support the long-term sustainability of the ecosystem, fish stocks; fish habitat; and the recreational, commercial, and charter fishing industry in the Gulf of Mexico, including: - Marine and estuarine research; - Marine and estuarine ecosystem monitoring and ocean observation; - Data collection and stock assessments; - Pilot programs for fishery independent data and reduction of exploitation of spawning aggregations; - Cooperative research; or - Administrative costs.

Funding Source	Eligibility	Project Types
Centers of Excellence (also known as Bucket/Pot 5)	University of South Florida, Florida Institute of Oceanography is administering Florida's Centers of Excellence Program.	- Coastal and deltaic sustainability, restoration, and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast Region; - Coastal fisheries and wildlife ecosystem research and monitoring in the Gulf Coast Region; - Offshore energy development, including research and technology to improve the sustainable and safe development of energy resources in the Gulf of Mexico; - Sustainable and resilient growth, economic and commercial development in the Gulf Coast Region; and - Comprehensive observation, monitoring, and mapping of the Gulf of Mexico.
Other Deepwater Horizon Funding		
Natural Resource Damage Assessment (NRDA)	Trustee Implementation Groups develop restoration projects guided by the programmatic restoration plan finalized in 2016. Public may submit project ideas & comment on plans.	The final plan takes a comprehensive and integrated ecosystem-level approach to restoring the Gulf of Mexico: - Restore and Conserve Habitat - Restore Water Quality - Replenish and Protect Living Coastal and Marine Resources - Provide and Enhance Recreational Opportunities
National Fish and Wildlife Foundation (NFWF)	NFWF manages the Gulf Environmental Benefit (GEBF) fund established in 2013. In consultation with FWC and FDEP, NFWF identifies priority restoration and conservation projects for GEBF funding.	Projects that: - Restore and maintain the ecological functions of landscape-scale coastal habitats, including barrier islands, beaches & coastal marshes; - Restore and maintain the ecological integrity of priority coastal bays and estuaries; and - Replenish and protect living resources including oysters, red snapper and other reef fish, Gulf Coast bird populations, sea turtles and marine mammals.
Federal Sources		
NOAA Coastal Resilience Grants	- Non-profit organizations - Institutions of higher education - Regional organizations - Private entities - States, territories and federally recognized Indian tribes - Local governments	- Strengthening Coastal Communities: activities that improve capacity of coastal jurisdictions (states, counties, municipalities, territories, and tribes) to prepare and plan for, absorb impacts of, recover from, and/or adapt to extreme weather events and climate-related hazards. - Habitat Restoration: activities that restore habitat to strengthen the resilience of coastal ecosystems and decrease the vulnerability of coastal communities to extreme weather events and climate-related hazards.
NOAA Office of Education Grants	Educational institutions and organizations for education projects and programs	- Environmental Literacy Program provides grants and in-kind support for programs that educate and inspire people to use Earth systems science to improve ecosystem stewardship and increase resilience to environmental hazards. - Bay Watershed Education and Training (B-WET) provides competitive funding to support meaningful watershed educational experiences for K-12 audiences - Cooperative Science Centers provide awards to educate and graduate students who pursue degree programs with applied research in NOAA mission-related scientific fields.

Funding Source	Eligibility	Project Types
US EPA Environmental Education Grants	- Local education agencies - State education or environmental agencies - Colleges or universities - Non-profit organizations - Noncommercial educational broadcasting entities - Tribal education agencies	Environmental education projects that promote environmental awareness and stewardship and help provide people with the skills to take responsible actions to protect the environment. This grant program provides financial support for projects that design, demonstrate, and/or disseminate environmental education practices, methods, or techniques.
US EPA – Exchange Network Grant Program	States, territories and federally recognized Indian tribes	Promotes improved access to, and exchange of, high-quality environmental data from public and private sector sources.
US EPA - Water Infrastructure Finance and Innovation Act (WIFIA) Program	- States, territories and federally recognized Indian tribes - Partnerships and joint ventures - Corporations and trusts - Clean Water and Drinking Water State Revolving Fund (SRF) programs	Accelerates investment in water infrastructure by providing long-term, low-cost supplemental loans for regionally and nationally significant projects.
State Sources		
FDEP (WMDs) Spring Restoration Program	- Local governments - Public and non-profit utilities - Private landowners	State Spring Restoration funding efforts include land acquisition and restoration, septic to sewer conversion, and other projects that protect or restore the quality or quantity of water flowing from Florida's springs.
FDEP Special Management Area Grants	State agencies and water management districts	Research or coordination efforts in areas of special management. Examples of areas of special management would include, but not be limited to Areas of Critical State Concern, Critical Wildlife Areas, Aquatic Preserves, National Estuary Programs, and Surface Water Improvement and Management waterbodies
FDEP Coastal Partnership Initiative	Coastal counties and municipalities within their boundaries required to include a coastal element in the local comprehensive plan	Coastal resource stewardship and working waterfronts projects.
FDEP Beach Management Funding Assistance (BMFA) Program	- Local governments - Community development districts - Special taxing districts	Beach restoration and nourishment activities, project design and engineering studies, environmental studies and monitoring, inlet management planning, inlet sand transfer, dune restoration and protection activities, and other beach erosion prevention related activities consistent with the adopted Strategic Beach Management Plan.
FDEP Florida Communities Trust	Local governments and eligible non-profit organizations	Acquisition of land for parks, open space, greenways and projects supporting Florida's seafood harvesting and aquaculture industries.
Florida Forever	Funding is appropriated by the legislature distributed by the FDEP to state agencies	Acquisition of public lands in the form of parks, trails, forests, wildlife management areas, and more.
FDEP Coastal and Estuarine Land Conservation Program	States that have a coastal zone management program approved by NOAA or a National Estuarine Research Reserve (NERR)	Acquisition of property in coastal and estuarine areas that have significant conservation, recreation, ecological, historical, or aesthetic values, or that are threatened by conversion from a natural or recreational state to other uses.
FDEP Clean Vessel Act Grants	Facilities that provide public access to pump-out equipment	Construction, renovation or installation of pump out equipment or pump out vessels.

Funding Source	Eligibility	Project Types
FDEP Clean Water State Revolving Fund Loan Program (CWSRF)	Project sponsors	Planning, designing, and constructing water pollution control facilities.
FDEP Clean Water State Revolving Fund Program Small Community Wastewater Construction Grants	Small communities and wastewater authorities	This grant program assists in planning, designing, and constructing wastewater management facilities. An eligible small community must be a municipality, county, or authority with a total population of 10,000 or less, and have a per capita income (PCI) less than the State of Florida average of \$26,503.
FDEP 319 grants	- State and local governments - Special districts, including water management districts - Nonprofit public universities and colleges - National Estuary Programs	Projects or programs that reduce NPS pollution. Projects or programs must be conducted within the state's NPS priority watersheds, including SWIM watersheds and National Estuary Program waters. All projects should include at least a 40% nonfederal match.
FDEP 319 Education Grants	Local governments in Florida	For projects that provide education and outreach about nonpoint source pollution in the adopted Basin Management Action Plan (BMAP) areas.
FDEP TMDL Water Quality Restoration Grants	Local governments and water management districts	Projects that: - Reduce NPS loadings from urban areas affecting verified impaired waters. - Are at least the 60% design phase. - Have permits issued or pending. - Include storm monitoring to verify load reduction. - Will be completed within three years of appropriation. - Include a minimum of 50% match with at least 25% provided by the local government. - Allocate grant funds to construction of BMPs, monitoring, or related public education.
FDACS Rural and Family Lands Protection Program	Agricultural landowners	State conservation easements that: - Protect valuable agricultural lands. - Ensure sustainable agricultural practices and reasonable protection of the environment. - Protect natural resources in conjunction with economically viable agricultural operations.
FDACS Forest Stewardship Program	Private forest landowners with at least 20 acres of forest land	Cost-share grants for implementation of stewardship to improve and maintain timber, wildlife, water, recreation, aesthetics, and forage resources.
FDACS Endangered and Threatened Plant Conservation Program	Private individuals and non-federal government entities	Actions that restore and maintain populations of listed plants on public land and on private lands managed for conservation purposes.

Funding Source	Eligibility	Project Types
Natural Resources Conservation Service	Private agricultural producers, landowners, and local governments	• Conservation Innovation Grants (CIG) stimulate development and adoption of innovative conservation approaches and technologies. • The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to agricultural producers that address natural resource concerns and improve water and air quality, conserve ground and surface water, reduce soil erosion and sedimentation, or improve or create wildlife habitat • Emergency Watershed Protection Program includes assistance to remove debris from streams, protect streambanks, establish cover on critically eroding lands, repair conservation practices, and purchase of floodplain easements.
Florida Fish and Wildlife Conservation Commission Wildlife Grants Program	State fish and wildlife agencies	Projects identified within State Wildlife Action Plan, including fish and wildlife surveys, species restoration, habitat management, and monitoring.
Florida Fish and Wildlife Conservation Commission Landowner Assistance Program	Private landowners	Cooperative and voluntary effort between landowners and the FWC to improve habitat conditions for fish and wildlife.
Florida Fish and Wildlife Conservation Commission, Partners for Fish and Wildlife	Private landowners	Cooperative and voluntary efforts between landowners, the FWC, and the USFWS to improve habitat conditions for fish and wildlife
Local Governments		
Local Government General Revenue	Defined by local statute. Generally local projects as approved by elected body, frequently leveraging state, federal, and other funding sources.	Defined by local statute and elected board.
Utility Funds – Stormwater and Wastewater	Utility projects benefiting rate payers. May leverage other local, state, and federal funding.	Stormwater and wastewater capital improvement and maintenance projects.

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Appendix A Implementation and Achievements of the Previous SWIM Plan

Previous SWIM Plan Issues and Priorities

The NFWFMD developed a SWIM Plan for the Pensacola Bay in 1988 and updated the plan in 1990 and 1997. The priority issues identified in the plan include the following (NFWFMD 1997):

- Water and Sediment Quality
- Habitat Quality
- Administration, Planning, and Coordination
- Public Education and Awareness

The 1997 SWIM plan identified 20 projects and proposed a spending plan to address these issues (see Table A-1.). The spending plan was provided for planning purposes only, and the actual spending varied, depending on available funding.

Table A-1 1997 SWIM Plan Projects

ID	Projects	FY 1998-2000
Nonpoint source Program		
WSQ 1.0	Tributary monitoring	\$172,000
WSQ 2.0	Land use/loading rate analysis	\$80,000
WSQ 3.0	Bayou Chico restoration	\$258,000
WSQ 4.0	Septic tank impact assessment	\$20,000
WSQ 5.0	Bayou Texar retrofit	\$75,400
WSQ 6.0	Gulf Breeze Bayous	\$100,000
WSQ 7.0	Palafox/Cole restoration	\$55,400
WSQ 8.0	Role of bay sediments	\$92,100
WSQ 9.0	Pollutant load reduction goals	\$100,000
Habitat Program		
HAB 1.0	Tidal marsh preservation	\$60,000
HAB 2.0	Bottomland hardwood preservation	\$82,200
HAB 3.0	Biological Monitoring	\$67,300
HAB 4.0	Circulation study	\$0
Coordinating Program		
APC 1.0	Administration and planning	\$56,400
APC 2.0	Institutional and regulatory assessment	\$7,000
APC 3.0	Interstate coordination	\$87,600
APC 4.0	GIMS integration and coordination	\$94,000
Public Education and Awareness Program		
ED 1.0	Strategy development	\$10,000
ED 2.0	Media and community relations	\$30,000
ED 3.0	WaterWays video	\$54,250

Source: NFWFMD 1997

Progress toward Meeting Plan Goals and Objectives

Specific SWIM projects and related cooperative projects previously implemented or ongoing in the watershed are listed in Table A-2. The District's Consolidated Annual Reports (<http://www.nwfwater.com/Data-Publications/Reports-Plans/Consolidated-Annual-Reports>) provide listings and descriptions of specific projects that have been completed under the auspices of the SWIM and Florida Forever programs.

Table A-2 Project Implementation

Project	General Description	Lead Entity	Corresponding SWIM Project ¹	Status ²
Sediment Quality in the Pensacola Bay System	Compilation and analysis of sediment monitoring data for the Pensacola Bay system, detailed in DeBusk <i>et al.</i> 2002	NFWFMD	Role of Bay Sediments	Complete 2002
Biological Monitoring in the Pensacola Bay System: 1990-2000	Compilation and analysis of biological data for the Pensacola Bay system, detailed in Von Appen and Winter 2000; provides an update to Collard 1991	NFWFMD	Biological Monitoring	Complete 2000
Clear Creek Restoration	Stabilization of 45 acres of eroding gully	Blackwater SWCD	Basinwide Sedimentation Abatement (2017 plan update)	Complete 2004
Carpenter Creek Basin Stormwater Retrofit Project	Installation of stormwater treatment vault and three stormwater treatment units to reduce sediment entering Carpenter Creek and Bayou Texar	City of Pensacola	Bayou Texar Retrofit	Complete 2005
Big Escambia Creek Restoration	Restoration of stream to original channel	Three Rivers RC&D	Hydrologic and Wetland Restoration (2017 plan update)	Complete 2004
Palafox Basin Alum Injection System	Retrofit of "L" Street Pond with installation of alum injection system	City of Pensacola	Palafox/Coyle Restoration	Complete 2001
Bayou Chico Restoration	Maggie's Ditch stormwater retrofit project	NFWFMD	Bayou Chico Restoration	Complete 1999
Main Street WWTP Relocation	Major state-local-federal WWTP relocation project to move the main plant in Pensacola outside of the floodplain/hurricane zone	ECUA	Wastewater Treatment and Management Improvements (2017 plan update)	Complete 2010
Project Greenshores Phase I	Restoration of 15-20 acres of saltmarsh along Pensacola Bay shoreline	FDEP	Estuarine Habitat Restoration (2017 plan update)	Complete 2003
17th Avenue Stormwater Pond	Construction of a stormwater treatment system, to reduce pollutant loading to Bayou Texar	City of Pensacola	Bayou Texar Retrofit	Complete 2003
Bayou Chico Restoration	Removal of sediment (187,000 cubic yards) from Bayou Chico	NFWFMD	Bayou Chico Restoration	Complete 2004
19th Avenue and Brainerd Street Stormwater Retrofit	Installation of stormwater treatment facilities for 160 acre drainage basin discharging into Pensacola Bay	City Of Pensacola	Bayou Texar Retrofit	Complete 2004

Project	General Description	Lead Entity	Corresponding SWIM Project ¹	Status ²
Bayou Texar Retrofit	Stormwater retrofit of I-110 Pond	City of Pensacola	Bayou Texar Retrofit	Complete 2001
Stormwater Drainage Improvement (Gulf Breeze)	Construction of an exfiltration system and other stormwater improvements at five sites to reduce runoff and nonpoint surface water discharge to Santa Rosa Sound	City of Gulf Breeze	Gulf Breeze Bayous	Complete 2006
Second and Sunset Wetland Water Quality Improvement	Stormwater retrofit urbanized 33 acre contributing basin to Davenport Bayou/Pensacola Bay. Project will create a wetland treatment system, including planting of vegetation and installation of dissipation structures	Escambia County	Stormwater Planning and Retrofit (2017 plan update)	Complete 2008
Holley-Navarre Water System Golf Course Re-Use Line Replacement	Replace an existing 13,000 LF of 10" reclaimed water line with a 12" line, serving the Hidden Creek Golf Course and surrounding residential neighborhood	Holley-Navarre Water System, Inc.	Wastewater Treatment and Management Improvements (2017 plan update)	Complete 2015
South Santa Rosa Utility System Reclaimed Water Elevated Storage Tank	Construction of elevated reclaimed water storage tank for an existing system	City of Gulf Breeze	Wastewater Treatment and Management Improvements (2017 plan update)	Complete 2014
ECUA Pensacola Beach Reclaimed Water System Expansion	Planning, design and construction of a ground storage tank; pump station; and associated piping, valves, and other system components to expand the Pensacola Beach reclaimed water system	ECUA	Wastewater Treatment and Management Improvements (2017 plan update)	In progress
City of Mary Esther Reclaimed Water Feasibility	Planning and evaluation for reclaimed water reuse program	City of Mary Esther	Wastewater Treatment and Management Improvements (2017 plan update)	In Progress

¹1997 plan projects unless otherwise indicated

²As of July 2017

In addition to the projects listed above, local governments and state and regional agencies have completed a number of initiatives and projects that directly correspond to and advance SWIM plan implementation. Several of the more prominent efforts are described below. Other related resource management activities are described in Appendix B.

Escambia County Dirt Road Project – With U.S. EPA 319(h) program funding, Escambia County evaluated alternative pavements for unpaved roads and implemented paving projects to reduce sediment erosion and runoff to streams. Work was completed in 2011 (Fabre Engineering and Surveying 2016).

Big Escambia Creek Restoration – About 40 years ago, a major storm rerouted the Big Escambia Creek from its original braided streams and floodplain through a series of sandpits. The new channel lacked a floodplain and stable riparian areas, thus, allowing increased velocity and sedimentation. The sedimentation impacts reached several miles downstream into the Escambia River. The USACE, in

partnership with the states of Alabama and Florida, the NFWFMD, Three Rivers Resource Conservation and Development Council, and the Alabama Rural Development Council, completed a large-scale project that restored the creek back to its natural channel within the wetland floodplain (FDEP 2009).

Project Greenshores – Two habitat restoration projects on the north shore of Pensacola Bay created salt marsh, seagrass, and oyster reef habitat along the shoreline. It is a partnership between the FDEP’s Northwest District Office Ecosystem Restoration Section, the City of Pensacola, the Ecosystem Restoration Support Organization, federal and local agencies, businesses, and community volunteers. The first habitat restoration site (Site I) provides eight acres of salt marsh habitat and seven acres of oyster reef. The second site (Site II), when completed, will provide an additional 14 acres of salt marsh and 13 acres of oyster reef habitat. Project Greenshores received the Coastal America Partnership Award for its extensive community involvement (FDEP 2016g).

City of Pensacola Transportation/Stormwater Plan Projects – Numerous stormwater retrofits, reconstruction, drainage improvements, and other projects have been completed, as follows (City of Pensacola 2016):

- Government Street Regional Stormwater Pond;
- Guillemard Street Storm Sewer Reconstruction
- Long Hollow/Cervantes Street Stormwater Pond
- Carpenter Creek Retrofit
- 17th Avenue Park and Drainage Improvement
- Sewell Street Stormwater Drainage Easement Acquisition
- Chipley Street Drainage Improvement
- L and Zarrogossa Street Drainage Improvement
- Government Street/Jones Park Drainage Improvement
- Zarrogossa and C Street Drainage Improvement
- 9th Avenue Baars Drainage Improvement
- Sanders Beach Storm Sewer Reconstruction
- Longhollow Pond Reconstruction
- 9th Avenue and Texar Drainage Improvement
- Burgess Road and Sanders Drainage Improvement
- Carpenter Creek/Bayou Texar stormwater management assessment
- East Hill Drainage Improvement

Bayou Chico Restoration Projects – Over the past 20 years, several water quality improvement projects have been undertaken by the FDEP’s Northwest District Ecosystem Restoration Section, Escambia County, NFWFMD, and Bayou Chico Association. Projects include the removal of the old Barrancas Street drawbridge, removal of the old CSX train trestle, construction of a sediment basin at W Street, construction of the Maggie’s Ditch stream restoration, and several emergent marsh restoration projects along the bayou’s shoreline.

Wayside Park Restoration Project – The City of Gulf Breeze, FDEP, and the USACE constructed an offshore rock breakwater and seagrass/emergent marsh at the south end of Three Mile Bridge (FDEP 2007).

Deadman’s Island Restoration Project – With funding assistance from the U.S. Army Corps of Engineers, the City of Gulf Breeze completed restoration of approximately 13 acres of littoral habitat, including an oyster reef breakwater and salt marsh (Reed 2017). The project included demonstration and evaluation of alternative restoration techniques and accomplished protection of habitats affected by historical bridge construction, dredging, and shoreline armoring.

Appendix B Related Resource Management Activities

Much of the progress to date is attributable to cooperative efforts made on the part of local governments; state, federal, and regional agencies; and private initiatives. Many programs and projects share common goals, and their implementation is most frequently accomplished through coordinated planning, funding, management, and execution. This section describes historical and ongoing activities and programs to address resource issues within the watershed.

Minimum Flows and Minimum Water Levels

Section 373.042, F.S., requires each water management district to develop minimum flows and minimum water levels (MFLs) for specific surface and groundwaters within their jurisdiction. A minimum flow or minimum water level for a given waterbody is the limit below which further withdrawals would be significantly harmful to the water resources or ecology of the area. Minimum flows and minimum water levels are calculated using best available data and consider natural seasonal fluctuations; non-consumptive uses; and environmental values associated with coastal, estuarine, riverine, spring, aquatic, and wetlands ecology as specified in Section 62-40.473, F.A.C.

The process of establishing MFLs involves a series of steps including identification of priority waterbodies, data collection, technical assessments, peer review, rule-making and rule adoption. Adopted MFLs are considered when reviewing consumptive use permit applications. A recovery or prevention strategy must be developed for any waterbody where consumptive uses are currently or anticipated to result in flows or water levels below adopted MFLs.

A technical assessment for an MFL for the Floridan aquifer, Coastal Region II, in Santa Rosa, Okaloosa, and Walton counties was initiated in 2014. The Shoal River system MFL technical assessment was initiated in 2017. The current status of planning and development of MFLs in northwest Florida may be found at <http://www.nwfwater.com/Water-Resources/Minimum-Flows-Levels>.

Special Resource Management Designations

Outstanding Florida Waters

The FDEP designates Outstanding Florida Waters (OWFs) under section 403.061(27), F.S., which are then approved by the Environmental Regulation Commission. An OFW is defined by FDEP as a waterbody "...worthy of special protection because of its natural attributes." A number of waterbodies and segments in the watershed have been recognized and receive additional regulatory protection through designation as OFWs, per Section 62-302.700, F.A.C. Designated OFWs include:

- Yellow River Marsh Aquatic Preserve
- Fort Pickens Aquatic Preserve
- Gulf Islands National Seashore
- Escambia Bay Bluffs
- Blackwater River State Park
- Yellow River Marsh Preserve State Park
- Clear Creek between Milton and Whiting Field

Aquatic Preserves

Florida currently has 41 aquatic preserves, encompassing approximately 2.2 million acres of submerged lands protected for their biological, aesthetic, and scientific value. As described in Chapter 18-20, F.A.C., aquatic preserves were established for the purpose of being preserved in an essentially natural or existing condition so that their aesthetic, biological, and scientific values may endure for the enjoyment of future

generations. The Pensacola Bay system includes two aquatic preserves: the Yellow River Marsh Aquatic Preserve, and the Fort Pickens Aquatic Preserve.

The Yellow River Marsh Aquatic Preserve encompasses approximately 11,000 acres of the Yellow River, Blackwater Bay, and East Bay. The aquatic preserve is among the watershed's least impacted natural areas and includes more than 3,000 acres of salt and freshwater marshes and approximately 5,000 acres of forested wetlands. The remainder of the preserve is open water. Eglin AFB and the NFWFMD manage almost half of the uplands adjacent to the preserve, which further protects water quality (FDEP 2016f).

Fort Pickens Aquatic Preserve includes 34,000 acres of submerged lands adjacent to Gulf Islands National Seashore. The preserve includes sandy bottom and seagrass bed habitats that are for numerous species, including the loggerhead turtle (*Caretta caretta*), the southeastern snowy plover (*Charadrius nivosus*), the least tern, and the black skimmer (*Rynchops niger*). Fort Pickens Aquatic Preserve includes portions of Santa Rosa Sound, Pensacola Bay, and Big Lagoon, extending northward to the Gulf Intracoastal Waterway. The preserve also includes submerged lands in the Gulf of Mexico up to three miles south of the coastline (FDNR 1992).

Conservation Lands

Approximately 520,000 acres, or 35 percent, of the watershed in Florida consists of public and conservation lands. These are listed with short descriptions in Appendix G.

The NFWFMD owns and manages over 55,000 acres within the watershed. The Yellow River, Escambia River, Blackwater River, and Garcon Point WMAs are public lands that provide joint conservation and recreational use. The District also manages 19 acres in the watershed as conservation easements, maintaining private ownership while protecting water resources. The Yellow, Blackwater, and Escambia River WMA tracts are also managed by FWC as Wildlife Management Areas. These areas are managed to protect and restore wildlife habitat, while also providing a resource for compatible public recreation. Land-management activities include prescribed burning, timber management, groundcover restoration, reforestation, and other activities (FWC 2016d, NFWFMD 2016). The FWC also manages the Lake Stone Fish Management Area in Escambia County.

The National Park Service owns and manages the Gulf Islands National Seashore, established in 1971. The seashore supports an abundance of natural habitats, including coastal dunes, scrub, and estuarine marsh ecosystems. Portions of the military lands within the watershed are managed as conservation areas, including 10,738 acres owned and managed by the U.S. Navy and 229,743 acres owned and managed by the U.S. Air Force (FNAI 2010).

State lands in the watershed include the Blackwater River State Forest, Fort Pickens State Park, and Blackwater River State Park. The Blackwater River State Forest covers over 210,000 acres in northern Santa Rosa and Okaloosa counties, including significant portions of the Blackwater River and Yellow River watersheds. These park and forest lands protect water and other natural resources, while also providing important opportunities for public use and recreation. The state forest is also a resource for timber production, with harvesting following silvicultural BMPs.

Garcon Peninsula Mitigation Bank and Pensacola Bay Mitigation Bank are privately owned wetland mitigation banks within the Pensacola watershed. The Pensacola Bay Mitigation bank consists primarily of mixed hardwood and pine flatwoods and hosts a healthy population of carnivorous pitcher plants, while Garcon Peninsula Mitigation Bank consists primarily of pitcher plant prairie (Garcon Peninsula Mitigation Bank, LLC 2001; Westervelt Ecological Services 2016). The Garcon Peninsula Mitigation

Bank is northwest Florida's first wetlands mitigation bank and includes over 330 acres within the watershed (FNAI 2010, 2016a).

Jones Swamp Preserve was purchased by Escambia County in 1996 as part of Bayou Chico restoration efforts to provide buffering and protection of water quality in the Pensacola Bay area. The Jones Swamp Wetland Preserve consists of over 580 acres within the Jones Creek watershed, at the urban interface within the Bayou Chico drainage (Escambia County 2016a). More than 60 percent of the Jones Swamp Preserve is covered by forested wetlands, including hardwood swamp, bay swamp, cypress swamp, and mixed wetland forest communities. The Preserve is managed for wetland, groundwater, and surface water quality protection and restoration; hydrological restoration, including floodplain restoration; preservation and conservation of natural resources; environmental education; and outdoor recreation.

Critical Habitat and Strategic Habitat Conservation Areas

The Pensacola Bay system sustains numerous listed species, as designated under the Endangered Species Act (ESA). The ESA also provides special protection for Critical Habitat of certain species, which may include an area that is not currently occupied by the species, but that will be needed for its recovery.

As described above, the Pensacola Bay system includes federally designated critical habitat for the threatened Gulf sturgeon and several species of freshwater mussels. The watershed also supports the threatened piping plover, the endangered reticulated flatwoods salamander, and the blackmouth shiner, which is considered endangered by the state of Florida (FNAI 2001).

Certain natural areas within the watershed have been identified by the FWC as Strategic Habitat Conservation Areas (SHCAs). SHCAs are important habitats in Florida that do not have conservation protection, which would increase the security of rare and imperiled species if they were protected. Within the Pensacola Bay watershed, SHCAs have been identified for several species, including the Florida black bear (*Ursus americanus floridanus*), pine barrens tree frog (*Hyla andersonii*), seal salamander (*Desmognathus monticola*), and others (Endries *et al.* 2009)

Portions of the estuary adjacent to the Gulf of Mexico also provide habitat for three species of threatened and endangered sea turtles, and beach and dune communities also provide habitat for the endangered Santa Rosa Beach mouse (*Peromyscus polionotus leucocephalus*) (USFWS 2016a).

The FDACS publishes a list of the protected plants of Florida, including those species listed as federally threatened and endangered by the USFWS (Weaver and Anderson 2010). The table in Appendix D provides a list of species that are protected for the watershed, as well as their habitat requirements.

Gulf Ecological Management Sites

The watershed includes two Gulf Ecological Management sites (GEMS), the Yellow River Marsh Fort Pickens aquatic preserves. The GEMS Program is an initiative of the Gulf of Mexico Foundation, the EPA Gulf of Mexico Program, and the five Gulf of Mexico states (Gulf of Mexico Foundation 2015). Designated GEMS are considered high priority for protection, restoration, and conservation by state and federal authorities due to unique ecological qualities such as habitats significant to fish, wildlife, or other natural resources (Gulf of Mexico Foundation 2015).

Deepwater Horizon: RESTORE Act, Natural Resource Damage Assessment (NRDA), and NFWF Projects

The FDEP and the FWC are the lead state agencies in Florida for responding to the impacts of the Deepwater Horizon oil spill and the resulting restoration process. Restoration projects submitted through the FDEP are considered for funding under the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast Act (RESTORE Act) Comprehensive Plan Component, the NRDA, and the NFWF's GEBF.

RESTORE

The RESTORE Act of 2012 allocates to the Gulf Coast Restoration Trust Fund 80 percent of the CWA administrative and civil penalties resulting from the oil spill. The major means of allocation under the RESTORE Act are as follows:

Direct Component Funds ("Bucket 1"): Seven percent of these funds will be directly allocated to counties affected in Florida (5.25 percent to the eight disproportionately affected counties in the Panhandle from Escambia to Wakulla counties; and 1.75 percent to the non-disproportionately impacted Gulf Coastal counties). To receive funds under the Direct Component, each county is required to submit a Multiyear Implementation Plan, subject to review by the U.S. Department of the Treasury, detailing the county's plan to expend funds for a set of publically vetted projects and goals (FDEP 2016h).

Comprehensive Plan Component ("Bucket 2"): A portion of RESTORE funds will go toward projects with a wider geographic benefit (multiple states). These projects are selected by the Gulf Coast Ecosystem Restoration Council, which includes the five Gulf States and six federal agencies. Projects can be submitted by the Council members and federally recognized Native American tribes.

In August 2017, the U.S. Environmental Protection Agency announced that Escambia County's proposal on behalf of the Bay Area Resource Council for the Pensacola and Perdido Bays Estuary Program was selected for funding through the RESTORE Council. Near term component of program development will include establishing an independent estuary program office, hiring a program director and staff, developing a Management Conference to include a Policy Board and Technical, Community, Education, and Economic advisory committees; identifying stressors; conducting initial outreach; and develop and adopting a Comprehensive Conservation and Management Plan (CCMP).

Spill Impact Component ("Bucket 3"): Each of the five Gulf states will receive these funds to implement a State Expenditure Plan. In Florida, this plan is being developed through the Gulf Consortium, which was created by inter-local agreement among Florida's 23 Gulf Coast counties. Projects will be submitted by each of the 23 counties on Florida's Gulf Coast.

National Resource Damage Assessment (NRDA)

The Oil Pollution Act of 1990 authorizes certain state and federal agencies to evaluate the impacts of the Deepwater Horizon oil spill. This legal process, known as NRDA, determines the type and amount of restoration needed to compensate the public for damages caused by the oil spill. The FDEP, along with the FWC, are co-trustees on the Deepwater Horizon Trustee Council.

National Fish and Wildlife Foundation

The National Fish and Wildlife Foundation (NFWF) established the GEBF to administer funds arising from plea agreements that resolve the criminal cases against BP and Transocean. The purpose of the

GEBF, as set forth in the plea agreements, is to remedy harm and eliminate or reduce the risk of future harm to Gulf Coast natural resources. The plea agreements require NFWF to consult with state and federal resource agencies in identifying projects. The FWC and the FDEP work directly with the NFWF to identify projects for the state of Florida, in consultation with the USFWS and the NOAA. From 2013 to 2018, the GEBF will receive a total of \$356 million for natural resource projects in Florida. However, the allocation of funds is not limited to five years. NFWF funded the development of the 2017 SWIM plan updates through the GEBF. Additional projects currently funded that will benefit watershed resources in the Pensacola Bay System are Government Street Stormwater, Bayou Chico Restoration, Eastern Pensacola Bay Oyster Habitat Restoration- Phase I, and Escribano Point Phases I & II.

The Nature Conservancy (TNC): Watershed Management Planning

To achieve comprehensive and long-term success for Gulf restoration, TNC facilitated a community-based watershed management planning process in 2014 and 2015 along Florida's Gulf Coast for the following six watersheds: Perdido Bay, Pensacola Bay, Choctawhatchee Bay, St. Andrew and St. Joseph bays, Apalachicola to St. Marks, and the Springs Coast. The process was designed to develop watershed-based plans that identify environmental issues affecting each watershed and solutions that address the issues. The process was also intended to create long-term partnerships among stakeholders in each watershed and across the regions to maximize effectiveness of project implementation and funding efforts and to provide a screening tool to evaluate priorities for potential funding (TNC 2014).

The TNC Plan developed for the Pensacola Bay system identifies 43 separate projects to address seven major actions (TNC 2014):

- Protect, restore, create and/or manage natural habitat and resources and increase buffer areas;
- Increase cooperation and coordination for management, monitoring, funding, implementation, outreach, and enforcement;
- Reduce impacts to groundwater and ensure adequate fresh water availability;
- Reduce and treat stormwater;
- Reduce nutrient loading;
- Reduce sedimentation; and
- Increase economic diversification.

To complete the planning process and ensure that all of the priority issues are identified and addressed, the plan recommended updating the 1997 Pensacola Bay System SWIM Plan (TNC 2014).

Monitoring Programs

The majority of the monitoring data in the Pensacola Bay system, including chemical and biological data, has been collected by the FDEP Northwest District staff and the Bream Fishermen Association (BFA) (FDEP 2007). Data-gathering activities include working with environmental monitoring staff in the NFWFMD and local and county governments to obtain applicable monitoring data from their routine monitoring programs and special water quality projects in the basin. All of the data collected by the FDEP and its partners is uploaded to the statewide water quality database for assessment.

Several water quality monitoring programs are ongoing in the watershed. These include the FDEP Trend and Status Networks; FDACS Shellfish Environmental Assessment Section (SEAS); the FDOH Florida Healthy Beaches monitoring program; and the BFA.

The following subsections provide an overview of these programs and some of their relevant findings.

FDEP/NFWFMD

Long-term trends in water quality are monitored by FDEP's Surface Water Temporal Variability (SWTV) and Groundwater Temporal Variability (GWTV) monitoring networks. These are statewide networks of fixed sites selected to reflect the water quality impacts across the state. The SWTV network includes data collection at 78 fixed sites, including seven sites in the Pensacola Bay system (FDEP 2016j, 2016k):

- Escambia River – two sites: one in Century, near the Alabama-Florida state line, and one downstream at a site that is representative of the watershed's land use activities.
- Blackwater River – two sites: one in the upstream, undeveloped portions of the river. And one on Big Coldwater Creek, a tributary of the Blackwater River.
- Yellow River – two sites: one near the Alabama-Florida state line, and one downstream, near East Bay, at a site that is representative of the watershed's land use activities.
- East Bay River – one site near East Bay that is representative of the watershed's land use activities.

Parameters monitored include color alkalinity, turbidity, suspended and dissolved solids, nutrients, total organic carbon, chlorides, sulfate, metals (calcium, potassium, sodium, magnesium), pH, conductivity, temperature, DO, total coliform bacteria, fecal coliform bacteria, enterococci bacteria, and Escherichia bacteria (FDEP 016i, 2016j).

The GWTV network includes data collection at 49 fixed stations statewide (24 unconfined aquifer wells, 23 confined aquifer wells, and two spring vents), including one unconfined aquifer well sampled monthly, located north of Bayou Grande and the Pensacola NAS.

Water quality data are maintained and made available through the Storage and Retrieval (STORET) database.

FDEP Northwest District

The FDEP's Northwest District has collected considerable biological data and conducted biological evaluations of numerous stream and other aquatic habitat sites throughout the watershed (FDEP 2007). The biological data collected by the FDEP Northwest District includes Stream Condition Index, Stream Habitat Assessment, Stream Linear Vegetation Index, Stream Rapid Periphyton Survey, Wetland Condition Index, and Bioassessment data, all are reported and accessible via STORET.

Florida Department of Agriculture and Consumer Services

To minimize the risk of shellfish-borne illness, FDACS continually monitors and evaluates shellfish harvesting areas and classifies them accordingly. It also ensures the proper handling of shellfish sold to the public. Under the SEAS program, FDACS collects and analyzes data from 1,200 bacteriological sampling stations in 39 shellfish harvesting areas encompassing 1.4 million acres in Florida, including five shellfish harvesting areas in the Pensacola Bay system. The FDACS monitors bottom and surface temperature, salinity, DO, surface pH, turbidity, fecal coliform bacteria, water depth, and wind direction and speed at monitoring stations in Pensacola Bay, Escambia Bay, East Bay, East Bay River, and Blackwater Bay. The dataset begins in 1985 and continues to the present. These stations are monitored at least monthly and often more frequently (FDACS 2016b).

The FDEP identified eight waterbody segments as verified impaired for bacteria in the Pensacola Bay watershed, based on shell fish classifications issued by the FDACS (see Section 3.2).

Florida Department of Health

The Florida Healthy Beaches Program was initiated by the FDOH as a pilot beach monitoring program in 1998 with expansion to include all the state's coastal counties in August 2000 (FDOH 2005). The Escambia County and Santa Rosa County health departments participate in the program with weekly monitoring of beaches for enterococcus and fecal coliform bacteria at 14 local beaches. County health departments issue health advisories or warnings when bacterial counts are excessive (FDEP 2007). Beaches with more than 21 closures in a year are identified as impaired by FDEP.

Bream Fishermen Association

The Bream Fishermen Association (BFA) is an organization of local fishermen and residents that assists the city, county, state, and region as an environmental steward in protecting northwest Florida and south Alabama waters by performing regular water quality monitoring. The BFA was established in the mid-1960s and was chartered as a non-profit organization in 1970. Today, the BFA collects samples at 48 quarterly stations in Escambia, Santa Rosa, and Okaloosa counties (BFA 2016).

Submerged Aquatic Vegetation Monitoring

In the late 1990s, FDEP Northwest District's Ecosystem Restoration Section conducted a study to monitor the health of seagrasses in Big Lagoon and Santa Rosa Sound. The study concluded with a management plan, which included recommendations for improving the health of SAVs in the study area (FDEP 2001). The USGS published a report on the status and trends of seagrasses along the Gulf Coast, including the Pensacola Bay system (USGS 2006). The FWC's FWRI currently evaluates changes in the extent, density, and quality of seagrasses in Pensacola Bay, Big Lagoon, and Santa Rosa Sound as part of the statewide SIMM program. The maps are generated through photointerpretation of high-resolution imagery. The general status of seagrasses for the bays is discussed in Section 3.3.1 (FWC 2015c).

Environmental Restoration and Protection Programs

Water quality in the Pensacola Bay watershed is protected through several programs working together to restore water quality and prevent degradation. These programs include FDEP's adopted TMDLs; BMPs for silviculture, agriculture, construction, and other activities related to land use and development; regulatory programs including NPDES, domestic and industrial wastewater permits, stormwater permits, and ERP; and local efforts to retrofit stormwater infrastructure to add or improve water quality treatment. Additionally, water quality is protected through a number of conservation, mitigation, and management programs that protect water resources, aquifer recharge areas, floodplains, and other natural systems within the watershed. These programs include Florida Forever Work Plan, regional mitigation for state transportation projects, and spring protection and restoration. The following section provides an overview of these programs and their contribution to water quality restoration and protection.

Total Maximum Daily Loads

As described above, TMDLs are developed for waterbodies that are verified as not meeting adopted water quality standards to support their designated use. They provide important water quality restoration goals to guide restoration activities. They identify the reductions in pollutant loading required to restore water quality. Total daily maximum loads are implemented through the development and adoption of BMAPs that identify the management actions necessary to reduce the pollutant loads. Basin Management Action Plans are developed by local stakeholders (public and private) in close coordination with FDEP. Although water segments with adopted TMDLs are removed from the state's impaired waters list, they remain a

high priority for restoration. Impaired waters and TMDLs are described in greater detail in Chapter 3 and Appendix F.

National Pollutant Discharge Elimination System Permitting

Point sources that discharge to surface waterbodies require a National Pollutant Discharge Elimination System (NPDES) permit. These permits can be classified into two types: domestic or industrial wastewater discharge permits, and stormwater permits. An NPDES permit includes limits on the composition and quantity of a discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not pose a threat to human health or water quality. All NPDES permits include “reopener clauses” that allow the FDEP to incorporate new discharge limits when a TMDL is established. These new limitations may be incorporated into a permit when a TMDL is implemented or at the next permit renewal, depending on the timing of the permit renewal and workload. For NPDES municipal stormwater permits, the FDEP will insert the following statement once a BMAP is completed (FDEP 2007):

The permittee shall undertake those activities specified in the (Name of Waterbody) BMAP in accordance with the approved schedule set forth in the BMAP.

The FDEP implements the NPDES stormwater program in Florida under delegation from the EPA. The program requires the regulation of stormwater runoff from MS4s generally serving populations of more than 10,000 and denser than 1,000 per square mile, construction activity disturbing more than one acre of land, and ten categories of industrial activity. An MS4 can include roads with drainage systems, gutters, and ditches, as well as underground drainage, operated by local jurisdictions, the FDOT, universities, local sewer districts, hospitals, military bases, and prisons. Escambia County, Pensacola, and Century are Phase 1 co-permittees with the FDOT District 3. Stormwater management for other local governments, military bases, and educational institutes within the Pensacola Bay system is covered under Phase 2 MS4 permits. Phase 2 permits are general permits and are not written for a specific local government. Phase 2 permit holders in the Pensacola Bay system include: Pensacola NAS, Eglin AFB, Hulbert Field (U.S. Air Force), University of West Florida, Okaloosa and Santa Rosa counties, and the cities of Niceville, Gulf Breeze, and Milton (FDEP 2007).

As part of the MS4 program, Escambia County’s Stormwater Program has delineated the county into 41 drainage basins. The basins have been numerically ranked based on the severity of water quality and drainage issues to establish an order of priority for remediation. A countywide Stormwater Master Plan has been completed (Hatch Mott MacDonald 2004). Countywide drainage plans have either been completed or are under way for 23 individual drainage basins. Each plan describes current stormwater structural controls and identifies and recommends water quality and drainage improvement projects. Funding for stormwater retrofits is provided by a local option sales tax, which was approved by Escambia County voters in 1992. The intent of the tax is to help pay for capital improvement projects that address flooding, improve access to residential and commercial properties (improve transportation), and improve stormwater quality. It became effective June 1, 1992, and was renewed by a voter referendum in 1999. It was reapproved by voters in 2008 and will be in effect until December 31, 2017. Revenue generated by the tax has provided money to pave dirt roads and improve drainage and transportation. As of February 2003, \$37.3 million had been spent for projects to primarily improve drainage, \$28.4 million to primarily improve transportation, and \$16.2 million to pave dirt roads (Hatch Mott MacDonald 2004).

Domestic and Industrial Wastewater Permits

In addition to NPDES-permitted facilities, all discharge to surface waters, Florida also regulates domestic and industrial wastewater discharges to groundwater via land application. Since groundwater and surface water are so intimately linked in much of the state, reductions in loadings from these facilities may be

needed to meet TMDL limitations for pollutants in surface waters. If such reductions are identified in the BMAP, they would be implemented through modifications of existing state permits.

Best Management Practices

Best management practices may include structural controls (such as retention areas or detention ponds) or non-structural controls (such as street sweeping or public education). Many BMPs have been developed for urban stormwater to reduce pollutant loadings and peak flows. These BMPs accommodate site-specific conditions, including soil type, slope, depth to groundwater, and the use designation of receiving waters (such as drinking water, recreation, or shellfish harvesting).

The passage of the 1999 Florida Watershed Restoration Act (Chapter 99-223, Laws of Florida) increased the emphasis on implementing BMPs to reduce NPS pollutant discharges from agricultural operations. It authorized the FDEP and the FDACS to develop interim measures and agricultural BMPs. While BMPs are adopted by rule, they are voluntary if not covered by regulatory programs. If they are adopted by rule and the FDEP verifies their effectiveness, then implementation provides a presumption of compliance with water quality standards, similar to that granted a developer who obtains ERP (FDACS 2016c).

Over the last several years, the FDACS has worked with farmers, soil and water conservation entities, the University of Florida's Institute of Food and Agricultural Sciences, and other interests to improve product marketability and operational efficiency of agricultural BMPs, while at the same time promoting water quality and water conservation objectives. In addition, programs have been established and are being developed to create a network of state, local, federal, and private sources of funds for developing and implementing BMPs. BMPs have been adopted by rule for silviculture, row crops, container plants, cow calf, and dairies. The BMP manuals can be accessed on the FDACS website (FDACS 2016c).

Florida Environmental Resource Permitting Program

Florida established the Environmental Resource Permitting (ERP) program to prevent stormwater pollution of Florida's rivers, lakes, and streams, and to protect wetland functions and provide flood protection. The ERP program regulates the management and storage of surface waters and provides protection for the vital functions of wetlands and other surface waters. Environmental resource permits are designed to obtain 80 percent average annual load reduction of total suspended solids. In northwest Florida, the ERP program is jointly implemented by the NFWFMD and the FDEP.

Regional Mitigation for State Transportation Projects

Under Section 373.4137, F.S., the NFWFMD offers mitigation services, as an option, to the FDOT for transportation projects with unavoidable wetland impacts when the use of private **mitigation banks** is not feasible. As required by this statute, a regional mitigation plan has been developed and is updated annually to address FDOT mitigation needs submitted to the NFWFMD. Components of the Umbrella Plan include the federally permitted "In-Lieu Fee Program" instrument and other mitigation projects (NFWFMD 2016). The District does not compete with private mitigation banks. The District's mitigation plan is developed and implemented in consultation with the FDOT, the FDEP, the USACE, the EPA, the USFWS, the U.S. National Marine Fisheries Service, and the FWC and is maintained and available for review at <http://www.nwfwmdwetlands.com/>.

Since 1997, the NFWFMD has implemented mitigation at seven sites in the Pensacola Bay system: Bluff Springs, Brewer, Cotton Creek Road, Jones Swamp, Mystic Springs, Rogers, and Yellow River Ranch (NFWFMD 2016).

FDEP Ecosystem Restoration Section

The FDEP (through funding from the USFWS Coastal Program and other sources) has established living shoreline restoration sites within the Pensacola Bay system to aid in shoreline stabilization, biodiversity, and water quality (FDEP 2015e). Living shorelines are constructed of oyster shells, limestone rock, or other substrate conductive to the natural environment. These created shorelines provide a physical barrier for the mainland during storms, and aid in sediment stabilization through the use of planted native vegetation (FDEP 2015e).

Florida Forever

Florida Forever is Florida's conservation and recreation lands acquisition program. Under section 373.199, F.S., and the NFWMD Florida Forever 2016 Five Year Work Plan, a variety of projects may be implemented, including capital projects, land acquisition, and other environmental projects. Since its inception, the District's land acquisition program has sought to bring as much floodplain as possible of the major rivers and creeks under public ownership and protection. The District's Florida Forever Five Year Plan identifies land acquisition priorities along the Escambia River, Garcon Point Peninsula, the Blackwater River, and the Yellow River. Additional information is available at <http://www.nfwmd.com/Lands/Land-Acquisition/Forever-Florida-Land-Acquisition-Work-Plans>.

EPA Gulf Ecology Division

The EPA, Gulf Ecology Division Laboratory in Gulf Breeze, Florida, is a primary research facility of the EPA's Office of Research and Development National Health and Environmental Effects Research Laboratory. The lab assesses the ecological condition, ecological services and values of estuaries, coastal wetlands, seagrass, and coral ecosystems of the Gulf of Mexico and the southeastern U.S.; determines causes of ecological impairment; predicts future risk to populations, communities and ecosystems from multiple aquatic stressors; supports the development of criteria to protect coastal environments; and transfers scientific technology to federal and state agencies, industry, and the public (EPA 2016f).

Natural Resource Management on Department of Defense Lands

The U.S. military, represented by the Air Force at Eglin AFB and Hurlburt Field, and the Navy at NAS Pensacola and NAS Whiting Field, occupies about 241,000 acres in the Pensacola Bay system. Eglin AFB is the largest forested military reservation in the U.S. and provides habitat for numerous rare and endangered species, including the red-cockaded woodpecker and reticulated flatwoods salamanders. The AFB spans 20 miles of the Gulf of Mexico shoreline, and includes 55 acres of lakes and 186 miles of streams. The property also hosts 34 of the FNAI recognized natural communities (FWC 2016e; Secretary of Defense 2011). Consequently, management actions on Air Force property have the potential to substantially influence water and habitat quality at the scale of the drainage basin.

Large tracts of Eglin AFB are managed for habitat conservation and the protection of endangered species. Extensive tracts of mature longleaf pine (*Pinus palustris*) forest are still present, particularly in the Conecuh National Forest–Blackwater River State Forest–Eglin AFB corridor (FDEP 2007).

Since 2009, TNC and Eglin AFB, with support from NAS Pensacola and NAS Whiting Field and with funding from the Legacy Program, have worked with military bases in Florida to establish the Six Rivers Cooperative Invasive Species Management Areas (CISMAs). These CISMAs are designed to help to decrease re-infestation of invasive species at six Florida bases (U.S. Department of Defense [DOD] 2011). As a result of this initiative, a report called *Utilizing Cooperative Invasive Species Management Areas (CISMAs) to Effectively Reduce Re-infestation of Invaders on Six (6) Military Bases and Adjacent Lands in Florida* was developed. The report details the development of the CISMAs, their

accomplishments, project monitoring, and strategic plans. Locally, the Six Rivers Cisma was organized, and Eglin AFB and NAS Pensacola representatives serve as committee chairpersons."

About 404,000 acres of Eglin AFB are managed under the Integrated Natural Resources Management Plan, which is updated every five years and is signed by Eglin, the FWC, and the USFWS. Additionally, Eglin AFB's Jackson Guard maintains an interactive web-based Integrated Natural Resources Management Plan that functions as an adaptive management tool (Secretary of Defense 2011). In 2013, Eglin's Natural Resources Team exceeded the goal of rehabilitating wetland riparian and 20 threatened and endangered species sites as specified in the Integrated Natural Resources Management Plan Erosion Control Component Plan. Other ongoing initiatives at the AFB include fish and wildlife management, invasive species control and pest management, and forest management using prescribed fires and other BMPs (Secretary of Defense 2011). The Navy also has INRMP Management Programs for conservation of natural resources similar to the Eglin AFB initiatives that extend the Department of Defense influence westward to the extent of the Florida Panhandle.

Bay Area Resource Council

The Bay Area Resource Council (BARC) was created from the Escambia/Santa Rosa Coast Resource Planning and Management Committee in 1985 by then Governor Bob Graham. An interlocal agreement between Escambia and Santa Rosa counties and the cities of Pensacola and Gulf Breeze was established in May 1987 to establish an entity that could accept funding and promote the goals of the committee. The City of Milton has since joined the BARC. Advisory committees for citizens and scientists were established to begin the development of a management plan for the Pensacola Bay system. The Pensacola Bay Watershed Management Guide, completed in 1998, contained 50 action plans. The BARC Technical Advisory Committee completed an update of the plan in late 2004 (Pensacola Bay Watershed Partnership and BARC 2005). The BARC's goal is improving the area's quality of life and the waters of the Pensacola Bay basin through community participation and coordination with local governments, citizens, academia, and the private sector. The WFRPC serves as staff to the BARC (WFRPC 2016b).

University of Florida Institute of Food and Agricultural Sciences Extension (UF-IFAS)

The UF/IFAS is a federal-state-county partnership that focuses on research, teaching, and extension to *"develop knowledge in agriculture, human and natural resources, and the life sciences, and enhance and sustain the quality of human life by making that information accessible."*

Many UF/IFAS programs and partnerships help protect water resources across the Pensacola Bay watershed and the state of Florida. Such programs and partnerships include the Fisheries and Aquatic Sciences and Marine Sciences Program, the Aquatic and Invasive Plants Center, the Florida Cooperative Fish and Wildlife Research Unit, the Florida Partnership for Water, Agriculture and Community Sustainability, the Natural Resources Leadership Institute, the Wetland Biogeochemistry Laboratory, and the Shellfish Aquaculture Extension among others.

To promote environmentally sound forestry practices, the UF/IFAS offers the voluntary Forest Stewardship Program, which seeks to help private landowners develop a plan to increase the economic value of their forestland while maintaining its environmental integrity (UF-IFAS 2016b). The Extension also works with farmers and property owners across the state to minimize the need for commercial pesticides and fertilizers, through environmentally friendly BMPs.

Local Government Planning Initiatives

Escambia County Land Development Code and Comprehensive Plan for Wetlands and Environmentally Sensitive Lands – Escambia County’s land development regulations limit adverse impacts and discourage development that may adversely affect wetlands and other sensitive areas. The county implemented a wetland ordinance in 2001 that provides protection standards, presents local permitting and mitigation programs, and establishes an environmental lands trust fund (Escambia County 2014).

Santa Rosa County Land Development Code for Environmentally Sensitive Lands – The County’s land development regulations add protection of environmentally sensitive lands. Sensitive lands recognized include aquatic preserves, OFWs, functioning wetlands, fish and marine habitats, habitats of threatened or endangered plants and animals, and potable wells (Santa Rosa County 2016).

Escambia County Wellhead Protection Ordinance – Escambia County’s wellhead protection zone ordinance restricts or prohibits certain land use activities within buffers around protected wells or within the seven- or 20-year time of travel contours around protected wells (FDEP 2007).

Okaloosa County Wellhead Protection Ordinance – Okaloosa County’s wellhead protection ordinance prohibits certain land use activities within a 200-foot radius buffer of public supply water wells with a permitted capacity of 100,000 gallons or more per day (FDEP 2007).

Walton County Wellhead Protection – Walton County’s wellhead protection zone limits land uses in wellhead protection zones and/or aquifer recharge areas, to include protection of a 400-foot radius around public potable water wells (FDEP 2007).

Santa Rosa County Wellhead Protection – Santa Rosa County wellhead protection zones were established for public supply wells, consisting of a 200-foot radius Floridan aquifer wells and a 500-foot radius for sand-and-gravel aquifer wells (FDEP 2007).

East Milton Wellfield Protection Area Zoning Overlay District – Santa Rosa County established an overlay district encompassing almost 51 square miles in the inland sand-and-gravel aquifer wellfield area (Santa Rosa County 2013).

Other Programs and Initiatives

As described in the preceding section, local governments and organizations are active participants in the restoration projects being or expected to be funded through the RESTORE Act, the NRDA, and the NFWF. These organizations have been longstanding partners in monitoring water quality and environmental health throughout the watershed. They have also been key partners in developing stormwater master plans and retrofit projects to reduce and treat stormwater, as well as building community support for watershed protection through the creation of citizen advisory councils and volunteer organizations.

Numerous citizen or citizen-government groups with a primary interest in protecting or enhancing water resources are active in the Pensacola Bay system. Most organizations have a specific geographic focus at either the watershed or waterbody level. Among local and regional organizations and initiatives are the following:

Bayou Chico Association – The Bayou Chico Association is involved in educating the public, seeking grants, and initiating various projects to promote the restoration and preservation of Bayou Chico. The

Association has worked for many years in partnership with local governments and the District to advance efforts to protect and restore Bayou Chico.

Bayou Texar Foundation – The mission of the Bayou Texar Foundation is to protect and improve the bayou. Its members have worked with the City of Pensacola to implement a stormwater utility to fund stormwater retrofits. The Foundation has educated its members and other area residents about stormwater runoff and what each citizen can do to improve the water quality of this urban bayou (BTF 2016).

Environmental Education Coordination Team (EECT) – A partnership of representatives of more than 20 public and private organizations, as well as individual community members, the EECT was formed to consolidate the efforts of members' environmental education activities in the community. In 2002, the EECT became a subcommittee on the BARC Technical Advisory Committee (WFRPC 2016b).

Pensacola Environmental Advisory Board (EAB) – The Pensacola City Council created this group of appointed citizen volunteers in November 2001 to provide policy advice and recommendations on environmental matters to the City Council and city staff (Pensacola EAB 2016).

Escambia County Citizens Environmental Committee – The Escambia County Citizens Environmental Committee provides professional advice, based on citizen input, to Escambia County through its Board of County Commissioners on matters of environmental concern (land, air, and water). The County Administrator appoints one member and each commissioner appoints two members, with their terms running concurrently with that of the commissioner who appointed them. Monthly meetings are open to the public (FDEP 2007).

Escambia County Storm-Water Advisory Team – In response to the large flooding event in April 2014, the Storm-Water Advisory Team was created to identify conditions associated with the April 2014 flooding and to assist Escambia County staff. The rainfall caused damage to both public and private stormwater facilities across the county, but mostly in the southern area. A needs assessment and a county-wide stormwater recommendation report were drafted to rank priority drainage projects and provide recommendations for stormwater within Escambia County (Escambia County 2016b).

Emerald Coastkeeper – The Emerald Coastkeeper is a part of the Waterkeeper Alliance, working to protect and restore area waterbodies. The Emerald Coastkeeper has participated in efforts to restore Carpenter Creek and Bayou Texar, among other activities.

Partnership for Environmental Research and Community Environmental Health (PERCH) – This group, funded by federal appropriation grants, was formed to provide input to the University of West Florida regarding environmental health studies, and investigate questions pertaining to environmental pollution and how it may affect human health (University of West Florida PERCH 2016).

Gulf Coastal Plain Ecosystem Partnership – Formed in 1996, this is a cooperative environmental management partnership between the NFWFMD, Blackwater River State Forest, Conecuh National Forest, Nokuse Plantation, Eglin AFB, International Paper, FDEP, and TNC. The Partnership's initial focus was to restore and protect longleaf pine habitat. The partners currently manage more than 950,000 acres in northwest Florida and southern Alabama, including the Pensacola Bay system. The partnership provides a collaborative approach to preservation and management of natural lands through a set of land management principles directed at ecosystem preservation including prescribed burning, recovering listed species, restoring aquatic habitat, providing public outreach, and sharing and exchanging relevant information and technology on new land management and protection techniques. Through collaboration and the pooling of resources, the partners are able to leverage the purchase of additional conservation lands (The Longleaf Alliance 2016).

Ecosystem Restoration Support Organization, Inc. – Formed in 1998, this 501(c)(3) citizen support organization provides financial and volunteer support for the FDEP's Northwest District Ecosystem Restoration Section. Fundraising and grant-writing efforts have provided over \$1 million to Project GreenShores and the FDEP's seagrass tissue culture lab and greenhouses (FDEP 2016f).

Appendix C Geographic and Physical Characteristics

Overview

The greater Pensacola Bay watershed covers approximately 6,831 square miles of Florida and Alabama. About 34 percent of this area is within Florida (Figure C-1). There is distinct topographical variation, with the highest elevations and most significant slopes within the northern extent of the watershed (Figure C-2). The majority of the Florida portion of the watershed is primarily defined by western highlands with coastal plains in the southern extent of the watershed.

Generalized land cover (Figure C-3) reflects major urban development associated with the City of Pensacola in the southwestern portion of the watershed, with other areas of development associated with the cities of Milton, Crestview, and Gulf Breeze. Extensive coverage of upland forests exists throughout the watershed planning area.

The following three figures depict the interstate basin, topography, and generalized land use and land cover.

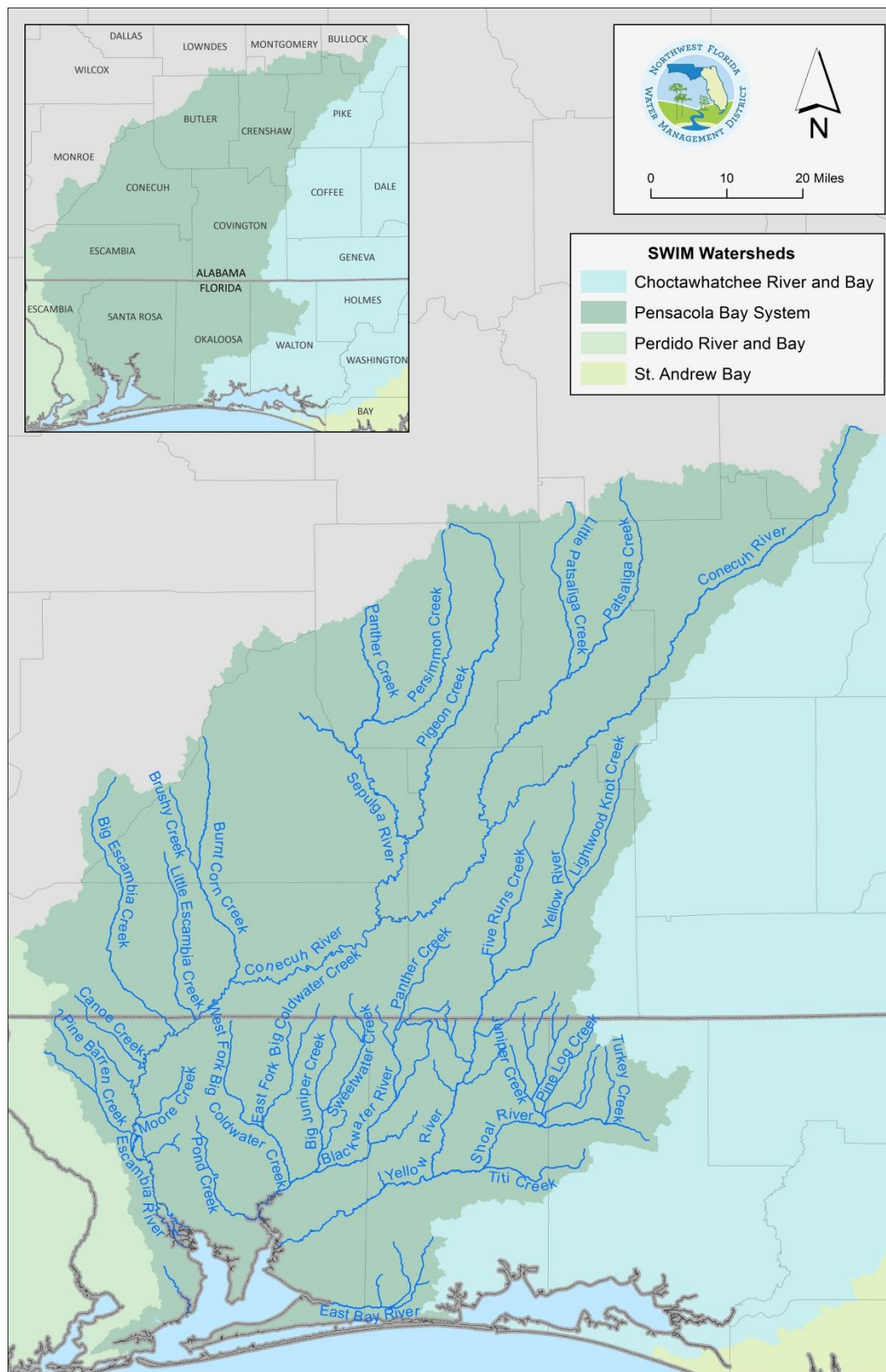


Figure C-1 Greater Pensacola Bay System Watershed

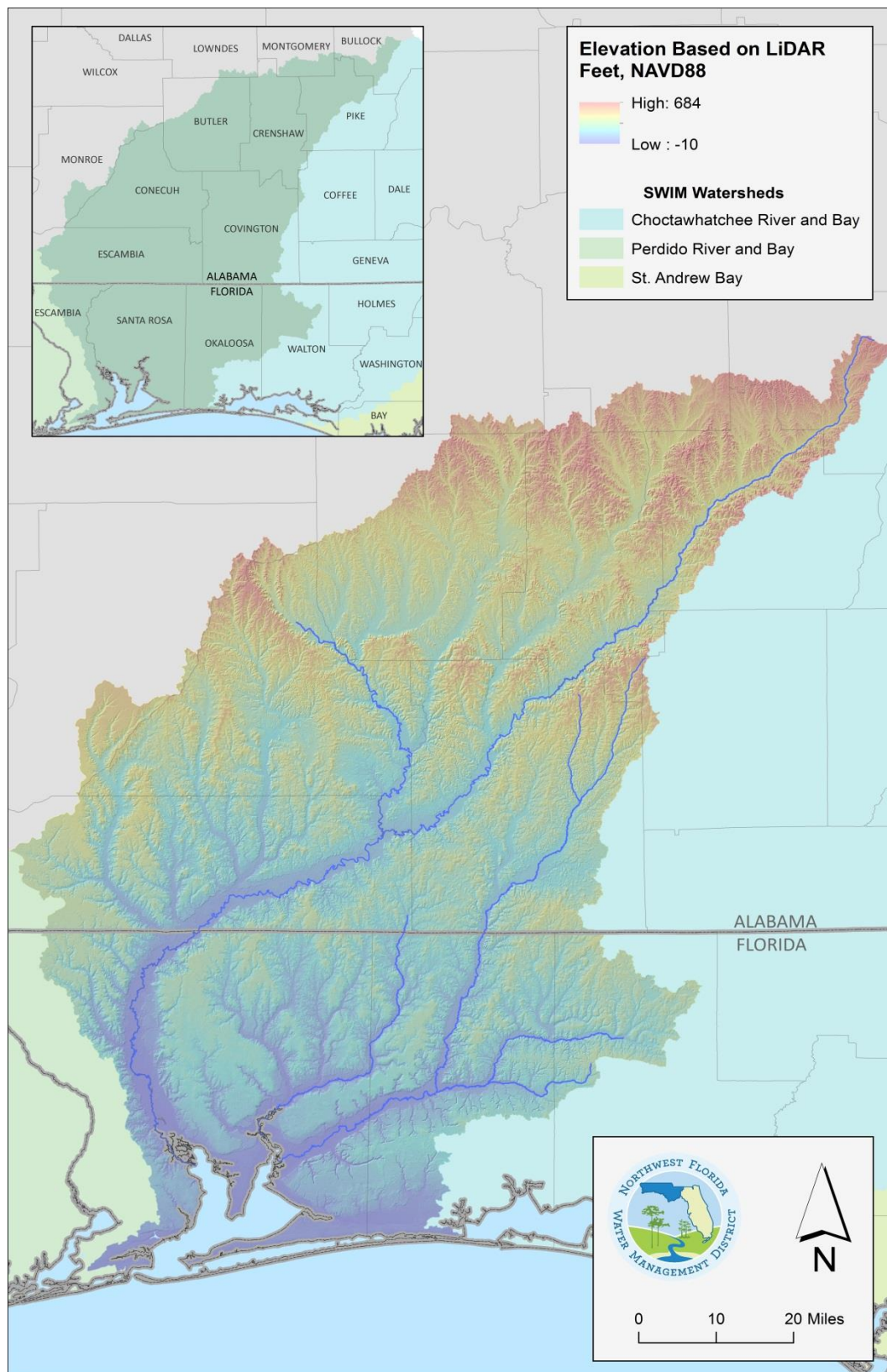


Figure C-2 Greater Pensacola Bay System Watershed Topography

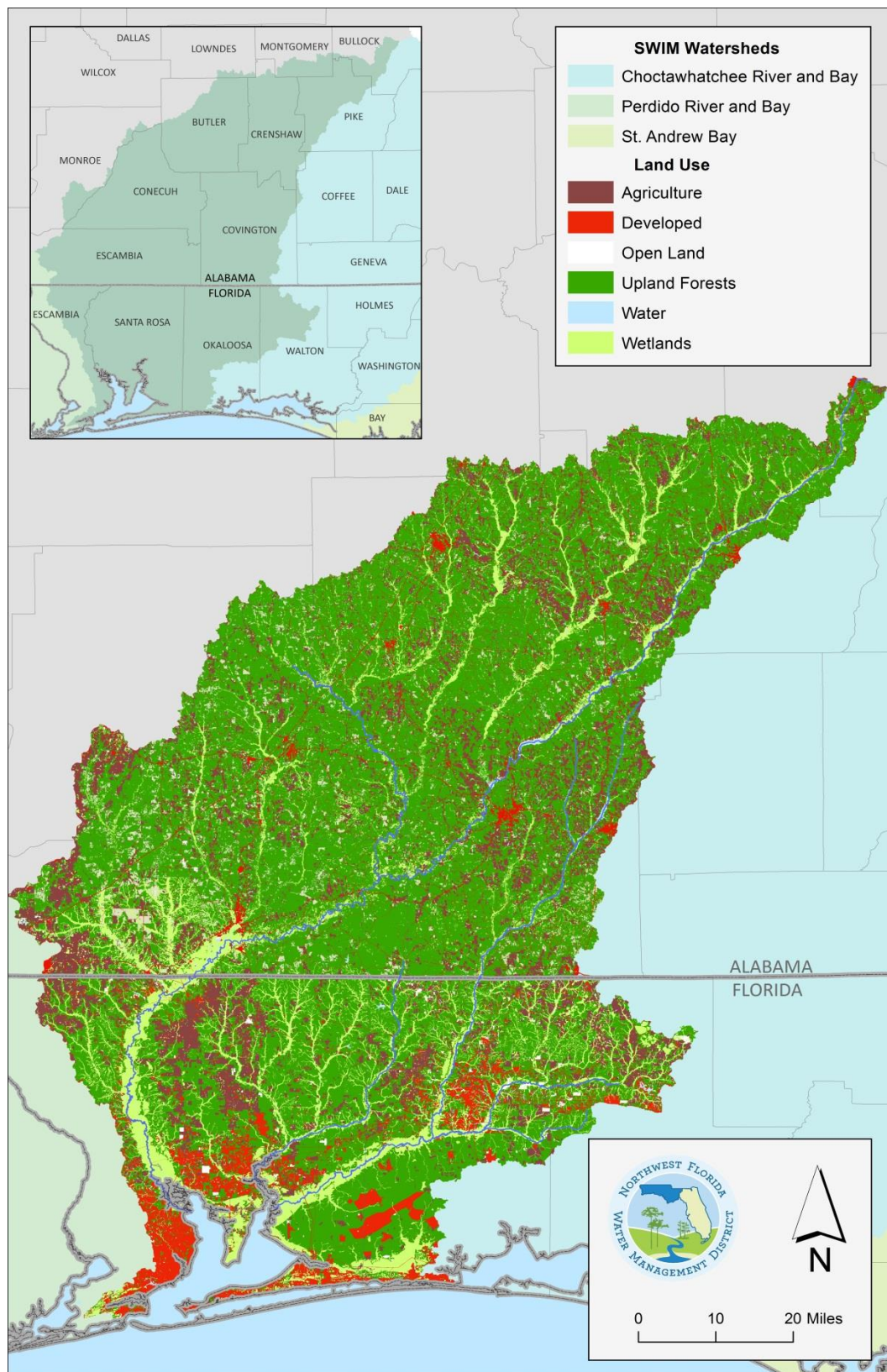


Figure C-3 Greater Pensacola Bay System Watershed Land Use and Land Cover

Aquifer Vulnerability Assessment

In 2017, the Florida Geological Survey released the Floridan Aquifer System Contamination Potential (FAVA II) dataset, which examines the sand-and-gravel aquifer as well as the Floridan and surficial aquifers (Figures C-4 and C-5). This dataset was calculated through the application of the weights of evidence method. This method examines different data layers including point and area data to determine relative vulnerability. These maps were developed to provide FDEP with a ground-water resource management and protection tool to carry out agency responsibilities related to natural resource management and protection regarding the Floridan aquifer system. The maps are not appropriate for site specific analysis.

Potable water sources within the Pensacola Bay System come primarily from the sand-and-gravel aquifer system (Figure C-5). As depicted in the figure, the sand-and-gravel aquifer system is most vulnerable to contamination along the extent of coastline within the watershed planning area. The Floridan aquifer system is most vulnerable in the northeastern most portion of the watershed planning area.

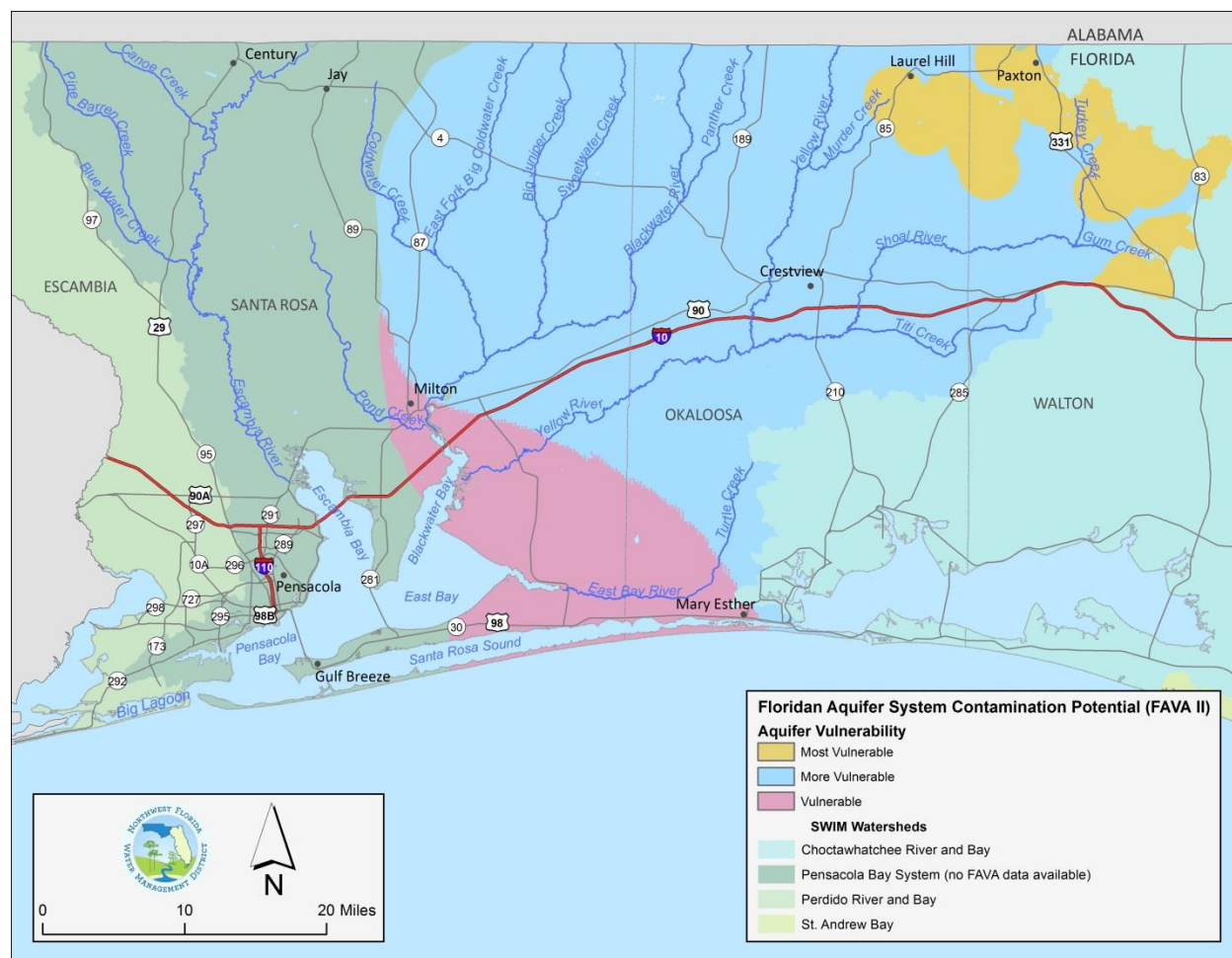


Figure C-4 Floridan Aquifer System Contamination Potential

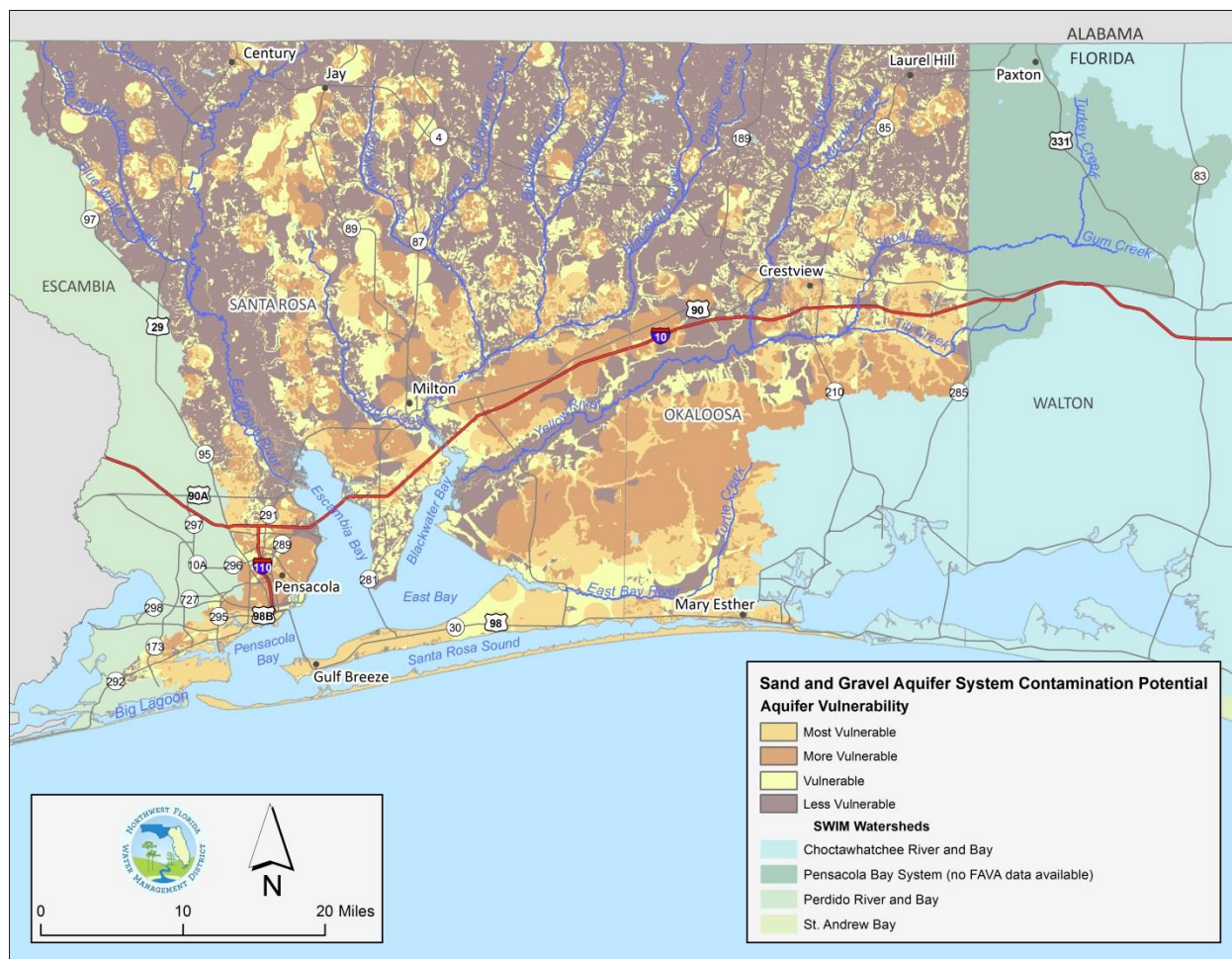


Figure C-5 Sand-and-Gravel Aquifer System Contamination Potential

Geologic Units

The Pensacola Bay system encompasses two localized physiographic regions in Florida: the Western Highlands subdivision of the Northern Highlands and the Gulf Coastal Lowlands. Both physiographic regions exhibit unique geology and soils. The Northern Highlands are underlain by the Citronelle formation, ancient delta deposits of clays, clayey sands, and gravel, deposited on limestone bedrock. The Coastal Lowlands are described as a flat, weakly dissected alluvial plain formed by deposition of continental sediments onto a submerged, shallow continental shelf, that were later exposed by sea level subsidence. In the Coastal Lowlands, ancient marine geomorphic features including beach ridges, spits, bars, dunes, and terraces make up the modern topography. Terraces represent wave-cut platforms and depositional features that formed during still sands of the sea.

The area surrounding the Pensacola Bay system is underlain by thin undifferentiated alluvium and Pleistocene terrace deposits that dip southwestward at 30 to 40 feet per mile (Marsh 1966). Stratigraphically, these sediments are underlain by the Pliocene Citronelle Formation and Tertiary beds of sand, silt, and limestone. Three Pleistocene-age marine terraces can be recognized in the area: the Pamlico terrace at 30 feet, the Penholoway terrace at 70 feet, and a seaward sloping upland surface with elevations ranging from 60 to 200 feet. Remnants of these terraces are preserved as upland plateaus, flat-topped hills, and low coastal plains (Marsh 1966).

Santa Rosa Island is a bay barrier bar with a straight seaward margin. The island is approximately half a mile wide with sand dunes that reach elevations of 50 feet above sea level. Santa Rosa Island also has two backshore terraces likely formed during storm events.

The mineralogy of sediments within Pensacola Bay is controlled by erosion throughout the watershed, which has taken place since the Pleistocene Epoch. During the Pleistocene, the Citronelle deposits were reworked and intermixed with marine terrace deposits (Marsh 1966). These marine deposits, as well as Miocene and Pleistocene terrace deposits, are now actively eroding. Because the watershed's streams pass largely through Neogene Coastal Plain formations, the bay's sediments consist almost entirely of sand, silt, and clay eroded from these older units (George 1988).

The mineral suite for the Pensacola Bay system is made up of largely reworked, stable, heavy minerals dominated by zircon, tourmaline, staurolite, and kyanite. Unstable heavy minerals, such as hornblende, garnet, pyroxene, and epidote are lacking. Clay mineral analyses indicate that the Escambia River carries mainly kaolinite, with lesser amounts of montmorillonite, vermiculite, illite, and gibbsite (Isphording *et al.* 1989). The deposition of sediments in the Pensacola Bay system has significantly changed over recent time. Borings collected during construction of local bridges generally indicate a vegetative "muck" layer in places as deep as 60 feet with cleaner fine to coarse sands below. These deposits are evidence of plant growth at a lower stand of sea level (approximately 6,000 years ago).

The changes in the sedimentary regime of the system are primarily due to the geologically recent rise in sea level. The presence of silty clays, similar to the central bay floor sediment today, suggests that the present sediments were deposited on bay-lagoon deposits behind late Pleistocene barrier islands further offshore.

Soils

Soils within the watershed have been used extensively for crop production, silviculture, and pastureland. Along with being a valuable agricultural resource, soils also protect water quality by absorbing runoff, store soil organic carbon, and help mitigate flooding. The following soils are found in the Florida portion of the watershed:

Ultisols – Ultisols are intensely-weathered soils of warm and humid climates, and are usually formed on older geologic formations in parent material that is already extensively weathered (i.e., upland areas of the watershed). They are generally low in natural fertility and high in soil acidity, but contain subsurface clay accumulations that give them a high nutrient retention capacity. In the Pensacola Bay watershed, ultisols form in the majority of non-coastal, interior locations where the landscape has been relatively stable over recent geologic time (Collins 2010). Ultisols are the primary agricultural and silvicultural soils of the watershed, as their high clay content contributes to nutrient and water retention, when properly managed and are found extensively in the northern reaches of the entire watershed.

Entisols – Entisols are young soils that show little development, have no diagnostic horizons, and are largely unaltered from their parent material, which can be unconsolidated sediment or rock (USDA 2014). Entisols are found in the floodplain of the Escambia River and on Santa Rosa Sound where surficial processes are active (Collins 2010).

Spodosols – Spodosols are sandy, acidic soils, often found in cool, moist climates such as coastal conifer forests (USDA 2014). They are easily identified by their strikingly-colored horizons, which form as a result of leaching and accumulation processes. Spodosols can be found throughout the coastal portion of the watershed, particularly on the Fairpoint Peninsula, along the Blackwater and Yellow rivers near Blackwater Bay, and throughout the Garcon Point WMA (Collins 2010). The presence of spodosols usually indicates an area that was historically dominated by a pine over-story.

Inceptisols – Inceptisols are described as soils in the beginning stages of soil profile development, as the differences between soil horizons are just beginning to appear in the form of color variation due to accumulations of small amounts of clay, salts, and organic material. Inceptisols occur predominantly along the floodplains of the watershed's various rivers and tributaries, as well as on Santa Rosa Sound and the tip of Garcon Point (Collins 2010).

Histosols – Histosols are described as soils without permafrost and predominantly composed of organic material in various stages of decomposition. These soils are usually saturated, resulting in anaerobic conditions, slower rates of decomposition, and increased organic matter accumulation. Histosols generally consist of at least half organic materials and are common in wetlands (USDA 2014). Histosols in the watershed occur along the eastern coast of East Bay, along the Escambia River, and along East River near Holley (Collins 2010; USDA 2014). Histosols cover approximately 6,155 square miles in the state of Florida and store more organic carbon than any other soil type (Kolka *et al.* 2016; Vasques *et al.* 2010). Drainage of wetland areas and the associated decomposition of organic matter stored in histosols is a well-documented source of atmospheric carbon dioxide and methane.

Appendix D Listed Species within the Watershed

The Pensacola Bay system supports a wide array of biological resources and habitats and; therefore, many species of flora and fauna. This Appendix provides a list of species that are protected and tracked for the watershed, as well as their habitat requirements (FNAI 2010; FWC 2016f; USFWS 2016a).

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
Plants					
<i>Agrimonia incisa</i>	Incised Groove-bur	S2	T	N	Terrestrial Habitat(s): Forest/Woodland, Woodland - Conifer, Woodland - Mixed
<i>Andropogon arctatus</i>	Pine-woods Bluestem	S3	T	N	Lacustrine: wet pine flatwoods, seepage wetlands, bogs, wet pine savannas
<i>Asclepias viridula</i>	Southern Milkweed	S2	T	N	Estuarine Habitat(s): Bay/sound Terrestrial Habitat(s): Savanna
<i>Baptisia calycosa</i> var. <i>villosa</i>	Hairy Wild Indigo	S3	T	N	N/A
<i>Calamintha dentata</i>	Toothed Savory	S3	T	N	Terrestrial: longleaf pine-deciduous oak sandhills, planted pine plantations, sand, open and abandoned fields, and roadsides
<i>Calamovilfa curtissii</i>	Curtiss' Sandgrass	S3	T	N	Palustrine: mesic and wet flatwoods, wet prairie, depression marsh Terrestrial: mesic flatwoods
<i>Calopogon multiflorus</i>	Many-flowered Grass-pink	S2S3	T	N	Palustrine Habitat(s): Bog/fen, forested wetland, herbaceous wetland Terrestrial Habitat(s): Forest Edge, Forest/Woodland, Grassland/herbaceous, Savanna, Woodland - Conifer
<i>Carex baltzellii</i>	Baltzell's Sedge	S3	T	N	Terrestrial Habitat(s): Forest/Woodland, Woodland - Mixed
<i>Carex tenax</i>	Sandhill Sedge	S3	N	N	Dry sandy sites in turkey oak/bluejack oak woods; Longleaf pine/turkey oak sandhills; ruderal in sandy fields and roadsides; Dry, coarse soils
<i>Cladium mariscoides</i>	Pond Rush	S1	N	N	Occurs in open, sunny, wet areas dominated by sedges. Its habitats include the following: calcareous and saline marshes and swamps; patterned water tracks, spring fens, and calcareous fens; and wetlands and swales of the Atlantic coastal plain and the Great Lakes
<i>Cladonia perforata</i>	Perforate Reindeer Lichen	S1	E	E	Terrestrial Habitat(s): Sand/dune, Shrubland/chaparral
<i>Epigaea repens</i>	Trailing Arbutus	S2	E	N	N/A
<i>Fothergilla gardenii</i>	Dwarf Witch-alder	S1	E	N	Wet edges of baygalls, shrub swamps, pocosins, Carolina bays, Atlantic white cedar forests, pitcher plant bogs, and wet savannas and flatwoods

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
<i>Hexastylis arifolia</i>	Heartleaf	S3	T	N	N/A
<i>Hymenocallis henryae</i>	Panhandle Spiderlily	S2	E	N	Palustrine Habitat(s): Bog/fen, herbaceous wetland Terrestrial Habitat(s): Forest/Woodland
<i>Ilex amelanchier</i>	Serviceberry Holly	S2	T	N	N/A
<i>Lachnocaulon digynum</i>	Bog Button	S3	T	N	Riverine Habitat(s): Pool Palustrine Habitat(s): Bog/fen, forested wetland
<i>Lilium iridollae</i>	Panhandle Lily	S2	E	N	Palustrine Habitat(s): Bog/fen, herbaceous wetland, Riparian, scrub-shrub wetland
<i>Linum westii</i>	West's Flax	S1	E	N	Palustrine Habitat(s): Bog/fen, forested wetland, herbaceous wetland Terrestrial Habitat(s): Forest/Woodland, Woodland - Mixed
<i>Litsea aestivalis</i>	Pondspice	S2	E	N	Palustrine Habitat(s): Bog/fen
<i>Lobelia boykinii</i>	Boykin's Lobelia	S1	E	N	Palustrine Habitat(s): Forested wetland, herbaceous wetland, scrub-shrub wetland Terrestrial Habitat(s): Forest/Woodland, Savanna, Woodland - Conifer
<i>Lupinus westianus</i>	Gulf Coast Lupine	S3	T	N	Terrestrial: beach dune, scrub, disturbed areas, roadsides, blowouts in dunes
<i>Macranthera flammea</i>	Hummingbird Flower	S2	E	N	Palustrine: seepage slope, dome swamp edges, floodplain swamps Riverine: seepage stream banks Terrestrial: seepage slopes
<i>Magnolia ashei</i>	Ashe's Magnolia	S2	E	N	Terrestrial: slope and upland hardwood forest, ravines
<i>Matelea alabamensis</i>	Alabama Spiny-pod	S2	E	N	Terrestrial Habitat(s): Cliff, Forest - Hardwood, Forest - Mixed, Forest Edge, Forest/Woodland, Woodland - Hardwood, Woodland - Mixed
<i>Nuphar advena ssp. ulvacea</i>	West Florida Cowlily	S2	N	N	Riverine Habitat(s): Medium river, spring/spring brook
<i>Nyctiophylax morsei</i>	Morse's Dinky Light Summer Sedge	S2	N	N	Riverine Habitat(s): creek, Moderate gradient
<i>Oxypolis greenmanii</i>	Giant Water-dropwort	S3	E	N	Palustrine: dome swamp, wet flatwoods, ditches: in water
<i>Panicum nudicaule</i>	Naked-stemmed Panicgrass	S3	T	N	N/A
<i>Myriophyllum laxum</i>	Piedmont Water Milfoil	S3	N	N	Riverine Habitat(s): Creek, pool, spring/spring brook Palustrine Habitat(s): Riparian, temporary pool

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
<i>Pinguicula primuliflora</i>	Primrose-flowered Butterwort	S3	E	N	Palustrine: bogs, pond margins, margins of spring runs
<i>Platanthera integrata</i>	Yellow Fringeless Orchid	S3	E	N	Palustrine: bogs, wet flatwoods Terrestrial: bluff
<i>Polygonella macrophylla</i>	Large-leaved Jointweed	S3	T	N	Terrestrial: scrub, sand pine/oak scrub ridges
<i>Potamogeton floridanus</i>	Florida Pondweed	S1	E	N	Riverine Habitat(s): Low gradient, spring/spring brook
<i>Pteroglossaspis ecristata</i>	Giant Orchid	S2	T	N	Terrestrial Habitat(s): Forest Edge, Forest/Woodland, Old field, Savanna, Shrubland/chaparral, Woodland - Conifer
<i>Quercus arkansana</i>	Arkansas Oak	S3	T	N	Sandy or sandy clay uplands or upper ravine slopes near heads of streams in deciduous woods
<i>Rhexia parviflora</i>	Small-flowered Meadow-beauty	S2	E	N	Palustrine Habitat(s): Bog/fen, forested wetland, scrub-shrub wetland
<i>Rhexia salicifolia</i>	Panhandle Meadow-beauty	S2	T	N	Lacustrine: full sun in wet sandy or sandy-peaty areas of sinkhole pond shores, interdunal swales, margins of depression, marshes, flatwoods, ponds and sandhill upland lakes
<i>Rhododendron austrinum</i>	Florida Flame Azalea	S3	E	N	Lacustrine: shaded ravines & in wet bottomlands on rises of sandy alluvium or older terraces
<i>Rhynchospora crinipes</i>	Hairy-peduncled Beaksedge	S2	E	N	Palustrine Habitat(s): Riparian
<i>Ruellia noctiflora</i>	Nightflowering Wild Petunia	S2	E	N	Lacustrine: moist to wet coastal pinelands, bogs, low meadows, open pine savannahs
<i>Sarracenia leucophylla</i>	White-top Pitcherplant	S3	E	N	Palustrine: wet prairie, seepage slope, baygall edges, ditches
<i>Sarracenia rubra</i>	Sweet Pitcherplant	S3	T	N	Palustrine: bog, wet prairie, seepage slope, wet flatwoods Riverine: seepage stream banks
<i>Stewartia malacodendron</i>	Silky Camellia	S3	E	N	Palustrine: baygall Terrestrial: slope forest, upland mixed forest; acid soils
<i>Tephrosia mohrii</i>	Pineland Hoary-pea	S3	T	N	Longleaf pine-turkey oak sandhills; driest sites
<i>Xyris scabrifolia</i>	Harper's Yellow-eyed Grass	S3	T	N	Palustrine: seepage slope, wet prairie, bogs
<i>Xyris stricta</i> var. <i>obscura</i>	Kral's Yellow-eyed Grass	S1	N	N	Lacustrine: sandhill upland lake margins

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
Animals					
<i>Attenella attenuata</i>	Hirsute Mayfly	S1S2	N	N	N/A
<i>Baetisca becki</i>	A Mayfly	S2	N	N	Riverine Habitat(s): medium river
<i>Baetisca gibbera</i>	A Mayfly	S1S2	N	N	Freshwater
<i>Dolania americana</i>	American Sand-burrowing Mayfly	S2	N	N	Riverine Habitat(s): big river, creek, High gradient, medium river
<i>Homoeoneuria dolani</i>	Blue Sand-river Mayfly	S1S2	N	N	Riverine Habitat(s): big river, High gradient, medium river
<i>Stenacron floridense</i>	A Mayfly	S3S4	N	N	Freshwater
<i>Hetaerina americana</i>	American Rubyspot	S2	N	N	N/A
<i>Acroneuria evoluta</i>	A Stonefly	S1S2	N	N	N/A
<i>Hydroperla phormidia</i>	A Stonefly	S2	N	N	N/A
<i>Helopicus subvarians</i>	A Stonefly	S1S2	N	N	N/A
<i>Phyllophaga elongata</i>	Elongate June Beetle	S3	N	N	N/A
<i>Selonodon santarosae</i>	Santa Rosa Cebriionid Beetle	S1	N	N	Terrestrial
<i>Agarodes ziczac</i>	Zigzag Blackwater River Caddisfly	S2	N	N	Riverine Habitat(s): creek, medium river, spring/spring brook
<i>Cheumatopsyche gordonae</i>	Gordon's Little Sister Sedge Caddisfly	S1S2	N	N	Presumably, small clear streams with moderate stream flow in wooded areas or below a small impoundment
<i>Cheumatopsyche petersi</i>	Peters' Cheumatopsyc he Caddisfly	S2	N	N	Small, clear lower coastal plain streams with moderate flow
<i>Oxyethira elerobi</i>	Elerob's Microcaddisfly	S2S3	N	N	Riverine Habitat(s): creek, medium river, spring/spring brook

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
<i>Amblyscirtes alternata</i>	Dusky Roadside-Skipper	S2	N	N	Habitat seems to always be open grassy pine woods but may range from moist to dry, includes moist flatwoods, savannas, and sandhill ridges
<i>Amblyscirtes reversa</i>	Reversed Roadside-Skipper	S1	N	N	Palustrine Habitat(s): forested wetland, Riparian Terrestrial Habitat(s): Forest - Mixed, Woodland - Mixed
<i>Callophrys hesseli</i>	Hessel's Hairstreak	S2	N	N	Palustrine Habitat(s): Bog/fen, forested wetland, Riparian
<i>Cupido comyntas</i>	Eastern Tailed Blue	S2	N	N	Palustrine Habitat(s): Riparian Terrestrial Habitat(s): Cropland/hedgerow, Grassland/herbaceous, Old field, Savanna, Shrubland/chaparral, Suburban/orchard, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
<i>Erynnis martialis</i>	Mottled Duskywing	S1	N	N	Terrestrial Habitat(s): Grassland/herbaceous, Shrubland/chaparral, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
<i>Hesperia meskei straton</i>	Eastern Meske's Skipper	S2S3	N	N	N/A
Invertebrates					
<i>Amblyscirtes plicata</i>	Threeridge	S1	N	N	Riverine Habitat(s): big river, creek, High gradient, Low gradient, medium river, Moderate gradient, Pool, Riffle Lacustrine Habitat(s): Deep water, Shallow water
<i>Fusconaia escambia</i>	Narrow Pigtoe	S1S2	FT	T(CH)	Riverine Habitat(s): big river, creek, Low gradient, medium river, Pool, Riffle
<i>Villosa choctawensis</i>	Choctaw Bean		E	E(CH)	Riverine Habitat
<i>Pleurobema strodeanum</i>	Fuzzy Pigtoe		E	T(CH)	Riverine Habitat
<i>Hamiota australis</i>	Southern Sandshell		E	T(CH)	Riverine Habitat

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
Fish					
<i>Acipenser oxyrinchus desotoi</i>	Gulf Sturgeon	S2	FT	T(CH)	Estuarine: various Marine: various habitats Riverine: alluvial and blackwater streams
<i>Atractosteus spatula</i>	Alligator Gar	S3	N	N	Riverine: sluggish pools of large rivers and their bayous, oxbow lakes, swamps, and backwaters, rarely brackish or marine waters along the coast
<i>Crystallaria asprella</i>	Crystal Darter	S1	ST	N	Riverine Habitat(s): creek, medium river, Moderate gradient
<i>Etheostoma histrio</i>	Harlequin Darter		SSC		Riverine Habitat(s): creek, medium river, Moderate gradient
<i>Etheostoma okaloosae</i>	Okaloosa Darter	S1	ST	T	Riverine Habitat(s): creek, medium river, Moderate gradient
<i>Etheostoma proeliare</i>	Cypress Darter	S2	N	N	Riverine Habitat(s): creek, Low gradient, medium river, Pool Lacustrine Habitat(s): Shallow water Palustrine Habitat(s): forested wetland
<i>Hybognathus hayi</i>	Cypress Minnow	S1S2	N	N	Riverine Habitat(s): creek, Low gradient, medium river, Pool Lacustrine Habitat(s): Shallow water Palustrine Habitat(s): forested wetland
<i>Fundulus jenkinsi</i>	Saltmarsh Topminnow	S2	ST	SC	Estuarine Habitat(s): Herbaceous wetland, Lagoon, Tidal flat/shore Palustrine Habitat(s): herbaceous wetland
<i>Moxostoma carinatum</i>	River Redhorse	S1S2	N	N	Riverine Habitat(s): creek, High gradient, medium river, Moderate gradient, Pool
<i>Macrhybopsis sp. 2</i>	Florida Chub	S2	N	N	N/A
<i>Notropis melanostomus</i>	Blackmouth Shiner	S1	ST	N	Riverine Habitat(s): creek, Low gradient, medium river, Pool Lacustrine Habitat(s): Shallow water Palustrine Habitat(s): forested wetland
<i>Percina austroperca</i>	Southern Logperch	S2	N	N	Riverine Habitat(s): creek, Low gradient, medium river, Moderate gradient
<i>Pteronotropis welaka</i>	Bluenose Shiner	S3S4	ST	N	Riverine Habitat(s): creek, Low gradient, medium river, Pool
Amphibians					
<i>Ambystoma bishopi</i>	Reticulated Flatwoods Salamander	S2	FE	E(CH)	Terrestrial: slash and longleaf pine flatwoods that have a wiregrass floor and scattered wetlands
<i>Amphiuma pholeter</i>	One-toed Amphiuma	S3	N	N	Riverine Habitat(s): creek, Low gradient, spring/spring brook Palustrine Habitat(s): forested wetland, Riparian, scrub-shrub wetland, temporary pool

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
<i>Hyla andersonii</i>	Pine Barrens Treefrog	S3	ST	N	Riverine Habitat(s): Low gradient, Pool Palustrine Habitat(s): Bog/fen, forested wetland, herbaceous wetland, riparian, scrub-shrub wetland Terrestrial Habitat(s): Woodland - Mixed
<i>Lithobates capito</i>	Gopher Frog	S3	N	N	Palustrine Habitat(s): herbaceous wetland, Riparian, temporary pool Terrestrial Habitat(s): Forest - Mixed, Savanna, Woodland - Hardwood, Woodland - Mixed
Reptiles					
<i>Alligator mississippiensis</i>	American Alligator	S4	FT (S/A)	SAT	Estuarine: herbaceous wetland Riverine: big river, creek, low gradient, medium river, pool, spring/spring brook Lacustrine: shallow water Palustrine: forested wetland, herbaceous wetland, riparian, scrub-shrub wetland
<i>Caretta caretta</i>	Loggerhead Sea Turtle	S3	FT	T(CH)	Terrestrial: sandy beaches; nesting
<i>Chelonia mydas</i>	Green Sea Turtle	S2	FE	E	Terrestrial: sandy beaches; nesting
<i>Crotalus adamanteus</i>	Eastern Diamondback Rattlesnake	S3	N	N	Palustrine: riparian Terrestrial: grassland/herbaceous, old field, savanna, shrubland/chaparral, woodland - conifer, woodland - hardwood, woodland - mixed
<i>Dermochelys coriacea</i>	Leatherback Sea Turtle	S2	FT	E	Terrestrial: sandy beaches; nesting
<i>Drymarchon corais couperi</i>	Eastern Indigo Snake	S3	FT	T	Estuarine: tidal swamp Palustrine: hydric hammock, wet flatwoods Terrestrial: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal
<i>Gopherus polyphemus</i>	Gopher Tortoise	S3	ST	C	Terrestrial: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal
<i>Graptemys ernsti</i>	Escambia Map Turtle	S2	N	N	Riverine Habitat(s): big river, Low gradient, medium river, Pool Palustrine Habitat(s): Riparian Terrestrial Habitat(s): Sand/dune
<i>Heterodon simus</i>	Southern Hognose Snake	S2	N	N	Palustrine Habitat(s): Riparian Terrestrial Habitat(s): Grassland/herbaceous, Old field, Savanna, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
<i>Lepidochelys kempii</i>	Kemp's Ridley Sea Turtle	S1	E	E	Terrestrial: sandy beaches; nesting

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
<i>Macrochelys temminckii</i>	Alligator Snapping Turtle	S3	SSC	N	Estuarine: tidal marsh Lacustrine: river floodplain lake, swamp lake Riverine: alluvial stream, blackwater stream
<i>Nerodiaclarkii clarkii</i>	Gulf Salt Marsh Snake	S3	N	N	Estuarine: herbaceous wetland, scrub-shrub wetland
<i>Pituophis melanoleucas mugitus</i>	Florida Pine Snake	S3	ST	N	Lacustrine: ruderal, sandhill upland lake Terrestrial: sandhill, scrubby flatwoods, xeric hammock, ruderal
Birds					
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	S3	ST	N	Terrestrial Habitat(s): Grassland/herbaceous, Sand/dune
<i>Calidris canutus rufa</i>	Red knot	S2	N	T	Estuarine: bays, tidal flats, salt marshes Terrestrial: sandy beaches Marine: aerial, near shore
<i>Charadrius alexandrius</i>	Snowy Plover	S2	ST	N	Estuarine: exposed unconsolidated substrate Marine: exposed unconsolidated substrate Terrestrial: dunes, sandy beaches, and inlet areas.
<i>Charadrius melodus</i>	Piping Plover	S2	T	T(CH)	Estuarine: exposed unconsolidated substrate Marine: exposed unconsolidated substrate Terrestrial: dunes, sandy beaches, and inlet areas. Mostly wintering and migrants
<i>Cistothorus Palustris marianae</i>	Marian's Marsh Wren	S3	ST	N	N/A
<i>Haliaeetus leucocephala</i>	Bald Eagle	S3	T	BGEPA	Estuarine: marsh edges, tidal swamp, open water Lacustrine: swamp lakes, edges Palustrine: swamp, floodplain Riverine: shoreline, open water Terrestrial: pine and hardwood forests
<i>Mycteria americana</i>	Wood Stork	S2	E	E	Estuarine: marshes Lacustrine: floodplain lakes, marshes (feeding), various Palustrine: marshes, swamps, various
<i>Peucaea aestivalis</i>	Bachman's Sparrow	S3	N	N	Terrestrial Habitat(s): Old field, Savanna, Woodland - Conifer, Woodland - Hardwood
<i>Picoides borealis</i>	Red-cockaded Woodpecker	S2	FE	E	Terrestrial Habitat(s): Woodland - Conifer
Mammals					

Scientific Name	Common Name	Regulatory Designation			Natural Communities
		FNAI	State	Federal	
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat	S2	N	N	Palustrine Habitat(s): Riparian Terrestrial Habitat(s): Forest - Hardwood, Suburban/orchard, Urban/edificarian, Woodland – Hardwood Subterranean Habitat(s): Subterrestrial
<i>Mustela frenata olivacea</i>	Southeastern Weasel	S3	N	N	Palustrine: forested wetland, riparian Terrestrial: forest - hardwood, old field, woodland - conifer, woodland - hardwood, woodland - mixed
<i>Myotis austroriparius</i>	Southeastern Bat	S3	N	N	Riverine Habitat(s): Aerial Palustrine Habitat(s): Aerial, forested wetland, Riparian Terrestrial Habitat(s): Forest - Conifer, Forest - Hardwood, Forest - Mixed, Forest Edge, Forest/Woodland, Suburban/orchard, Urban/edificarian, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed Subterranean Habitat(s): Subterrestrial
<i>Neofiber alleni</i>	Round-tailed Muskrat	S3	N	N	Estuarine Habitat(s): Herbaceous wetland Lacustrine Habitat(s): Shallow water Palustrine Habitat(s): Bog/fen, herbaceous wetland
<i>Peromyscus polionotus leucocephalus</i>	Santa Rosa Beach Mouse	S1	N	N	Terrestrial Habitat(s): Grassland/herbaceous, Sand/dune
<i>Peromyscus polionotus trissyllepsis</i>	Perdido Key Beach Mouse	S1	FE	E(CH)	Terrestrial Habitat(s): Grassland/herbaceous, Sand/dune
<i>Trichechus manatus latirostris</i>	West Indian Manatee	S2	E	E	Estuarine: submerged vegetation, open water Marine: open water, submerged vegetation
<i>Ursus americanus floridanus</i>	Florida Black Bear	S2	N	N	Palustrine: forested wetland, riparian Terrestrial: forest - hardwood, forest - mixed

Sources: FNAI 2010; FWC 2016f; USFWS 2016a.

Key:

FNAI STATE ELEMENT RANK

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

S4 = Apparently secure in Florida (may be rare in parts of range).

S5 = Demonstrably secure in Florida.

SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).

SX = Believed to be extirpated throughout Florida.

SU = Unrankable; due to a lack of information no rank or range can be assigned.

SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).

SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

BGEPA = Protected by Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

E(CH) = Endangered critical habitat

E = Endangered: species in danger of extinction throughout all or a significant portion of its range.

E, T = Species currently listed endangered in a portion of its range but only listed as threatened in other areas

E, PDL = Species currently listed endangered but has been proposed for delisting.

E, PT = Species currently listed endangered but has been proposed for listing as threatened.

E, XN = Species currently listed endangered but tracked population is a non-essential experimental population.

N = None

T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

T(CH) = Threatened critical habitat

PE = Species proposed for listing as endangered

PS = Partial status: some but not all of the species' infraspecific taxa have federal status

PT = Species proposed for listing as threatened

SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.

SC = Not currently listed, but considered a "species of concern" to USFWS.

STATE LEGAL STATUS

C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service

FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service

FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service

FXN = Federal listed as an experimental population in Florida

FT(S/A) = Federal Threatened due to similarity of appearance

ST = State population listed as Threatened by the FWC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.

SSC = Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* for *Pandion haliaetus* (Osprey) indicates that this status applies in Monroe county only.)

N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: <http://www.doacs.state.fl.us/pi/>.

E = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.

T = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.

N = Not currently listed, nor currently being considered for listing.

Appendix E Habitats and Natural Communities

The FNAI defines a natural community as a distinct and recurring assemblage of populations of plants, animals, fungi, and microorganisms naturally associated with each other and their physical environment. Based on GIS analysis, there are 31 unique natural communities recognized by the FNAI within the Pensacola Bay watershed (FNAI 2010). Habitats and Natural Communities were identified using the 2010 Florida Land Use, Cover and Forms Classification System (FLUCFS) data from the NFWFMD as well as the 2004-2013 Statewide Land Use Land Cover datasets created by the five (5) Water Management Districts in Florida. Data were modified and refined based on aerial photograph signatures and field observations. Below are community descriptions (excerpts from FNAI 2010) with site-specific information about many of the communities in the watershed.

Upland Communities	
Bluff	Bluff is a habitat characterized as a steep slope with rock, sand, and/or clay substrate that supports sparse grasses, herbs, and shrubs. This community type can be found along the watersheds' major rivers. In Okaloosa County, the Yellow River cuts through the Western Highlands province, characterized in some areas by bluffs as high as 40 feet (Gardner 1991).
Mesic Flatwoods	Mesic flatwoods can be found on the flat sandy terraces left behind by Plio-Pleistocene high sea level stands. Mesic flatwoods consist of an open canopy of tall pines (commonly longleaf pine or slash pine) and a dense, low ground layer of shrubs, grasses (commonly wiregrass), and forbs. The most widespread natural community in Florida, mesic flatwoods are home to many rare plants and animals such as the frosted flatwoods salamander (<i>Ambystoma cingulatum</i>), the reticulated flatwoods salamander (<i>Ambystoma bishop</i>) the Red-cockaded woodpecker (<i>Leuconotopicus borealis</i>) and many others. Mesic flatwoods require frequent fire (two to four years) and all of its constituent plant species recover rapidly from fire, including many rare and endemic plants. In the Panhandle north of the Cody Scarp, mesic flatwoods occupy relatively small, low-lying areas (FNAI 2010). Within the Pensacola Bay watershed, healthy mesic flatwoods occur in the Elevenmile Creek watershed and Escribano Point.
Sandhill	Sandhill communities are characterized by broadly-spaced pine trees with a deciduous oak understory, sparse midstory of deciduous oaks, and a moderate to dense groundcover of grasses, herbs, and low shrubs. Species typical of sandhill communities include longleaf pine (<i>Pinus palustris</i>), turkey oak (<i>Quercus laevis</i>), and wiregrass (<i>Aristida stricta</i> var. <i>beyrichiana</i>). Sandhill is observed on crests and slopes of rolling hills and ridges with steep or gentle topography. Sandhill communities are important for aquifer recharge, as sandy soils allow water to infiltrate rapidly, resulting in sandy, dry soil, with little runoff evaporation. Fire is a dominant environmental factor in sandhill ecology and is essential for the conservation of native sandhill flora and fauna (FNAI 2010). Within the Pensacola Bay watershed, exemplary sandhill communities can be found on Eglin AFB.
Scrub	Scrub is a community composed of evergreen shrubs, with or without a canopy of pines, and is found on well-drained, infertile, narrow sandy ridges distributed parallel to the coastline. Signature scrub species include three species of shrubby oaks, Florida rosemary (<i>Ceratiola ericoides</i>), and sand pine (<i>Pinus clausa</i>), which may occur with or without a canopy of pines. Scrub is characterized by burn intervals of five to 40 years, depending on the dominant vegetation. This community type can be found in the Gulf Islands National Seashore.

Scrubby Flatwoods	Scrubby flatwoods have an open canopy of widely-spaced pine trees (commonly longleaf or slash pines) and a low, shrubby understory which differ structurally from scrub communities in the respect that scrub flatwoods lack continuous shrubby oak cover. Understory vegetation consists largely of scrub oaks and saw palmetto, often interspersed with barren areas of exposed sand. Scrubby flatwoods occur on slight rises within mesic flatwoods and in transitional areas between scrub and mesic flatwoods. Scrubby flatwoods are inhabited by several rare plant and animal species including the Florida mouse (<i>Peromyscus floridanus</i>), Florida scrub-jay (<i>Aphelocoma coerulescens</i>) (Peninsular Florida only), gopher tortoise (<i>Gopherus polyphemus</i>), the Florida gopher frog (<i>Rana capito</i>), goldenaster (<i>Chrysopsis floridana</i>), and large-plumed beaksedge (<i>Rhynchospora megaplumosa</i>) (FNAI 2010). Within the Pensacola Bay watershed, scrubby flatwood communities can be found in the Gulf Islands National Seashore.
Slope Forest	Slope forest is a well-developed, highly diverse, dense canopy forest of upland hardwoods that occurs on steep slopes, bluffs, and in sheltered ravines. In slope forests, high density and diversity is driven by competition for space, water, sunlight, and nutrients. The combination of densely shaded slopes and cool, moist microclimates produces conditions that are conducive for the growth of many plant species that are more typical of the Piedmont and Southern Appalachian Mountains (FNAI 2010).
Terrestrial Caves	Terrestrial caves are cavities below the surface that lack standing water. These caves develop in areas of karst topography; water moves through underlying limestone, dissolving it and creating fissures and caverns. Most caves have stable internal environments with temperature and humidity levels remaining fairly constant. In areas where light is present, some plants may exist, although these are mostly limited to mosses, liverworts, ferns, and algae. Subterranean natural communities such as terrestrial caves are extremely fragile because the fauna they support are adapted to stable environments and do not tolerate environmental changes (FNAI 2010).
Upland Hardwood Forests	Upland hardwood forests are described as having a well-developed, closed-canopy dominated by deciduous hardwood trees such as southern magnolia (<i>Magnolia grandiflora</i>), pignut hickory (<i>Carya glabra</i>), sweetgum (<i>Liquidambar styraciflua</i>), Florida maple (<i>Acer saccharum ssp. floridanum</i>), live oak (<i>Quercus virginiana</i>), American beech (<i>Fagus grandifolia</i>), white oak (<i>Q. alba</i>), and spruce pine (<i>Pinus glabra</i>), and others. This community occurs on mesic soils in areas sheltered from fire, on slopes above river floodplains, in smaller areas on the sides of sinkholes, and occasionally on rises within floodplains. It typically supports a diversity of shade-tolerant shrubs, and a sparse groundcover. Upland hardwoods occur throughout the Florida Panhandle and can be found in upper portions of the watershed.
Wet Flatwoods	Wet flatwoods are pine forests with a sparse or absent midstory. The typically dense groundcover of hydrophytic grasses, herbs, and low shrubs occurring in wet flatwoods can vary depending on the fire history of the system. Wet flatwoods occur in the ecotones between mesic flatwoods and shrub bogs, wet prairies, dome swamps, or strand swamps and are common throughout most of Florida. Wet flatwoods also occur in broad, low flatlands, frequently within a mosaic of other communities. Wet Flatwoods often occupy large areas of relatively inaccessible land, providing suitable habitat for the Florida black bear (<i>Ursus americanus floridanus</i>) as well as a host of rare and endemic plant species (FNAI 2010). This community type is found throughout Eglin AFB.
Xeric Hammock	Xeric hammock is an evergreen forest typically dominated by sand live oak (<i>Quercus geminata</i>), found on deep, fine sand substrate, where fire exclusion allows for the establishment of an oak canopy. In these areas, xeric hammock can form extensive stands or as small patches within or near sandhill or scrub. These forests are also found on high islands within flatwoods or less commonly on a high, well-drained ridge within a floodplain where fire-exclusion allows for the establishment of an oak canopy. Xeric hammocks are inhabited by several rare animals including the gopher frog (<i>Rana capito</i>), gopher tortoise (<i>Gopherus polyphemus</i>), eastern diamondback rattlesnake (<i>Crotalus adamanteus</i>), and the Florida pine snake (<i>Pituophis melanoleucus mugitus</i>). Xeric hammock is most common in the central peninsula of Florida and is less common north of the Cody Scarp where clay-rich soils create mesic conditions (FNAI 2010). This community type can be found throughout Eglin AFB.

Coastal Communities	
Beach	The beach is the immediate shoreline area of the Gulf of Mexico and consists of white quartz sand. It has few plants, except along the extreme inner edge at the base of the dunes. Organic marine debris, including seaweed and driftwood, typically form a wrack line on the shore. The upper beach area at the base of the foredune is an unstable habitat and is continually re-colonized by annuals, trailing species, and salt-tolerant grasses (FNAI 2010). Beach habitat is found along the entire Gulf front, especially at tidal passes, and some bay front shorelines in the watershed.
Beach Dune	The beach dune community includes seaward dunes that have been shaped by wind and water movement. This community is composed primarily of herbaceous plants such as pioneer grasses and forbs, many are coastal specialists. The vegetated upper beach and foredune are often sparsely covered by plants adapted to withstand the stresses of wind, water, and salt spray, or to rapidly recolonize after destruction. Many rare shorebirds use the Florida Panhandle's beach dunes for nesting. This community is also a major nesting area for loggerhead, green, Kemp's Ridley, and leatherback sea turtles. Beach dune habitat can be found south of the Santa Rosa Sound and the Gulf Islands National Seashore.
Coastal Grasslands	Coastal grassland, found primarily on broad barrier islands and capes, is a predominantly herbaceous community found in the drier portion of the transition zone between the beach dune and coastal strand or maritime hammock communities. Several rare animals use coastal grasslands for foraging and nesting, including neo-tropical migratory birds and the Santa Rosa beach mouse (<i>Peromyscus polionotus leucocephalus</i>), one of four rare subspecies of beach mouse along the Florida Panhandle coast. Coastal grassland can form from two major processes: the seaward build-up of a barrier island, which protects inland ridges from sand burial and salt spray, or the development of a new foredune ridge, which protects the previously overwashed area behind it (FNAI 2010). This community type can be found throughout Eglin AFB and the Gulf Islands National Seashore.
Coastal Strand	Coastal strand is an evergreen shrub community growing on stabilized coastal dunes, often with a smooth canopy due to pruning by wind and salt spray. It usually develops as a band between dunes dominated by sea oats along the immediate coast, and maritime hammock, scrub, or mangrove swamp (in peninsular Florida) communities further inland. This community is very rare on the Florida Panhandle coast where the transition zone is occupied by scrub or coastal grassland communities (FNAI 2010). This community type can be found in the Gulf Islands National Seashore.
Maritime Hammock	Maritime hammock is a predominantly evergreen hardwood forest that occurs on deep well-drained sandy soils or sandy soils mixed with shell fragments. Maritime hammock forests grow on stabilized coastal dunes at various distances from the shoreline. Maritime hammocks provide migrating songbirds with crucial resting and foraging areas on their fall and spring migrations to and from the tropics. On the Florida Panhandle coast, maritime hammock is found only in isolated pockets where shell is mixed with sandy substrate (FNAI 2010). Within the Pensacola Bay watershed, this community type can be found in the Pensacola NAS.
Transitional and Wetland Communities	
Basin Marsh	Basin marshes, unlike depression marshes, are marshes that lack a fire-maintained matrix community and rather occur in relative isolation as larger landscape features. Basin marshes are regularly inundated freshwater from local rainfall, as they occur around fluctuating shorelines, on former "disappearing" lake bottoms, and at the head of broad, low basins marking former embayments of the last high-sea level stand. Species composition is heterogeneous both within and between marshes and generally includes submerged, floating, and emergent vegetation with intermittent shrubby patches. Common species include maidencane (<i>Panicum hemitomon</i>), sawgrass (<i>Cladium sp.</i>), bulltongue arrowhead (<i>Sagittaria lancifolia</i>), pickerelweed (<i>Pontederia cordata</i>), and cordgrass (<i>Spartina sp.</i>) (FNAI 2010).

Basin Swamp	Basin swamp is a wetland vegetated with hydrophytic trees, commonly including pond cypress (<i>Taxodium ascendens</i>) and swamp tupelo (<i>Nyssa sylvatica</i> var. <i>biflora</i>) and shrubs that can withstand an extended hydro-period. Basin swamps are characterized by highly variable species composition and are expressed in a variety of shapes and sizes due to their occurrence in a variety of landscape positions including old lake beds or river basins, or ancient coastal swales and lagoons that existed during higher sea levels. Basin swamps can also exist around lakes and are sometimes headwater sources for major rivers. Many basin swamps have been heavily harvested and undergone significant hydrological changes due to the conversion of adjacent uplands to agricultural and silvicultural lands (FNAI 2010). An exemplary basin swamp community is located in the Blackwater River State Park near the entrance station (FDEP 2016a).
Baygall	Baygall is an evergreen-forested wetland dominated by bay species including loblolly bay (<i>Gordonia lasianthus</i>), sweetbay (<i>Magnolia virginiana</i>), and/or swamp bay (<i>Persea palustris</i>). This community can be found on wet soils at the base of slopes or in depressions; on the edges of floodplains; and in stagnant drainages. Baygalls are not generally influenced by flowing water, but may be drained by small blackwater streams. Most baygalls are small; however, some form large, mature forests, called “bay swamps.” The dominance of evergreen bay trees rather than a mixture of deciduous and evergreen species can be used to distinguish baygall from other forested wetlands (FNAI 2010). An exemplary baygall community is located in the Blackwater River State Park.
Bog	Bog habitat typically includes areas of saturated substrates, often deep peat, and acidic conditions, with the dominant vegetation consisting of sedges and grasses. Bog habitat is often surrounded by a transition zone of trees and shrubs between the bog and upland area (FNAI 2010). In the Pensacola Bay watershed, this community type can be found along many of the watersheds’ major rivers.
Coastal Interdunal Swales	Coastal interdunal swales are marshes, moist grasslands, dense shrublands, or damp flats in linear depressions that occur between successive dune ridges as sandy barrier islands, capes, or beach plains. Dominant species tend to vary based on local hydrology, substrate, and the age of the swale, but common species include sawgrass (<i>Cladium</i> sp.), hairawn muhly (<i>Muhlenbergia capillaris</i>), broomsedge (<i>Andropogon virginicus</i>), seashore paspalum (<i>Paspalum vaginatum</i>), sand cordgrass (<i>Spartina bakeri</i>), and saltmeadow cordgrass (<i>Spartina patens</i>). For example, hurricanes and large storm events can flood swales with saltwater, after which they become colonized, often temporarily, by more salt-tolerant species. Saltwater intrusion and increased sand movement after storm events can reset successional processes of interdunal swale communities (FNAI 2010). This community type can be found in the Gulf Islands National Seashore.
Dome Swamp	Dome swamp is an isolated, forested, and usually small depression wetland consisting of predominantly pond cypress (<i>Taxodium ascendens</i>) and/or swamp tupelo (<i>Nyssa sylvatica</i> var. <i>biflora</i>). This community occurs within a fire-maintained community such as mesic flatwoods and commonly occupies depressions over a perched water table. Smaller trees grow on the outer edge of the swamp where the water is shallow, while taller trees grow deeper in the swamp interior creating the characteristic dome shape. Shrubs are typically sparse to moderate, but dome swamps with high fire frequencies or fire exclusion, the shrub layer may be absent. Many dome swamps form when poor surface drainage causes the dissolution of limestone bedrock, creating depressions which fill in with peat or marl. Surficial runoff from the surrounding uplands supplies much of the water within dome swamps. Consequently, water levels in these communities fluctuate naturally with seasonal rainfall changes. Dome swamps may also be connected directly to the aquifer, where groundwater influences the hydrological regime. Thus, dome swamps can function as reservoirs that recharge the aquifer. Logging, nutrient enrichment, pollution from agricultural runoff, ditching, impoundment, and invasive exotic species invasion have degraded dome swamps. Some dome swamps have been used as treatment areas for secondarily-treated wastewater (FNAI 2010).

Hydric Hammock	Hydric hammock is an evergreen hardwood and/or palm forest with a variable understory typically dominated by palms and ferns. This community occurs on moist soils, often with limestone very near the surface. While species composition varies, the community generally has a closed-canopy of oaks and palms, an open understory, and a sparse to a moderate groundcover of grasses and ferns. Hydric hammock occurs on low, flat, wet sites where limestone may be near the surface and soil moisture is kept high mainly by rainfall accumulation on poorly-drained soils. During heavy rains, sheet flow is slowed across the forested-floor of a hammock, resulting in greater absorption into the soil. Hammocks adjacent to salt marshes protect inland areas from damage during hurricanes and major storms (FNAI 2010). This community type is found on in the Pensacola NAS.
Floodplain Swamp	Floodplain swamp is a closed-canopy forest community of hydrophytic trees such as bald cypress (<i>Taxodium distichum</i>), water tupelo (<i>Nyssa aquatica</i>), swamp tupelo (<i>N. sylvatica</i> var. <i>biflora</i>), or ogeechee tupelo (<i>N. ogeche</i>). Floodplain swamp occurs on frequently- or permanently-flooded hydric soils adjacent to stream and river channels and in depressions and oxbows within the floodplain. The understory and groundcover are sparse in floodplain swamps, which can also occur within a complex mosaic of communities including alluvial forest, bottomland forest, and baygall. As rivers meander, they create oxbows and back swamps that are important breeding grounds for fish when high water connects them to the river. Floodplain swamp communities provide important wildlife habitat, contribute to flood attenuation, and help protect the overall water quality of streams and rivers. These communities may also transform nutrients or act as a nutrient sink depending on local conditions. This makes floodplain swamps useful for the disposal of partially-treated wastewater. Artificial impoundments on rivers can severely limit the seasonal flooding effects that maintain healthy floodplain systems; particularly, the stabilization of alluvial deposits and the flushing of detritus (FNAI 2010). Floodplain swamp communities are distributed along most creeks and streams within the watershed, particularly along the Yellow, Blackwater, and Escambia rivers. Exemplary sites include the floodplain swamps within the Yellow River Marsh Aquatic Preserve (Gardner 1991). Floodplain swamp occurs along both sides of the Backwater River in the Blackwater River State Park from the edge of the river to about 40 feet in elevation (FDEP 2016a).
Seepage Slope	Seepage slope is an open, grass sedge-dominated community consisting of wiregrass (<i>Aristida stricta</i>), toothache grass (<i>Ctenium aromaticum</i>), pitcher plants, plumed beaksedge (<i>Rhynchospora plumose</i>), flattened pipewort (<i>Eriocaulon compressum</i>), and woolly huckleberry (<i>Gaylussacia mosieri</i>). Seepage slopes are kept continuously moist by groundwater seepage. This community occurs in topographically variable areas, with 30- to 50-foot elevational gradients, frequently bordered by well-drained sandhill or upland pine communities. The soil is often soft and mucky underfoot, in contrast to the firm texture of the bordering sandhill and upland pine soils. Seepage slopes range from the Alabama border eastward to Calhoun County in the inland portions of the Florida Panhandle. Within the Pensacola Bay watershed, seepage slopes can be found throughout Eglin AFB.
Wet Prairie	Wet prairie is an herbaceous community usually occurring on acidic, continuously wet, but not inundated, soils. This community can be found on somewhat flat or gentle slopes between lower lying depression marshes, shrub bogs, or dome swamps or on slightly higher wet or mesic flatwoods. Wet prairies in northern Florida are some of the most diverse communities in the U.S., with an average of over 20 species per square meter in some places and over 100 total species in any given stand. The Panhandle is a hotspot for rare plants of the wet prairie community with 25 out of the 30 rare species found in this community; 12 of these are endemic to the Panhandle (FNAI 2010). This community type is found along the watershed's major rivers and Eglin AFB.

Aquatic Communities	
Blackwater Streams	Blackwater streams are perennial or intermittent seasonal watercourses laden with tannins (natural organic chemicals), particulates, and dissolved organic matter and iron. These dissolved materials result from the streams' origins in extensive wetlands with organic soils that collect rainfall and discharge it slowly to the stream. The dark-colored water reduces light penetration, inhibits photosynthesis, and prevents the growth of submerged aquatic plants. Blackwater streams are frequently underlain by limestones and have sandy bottoms overlain by organics that have settled out of suspension. Blackwater streams are the most widely distributed and numerous riverine systems in the southeast Coastal Plain (FNAI 2010) and found draining into most creeks, streams and bayous in the watershed. Many of the watershed's smaller tributaries are true blackwater streams, including several streams that traverse the Blackwater River State Park.
Seepage Streams	Seepage streams may be perennial or intermittent seasonal as they originate from shallow groundwater percolating through sandy upland soils. Seepage streams are small magnitude features, and unlike other stream communities in Florida, they lack a deep aquifer water source and extensive swamp lowlands surrounding their head waters. Seepage streams are generally sheltered by a dense overstory of broad-leaved hardwoods which block out most sunlight. Filamentous green algae occur sporadically within the stream, while vegetation at the water's edge may include mosses, ferns and liverworts. Seepage streams are often associated with seepage slope and slope forest communities near their head waters, and bottomland forest, alluvial forest and floodplain swamp communities near their mouths. The waters of seepage streams is filtered by percolation through deep soils which slows the release of rainwater and buffers temperature extremes, creating low flow rates of clear, cool, unpolluted water. Seepage streams are generally confined to areas where topographic relief is pronounced such as northern Florida (FNAI 2010). Within the Pensacola Bay watershed, seepage streams are found along the watersheds' major rivers and Eglin AFB. Seepage streams run throughout the Blackwater River State Park. The Hynote Branch is one example of a seepage stream in the park that is good to excellent condition (FDEP 2016a).
Estuarine and Marine Communities	
Salt Marsh	Salt marsh is a largely herbaceous tidal zone community commonly consisting of saltmarsh cordgrass (<i>Spartina alterniflora</i>), which dominates the seaward edge, and needle rush (<i>Juncus roemerianus</i>), which dominates higher, less frequently flooded areas. Salt marshes form where the coastal zone is protected from large waves, either by the topography of the shoreline, a barrier island, or by location along a bay or estuary. Salt marshes support a number of rare animals and plants, and provide nesting habitat for migratory and endemic bird species. Many of Florida's extensive salt marshes are protected in aquatic preserves, but the loss of marshes and adjacent seagrass beds due to human impacts such as shoreline development, ditching, and pollution and natural stressors, such as sea level rise, have vastly reduced their numbers. Salt marshes are instrumental in attenuating wave energy and protecting shorelines from erosion (FNAI 2010) and are found in the coastal/ estuarine portion of the watershed. Salt marsh communities are common throughout the Pensacola Bay watershed and are particularly extensive at the Yellow River Marsh Aquatic Preserve (Gardner 1991).

Seagrass Beds	Seagrass beds consist of expansive stands of submerged aquatic vascular plants including turtlegrass (<i>Thalassia testudinum</i>), manateegrass (<i>Syringodium filiforme</i>), and shoalgrass (<i>Halodule wrightii</i>), which occur predominantly in subtidal zones in clear low-energy coastal waters. Seagrass beds occur on unconsolidated substrates and are highly susceptible to changes in water temperature, salinity, wave-energy, tidal activity, and available light. This natural community supports a wide variety of animal life including manatees, marine turtles, and many fish, particularly spotted sea trout (<i>Cynoscion nebulosus</i>), spot (<i>Micropogonias undulates</i>), sheepshead, (<i>Archosargus probatocephalus</i>), and redfish (<i>Sciaenops ocellatus</i>). Pollution, particularly sedimentation and wastewater/sewage, have led to the widespread loss of seagrasses in nearly every bay in the Florida Panhandle (FNAI 2010). Seagrass beds have historically been widespread throughout the Pensacola Bay system, but declined substantially in the mid-1900s due to poor water quality.
Oyster/Mollusk Reef	Oyster/mollusk reef consists of expansive concentrations of sessile mollusks, which settle and develop on consolidated substrates including rock, limestone, wood, and other mollusk shells. These communities occur in both the intertidal and subtidal zones to a depth of 40 feet. In Florida, the American oyster (<i>Crassostrea virginica</i>) dominates mollusk reef communities, but other organisms including species of sponge, anemones, mussels, the burrowing sponge anemones, mussels, clams, barnacles, crabs, amphipods, and starfish live among or within the reef itself. Mollusks are filter-feeders that remove toxins from polluted waters and improve overall water quality (FNAI 2010).
Unconsolidated (Marine) Substrate	Unconsolidated (marine) substrate consists of coralgall, marl, mud, mud/sand, sand or shell deposited in expansive, open areas of subtidal, intertidal, and supratidal zones. Unconsolidated substrates support large populations of tube worms, sand dollars, mollusks, isopods, amphipods, burrowing shrimp, and an assortment of crabs, but lack dense populations of sessile plant and animal species. Unconsolidated substrates are an important feeding ground for bottom-feeding fish, shorebirds, and invertebrates. These areas also grade into a variety of other natural communities, making them the foundation for the development of other marine and estuarine habitats. Unconsolidated substrate communities are found throughout the estuarine and riverine portions of the watershed. They are susceptible to many types of disturbances including vehicle traffic, low DO levels, as well as the accumulation of metals, oils, and pesticides in the sediment (FNAI 2010). Unconsolidated (marine) substrate can be found throughout Escambia Bay, Pensacola Bay, and Big Lagoon.

Source: FNAI 2010.

Appendix F Impaired Waterbody Segments in the Pensacola Bay Watershed

All states are required to submit lists of impaired waters that are too polluted or degraded to meet water quality standards and their designated use (potable, recreational, shellfish harvesting) to the EPA under section 303(d) of the CWA (EPA 2016b). The following table provides a list of impaired waters in the Pensacola Bay system. The list is based on data current through June 2012 (FDEP 2017).

Waterbody Segment ID	Water Segment Name	County	Waterbody Class ¹	Parameters Assessed Using the Impaired Waters Rule (IWR)
738AB	Bayview Park Pier	Escambia	3M	Bacteria (Beach Advisories)
548GB	Blackwater Bay (South Segment)	Santa Rosa	2	Bacteria (Shellfish Harvesting Classification)
548GB	Blackwater Bay (South Segment)	Santa Rosa	2	Fecal Coliform
24AB	Blackwater River (Tidal)	Santa Rosa	3M	Nutrients (Total Nitrogen)
639	Direct Runoff to Bay	Escambia	3F	Fecal Coliform
639	Direct Runoff to Bay	Escambia	3F	Lead
548H	East Bay	Santa Rosa	2	Bacteria (Shellfish Harvesting Classification)
701A	East Bay River (Marine Portion)	Santa Rosa	2	Bacteria (Shellfish Harvesting Classification)
701A	East Bay River (Marine Portion)	Santa Rosa	2	Enterococci
8007A	Emerald Promenade Beachwalk (Santa Rosa Island)	Okaloosa	3M	Bacteria (Beach Advisories)
548AA	Escambia Bay (North Segment)	Escambia, Santa Rosa	3M	Enterococci
548B	Escambia Bay (South Segment)	Escambia, Santa Rosa	2	Bacteria (Shellfish Harvesting Classification)
548AC	Escambia Bay North (Shellfish)	Escambia, Santa Rosa	2	Bacteria (Shellfish Harvesting Classification)
915C	Liza Jackson Park	Okaloosa	3M	Bacteria (Beach Advisories)
915D	Marler Park	Okaloosa	3M	Bacteria (Beach Advisories)
915B	Navarre Park Hwy. 98	Santa Rosa	3M	Bacteria (Beach Advisories)
548FB	Navy Point	Escambia	3M	Bacteria (Beach Advisories)
548D	Pensacola Bay (Middle Segment)	Escambia, Santa Rosa	3M	Nutrients (Chlorophyll-a)
548C	Pensacola Bay (North Segment)	Escambia, Santa Rosa	2	Bacteria (Shellfish Harvesting Classification)
176	Pond Creek	Santa Rosa	3F	Fecal Coliform
35	Pond Creek	Okaloosa, Walton	3F	Fecal Coliform
534	Sandy Point Bayou	Santa Rosa	3F	Iron
915	Santa Rosa Sound	Escambia, Okaloosa, Santa Rosa	2	Bacteria (in Shellfish)
160A	Shoal River	Okaloosa	3F	Escherichia coli
160B	Shoal River	Okaloosa	3F	Fecal Coliform
833A	Tom King Bayou	Santa Rosa	3M	Nutrients (Historic Chlorophyll-a)

Source: FDEP 2017

Notes:

* = new Florida listings since 2003

Footnote 1 - Florida's waterbody classifications:

1 - Potable water supplies

2 - Shellfish propagation or harvesting

3F - Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife in fresh water

3M - Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife in marine water

4 - Agricultural water supplies

5 - Navigation, utility, and industrial use

Footnote 2 - TSI = trophic state index

The following table provides a list of EPA established TMDLs in the Pensacola Bay System watershed.

Waterbody Segment ID	Water Segment Name	County	Waterbody Class ¹	Pollutant
18	Big Coldwater Creek	Santa Rosa	3F	Fecal Coliform
18A	Big Coldwater Creek (East Fork)	Santa Rosa	3F	Fecal Coliform
19	Big Juniper Creek	Santa Rosa	3F	Fecal Coliform
24A	Blackwater River	Santa Rosa	3F	Fecal Coliform
24D	Blackwater River	Okaloosa	3F	Fecal Coliform
548A	Escambia Bay (North Segment)	Escambia, Santa Rosa	3M	Fecal Coliform
548B	Escambia Bay (South Segment)	Escambia, Santa Rosa	2	Fecal Coliform
846A	Jones Creek	Escambia	3F	Phosphorus, Total
846A	Jones Creek	Escambia	3F	Nitrogen, Total
846A	Jones Creek	Escambia	3F	Biochemical Oxygen Demand
127	Manning Creek	Santa Rosa	3F	Fecal Coliform
420	Pace Mill Creek	Santa Rosa	3F	Phosphorus, Total
420	Pace Mill Creek	Santa Rosa	3F	Nitrogen, Total
420	Pace Mill Creek	Santa Rosa	3F	Biochemical Oxygen Demand
548C	Pensacola Bay (North Segment)	Escambia, Santa Rosa	2	Fecal Coliform
11A	West Fork	Santa Rosa	3F	Fecal Coliform

Source: EPA 2016g

Footnote 1 – see Footnote 1 above.

Appendix G Conservation Lands within the Pensacola Bay Watershed

Within the Pensacola Bay watershed, there are approximately 519,702 acres of conservation lands including 245,154 acres of federally managed lands; 269,585 acres of state-managed lands; 1,218 acres of locally managed lands; and 3,158 acres of privately managed lands. Six conservation lands within the Pensacola Bay watershed span multiple counties and several extend into other watersheds. The details of these conservation lands are presented in the following table (FNAI 2016a):

Conservation Land	Managing Agency	County(ies)	Description	Website	Acres Within Watershed
Federally Managed					
Air Force Special Operations Command, Hurlburt Field	U.S. Dept. of Defense, Air Force	Okaloosa	This facility is dominated by mesic flatwoods and floodplain swamp; it supports a large population of reticulated flatwoods salamanders.	http://www.hurlburt.af.mil/	6,165.83
Choctawhatchee National Forest	U.S. Dept. of Agriculture, Forest Service	Okaloosa Santa Rosa	Several small parcels of nationally protected forest located north of Choctawhatchee Bay and Pensacola Beach, east of Pensacola Bay, and south of Interstate 10.	http://www.fs.fed.us	139.02
Eglin Air Force Base	U.S. Dept. of Defense, Air Force	Escambia Okaloosa Santa Rosa Walton	Largest forested military reservation in the free world. Extends 51 miles east-west and 19 miles north-south. 86% is forested, 81% of that is sandhill, 15% is forested wetlands, flatwoods, or baygall. Contains 35 natural communities and 64 rare plant species	http://www.eglin.af.mil/	229,743
Gulf Islands National Seashore	U.S. Dept. of the Interior, National Park Service	Escambia Okaloosa Santa Rosa	This national seashore stretches 150 miles from Mississippi into Florida. In Florida, it extends from the eastern end of Perdido Key, across the mouth of Choctawhatchee Bay, to the east end of Santa Rosa Island. It also includes other barrier islands, historic sites on the Florida mainland, as well as the waters in between. Florida acreage within the national seashore boundary includes 28,893.68 acres of federal land and 37,655.56 acres of other public land.	http://www.nps.gov	4,531.32

Conservation Land	Managing Agency	County(ies)	Description	Website	Acres Within Watershed
Harold Outlying Landing Field	U.S. Dept. of Defense, Navy	Santa Rosa	Naval reservation with grassy airfield surrounded by high quality old-growth longleaf pine, supporting a diverse sandhill ecosystem. Includes gopher tortoise and foraging habitat for red cockaded woodpecker. A small steephead ravine occurs in the northwest corner. Included in the Naval Air Station (NAS) Whiting Field Integrated Natural Resources Management Plan (INRMP).	http://www.cnric.navy.mil/regions/cnrse/installations/nas_whiting_field.html	582.21
Holley Outlying Landing Field	U.S. Dept. of Defense, Navy	Santa Rosa	Naval reservation with a solar array facility on the former airfield, surrounded by a sandhill ecosystem with a gopher tortoise population. A large wet prairie/wet flatwoods mosaic in the southern portion contains many rare plants and animals including flatwoods salamander, Chapman's butterwort, white-topped pitcher plant, and Florida black bear. Included in the NAS Whiting Field INRMP.	http://www.cnric.navy.mil/regions/cnrse/installations/nas_whiting_field.html	661.44
NAS Pensacola	U.S. Dept. of Defense, Navy	Escambia	This facility is located at the mouth of Pensacola Bay on a peninsula formed by Bayou Grande and the bay. Although most of the site has been developed for mission-related activities, a wide variety of habitats remain. Natural communities include beach dune, maritime hammock, sand pine scrub, mesic flatwoods, and sandhill. Correy Station, Saufley Field, Bronson Outlying Landing Field, and Blue Angel Recreation Park are included in the NAS Pensacola INRMP.	http://www.cnric.navy.mil/regions/cnrse/installations/nas_pensacola.html	4,769.05

Conservation Land	Managing Agency	County(ies)	Description	Website	Acres Within Watershed
NAS Whiting Field	U.S. Dept. of Defense, Navy	Santa Rosa	Most of this facility has been developed for mission-related activities but significant natural features remain. These include over 900 acres of managed forests, a thriving gopher tortoise population, and critical watershed buffers. An interpretive boardwalk is located within a large beaver-impounded wetland on the western boundary. The facility includes the main base plus six outlying landing fields (Harold, Holley, Pace, Santa Rosa, Site 8A, and Spencer) and Whiting Park.	http://www.cnric.navy.mil/regions/cnrse/installations/nas_whiting_field.html	3,461.43
Information Warfare Training Center Corry Station	U.S. Dept. of Defense, Navy	Escambia	Former naval airfield that has been converted to a Department of Defense Training Center. Has approximately 72 acre of planted second-growth slash pine and 0.5 acres of wetlands. The property also has a U.S. Naval Hospital, Veterans' Administration Joint Ambulatory Care Center, Navy Commissary and Exchange and Housing. Included in the NAS Pensacola INRMP and part of the Bayou Chico BMAP	http://www.netc.navy.mil/centers/ceninfodocm/corry/	565.53
Patterson Natural Area	U.S. Dept. of Defense, Air Force	Okaloosa	150-200 year old longleaf pine stand. The natural area is part of Eglin Air Force Base.	http://www.eglin.af.mil/	290.51
Santa Rosa Outlying Landing Field	U.S. Dept. of Defense, Navy	Santa Rosa	A naval reservation that is primarily a single airfield, but does contain large forested areas in the northeast and southeast corners. Gopher frog and Florida pine snake occur here. Included in the NAS Whiting Field INRMP.	http://www.cnric.navy.mil/regions/cnrse/installations/nas_whiting_field.html	693.26
Whiting Park	U.S. Dept. of Defense, Navy	Santa Rosa	Naval recreation area along Blackwater River with boat launch and picnic facilities. Included in the NAS Whiting Field INRMP.	http://www.cnric.navy.mil/regions/cnrse/installations/nas_whiting_field/ffr/things_to_do/recreation/parks_and_picnic_areas.html	5.47

Conservation Land	Managing Agency	County(ies)	Description	Website	Acres Within Watershed
State Managed					
Blackwater Heritage State Trail	FDEP Division of Recreation and Parks	Santa Rosa	This is an 8.1-mile long paved recreational trail located along a former railroad corridor. It is the westernmost rail-trail in Florida and part of an integrated statewide network of trails and ecological greenways.	http://www.floridastateparks.org/	586.08
Blackwater River State Forest	FDACS Florida Forest Service	Okaloosa Santa Rosa	This is the largest expanse of sandhills, longleaf pine upland forests, and seepage slopes in state ownership.	http://www.floridaforestservice.com/index.html	635.83
Blackwater River State Park	FDEP Division of Recreation and Parks	Santa Rosa	Ponds, swamps, scrubby ridges; high pineland and pine flatwoods; Atlantic white cedars; on the Blackwater River.	http://www.floridastateparks.org/	635.11
Blackwater River Water Management Area	NWFWMD	Santa Rosa	Primarily cut-over paper lands in the uplands, but nice areas of floodplain forest and bottomland forest along the river. Rare plants include Florida flame azalea.	http://www.nwfwmd.com/	386.46
Cottage Hill State Forest	FDACS Florida Forest Service	Escambia	A small tract of state forest land managed through the Blackwater Forestry Center Field Unit, south of McKenzie Road, west of Chavers Road, and east of Gainey Lane.	http://www.floridaforestservice.com/index.html	30.83
Escribano Point Wildlife Management Area	FWC	Santa Rosa	Southern region has large expanses of wet flatwoods with lots of pitcher plants grading into baygall. Northern region is an impenetrable thicket of titi that has regenerated after the site was logged in the 1990s.	http://myfwc.com	3,924.52
FWC Mitigation Parcel	FWC	Okaloosa	Mitigation parcel surrounded by Blackwater River State Forest.	http://myfwc.com	110.37
Garcon Point Water Management Area	NWFWMD	Santa Rosa	This is a peninsula separating East Bay and Escambia Bay. It is an example of high quality wet prairie habitat that contains several very rare species, as well as carnivorous pitcher plants. Includes 78 acres less-than-fee.	http://www.nwfwmd.com/	3,222.80

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Conservation Land	Managing Agency	County(ies)	Description	Website	Acres Within Watershed
Gillis Road Tract	Undesignated State Land (not currently assigned to a managing agency)	Santa Rosa	Land formerly managed by FDACS, Division of Forestry, north of Old Hickory Hammock Road, west of Black Oak Road, and southeast of Interstate 10.	http://data.labins.org/mapping/FNAI/identify_list2.cfm?MA_ID=1188	19.97
Lake Stone Fish Management Area	FWC	Escambia	A 130-acre lake surrounded by 119 acres of uplands with a mixture of upland mixed forest and baygall. This lake is intensively managed for fish production. Jointly managed by FWC and Escambia County.	http://myfwc.com	248.02
Lower Escambia River Water Management Area	NWFWMD	Escambia Santa Rosa	Floodplain forest, bottomland forest, and some uplands along almost the entire length of the Escambia River near Pensacola. Several rare fish, reptiles, and amphibians have been documented here.	http://www.nwfwater.com/	36,666.89
Watson Conservation Easement	NWFWMD	Escambia	A conservation easement with no public access and all less-than-fee. Easement is located immediately west of the Lower Escambia River Water Management Area, east of North Century Boulevard/U.S.-29, north of Milstead Road, south of Brown Road.	http://www.nwfwater.com/	15.81
Yellow River Marsh Preserve State Park	FDEP Division of Recreation and Parks	Santa Rosa	Also known as Garcon Point Prairie, this is perhaps the largest intact wet prairie (pitcher plant prairie) in northwest Florida. The preserve adjoins Northwest Florida Water Management District lands. Hydrologic restoration is planned to offset impacts of past ditching and drainage.	http://www.floridastateparks.org/	832.14
Yellow River Water Management Area	NWFWMD/FWC	Okaloosa Santa Rosa	A tremendously diverse tract of land with upland pine forest, upland hardwood forest, seepage slopes, floodplain marsh, tidal marsh, streams, and lakes.	http://www.nwfwater.com/	16,643.05
Locally Managed					
Bay Bluffs Park	City of Pensacola	Escambia	Located on the west shore of Escambia Bay, this park is bordered on the north and south by Escambia Bay Bluffs.	http://cityofpensacola.com/Facilities/Facility/Details/Bay-Bluffs-Preserve-18	19.79

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Conservation Land	Managing Agency	County(ies)	Description	Website	Acres Within Watershed
Baycliff Preserve	City of Gulf Breeze	Santa Rosa	This site is a natural wetlands area with a nature trail and public beach access.	http://cityofgulfbreeze.us/	6.81
Escambia Bay Bluffs	City of Pensacola	Escambia	Three parcels on west shore of Escambia Bay.	http://pensacolascenicbluffs.org/	41.73
Jones Swamp Wetland Preserve and Escambia County Southwest Greenway	Escambia County Community and Environment Department	Escambia	This preserve and greenway is located in a 1,300-acre watershed targeted for acquisition to provide wetland buffering and protection for the Pensacola Bay area. The greenway is available for passive use recreation and has several miles of boardwalk and hiking trails.	http://www.myescambia.com/government/departments/ce	581.90
Mallory Heights Park #3	City of Pensacola	Escambia	Located on the west shore of Escambia Bay, this park is bordered on the north and south by Escambia Bay Bluffs.	http://cityofpensacola.com/132/Parks-Recreation?parkID=13246	7.01
Navarre Beach Park	Santa Rosa County	Santa Rosa	Restored coastal dunes located within the Gulf Islands National Seashore, south of Navarre Parkway, west of the Navarre Beach Pier and east of Bahia Drive.	http://www.santarosaf.l.gov/	136.90
Shoal River Land Acquisition	Okaloosa County	Okaloosa	Restrictive use easement purchased by Okaloosa County Water and Sewer located north of the Eglin Air Force Base Conservation Land, intersected in its northern portion by Interstate 10, east of Balboa Road and south of James Kennedy Road.	http://www.co.okaloosa.fl.us/ws/home	321.18
Shoreline Park South	City of Gulf Breeze	Santa Rosa	This park is a mostly wooded area that extends from Shoreline Drive south to the edge of Santa Rosa Sound. An open area near the water contains a boat ramp, picnic tables, fishing pier, swimming area, and a large gazebo. A nature trail winds through the property.	http://cityofgulfbreeze.us/parks-and-recreation-department/	103.24

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Conservation Land	Managing Agency	County(ies)	Description	Website	Acres Within Watershed
Privately Managed					
Camp Kolomoki	Girl Scouts of America	Walton	This site is used as a Girl Scout Camp. It contains a pitcher plant prairie.	http://www.gscfp.org/camps.html	1,635.26
Garcon Peninsula Mitigation Bank	Garcon Peninsula Mitigation Bank, LLC	Santa Rosa	Mitigation bank land owned by private individuals, located west of Blackwater Bay, north and west of Robinson Point Road (which runs east/west then turns and runs north/south), south of Trease Road, and east of Garcon Point Road.	http://www.garconmitigationbank.com/	334.70
Pensacola Bay Mitigation Bank	Westervelt Ecological Services	Santa Rosa	Mitigation bank. The site is in the Pensacola Bay Basin in a flat, near-coastal landscape adjacent to low-density residential and preservation lands with a major highway dividing two parcels. The site consisted of fire-suppressed, overgrown, but intact (with wiregrass) wet prairie and wet flatwoods, with some ORV-damaged areas. Also contains cypress dome/stringer depressions and a titi-baygall area isolated from fire.	http://www.wesmitigation.com/mitigation-conservation-projects/pensacola-bay-mitigation-bank.cfm#page=general	1188.73

Source: FNAI 2016c

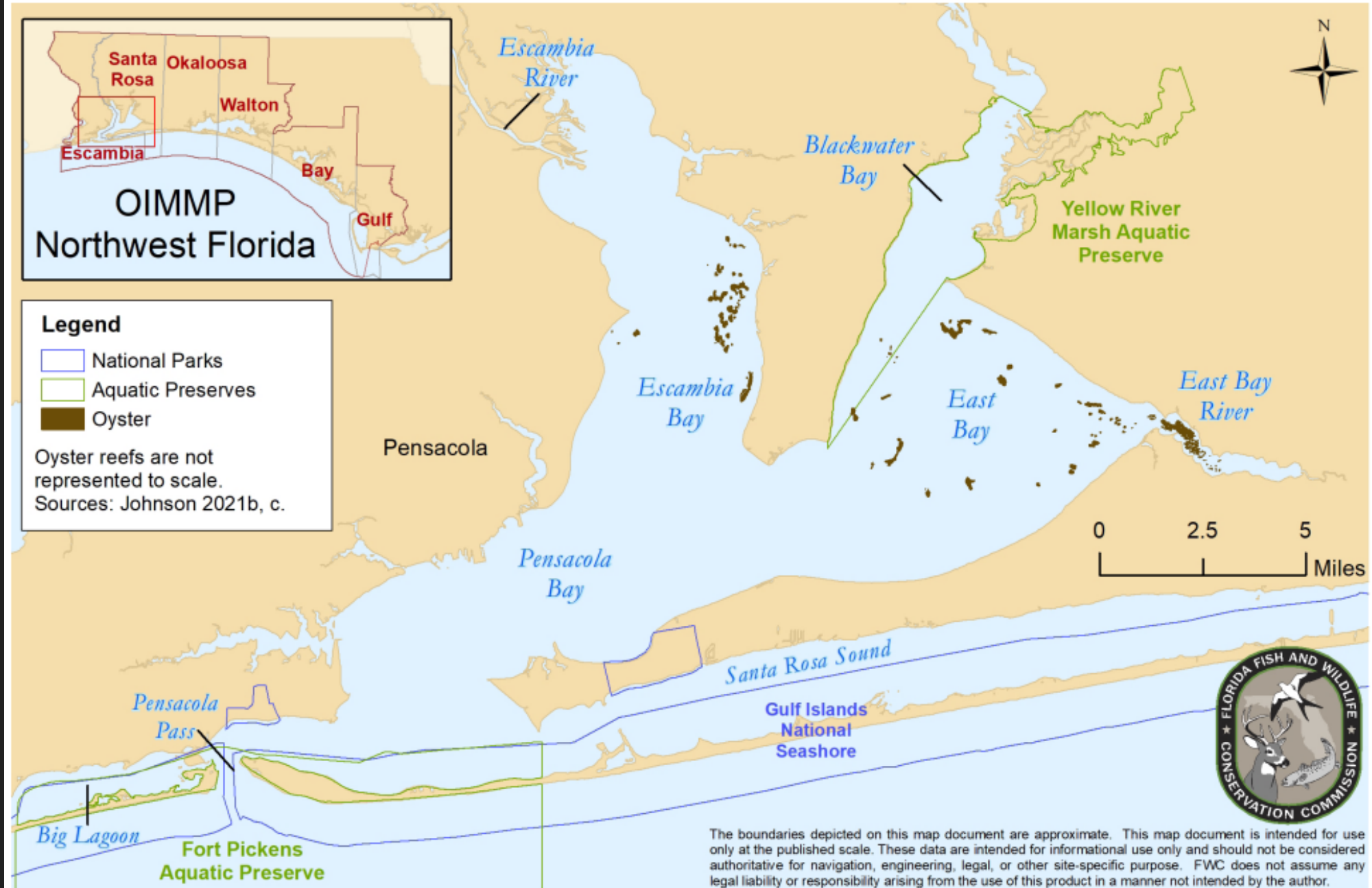
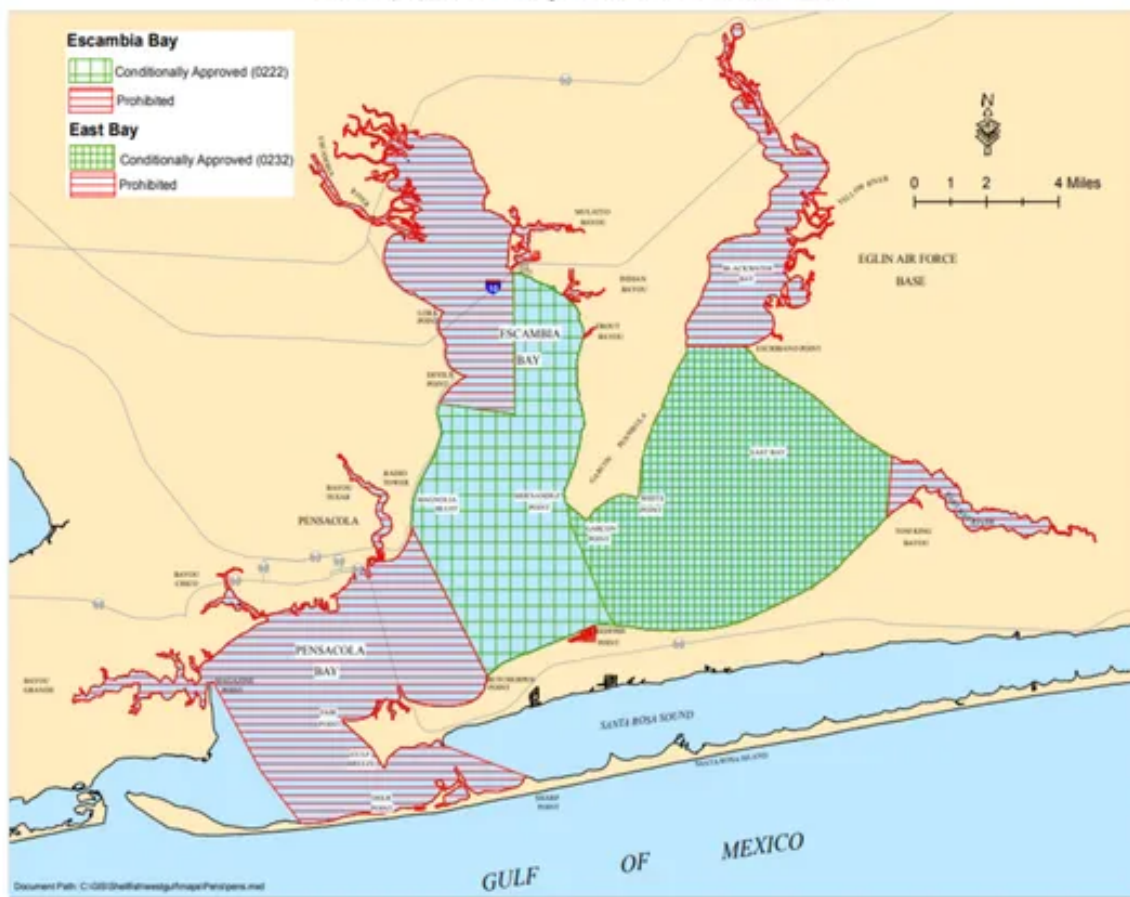
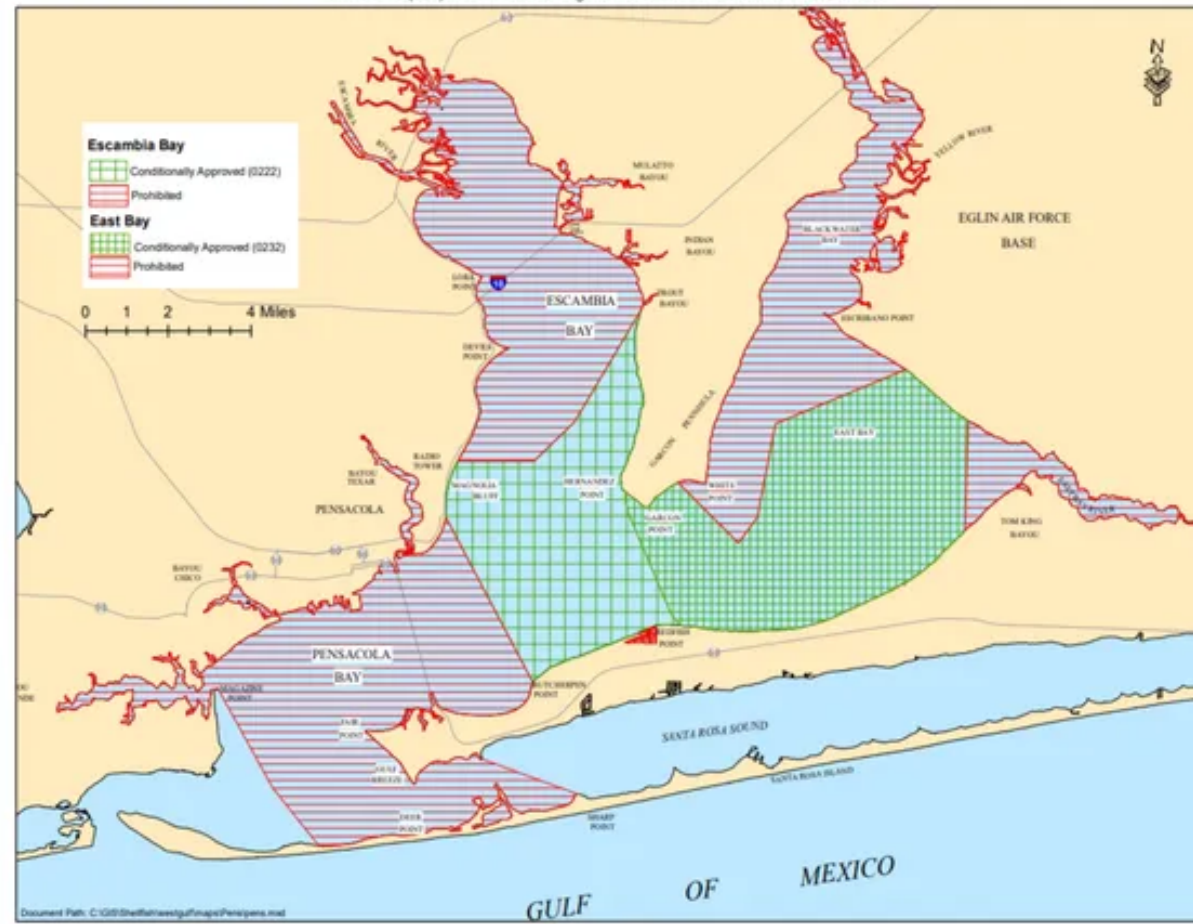


Figure 2.5. Bays and mapped oyster extent in the Pensacola Bay System. Oyster mapping sources: Johnson (2021b, c), mapped from side-scan sonar in 2020–2021.

SHELLFISH HARVESTING AREA CLASSIFICATION MAP #02 (Survey: July 22, 2016)
Pensacola (#02) Shellfish Harvesting Area in Escambia and Santa Rosa Counties



PROPOSED SHELLFISH HARVESTING AREA CLASSIFICATION MAP
Pensacola (#02) Shellfish Harvesting Area in Escambia and Santa Rosa Counties





Agenda Item # 2022-722

Blackwater River and Invasive Species Public Education Opportunity

MEETING DATE

October 20, 2022

PREPARED BY

Dawn Molinero, City Clerk

BACKGROUND

Although plants play an essential role in natural areas and public waterbodies, a select few are considered invasive and their ability to take over areas can completely alter these unique landscapes forever. With its subtropical climate, miles of coastline and thousands of travelers daily, Florida is uniquely prone to invasive plants.

SUMMARY

Although plants play an essential role in natural areas and public waterbodies, a select few are considered invasive and their ability to take over areas can completely alter these unique landscapes forever. With its subtropical climate, miles of coastline and thousands of travelers daily, Florida is uniquely prone to invasive plants.

RECOMMENDATION

Discussion item

ATTACHMENTS

1. INFORMATION AND EDUCATION invasive speices
2. tallow tree info sheet UF
3. camphor tree info sheet UF
4. mimosa info sheet UF



With 1.2 million acres of public water, Florida has about 7,700 lakes and ponds and 1,400 rivers and streams. Although plants play an essential role in those natural areas and public waterbodies, a select few are considered invasive and their ability to take over areas can completely alter these unique landscapes forever. With its subtropical climate, miles of coastline, and thousands of travelers daily, Florida is uniquely prone to invasive plants.

There are about 1,400 non-native plants in Florida, and of those, 6% (79) are considered invasive. Invasive plants are species that are non-native, introduced intentionally or accidentally by humans, and cause environmental and/or economic damage.

The UF/IFAS Center for Aquatic and Invasive Plants is dedicated to developing and disseminating strategies for addressing the impacts of invasive plants. Research shows that many invasive plants found in Florida will never be eradicated; they simply grow too fast. Instead, they become our responsibility to regularly manage for the sake of Florida's precious natural resources.

This website serves as a resource for Florida residents, environmental educators, and others interested in learning more about aquatic and invasive plants.

1.2M

acres of public water in Florida

1,400

non-native plant species in the state

6%

of those non-native plants are considered invasive

96%

of public waters contain non-native plants

Frequently Asked Questions about Invasive Species

What is an invasive species?

An invasive species is any non-native organism whose introduction can cause harm to the environment, human health or economic interests. Some of the invasive species on this website are already serious pests in North America, while others are not yet widespread.

How do invasive species get here?

Invasive species are introduced through many means. Intentional introductions have often been for agricultural or ornamental purposes. Once introduced, some of these species escape their enclosures or cultivation and can become established as viable populations. Accidental introductions are usually the result of contaminated freight or movement of contaminated wood products (including shipping pallets, bracing and other dunnage), plants, or food products. Individuals or propagules (including its seeds, eggs, spores, or other biological material capable of propagation) of these invasive species can be contaminants or hitchhikers in these shipments.

Are all exotic species invasive?

No, actually only a small percent of introduced species ever become invasive. However, it is nearly impossible to predict which species will become invasive and new species are being introduced every day. Some species are present for many years before they exhibit invasive characteristics. Many invasive species go through a "lag phase" in which their populations grow slowly until they reach a size large enough for the population to explode and/or become adapted to the local environment and become invasive.

What type of harm does an invasive species do?

Since invasive species are in a new environment, free from natural predators, parasites, or competitors, they often develop large population sizes very rapidly. These high populations can out-compete, displace or kill native species or can reduce wildlife food and habitat. Some also have the potential to disrupt vital ecosystem functions, such as water flow, nutrient cycling, or soil decomposition. Other invasive species cause massive amounts of economic damage to the agricultural business by destroying crops and contaminating produce. Some invasive species can cause direct harm to humans or domestic animals.

Why are the species on this website of concern to North America?

The species listed on this website have the potential to create significant damage or harm through direct losses to crops, forests, landscapes, man-made structures and aquatic environments. These species can also cause environmental damage through wide-spread plant mortality. The presence of these pests may also result in quarantines being implemented by the US or other governments that restrict the import and export of a commodity.

Most of the species listed in this website are not native to North America. Native species can be pests but the introduction of exotic species has the potential to cause greater damage due to the lack of effective biological control agents and the lack of resistance in our native plants.

Why don't our native plants have resistance to these exotic pests?

Plants developed resistance to pests through their interaction with the pest over many generations. The plants that were resistant survived to pass their survival characteristics on to the next generation. As a result, the plant species develops a set of effective defenses that allows the species to survive. When a new pest is introduced, the defenses of the plant are not prepared to counter the attacks of the new pest; therefore significant losses are often experienced.

What type of damage do these species cause?

Pests can damage plants in many different ways. They can cause direct damage, such as tunneling by wood boring insects can lead to the death of the plant, or indirect damage, where the injury inflicted by the pest weakens the plant and renders it susceptible to other stress factors. The type of damage can be diagnostic in the identification of the pest.

What can I do to fight these exotic pests?

The simplest and most important thing anybody can do to help fight invasive species is to prevent its' introduction and establishment! Invasive organisms can easily be transported on living plants or fresh products such as fruit. Many pests can be found in recently killed plant material including firewood, lumber, and wooden packing material. Avoiding the long range movement of these materials is a simple way to slow the spread of pests. Buying only certified pest-free nursery stock is also a good idea.

It is important to educate yourself and keep up to date on the status of these and other pests. Resources are available through your local extension office and on the web at www.bugwood.org and other websites. These resources have information on how to identify and control exotic pests that have already been introduced. By knowing what to look for and rapidly identifying any new introductions, we may be able to minimize the impact of new invaders. Report any occurrence of invasive species to your local county extension agent, state forestry agency, or to other federal or state natural resource or agricultural agencies. Spread the word; tell your neighbors if you see invasive species on their land. Volunteer with natural resource agencies to control invasive species. Control of small infestations is more effective and economical than trying to control a well-established, rapidly spreading infestation.

Natural Area Weeds: Chinese Tallow [*Triadica sebifera* (L.) Small]¹

K. A. Langeland and S. F. Enloe²

Introduction

Florida's natural areas—a great source of pride and enjoyment to its citizens—provide recreation, protect biodiversity and fresh water supplies, buffer the harmful effects of storms, and significantly contribute to the economic well-being of the state (Jue et al. 2001). Natural areas are protected in over ten million acres (nonsubmerged) of state, federal, local and private managed conservation lands in Florida (<http://fnai.org>). Unfortunately, many of these natural areas can be adversely affected by invasive plant species. An estimated 25,000 plant species have been brought into Florida for use as agricultural crops or landscape plants. While only a small number of these have become invasive, those that do can adversely affect native plant communities by competing for space and resources, disrupting hydrologic and fire regimes, or hybridizing with native species. They must be managed for the protection of native communities in natural areas. Chinese tallow (*Triadica sebifera* (L.) Small) is one of these invasive plant species.

How to Recognize Chinese Tallow

Chinese tallow is a deciduous tree with a milky sap that commonly grows to 30 ft tall. Leaves are simple, alternate, 1–2.5 inches wide, with broadly rounded bases and tapering to a slender point (Figure 1). Leaf stalks are 1–2 inches long. Small yellow flowers that are borne on spikes to 8

inches long occur in spring (Figure 2). The fruit is a 0.5 inch wide, 3-lobed capsule that turns brown at maturity to reveal 3 dull white seeds (Figure 1). The seeds, which often remain attached to the tree through the winter, resemble popcorn, suggesting the other common name of popcorn tree.



Figure 1. Chinese tallow tree [*Triadica sebifera* (L.) Small] can be identified by its simple, alternate leaves with broadly rounded bases that taper to a slender point and dull white seeds that remain attached after leaves have fallen.

Distribution

Chinese tallow was introduced to the US before 1800. In a letter from Benjamin Franklin written in 1772 to Dr. Noble Wimberly Jones of the Georgia colony, Franklin wrote: “I send also a few seeds of the Chinese Tallow Tree, which will I believe grow & thrive with you. ‘Tis a most useful plant” (Bell 1966). As early as 1803, Chinese tallow was

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2. K. A. Langeland, professor emeritus; and S. F. Enloe, associate professor, Agronomy Department, Center for Aquatic and Invasive Plants; UF/IFAS Extension, Gainesville, FL 32611.

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spreading into coastal forests according to the noted French botanist Andre Michaux. Since Franklin's time, Chinese tallow has been introduced repeatedly to the United States as an ornamental and potential oil crop species. It is now naturalized from North Carolina, south through Central Florida, extending west into Texas and northwest Arkansas (McCormick 2005). Within Florida, Chinese tallow has increased greatly over the last twenty years. In 1993, it was naturalized in 57% of the counties (Jubinsky and Anderson 1996) and found as far south as Dade County (Wunderlin et al. 2003). Today, it is found in almost every county in the state.



Figure 2. In spring, Chinese tallow tree displays spikes of small yellow flowers that are up to 8 inches in length.
Credits: Nancy J. Loewenstein, Auburn University

Invasiveness

Chinese tallow has been recognized as a pest plant in the Carolinas since the 1970s (Langeland and Burks 1998). It is found throughout Florida where it invades mesic flatwoods, scrubby flatwoods, alluvial floodplain forest, strand swamp, and ruderal communities. Chinese tallow has been extensively used for ornamental planting and is a common plant on landscaped property. These trees present a constant source of seed for infestation of natural areas because the seeds are transported by birds such as pileated woodpeckers, cardinals, yellow-rumped warblers, American robins, and grackles, as well as by water (Jubinsky and Anderson 1996). While the length of time needed to deplete the seedbank is unknown, indications are that seeds remain viable for many years (Jubinsky and Anderson 1996). The Florida Exotic Pest Plant Council (Now named the Florida Invasive Species Council, or FISC) included Chinese tallow

on its 1993 List of Florida's Most Invasive Species and it is currently a FISC Category 1 species. **Chinese tallow was added to the Florida Department of Agriculture and Consumer Services Noxious Weed List (5b-57.007 FAC) in 1998. Plants on the Florida Noxious Weed List may not be introduced, possessed, moved, or released without a permit.**

Remove and Replace

Homeowners can help mitigate the problem of Chinese tallow trees in Florida's natural areas by removing them from their property. Mature trees should be felled with a chain saw by the property owner or a professional tree service. The final cut should be made as close to the ground as possible and as level as possible to facilitate application of an herbicide to prevent sprouting. Stumps that are not treated with an herbicide will sprout to form multiple-trunked trees (Figure 3). If it is not objectionable for dead trees to be left standing, certain herbicides can be applied directly to the bark at the base of the tree (basal bark application).



Figure 3. Stumps of felled Chinese tallow trees that are not treated with a herbicide will rapidly sprout to form multiple-trunked trees.

Herbicides that contain the active ingredient triclopyr amine (e.g., Brush-B-Gon, Garlon 3A) can be applied to cut stumps to prevent resprouting. The herbicide should be applied as soon as possible after felling the tree and concentrated on the thin layer of living tissue (cambium) that is just inside the bark. Herbicides with the active ingredient triclopyr ester can be used for basal bark applications. Concentrated products (e.g., Garlon 4 Ultra) must be diluted, according to instructions on the herbicide label, with a penetrating oil, manufactured for this purpose. Herbicides with the active ingredients triclopyr ester can be used for basal bark applications. Herbicide products are available for basal bark application that are pre-diluted with penetrating oil (e.g., Pathfinder II). Only certain triclopyr amine products may be applied to trees that are growing in

standing water. Suckers may grow from remaining roots, even if herbicide is applied to the parent tree. These suckers can be cut or treated with a foliar herbicide application. **It is illegal to use a herbicide in a manner inconsistent with the label's instructions; therefore, read the label carefully and follow the instructions.**

If trees are cut at a time when seeds are attached, make sure that the material is disposed of in such a way the seeds will not be dispersed to new areas where they can germinate and produce new trees. Seedlings should be pulled by hand before they reach seed-bearing maturity. A complete description of each of these control techniques can be found in the following publication: <https://edis.ifas.ufl.edu/wg209>.

Space in a landscape left after removal of Chinese tallow can be used to plant a new native or noninvasive tree for shade, or some other landscape purpose. Tree species recommended in Table 1 are similar in size to Chinese tallow. Blackgum, maples, dogwood, and crepe myrtles provide fall color similar to Chinese tallow. Fact sheets that provide additional information on landscape plants can be viewed at http://hort.ifas.ufl.edu/database/trees/trees_scientific.shtml. For information on the availability of native landscape plant species contact the Association of Florida Native Nurseries (877-352-2366 or <http://www.afnn.org>). The UF/IFAS Extension office in your county can help you identify plants appropriate to your property conditions, the ecosystems on and near your site, and your aesthetic preferences.

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Table 1. Some suggested tree species for replacing Chinese tallow.

Native	Florida Hardiness Zones
American Hornbeam (<i>Carpinus caroliniana</i>)	North, Central
Blackgum (<i>Nyssa sylvatica</i> var. <i>sylvatica</i>)	North, Central
Cedar Elm (<i>Ulmus crassifolia</i>)	North, Central
Eastern Hophornbeam (<i>Ostrya virginiana</i>)	North, Central
Eastern Redbud (<i>Cercis canadensis</i>)	North, Central
Flatwoods Plum (<i>Prunus umbellata</i>)	North, Central
Florida Maple (<i>Acer saccharum</i> ssp. <i>floridanum</i>)	North, Central
Flowering Dogwood (<i>Cornus florida</i>)	North, Central
Fringe Tree (<i>Chionanthus virginicus</i>)	North, Central
Geiger Tree (<i>Cordia sebestena</i>)	South
Paradise Tree (<i>Simarouba glauca</i>)	South
Red Bay (<i>Persea barbonia</i>)	Throughout
Red Maple (<i>Acer rubrum</i>)	Throughout
Red Stopper (<i>Eugenia confusa</i>)	South
River Birch (<i>Betula nigra</i>)	North, Central
Satin Leaf (<i>Chrysophyllum oliviforme</i>)	South
Silverbell (<i>Halesia diptera</i>)	North, Central
Swamp Bay (<i>Persea palustris</i>)	Throughout
Turkey Oak (<i>Quercus laevis</i>)	North, Central
White Ash (<i>Fraxinus americana</i>)	North
Winged Elm (<i>Ulmus alata</i>)	North, Central
Non-Native	
Crepe Myrtle (<i>Lagerstroemia indica</i>)	Throughout
Queens Crepe Myrtle (<i>Lagerstroemia speciosa</i>)	South
Trumpet Tree (<i>Tabebuia argentea</i>)	South

Cinnamomum camphora: Camphor-Tree¹

Edward F. Gilman, Dennis G. Watson, Ryan W. Klein, Andrew K. Koeser, Deborah R. Hilbert, and Drew C. McLean²

Introduction

This large, round-canopied, evergreen tree has broad, large-diameter, unusually strong branches and can reach 70 feet in height with a broader spread but is usually 40 to 50 feet with a 50 to 70-foot spread. The glossy green, thin but leathery leaves give off a camphor aroma when crushed and create dense shade. The stems and bark on young branches of Camphor-tree are bright green, tinged with red when young, maturing into a dark grey-brown, rugged-looking trunk which appears almost black when wet from rain. Trunk and branch structure on older trees appear similar to mature live oaks. The inconspicuous, tiny, yellow flowers are followed by a profusion of small, black berries which can become an annoyance on walks and driveways because they are messy but are quite attractive to wildlife. Fruits will stain cars. Some occasionally germinate below the tree, but this is not nearly as much of a problem as some other trees. Birds can also carry the seed to remote areas where it will occasionally germinate. The leaves, twigs, and wood are the commercial source of camphor. The dried bark of *Cinnamomum zeylanicum* yields cinnamon.

Common name(s): camphor-tree

Family: *Lauraceae*

USDA hardiness zones: 9B through 11 (Figure 2)

Origin: native to eastern Asia

UF/IFAS Invasive Assessment Status: invasive and not recommended (North and Central); caution, may be recommended but manage to prevent escape (South)

Uses: screen; shade; urban tolerant



Figure 1. Full Form—*Cinnamomum camphora*: camphor-tree

General Information

Scientific name: *Cinnamomum camphora*

Pronunciation: sin-uh-MOE-mum kam-FOR-uh

1. This document is ENH326, one of a series of the Environmental Horticulture Department, UF/IFAS Extension. Original publication date November 1993. Revised February 2013 and December 2018. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.
2. Edward F. Gilman, professor emeritus, Environmental Horticulture Department; Dennis G. Watson, former associate professor, Agricultural Engineering Department; Ryan W. Klein, graduate assistant, Environmental Horticulture Department; Andrew K. Koeser, assistant professor, Environmental Horticulture Department, UF/IFAS Gulf Coast Research and Education Center; Deborah R. Hilbert, graduate assistant, Environmental Horticulture Department, GCREC; and Drew C. McLean, biological scientist, Environmental Horticulture Department, GCREC; UF/IFAS Extension, Gainesville, FL 32611.

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U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.



Figure 2. Range

Description

Height: 40 to 50 feet

Spread: 50 to 70 feet

Crown uniformity: symmetrical

Crown shape: round

Crown density: dense

Growth rate: fast

Texture: medium

Foliage

Leaf arrangement: alternate

Leaf type: simple

Leaf margin: entire

Leaf shape: ovate, obovate

Leaf venation: pinnate

Leaf type and persistence: evergreen, broadleaf evergreen, fragrant when crushed

Leaf blade length: 2 to 4 inches

Leaf color: dark green and shiny on top, glaucous and silvery underneath

Fall color: no color change

Fall characteristic: not showy

Flower

Flower color: greenish white

Flower characteristics: not showy; emerges in clusters on panicles

Flowering: spring

Fruit

Fruit shape: round

Fruit length: ½ inch

Fruit covering: fleshy drupe

Fruit color: green to black

Fruit characteristics: attracts birds; not showy; fruit/leaves a litter problem



Figure 3. Leaf—*Cinnamomum camphora*: camphor-tree



Figure 4. Flower—*Cinnamomum camphora*: camphor-tree



Figure 5. Fruit—*Cinnamomum camphora*: camphor-tree

Trunk and Branches

Trunk/branches: branches droop; showy; typically one trunk; no thorns

Bark: brown to gray, becoming increasingly furrowed and rigid with age

Pruning requirement: needed for strong structure

Breakage: resistant

Current year twig color: green

Current year twig thickness: thin, medium

Wood specific gravity: unknown



Figure 6. Bark—*Cinnamomum camphora*: camphor-tree

Credits: Gritta Hasing

Culture

Light requirement: full sun, partial sun or partial shade

Soil tolerances: clay; sand; loam; acidic; slightly alkaline; well-drained

Drought tolerance: high

Aerosol salt tolerance: low

Other

Roots: can form large surface roots

Winter interest: yes

Outstanding tree: no

Ozone sensitivity: unknown

Verticillium wilt susceptibility: susceptible

Pest resistance: resistant to pests/diseases

Use and Management

Too big for all but the largest spaces, Camphor-tree is ideal when used as a shade tree for parks or large landscapes. Use along streets should be tempered because messy fruits drop on sidewalks and cars. It might be considered for boulevard planting where cars do not park. Prune to develop major branches, space 18 to 30 inches apart along a central trunk to develop good structure. Do not allow major branches to grow from the same spot on the trunk and avoid upright, multi-trunked trees. It may be difficult to maintain a lawn beneath the dense shade of Camphor-trees and a shade-tolerant groundcover may better suit the purpose. The trunk on older specimens grows to six feet or more in diameter and is quite picturesque. Allow plenty of room for proper development above and below ground. Shallow roots can be a nuisance. Has escaped cultivation in some areas.

Growing in full sun to partial shade, Camphor-Tree is amenable to a variety of soils, will grow but often develops minor element deficiencies on alkaline soils. Camphor-Tree is highly tolerant of urban conditions but will not tolerate water-logged soils. It is adapted to grow along the coast exposed to some sea salt.

The cultivar 'Monum' has larger, richer green foliage.

Propagation is by seed.

Pests

Scales and mites are common problems on Camphor-Trees. Seeds can germinate easily in the landscape but this is usually a minor problem. Has escaped cultivation in Florida, Louisiana, and parts of coastal Texas, so use it (if at all) with caution.

Diseases

Camphor-Tree is subject to a root rot, especially in poorly-drained soils.

References

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Koeser, A.K., Friedman, M.H., Hasing, G., Finley, H., Schelb, J. 2017. *Trees: South Florida and the Keys*. Gainesville: University of Florida Institute of Food and Agricultural Sciences.

Albizia julibrissin: Mimosa¹

Edward F. Gilman and Dennis G. Watson²

Introduction

This fast-growing, deciduous tree has a low branching, open, spreading habit and delicate, lacy, almost fern-like foliage. Fragrant, silky, pink puffy pompom blooms, two inches in diameter, appear in abundance from late April to early July creating a spectacular sight. But the tree produces numerous seed pods and harbors insect (webworm) and disease (vascular wilt) problems. Although rather short-lived (10 to 20 years), mimosa is popular for use as a terrace or patio tree for its light, dappled shade and tropical effect. Its deciduous nature allows the warming sun to penetrate during the winter.



Figure 1. Mature *Albizia julibrissin*: mimosa

Credits: R.A. Howard. ©Smithsonian Institution. Courtesy of Smithsonian Institution, Richard A. Howard Photograph Collection. United States, MA, Boston, Arnold Arboretum.

General Information

Scientific name: *Albizia julibrissin*

Pronunciation: al-BIZ-zee-uh joo-lih-BRISS-in

Common name(s): Mimosa, silk tree

Family: *Leguminosae*

USDA hardiness zones: 6B through 9B (Figure 2)

Invasive potential: According to the IFAS Assessment of Non-Native Plants in Florida's Natural Areas (IFAS Invasive Plant Working Group 2008), *Albizia julibrissin* is invasive and not recommended in Florida.

Origin: not native to North America

Uses: deck or patio; reclamation; specimen

Availability: not native to North America



Figure 2. Range

1. This document is ENH227, one of a series of the Environmental Horticulture Department, UF/IFAS Extension. Original publication date November 1993. Revised April 2007 and February 2013. Reviewed June 2016. Visit the EDIS website at <http://edis.ifas.ufl.edu>.
2. Edward F. Gilman, professor, Environmental Horticulture Department; and Dennis G. Watson, former associate professor, Agricultural Engineering Department; UF/IFAS Extension, Gainesville, FL 32611.

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U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

Description

Height: 15 to 25 feet

Spread: 25 to 35 feet

Crown uniformity: irregular

Crown shape: vase, spreading

Crown density: open

Growth rate: fast

Texture: fine

Foliage

Leaf arrangement: alternate (Figure 3)

Leaf type: bipinnately compound, odd-pinnately compound

Leaf margin: entire, ciliate

Leaf shape: oblong, lanceolate

Leaf venation: pinnate

Leaf type and persistence: deciduous

Leaf blade length: less than 2 inches

Leaf color: green

Fall color: no color change

Fall characteristic: not showy



Figure 3. Foliage

Flower

Flower color: pink

Flower characteristics: showy

Fruit

Fruit shape: elongated

Fruit length: 3 to 6 inches

Fruit covering: dry or hard

Fruit color: brown

Fruit characteristics: does not attract wildlife; showy; fruit/leaves a litter problem

Trunk and Branches

Trunk/bark/branches: branches droop; not showy; typically multi-trunked; thorns

Pruning requirement: needed for strong structure

Breakage: susceptible to breakage

Current year twig color: gray

Current year twig thickness: very thick

Wood specific gravity: unknown

Culture

Light requirement: full sun

Soil tolerances: clay; sand; loam; slightly alkaline; acidic; occasionally wet; well-drained

Drought tolerance: high

Aerosol salt tolerance: moderate

Other

Roots: can form large surface roots

Winter interest: no

Outstanding tree: no

Ozone sensitivity: unknown

Verticillium wilt susceptibility: resistant

Pest resistance: sensitive to pests/diseases

Use and Management

Growing best in full sun locations, mimosa is not particular as to soil type but has low salt-tolerance. Grows well in acid or alkaline soil. Mimosa tolerates drought conditions well but has a deeper green color and more lush appearance when given adequate moisture. The litter problem of the blooms, leaves, and especially the long seed pods requires consideration when planting this tree. Also the wood is brittle and has a tendency to break during storms though usually the wood is not heavy enough to cause damage. Typically, most of the root system grows from only two or three large-diameter roots originating at the base of the trunk. These can raise walks and patios as they grow in diameter and makes for poor transplanting success as the tree grows larger.

Unfortunately, mimosa (vascular) wilt is becoming a very widespread problem in many areas of the country and has killed many roadside trees. Despite its picturesque growth habit and its beauty when in bloom, some cities have passed ordinances outlawing further planting of this species due to its weed potential and wilt disease problem.

Several cultivars exist: 'Alba' has white flowers; 'Rosea' ('Ernest Wilson') has bright pink flowers, is hardier than the species, and is 10 to 15 feet in height; 'Rubra' has deep pink

flowers. 'Charlotte', 'Tyron', and 'Union' are reportedly wilt resistant and may be coming into production in selected nurseries in some areas.

Mimosa readily germinates from its abundant seeds but the wilt resistant trees must be increased by root cuttings.

Pests

Problems include cottony cushion scale, mites, mimosa webworm.

Diseases

Mimosa (Fusarium) wilt is quite a problem and is fatal. It can spread to adjacent mimosa trees by root grafts.

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MIO-Vision

MEETING DATE	PREPARED BY
October 20, 2022	Clerk's Office Dawn Molinero, City Clerk

NEWS

'Smart traffic light' system plan in the works for Pensacola area roads



Jim Little

Pensacola News Journal

Published 6:00 a.m. CT June 14, 2019

Traffic delays can be costly but local governments are partnering together on a smarter traffic system that is predicted to cut travel delays in the greater Pensacola area by 25%.

The new system, called an Advance Traffic Management System, will connect 365 traffic signals in Escambia and Santa Rosa counties to a central control system that will allow for real-time monitoring of traffic and the ability to control traffic signals remotely to respond to changing traffic conditions.

Traffic congestion in the Pensacola area amounts to 38 hours of delay per commuter, according to a 2015 study by the Texas A&M Transportation Institute.

Transportation planners with Northwest Florida's transportation planning council, the Emerald Coast Regional Council, say creating a regional smart traffic management system will cut down on those delays.

The Pensacola area's five local governments — Pensacola, Escambia County, Santa Rosa County, Gulf Breeze and Milton — signed on to the idea in 2016.

Now the Emerald Coast Regional Council is asking the five local governments to commit to funding the operations of the new system.

New Bay Bridge landing: FDOT reveals illustrations of upcoming Pensacola flyover, roundabout project at open forum

Beach traffic: More SunPass lanes coming to Pensacola Beach. Will it help alleviate traffic?

The estimated cost to run the system is about \$920,000 a year, but if the local governments commit to funding it, the Florida Department of Transportation will pay to build the system.

and a new building to house the control center — an estimated cost of about \$45 million, according to Austin Mount, CEO of the Emerald Coast Regional Council.

"We are very, very far behind the ball on this as far as communities of comparative size across the country," Mount said during a presentation to the Pensacola City Council on Monday. "So, we're just trying to do what we can to help advance this project along."

Mount said the state funding for the system won't come until 2022 or 2023, but that's only if the local governments sign an agreement pledging to fund the operations of the system after it is built.

Mount told the Pensacola City Council he's received positive responses from the other four governments indicating they're willing to sign.

The Escambia County Commission signed on to the idea last week with the provision that the new traffic control center building is located somewhere in Escambia County since they're paying the largest share of the cost.

The Florida-Alabama Transportation Planning Organization, a committee of local governments in Escambia, Santa Rosa counties and Baldwin County, Alabama, will be the organization that ultimately decides where the new operations center will go.

The plan is to spread out the cost between the five governments by the number of traffic signals that will be on the system.

Under the current estimate, Escambia County will pay \$491,507 a year for the 195 traffic signals that will be on the system.

Pensacola will pay \$231,890 for its 92 traffic signals. Santa Rosa County will have 58 traffic signals on the system for a cost of \$146,192.

Milton has 15 signals for \$37,808, while Gulf Breeze only has five signals for \$12,603.

Ben Faust, vice president of DRMP engineering firm, told the council the system will not only cut down on traffic delays but also increase safety as its estimated to decrease crashes by 12.5%.

Faust said the system along with other advancements in communication technology will enable communication between autonomous cars, public transit and even people's smart phones.

"Even our own imaginations at this time can't really reach around the things that the equipment we will deploy will be able to do for us just a few years from now," Faust said.

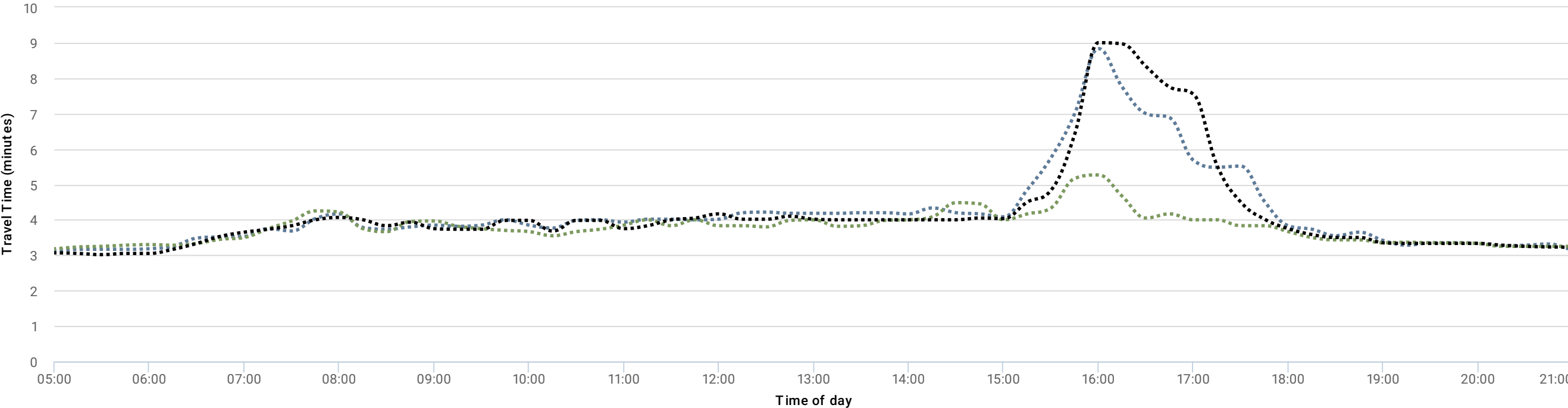
The City Council will vote on the agreement later this summer.

Pensacola Mayor Grover Robinson said he supported the project, adding that it will be "invaluable" to the city if its implemented and the state pays for the installation.

"We will try to work every way we can to make sure budget-wise when it comes 2022 or 2023, in that time period, that we're going to be in the right position to be able to take this going forward," Robinson said.

Jim Little can be reached at jwlittle@pnj.com and 850-208-9827.

Travel Time from US 90 and Ward Basin Rd/Dale St to US 90 and SR 87 (Stewart St)



— 24hr Median Travel Time Jul 31st 2022 • 24hr Match Instances Jul 1st 2022 - Jul 31st 2022 ■ Historical Trend 95% Jul 1st 2022 - Jul 31st 2022 ■ Historical Trend 90% Jul 1st 2022 - Jul 31st 2022
■ Historical Trend 80% Jul 1st 2022 - Jul 31st 2022 ■ Historical Trend Median Jul 1st 2022 - Jul 31st 2022 — 24hr Median Travel Time Aug 31st 2022 • 24hr Match Instances Aug 1st 2022 - Aug 31st 2022
■ Historical Trend 95% Aug 1st 2022 - Aug 31st 2022 ■ Historical Trend 90% Aug 1st 2022 - Aug 31st 2022 ■ Historical Trend 80% Aug 1st 2022 - Aug 31st 2022 ■ Historical Trend Median Aug 1st 2022 - Aug 31st 2022
— 24hr Median Travel Time Jun 30th 2022 • 24hr Match Instances Jun 1st 2022 - Jun 30th 2022 ■ Historical Trend 95% Jun 1st 2022 - Jun 30th 2022 ■ Historical Trend 90% Jun 1st 2022 - Jun 30th 2022
■ Historical Trend 80% Jun 1st 2022 - Jun 30th 2022 ■ Historical Trend Median Jun 1st 2022 - Jun 30th 2022



Agenda Item # 2022-730

Complete Streets Discussion for Design Collaboration with FDOT

MEETING DATE

October 20, 2022

PREPARED BY

Dawn Molinero, City Clerk

BACKGROUND

Implementing Complete Streets is an FDOT department-wide priority. The Complete Streets approach builds on flexibility and innovation in roadway planning and design to put the right street in the right place.

SUMMARY

Implementing Complete Streets is an FDOT department-wide priority. The Complete Streets approach builds on flexibility and innovation in roadway planning and design to put the right street in the right place.

RECOMMENDATION

Discussion item

ATTACHMENTS

1. fdot-completestreets-brochure
2. FDOT2017CSIHandbookDraft
3. Context Classification Guide 2022_lo-res

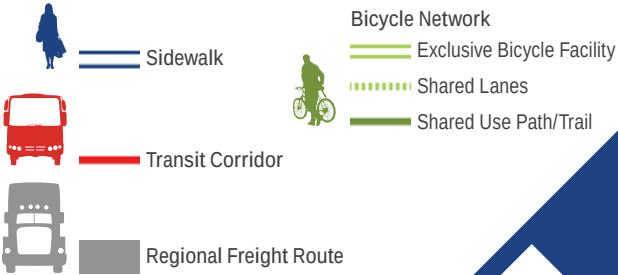
WHAT IS THE ROLE OF LOCAL PARTNERS?

A network of Complete Streets cannot be built entirely within the state roadway system and solely within FDOT's right of way. Transportation system and development pattern (such as land use, development density and intensity, building design, and site layout) are inextricably linked, and both have an effect on travel choices and mobility. A robust, connected roadway network provides options for the movement of people and goods and is the foundation for safe and comfortable travel for pedestrians, bicyclists, and transit riders.

Local governments and metropolitan planning organizations (MPOs) are responsible for land use and transportation planning to create supportive infrastructure and development patterns that match community goals and visions. Comprehensive plans, subarea plans, and land development regulations are some of the documents that will be reviewed to determine future visions and other land use-related items in evaluating context classification.

FDOT will apply criteria and standards based on the context classification. There is no separate FDOT funding category or FDOT funding source specifically for Complete Streets. Projects that require modifications to comply with criteria associated with the context classification will be funded through the funding programs currently available to Federal, State, and local roadways, as appropriate. The existing MPO funding process will remain the same. If local governments or other partners would like to include features that go beyond what is required by FDOT design criteria, such as decorative lighting or landscaping, patterned pavements, or street furniture and wayfinding, local communities must coordinate with FDOT to align local resources and projects with the FDOT project.

CONTEXT-SENSITIVE SYSTEM OF COMPLETE STREETS



Putting the right street in the right place.

WHAT IS FDOT'S APPROACH TO COMPLETE STREETS?

In September 2014, the Florida Department of Transportation (FDOT) adopted the Statewide Complete Streets Policy (Topic No. 000-625-017-a). Complete Streets serve the transportation needs of transportation system users of all ages and abilities, including pedestrians, bicyclists, transit riders motorists, and freight handlers. A transportation system based on Complete Streets principles can help to promote safety, quality of life, and economic development.

Safety: Safety for all users is FDOT's top priority. Roadways with context-appropriate speeds can result in reduced fatalities and serious injuries. The Complete Streets approach considers the mobility, convenience, accessibility, and safety of all road users, and places an emphasis on the most vulnerable users of a given roadway.

Quality of Life: A Complete Streets approach helps to align transportation decisions with land use, resulting in quality places where transportation investments support a community's quality of life.

Economic Development: A Complete Streets approach connects communities and supports Florida's existing economic centers, employment centers, and visitor destinations by striving to provide the highest level of multimodal infrastructure in these core areas.

Implementing Complete Streets is an FDOT department-wide priority. The Complete Streets approach builds on flexibility and innovation in roadway planning and design to put the right street in the right place.

WHEN WILL COMPLETE STREETS BE IMPLEMENTED?

The determination of a roadway's context classification is required in order to utilize the criteria in the FDOT Design Manual (FDM.) The context-based criteria in the FDM will be required on projects that have not begun design by January 1, 2018, and may be applied to active design projects at the discretion of the district. For PD&E projects, implementation of context classification and the FDM is required for projects that have the Public Hearing scheduled in April 2018 or later. The 2017 Plans Preparation Manual (PPM) will apply through the completion of the PD&E studies for projects that have the Public Hearing scheduled prior to April 2018. Criteria contained in the FDM may also be applied earlier at the discretion of the district.



WHERE CAN I FIND MORE RESOURCES?

WWW.FLCOMPLETESTREETS.COM

DeWayne Carver, AICP
State Complete Streets Program Manager
(850) 414 4322
dewayne.carver@dot.state.fl.us

Revised 3/29/2018

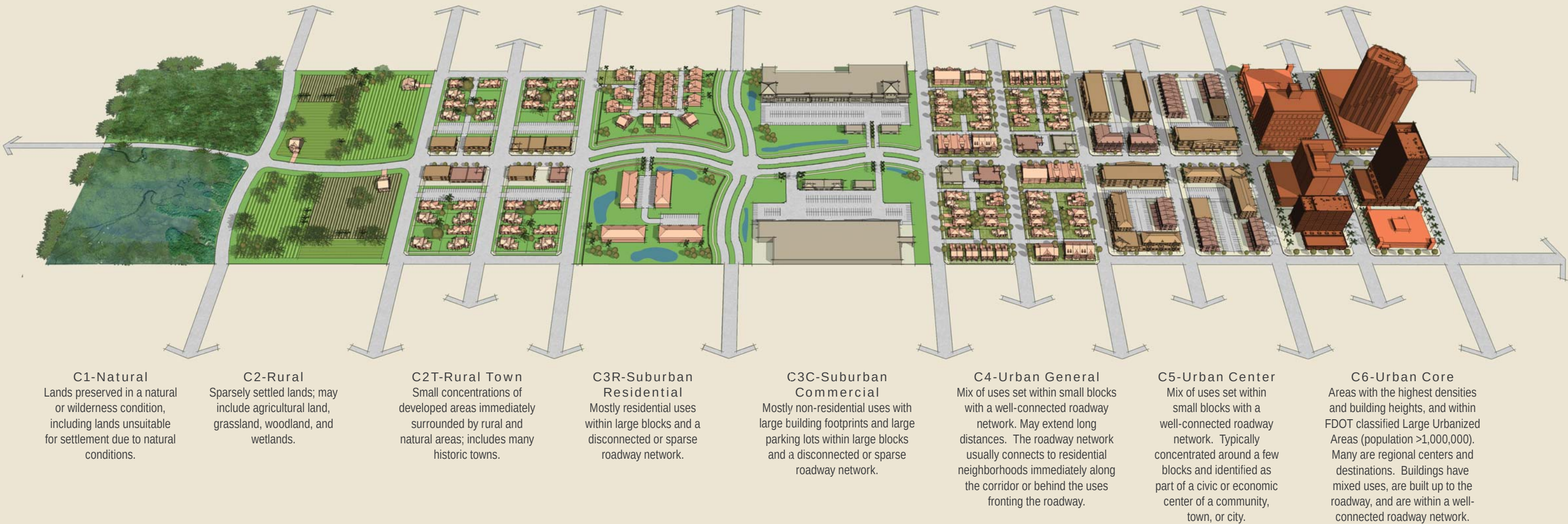
WHAT IS FDOT CONTEXT CLASSIFICATION?

Complete Streets are context sensitive, and the approach provides transportation system design that considers local land development patterns. Roadways will be planned and designed to support the safety, comfort, and mobility of all users based on the unique context of each roadway. The FDOT context classification system broadly identifies the various built environments existing in Florida. The context classification of a roadway will inform FDOT's planning, Project Development and Environment (PD&E), design, construction, and maintenance approaches to ensure that state roadways are supportive of safe and comfortable travel for their anticipated users. Identifying the context classification is a preliminary step in planning and design, as different context classifications will have different design criteria.

The Context Classification document presents and explains the Context Classification Matrix, which outlines the measures used to determine context classification. These include:

- (1) **Distinguishing Characteristics**, which give a broad description of the land use types and street patterns found within each context classification
- (2) **Primary Measures**, which measure the roadway connectivity and building use and form
- (3) **Secondary Measures**, which look at existing and allowed development intensity

FDOT CONTEXT CLASSIFICATIONS



CONTEXT CLASSIFICATION AND TRANSPORTATION CHARACTERISTICS

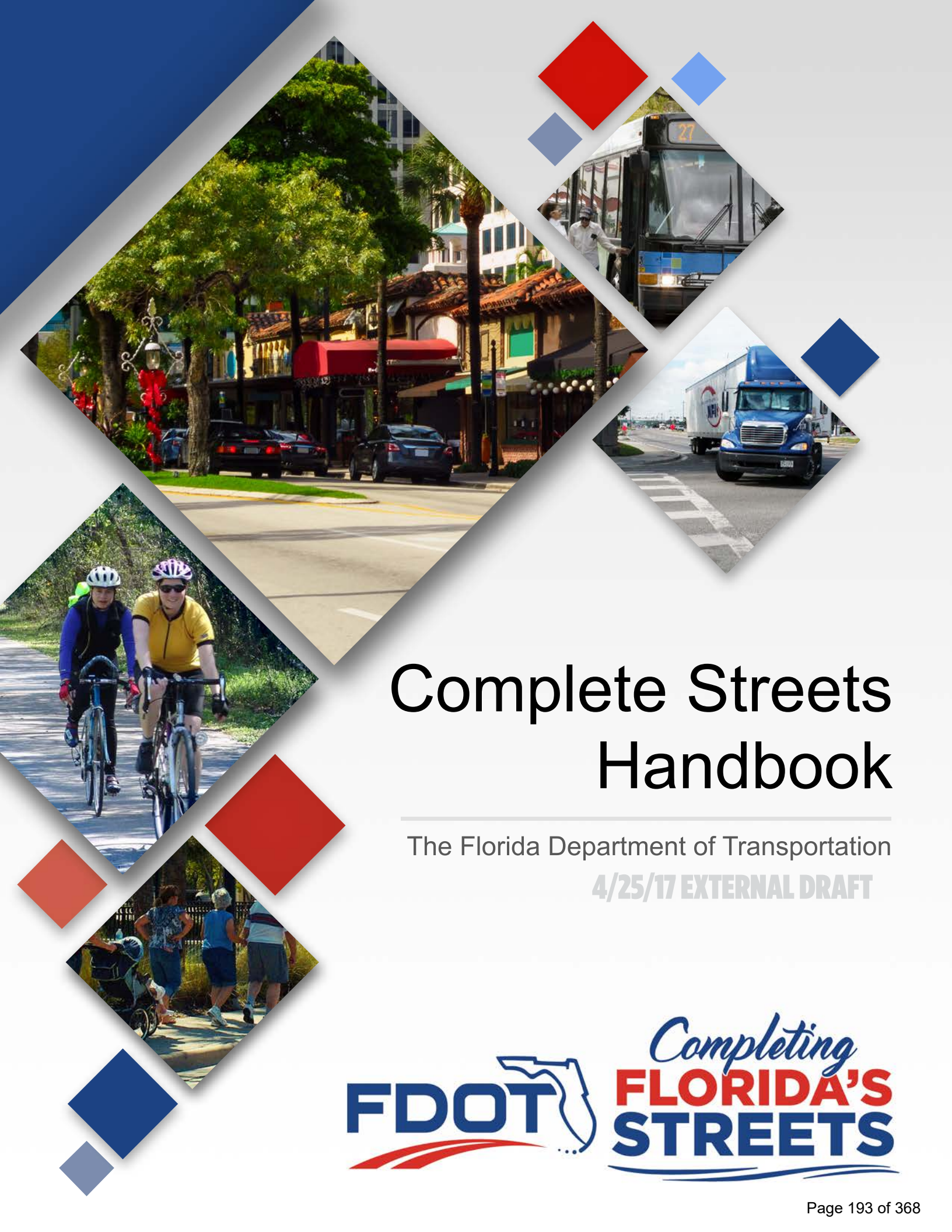


The context classification of a roadway, together with its transportation characteristics, will provide information about who the users are along the roadway, the regional and local travel demand of the roadway, and the challenges and opportunities of each roadway user.

WHAT IS THE FDOT PROCESS FOR IMPLEMENTING CONTEXT CLASSIFICATION?

Complete Streets are not a specific type of project, but rather are an approach to ensuring that projects are based on their contexts. This means that a Complete Streets approach will be implemented consistently for all non-limited access projects — from capital projects qualifying for Efficient Transportation Decision Making process (ETDM) screening to Resurfacing, Restoration and Rehabilitation (RRR), traffic operations, and safety projects.

FDOT will develop a database of context classification for all state roadways. Initially, districts will evaluate and map context classification as projects occur, while working to complete a statewide database of context classification. The context classification evaluations completed for the statewide database will utilize available data and information on existing built conditions. As FDOT projects are conducted, these initial evaluations will be updated or confirmed based on current data, as well as future conditions.

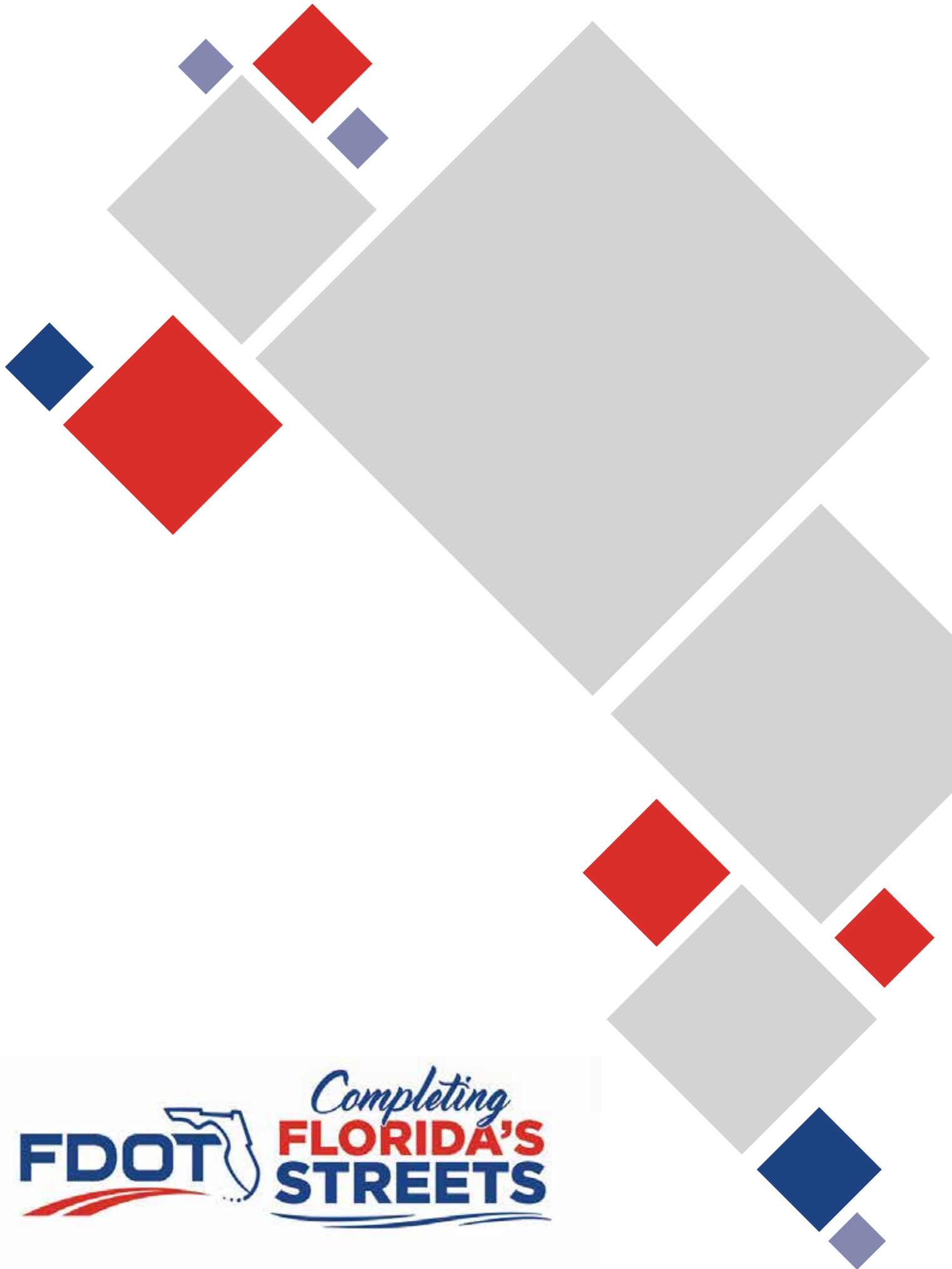


Complete Streets Handbook

The Florida Department of Transportation

4/25/17 EXTERNAL DRAFT





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GLOSSARY

LIST OF ABBREVIATIONS

AADT	Annual Average Daily Traffic	PD&E	Project Development and Environment
AASHTO	American Association of State Highway Transportation Officials	PED	Preliminary Environmental Determination
AASHTO Green Book	AASHTO A Policy on Geometric Design of Highways and Streets	PPM	Plans Preparation Manual
ACE	Alternative Corridor Evaluation	RCI	FDOT Enterprise Application Roadway Characteristics Inventory
BEBR	University of Florida Bureau of Economic and Business Research	RPC	Regional Planning Council
CNU	Congress for the New Urbanism	RRR	Resurfacing, Restoration, and Rehabilitation
D	Directional distribution factor	SD	Special District
ETAT	Environmental Technical Advisory Team	SIS	Strategic Intermodal System
ETDM	Efficient Transportation Decision Making	T	The percentage of the AADT volume generated by trucks or commercial vehicles
FAC	Florida Administrative Code	TAZ	Traffic Analysis Zone
FDM	FDOT Design Manual	TDP	Transit Development Plan
FDOT	Florida Department of Transportation	TPO	Transportation Planning Organization
FHWA	Federal Highway Administration	TSMO	Transportation Systems Management and Operations
FTP	Florida Transportation Plan	VMT	Vehicle Miles Traveled
GIS	Geographic Information System		
ITE	Institute of Transportation Engineers		
LAP	Local Agency Program		
LEHD	U.S. Census Bureaus' Longitudinal Employer-Household Dynamics website		
LOS	Level of Service		
LRTP	Long-Range Transportation Plan		
MPO	Metropolitan Planning Organization		
NACTO	National Association of City Transportation Officials		
NCHRP	National Cooperative Highway Research Program		
NEPA	National Environmental Policy Act of 1969		

DEFINITION OF TERMS

Context Classification System Comprised of eight context classifications, it broadly identifies the various built environments in Florida, based on existing or future land use characteristics, development patterns, and roadway connectivity of an area. In FDOT projects, the roadway will be assigned a context classification(s). The context classification system is used to determine criteria in the *FDM*.

The eight context classifications and their general descriptions:

C1-Natural	Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.
C2-Rural	Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.
C2T-Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.
C3R-Suburban Residential	Mostly residential uses within large blocks and a disconnected/ sparse roadway network.
C3C-Suburban Commercial	Mostly non-residential uses with large building footprints and large parking lots. Buildings are within large blocks and a disconnected/ sparse roadway network.
C4-Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor and/or behind the uses fronting the roadway.
C5-Urban Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of the civic or economic center of a community, town, or city.
C6-Urban Core	Areas with the highest densities and building heights and within FDOT classified Large Urbanized Areas (population > 1,000,000). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadways, and are within a well-connected roadway network.

Control Vehicle The infrequent vehicle that must be accommodated by allowing encroachment (see Chapter 4).

Design User The anticipated users of a roadway (including drivers, pedestrians, bicyclists, and freight handlers) that form the basis for each roadway's design (see Chapter 4).

Design Vehicle The vehicle that must be accommodated without encroachment into opposing traffic lanes (see Chapter 4).

Form-Based Code Land development regulations that use physical form, rather than separation of uses, as the organizing principle for the code. For more information, visit <http://formbasedcodes.org>.

Induced Demand	Describes the additional demand for travel when the cost of travel decreases, either in time savings or monetary costs.
K-Factor	The ratio of a design-hour traffic volume to AADT
Large Urbanized Areas	Quality/Level of Service Handbook - areas with population over 1,000,000.
Non-qualifying Project	Projects that do not go through ETDM screening.
Qualifying Project	Roadway project types that qualify for ETDM screening, per the PD&E Manual Section 2.3.1, including additional through lanes that add capacity to an existing road, new or reconstructed arterial highway (e.g., realignment), and bridge replacements.
Rural	FHWA Definition — Encompasses all population, housing, and territory not included within an urban area. Quality/Level of Service Handbook Definition — areas that are not urbanized, urban, or transitioning.
Small Urban Areas	FHWA definition — Designated as population between 5,000 and 49,999, and not within any urbanized area with boundaries to be fixed by responsible State and local officials in cooperation with each other, subject to approval by the Secretary. (Identified as Urban Areas in the Quality/Level of Service Handbook).
Transect	The rural-to-urban transect is a tool utilized by the Congress for New Urbanism and others to describe the characteristics of human settlements. The rural-to-urban Transect is divided into six zones (see Chapter 2).
Transitioning Areas	Quality/Level of Service Handbook Definition - areas generally considered as transitioning into urbanized/urban areas or areas over 5,000 population and not currently in urbanized areas. These areas can also at times be determined as areas within a Metropolitan Planning Area, but not within an urbanized area. These areas are anticipated to reach urban densities in a 20-year horizon.
Urbanized Areas	FHWA and Quality/Level of Service Handbook Definition — Designated as population of 50,000 or more by the U.S. Census Bureau, within boundaries to be fixed by responsible State and local officials in cooperation with each other, subject to approval by the Secretary. Such boundaries shall encompass, at a minimum, the entire urbanized area within a State as designated by the U.S. Census Bureau.

FDOT COMPLETE STREETS POLICY

ADOPTED SEPTEMBER 17, 2014



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

POLICY

Effective: September 17, 2014
Office: Design Director
Topic No.: 000-625-017-a

COMPLETE STREETS

It is the goal of the Department of Transportation to implement a policy that promotes safety, quality of life, and economic development in Florida. To implement this policy, the Department will routinely plan, design, construct, reconstruct and operate a context-sensitive system of "Complete Streets." While maintaining safety and mobility, Complete Streets shall serve the transportation needs of transportation system users of all ages and abilities, including but not limited to:

- Cyclists
- Freight handlers
- Motorists
- Pedestrians
- Transit riders

The Department specifically recognizes Complete Streets are context-sensitive and require transportation system design that considers local land development patterns and built form. The Department will coordinate with local governments, Metropolitan Planning Organizations, transportation agencies and the public, as needed to provide Complete Streets on the State Highway System, including the Strategic Intermodal System.

This **Complete Streets Policy** will be integrated into the Department's internal manuals, guidelines and related documents governing the planning, design, construction and operation of transportation facilities.

Ananth Prasad, P.E.
Secretary

Executive Summary

CONTEXT-BASED PLANNING AND DESIGN

In 1997, the Federal Highway Administration (FHWA) released guidance encouraging context-based transportation planning and design. Since then, many regional and local transportation planning agencies in Florida and throughout the U.S. have adopted context-based planning and design policies and practices. Context-based planning and design offers a flexible approach using existing tools in creative ways to address multimodal needs in different contexts. A specific context-based approach, called Complete Streets, also considers community needs, trade-offs between those needs, and alternatives to achieve multiple objectives.

In September 2014, the **Florida Department of Transportation (FDOT)** adopted the **Statewide Complete Streets Policy (Topic No. 000-625-017-a)**, (see facing page) joining 22 other state departments of transportation that have made a commitment to planning, designing, and operating their transportation systems for all users. Implementation of the Complete Streets Policy is an FDOT department-wide priority to provide FLEXIBILITY in the planning and design of projects on state roads, to put the right street in the right place.

WHAT IS FDOT'S APPROACH TO COMPLETE STREETS?

The FDOT Complete Streets policy captures three core concepts in its approach to Complete Streets:

- Complete Streets serve the transportation needs of transportation system users of all ages and abilities, including pedestrians, bicyclists, transit riders, motorists, and freight handlers.

- Complete Streets are context sensitive, and the approach provides transportation system design that considers local land development patterns.
- A transportation system based on Complete Streets principles can help to promote safety, quality of life, and economic development.

The FDOT Complete Streets approach builds on flexibility and innovation to ensure that all state roadways are developed based on their context classification, as determined by FDOT to the maximum extent feasible.

With a Complete Streets approach, every non-limited-access state roadway project, including those on the Strategic Intermodal System (SIS), is uniquely planned and designed to serve the context of that roadway and the safety, comfort, and mobility of all users. In a high-speed rural context, where higher truck traffic is anticipated and walking and bicycling are infrequent, wider travel lanes with paved shoulders or a shared use path may be appropriate. In urban contexts, where high volumes of pedestrians, bicyclists, and transit users are expected or desired, a roadway could include features such as wide sidewalks, bicycle facilities, transit stops, and frequent, safe pedestrian crossing opportunities. Limited-access highways and interstates may incorporate elements of context-based design where they connect to the non-limited-access system, but this handbook is not intended for use on the limited-access system itself.

Most roadway projects are funded by strategically matching federal, state, and local funding sources to specific elements of the project. FDOT's Complete Streets approach to the planning and design of state roadway projects uses existing funding sources, and these funding practices will not change.

FIGURE ES-1 FDOT'S APPROACH TO COMPLETE STREETS



¹ National Association of City Transportation Officials, Urban Street Design Guide (2013).
² Smart Growth America. Complete Streets Promote Good Health (2012).
³ Smart Growth America, Complete Streets Stimulate the Local Economy (2012).
⁴ AASHTO Guide to the Design of Pedestrian Facilities (2004).

Complete Streets

Promote Connectivity

by offering customers access to an **interconnected network** of pedestrian, bicycle, transit, and roadway facilities

Complete Streets spur

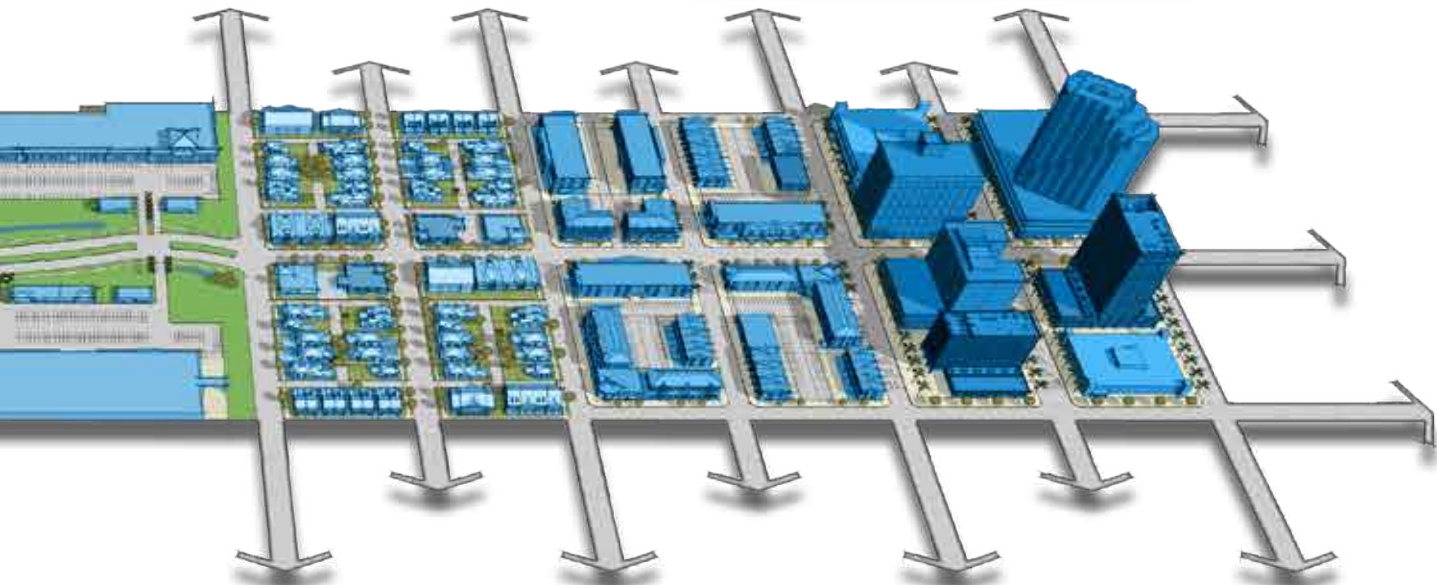
Private Investment & Enhance Economic Prosperity³

Complete Streets provide opportunities for

Increased Physical Activity & Improved Community Health

by incorporating features that promote regular walking, bicycling, and transit use²

Context appropriate vehicle speeds

Reduce the chance of Pedestrian Fatalities⁴**C3C-Suburban Commercial**

Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.

C4-Urban General

Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.

C5-Urban Center

Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.

C6-Urban Core

Areas with the highest densities and building heights, and within FDOT classified Large Urbanized Areas (population >1,000,000). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.

COMPLETE STREETS PRINCIPLES AND THE FLORIDA TRANSPORTATION PLAN

The *Florida Transportation Plan (FTP)* is the statewide long-range transportation plan guiding Florida's transportation future. FDOT's Complete Streets approach exemplifies the goals of the *FTP* regarding innovation and flexibility in design and collaboration and coordination with partners to create better transportation solutions. The Complete Streets approach uses existing tools in creative ways to address multimodal needs in different contexts, calling for a holistic consideration of community needs, trade-offs between needs, and alternatives to achieve multiple objectives. FDOT's Complete Streets

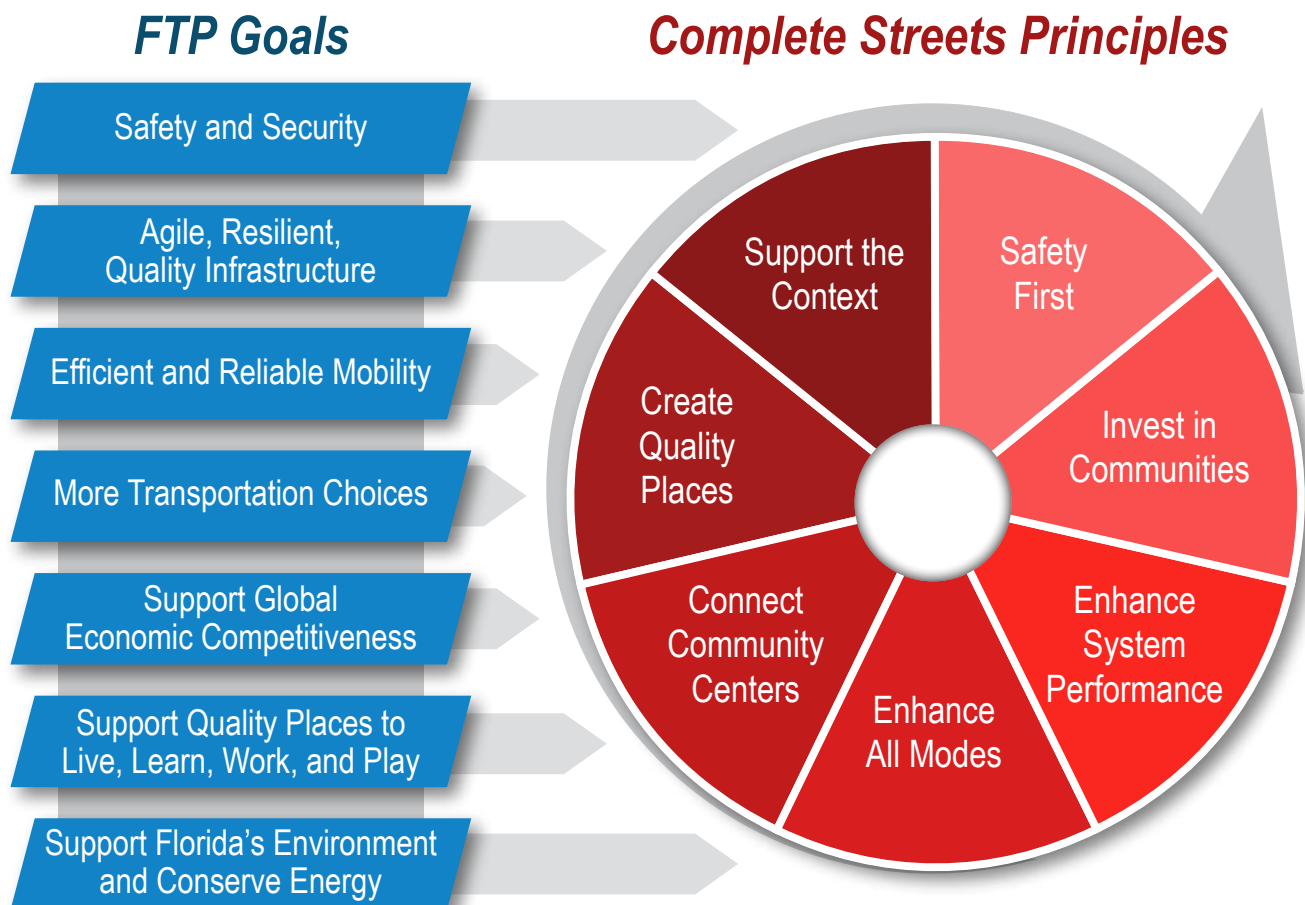
principles align with the FTP's goals as shown in Figure ES-2, and serve to guide the implementation of FDOT's Complete Streets Policy.

COMPLETE STREETS PRINCIPLES

Safety First

Safety for all users is FDOT's top priority and a goal of the *FTP*. Roadways with context-appropriate speeds can result in reduced fatalities and serious injuries in locations with higher levels of pedestrian and bicycle activity. The Complete Streets approach considers the mobility, convenience, accessibility, and safety of all road users, and places an emphasis on the most vulnerable users of a given roadway.

FIGURE ES-2 LINKING THE FLORIDA TRANSPORTATION PLAN AND COMPLETE STREETS PRINCIPLES



Invest in Existing and Emerging Communities

The **FTP** goal of agile, resilient, and quality infrastructure focuses on investing resources wisely. The Complete Streets approach helps to match roadways with the needs of urban areas as well as emerging growth centers, investing in the right road for the right location. The approach calls for design flexibility to develop roadway projects that consider local character and vision, the role and characteristics of the roadway within the transportation system, and the roadway's physical characteristics.

Enhance System Performance

Efficient and reliable mobility is a goal of the **FTP**. The Complete Streets approach matches, based on context, the roles of each roadway with customized solutions that consider local access and regional and interregional mobility for people and freight. A Complete Streets approach relies on a complete network of transportation facilities made up of unique streets, each supporting the role and function it has within the system. A complete network enhances efficiency and reliability for all modes by providing direct and multiple route choices, improving access to all modes, and reducing trip lengths.

Enhance All Modes

Increasing transportation choice is a goal of the **FTP**, reflecting the desire of residents, visitors, and businesses to have mobility options based on travel preferences, need, convenience, cost, or time. A Complete Streets approach provides opportunities to expand mobility options by considering all users and all modes during roadway planning and design. This is important for short-distance and local trips, where walking, bicycling, and transit are most desired.

Connect Community Centers

Transportation solutions that support Florida's economic competitiveness are a goal of the **FTP**. A Complete Streets approach connects communities and supports Florida's existing economic centers, employment centers, and visitor destinations by striving to provide the highest level of multimodal infrastructure in these core areas.

Create Quality Places

Creating quality places to live, learn, work and play is a goal of the **FTP**. A Complete Streets approach helps to align transportation decisions with land use, resulting in quality places offering transportation choices where transportation investments support a community's economic competitiveness and quality of life.

Support the Context

Transportation solutions that support the environment and conserve energy is a goal of the **FTP**. A Complete Streets approach uses design flexibility to develop roadways that consider the local character and vision, which often reflect a desire for a future in which a community manages land more efficiently, preserves environmental resources and natural countryside, and create distinctive places in which to live in both rural and urban settings.

WHAT IS IN THIS HANDBOOK?

This handbook provides:

- An explanation of FDOT's Complete Streets approach and principles for state roads
- Guidelines for FDOT's collaboration with local and regional partners
- Definitions of context classifications used for state roads
- Guidelines for applying a Complete Streets approach to state projects
- Guidelines for roadway design considerations

FDOT will coordinate with partner agencies when implementing this Complete Streets approach.

Chapter 1 describes FDOT's role in determining context classification, identifying associated transportation elements to incorporate in a project based on the context classification, and coordinating with local and regional partners to implement and fund projects. Chapter 1 also highlights the role partners play and how FDOT depends on their involvement and contributions. Local governments are responsible

for community visions, land use decisions, and local and regional transportation network connectivity, all of which influence the choice of multimodal solutions. Local governments, regional planning councils, and Metropolitan or Transportation Planning Organizations (MPOs/TPOs) are responsible for regional and community visions, including transportation goals. Other partners, such as transit agencies and private developers, provide targeted expertise and information about their services and plans.

Chapter 2 describes the context classifications FDOT will use for project planning and design of state projects, including projects on the SIS. Figure ES-1 presents the eight context classifications and provides short descriptions. Chapter 2 also describes the primary and secondary measures used to determine context classification.

Chapter 3 details how the Complete Streets approach is incorporated in existing FDOT processes and when the context classification is determined. FDOT will have the final determination of the context classification for state roadways. FDOT context classifications are assigned at the earliest stage possible, typically during project scoping. Information to determine context classification will be obtained using multiple sources and tools, such as through partner coordination for the desired future context, and field reviews and aerial photography for existing development patterns. Chapter 3 also explains how the Complete Streets approach integrates with existing processes, such as long-range transportation plan projects that use Efficient Transportation Decision Making (ETDM) screening and RRR – Resurfacing, Restoration, and Rehabilitation projects.

Chapter 4 explains design considerations in applying FDOT's Complete Streets approach. The FDOT context classification and transportation characteristics, such as the road's functional class, will be used together when applying Complete Streets planning or design considerations. After looking at the community's current environment and future vision to determine the context classification, FDOT staff will assign a context classification and choose transportation elements that fit within the parameters of that classification. The details are presented in the **FDOT Design Manual (FDM)** updates.

NEXT STEPS

Adopting the Complete Streets policy was only the beginning. FDOT has already taken bold steps towards making the Complete Streets implementation a priority. The **FDOT Complete Streets Implementation Plan** (December 2015) provides the framework for necessary changes to fully align with the Complete Streets philosophy. In particular, the Implementation Plan calls for:

- Integrating a context-based approach into project planning and design
- Revising standards, manuals, and policies
- Updating decision-making processes
- Modifying approaches for measuring performance

FDOT has begun revising its standards, policies, and guidance documents to align with this Complete Streets approach. These include:

- FDOT Design Manual (FDM), replacing the current Plans Preparation Manual (PPM)
- Efficient Transportation Decision Making Manual
- Project Development and Environment Manual
- Project Traffic Forecasting Handbook
- Level of Service Standards, Policies, and Procedures
- Strategic Intermodal System Highway Component Standards and Criteria
- Traffic Engineering Manual
- Quality/LOS Handbook

The **FDM** will be effective January 1, 2018. See Chapter 3 for details.

Partnership and Agency Collaboration

FDOT is committed to supporting the needs of all users as part of incorporating a Complete Streets approach in every phase of project development — planning, design, construction, operations, and maintenance. A system of Complete Streets cannot be built entirely within the state roadway system and solely within FDOT's right of way. Local and regional decisions have a strong influence on the state's decisions, and FDOT will seek to strengthen collaboration and partnerships with local governments, regional agencies, MPOs/TPOs, transportation agencies, and the public to further Complete Streets principles.

The **Florida Transportation Plan (FTP)** recognizes the importance of collaborating across sectors, jurisdictions, modes, and disciplines to create the desired transportation system for Florida. Regions and communities have different needs and expectations, and the flexibility of FDOT's Complete Streets approach is key to supporting each area's unique character and vision. For state roads, achieving the state's goals and the community's goals requires a balancing of priorities, constraints, and opportunities. Working together allows multiple agencies to achieve individual objectives while effectively and efficiently achieving shared and related goals to deliver a safe and quality transportation system to the public.

THE ROLE OF COMMUNITY VISIONS

To support quality places, the FTP calls for transportation systems to reflect regional and community visions. These visions are important to FDOT and other partners in setting the framework for transportation decision making. FDOT relies upon partners to develop and actively communicate their visions and goals to provide clear direction, not only to FDOT but to public and private partners engaged

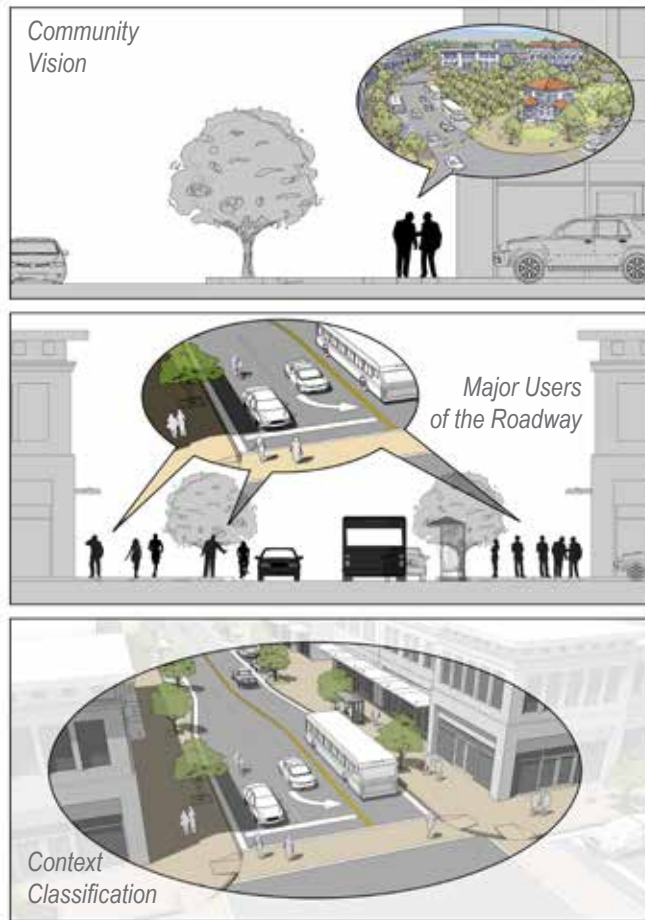
in community development. Visions also provide the basis for the land development regulations and policies used to implement community goals. Local and regional visions can take many forms, such as standalone vision documents, comprehensive plans, neighborhood or sub area plans, including community redevelopment areas, or land development regulations.

FDOT's approach to Complete Streets is context-sensitive, and FDOT will support local partners by building projects that help support local and regional visions to the maximum extent feasible. Where context-based design has not previously been envisioned, FDOT will collaborate with partners and rely upon existing development patterns and plans to determine the context classification. If the future vision of an area for a proposed transportation project is intended to be different from the existing, clear and documented direction from the local or regional government on that vision is imperative. (See Figure 1-1.)

HOW LAND USE SUPPORTS COMPLETE STREETS

The transportation system and development pattern (such as land use, development density and intensity, building design, and site layout) are inextricably linked, and both have an effect on travel choices and mobility. A robust, connected network provides options for the movement of people and goods and also is the foundation for safe and comfortable multimodal travel for pedestrians, bicyclists, and transit riders. Thoughtful application of context-based planning and design considers all modes of transportation and customizes projects appropriately. For example, in a more urban environment, emphasizing multimodal elements in the roadway may be important to match the diverse level of activity. In suburban and rural areas, vehicular travel remains important, and

FIGURE 1-1 HOW COMMUNITY VISIONS CAN INFORM CONTEXT CLASSIFICATION, USERS, AND ROADWAY DESIGN



Community visions can help inform who the major users are and what the context classification of the roadway is.

Source: Adapted from FDOT District 5 Multimodal Corridors Planning Guidebook

balancing needs is more nuanced.

For the transportation components, local and regional governments (counties, municipalities, military, etc.) take the lead in implementing projects on their facilities. FDOT is responsible for projects on the State Highway System and is available to offer technical assistance and expertise to its partners. Land use decisions are made by local governments, and FDOT will collaborate with these partners when applying the Complete Streets approach for projects. For projects serving multiple jurisdictions, this can include coordinating with multiple jurisdictions to determine the context classifications. Appendix A

presents additional information on land use tools to support safe and comfortable multimodal travel.

PROJECT DEVELOPMENT PROCESS

Throughout the project development process, local and regional partners will influence FDOT's Complete Streets approach to planning, design, and implementation of projects on state roads. Many of FDOT's processes will function as they currently do, with an additional emphasis on coordination and engagement with partners to achieve mutual benefits. Most importantly, FDOT planners and designers are able to support the local community context through flexibility in the placement and types of components (such as bike lanes or on-street parking) considered for a project.

The transportation planning process begins with long-range plans such as those created by FDOT for the Strategic Intermodal System (SIS) and by MPOs/TPOs for their planning areas. Local Government Comprehensive Plans, developed pursuant to **Chapter 163, Florida Statutes**, also provide system-level information about the desired long-term transportation network and community development. These plans identify at a high level the needs for certain types of projects or projects in specific locations while at the same time articulating policies that promote the system-wide use of context-based design.

A next step of the project's development is to perform a Project Development and Environment (PD&E) study, if applicable, to evaluate design concepts and alternatives that address the purpose and need for the project. Balancing mobility needs and community needs is an integral part of alternatives consideration, and coordination with environmental resource agencies, local governments, and the public is critical in the process. After selecting a preferred alternative, the project moves to the design phase, where additional coordination with local governments, partners and public continues, as appropriate.

FDOT will apply the Complete Streets approach to maintenance and operational projects; however, opportunities for significant enhancements to these types of projects are constrained because of

the purpose of these projects. Coordination and collaboration becomes more integrated and complex when applying the Complete Streets approach to projects later in the development process, because of more defined project schedules. The best opportunities in these cases are for resurfacing, restoration, and rehabilitation (RRR) projects. FDOT will coordinate early with local partners to identify feasible enhancements within the constraints of the project. More information regarding this process can be found Chapter 3 of this Handbook.

A key factor in the Complete Streets approach is blending and merging of projects and concepts to create the desired long-term solution. FDOT will fund the construction and maintenance of aspects of transportation projects that are necessary to comply with adopted FDOT design criteria contained in the FDM. If local governments or other partners would like to include features that go beyond what is required by FDOT design criteria, funding for the construction and maintenance of those additional components will be the responsibility of the local government or local partner, as defined in a local maintenance agreement. Current elements being maintained by local governments or other partners as part of local maintenance agreements (e.g. traffic signals on state roadways) will continue to be maintained per the agreements in place.

FDOT'S ROLE

The FDOT context classification for state projects will be determined as early as possible in the planning, design, and maintenance cycle. The process for project development is detailed in Chapter 3 of this Handbook, but summarized here as it relates to local government interaction. For state projects, the project manager (or designee, such as a scoping team member, growth management liaison, or MPO/TPO liaison) is responsible for coordinating with affected local and regional governments and agencies during the determination of the context classification. This information may eventually be stored in an integrated roadway asset identification system, such as the FDOT Enterprise Application Roadway Characteristics Inventory (RCI), the straightline diagram, and the typical section data sheet. Measures used to determine the context classification are based on

existing development patterns and may include future visions of the community. Collaboration with the local and regional agencies and governments associated with a project is the key for successful projects. In an ideal situation, a future vision for an area or corridor will be documented and approved by the community's governing body, such as in its comprehensive plan and land development codes. Community redevelopment area master plans or sector plans are other possible examples. FDOT will have the final determination of the context classifications to be used for state transportation projects (i.e., for roads on the State Highway System, including the SIS). Interstates and freeways are high-volume transportation facilities that are independent of the surrounding land uses, and are considered "complete," but context classification will be needed at locations where these facilities connect to the non-limited-access system.

To address projects identified as part of the MPO/TPO long-range planning process, districts may identify the context classification of state projects during the Efficient Transportation Decision Making (ETDM) screening and collaborate with affected local governments as part of Long-Range Transportation Plan (LRTP) preparation, or may follow other processes as described in Chapter 3. Each FDOT district has flexibility in its process for documenting context classifications that could vary within the district due to local and regional agency preferences. For example, instead of working on a project-by-project basis, a district could decide to proactively determine the context classification for all state facilities, or all state facilities in a specific area (e.g., an urbanized area). Or, a district could coordinate with a MPO/TPO to recommend context classifications for LRTP state projects.

After determining a project's context classification, or potentially multiple context classifications for a longer corridor, FDOT will choose transportation criteria that fit within the parameters of the classification(s). The FDOT context classification and transportation characteristics, such as the road's functional class and network connectivity, will be used together for planning and design. This task is easiest for new roads with right of way to incorporate all appropriate transportation elements. For existing roads, with limited rights of way, the ability to include transportation elements may require a balancing of

needs and constraints. Based on its processes and procedures, FDOT will coordinate with partners to evaluate options. Each FDOT district will decide how best to incorporate a Complete Streets planning and design approach in its processes. For example, some districts have scoping teams and tools to identify and tag projects for increased community collaboration and flexibility early.

The SIS is composed of facilities of statewide and regional significance with the objective of supporting interregional connectivity, intermodal connectivity, and economic development. To local communities, a SIS facility can serve as a corridor connecting communities or may be a main street for a town. Multiple partners working collaboratively to find solutions is key to the Complete Streets approach, whether for a SIS facility or state or local road. For example, some districts have worked with communities to shift SIS corridors to avoid main street areas and have designated alternate SIS routes or connectors to support interregional travel and local needs simultaneously.

FDOT will continue to use the same funding categories (federal, state, and local funds) with the Complete Streets planning and design approach. Context classification allows FDOT greater flexibility in designs and helps to match roads to their locations. FDOT will plan more carefully for what treatments are wanted, and where, and can help identify appropriate funding. Although no new funding is available for Complete Streets, existing sources will be tapped in more specific ways, by understanding place better than before. This also means FDOT will continue to rely on local partners to provide features that go beyond FDOT design criteria (e.g., decorative lighting or patterned facilities).

FDOT can collaborate with a community to identify a road's context classification at any time and communities are encouraged to reach out to their district to coordinate with FDOT before projects are identified. This is particularly the case if a community is interested in changing the character of a street over time or is considering requesting a lane elimination or "road diet" on a state road, where additional studies and steps are warranted. Each district will address community collaboration based on partner engagement preferences. For some of the more urban districts, a Complete Streets coordinator may

be designated. Other districts may rely on MPO/TPO liaisons or SIS or growth management coordinators.

THE ROLES OF PARTNERS

A Complete Streets approach to planning and design allows for flexibility in projects, which means that collaboration and partnering is required to meet and balance the transportation needs of the community, the region, and the State. It is important to ensure that state roadways maintain vital regional and statewide mobility goals, especially for SIS facilities. When planning and designing state projects, FDOT will rely on partners within the affected jurisdiction(s) who have local and regional expertise.

METROPOLITAN PLANNING ORGANIZATIONS

The transportation planning process requires MPOs/TPOs, with the involvement of state and local governments and stakeholders, to create an LRTP. The LRTP provides guidance on the MPO's/TPO's vision for the planning area's transportation system. For example, MPOs/TPOs have identified transit networks and systems of bicycle, sidewalk, and trail networks. Identifying projects, prioritizing them, allocating funding, and tracking performance measures also influence FDOT's Complete Streets approach for state projects. As part of the LRTP process, MPOs/TPOs are encouraged to work with FDOT districts to identify context classifications for projects, and identify and allocate funding to address FDOT and local Complete Streets needs.

A MPO/TPO is available to work with constituent communities to clarify and define regional and community visions that will be used during context classification determination. Also, communities may desire infrastructure for state roads that go beyond FDOT design criteria, and MPOs/TPOs are in a position to assist local governments in identifying those items and allocating and aligning other funding.

LOCAL GOVERNMENTS

Local governments are responsible for land use and transportation planning to create supportive infrastructure and development patterns that match community goals and visions. Clear policies delineated in a community's comprehensive plan to retain current development patterns, such as in historical or rural towns, or promote changes in development patterns, such as in urbanizing areas, provide direction to private and public partners in land development, infrastructure, and provision of services. FDOT will look to local governments when determining context classification as part of a state project. Comprehensive plans, subarea plans, and land development regulations, such as zoning or form-based codes, are some of the documents that will be reviewed to determine future visions and the land use-related items in determining context classification. The existing development pattern, determined through aerial/asset mapping or site visits, for example, will be used to evaluate current transportation network connectivity for the project and surrounding areas. It also will be used to evaluate current site plan oriented criteria, such as building and parking placement, and development intensity. The private sector is responsible for site development in accordance with local policies and codes and approval from the local government. For example, land use and development decisions to mix uses or locate buildings close to the road support easier pedestrian and bicyclist access. The specifics of how context classification is determined are covered in Chapters 2 and 3 of this Handbook.

After determining the context classification, FDOT identifies the elements that are appropriate for the context and assesses design and implementation options. If infrastructure for state roads that go beyond FDOT design criteria, such as decorative lighting or landscaping, patterned pavements, or street furniture and wayfinding is desired, local communities must coordinate with FDOT to align local resources and projects with the state project. Each district has flexibility in how the coordination of projects is handled. For example, districts have performed construction with the local government assuming maintenance responsibilities, particularly for the enhancements. Other districts have relied on the Local Agency Program (LAP) to allow the local government to implement the combined, broader project.

As part of the decision-making process to identify the elements to include in a state project, FDOT will evaluate the surrounding and connecting transportation network. Finding flexible and innovative solutions can mean looking at other roads/networks to support state and community goals. Local and regional roads are the responsibility of county and municipal governments, and others. Creating a roadway network with appropriate design elements also provides multiple travel options for all modes, assists with pedestrian and bicycling routing, shortens trip distances, and reduces the need to widen intersections and roadways. Regional and local road designs, such as inhibiting through access or limiting lanes, can increase the reliance on state roads for mobility for some road users.

TRANSIT AGENCIES

Transit agencies — at the city, county, and regional levels — play a significant role in providing transportation choices for all users. Transit agencies develop short-term Transit Development Plan (TDPs) and may develop longer-term plans that identify the investments needed in transit within their service areas. As part of project planning, FDOT districts will coordinate with local transit agencies to determine the proper role for transit along a roadway. This determination also requires coordination with local governments given their role in defining and regulating the desired land development. FDOT's **Assessing Transit Guidebook** includes planning and design recommendations for transit-supportive communities.

OTHER PARTNERS

Other agencies and entities may engage with FDOT as part of state project planning and design. Regional Planning Councils may prepare regional or community visions and transportation long-range plans, and support local government comprehensive planning and development regulations. Advocacy and community groups may raise items to be addressed by FDOT or local governments. Other public stakeholders also are involved through existing FDOT and other agencies processes and procedures.

Table 1-1 provides a representative overview of the roles of various partners in FDOT's Completes Streets approach.

TABLE 1-1 STAKEHOLDER ROLES IN FDOT'S COMPLETE STREETS APPROACH

	Project Planning	Context Classification	Identification of Project Elements	Selection of Project Elements	Project Funding
FDOT	- Plans state projects - Coordinates with partners	- Determines context classification - Coordinates with partners, as needed based on type of project	- Uses FDM and other guidance to define potential project elements based on context classification and transportation characteristics - Studies concepts, alternatives, and feasibility	- Considers benefits and costs of project elements - Determines feasible project elements - Coordinates with partners, as needed based on type of project	- Matches funding to project elements, within existing budget parameters - Coordinates with partners for project funding
MPOs/ TPOs	- Initiates project requests to FDOT via LRTP and other studies - Performs and participates in planning and studies	- Establishes transportation vision through long-range plans - Considers project context classifications during LRTP development	- Defines project in LRTP - Coordinates with partners, as needed	Collaborates with FDOT and partners on companion projects	- Establishes project funding during LRTP and Transportation Improvement Program (TIP/STIP) - Considers multimodal elements in project planning - Coordinates with FDOT and other partners
Local Governments	- Initiates project request to FDOT, as needed - Participates in planning processes and studies	- Establishes community vision through comprehensive and other plans - Sets local land use policies and land development regulations	- Identifies companion projects for additional elements, e.g., lighting, landscape, street furniture - Coordinates with partners, as needed	Supplements project elements provided by FDOT with companion projects, as needed	- Provides local funding for elements not funded by FDOT, as needed - Enters into maintenance agreements with FDOT for additional enhancements, as needed - Coordinates with FDOT and other partners
Other Partners (such as private businesses, developers, transportation operators, law enforcement, or advocacy groups)	Participates in planning processes and studies	- Participates in development of community and regional visions - Establish transit plans - Performs land development and economic development projects	Identifies companion projects for additional elements, e.g., transit stops	Supplements project elements provided by FDOT with companion projects, as needed	Coordinates with FDOT and other partners

Context-Based Complete Streets

FDOT will routinely plan, design, construct, and maintain state roadways in harmony with the surrounding land use characteristics and the intended uses of the roadway. To this end, a context classification system comprising eight context classifications has been adopted. The context classification of a roadway, together with its transportation characteristics, will provide information about who the users are along the roadway, the regional and local travel demand of the roadway, and the challenges and opportunities of each roadway user (see Figure 2-1). The context classification and transportation characteristics of a roadway will determine key design criteria for all non-limited-access state roadways.

This chapter describes the measures to be used to determine the context classification of a roadway. See Chapter 3 of this Handbook for a discussion of how context classification is incorporated into the existing FDOT project development process.

FIGURE 2-1 CONTEXT CLASSIFICATION AND TRANSPORTATION CHARACTERISTICS



CONTEXT CLASSIFICATION

The context classification system broadly identifies the various built environments existing in Florida, as illustrated in Figure 2-2. State roadways will extend through a variety of context classifications. Figure 2-2 should not be taken literally to imply all roadways will have every context classification or that context classifications occur in the sequence shown. FDOT's context classification system describes the general characteristics of the land use, development patterns, and roadway connectivity along a roadway, providing cues as to the types of uses and user groups that will likely utilize the roadway. The context classification

of a roadway will inform FDOT's planning, PD&E, design, construction, and maintenance approaches to ensure that state roadways are supportive of safe and comfortable travel for their anticipated users. Identifying the context classification is a preliminary step in planning and design, as different context classifications will have different design criteria and standards.

The use of context classifications to determine criteria for roadway design elements is consistent with national best practices and direction, including the National Cooperative Highway Research Program

FIGURE 2-2 FDOT CONTEXT CLASSIFICATIONS



C1-Natural

Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.

C2-Rural

Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.

C2T-Rural Town

Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.

C3R-Suburban Residential

Mostly residential uses within large blocks and a disconnected or sparse roadway network.

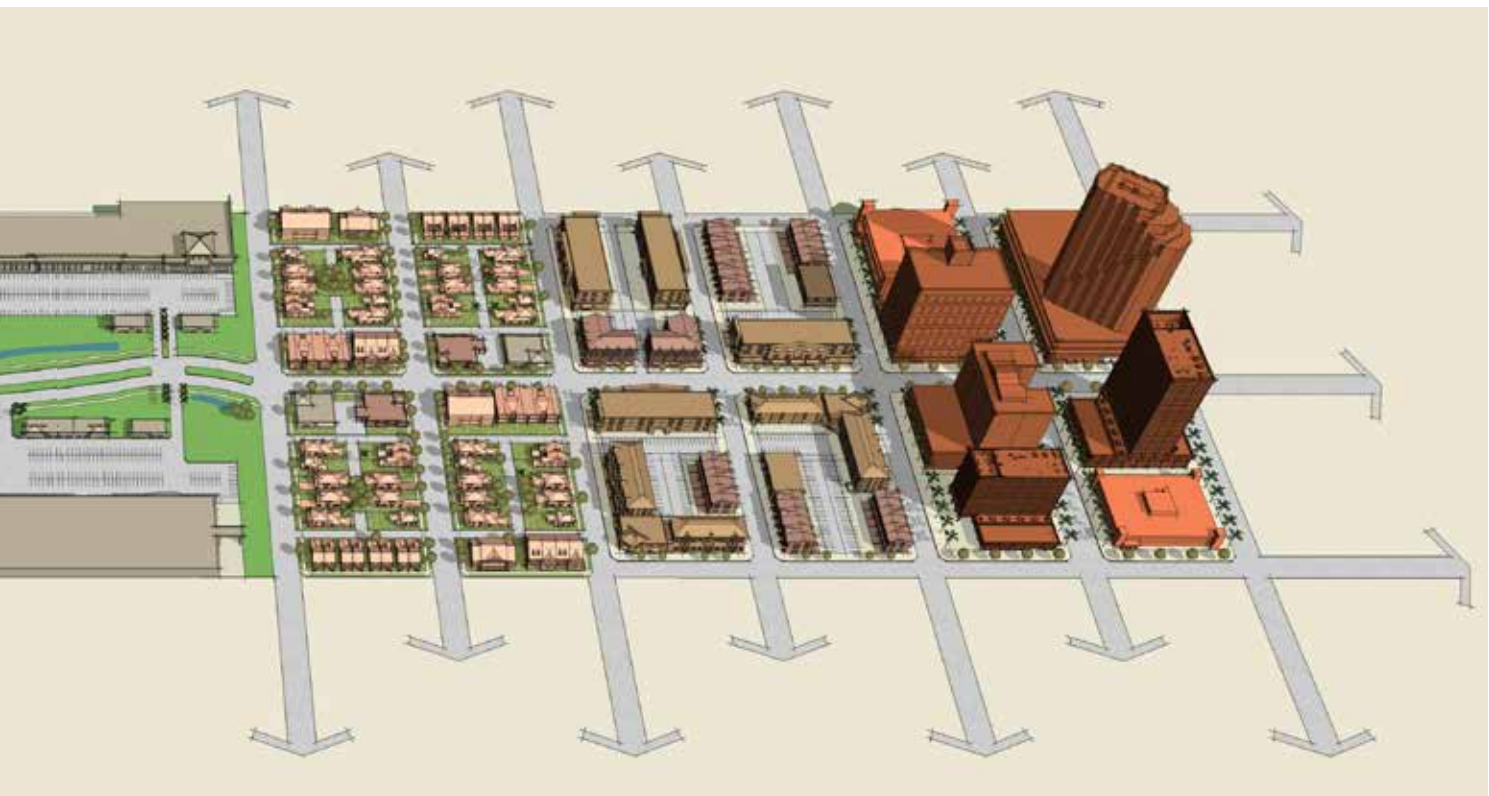
(NCHRP) that informs Federal Highway Administration (FHWA) and American Association of State Highway Transportation Officials (AASHTO) guidance.

Ongoing research under ***NCHRP 15-52: Developing a Context-Sensitive Functional Classification System for more Flexibility in Highway Design***

is proposing a similar context-based approach to design that incorporates context, user needs, and transportation functions into the design process. This research was born out of a need to better define contexts beyond urban and rural classifications, and to incorporate multimodal needs into the existing functional classification system.

This chapter outlines the steps to determine a roadway's context classification. Measures used to determine the context classification are presented, and a process to define the context classification is outlined for:

- All projects on existing roadways and for projects that propose new roadways and are in the PD&E or design phases
- Projects evaluating new roadways in the planning and ETDM screening phases



C3C-Suburban Commercial

Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.

C4-Urban General

Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.

C5-Urban Center

Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.

C6-Urban Core

Areas with the highest densities and building heights, and within FDOT classified Large Urbanized Areas (population >1,000,000). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.

CONTEXT CLASSIFICATION MATRIX

Table 2-1 Context Classification Matrix presents a framework to determine the context classifications along state roadways. This Context Classification Matrix outlines (1) distinguishing characteristics, (2) primary measures, and (3) secondary measures.

The distinguishing characteristics give a broad description of the land use types and street patterns found within each context classification. The primary and secondary measures provide more detailed assessments of the existing or future conditions along the roadway. These measures can be evaluated through a combination of a field visit, internet-based

TABLE 2-1 CONTEXT CLASSIFICATION MATRIX

Context Classification	Distinguishing Characteristics	Primary Measures		
		Land Use	Building Height	Building Placement
		Description	Floor Levels	Description
C1-Natural	Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.	Conservation Land, Open Space, or Park	N/A	N/A
C2-Rural	Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.	Agricultural or Single-Family Residential	1 to 2	Detached buildings with no consistent pattern of setbacks
C2T-Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.	Retail, Office, Single-Family or Multi-Family Residential, Institutional, or Industrial	1 to 2	Both detached and attached buildings with no, shallow (<10'), or medium (10' to 24') front setbacks
C3R-Suburban Residential	Mostly residential uses within large blocks and a disconnected or sparse roadway network.	Single-Family or Multi-Family Residential	1 to 2, with some 3	Detached buildings with medium to large (>10') front setbacks
C3C-Suburban Commercial	Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.	Retail, Office, Multi-Family Residential, Institutional, or Industrial	1 (retail uses) and 1 to 4 (office uses)	Detached buildings with medium to large (>10') setbacks on all sides
C4-Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.	Single-Family or Multi-Family Residential, Institutional, Neighborhood Scale Retail, or Office	1 to 3, with some taller buildings	Both detached and attached buildings with no, shallow (<10'), or medium (10' to 24') front setbacks
C5-Urban Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.	Retail, Office, Single-Family or Multi-Family Residential, Institutional, or Light Industrial	1 to 5, with some taller buildings	Both detached and attached buildings with no, shallow (<10'), or medium (10' to 24') front setbacks
C6-Urban Core	Areas with the highest densities and building heights, and within FDOT classified Large Urbanized Areas (population >1,000,000). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.	Retail, Office, Institutional, or Multi-Family Residential	>4, with some shorter buildings	Mostly attached buildings with no or shallow (<10') front setbacks

The thresholds presented in Table 2-1 are based on the following sources, with modifications made based on Florida case studies:

1) *2008 Smart Transportation Guidebook: Planning and Designing Highways and Streets that Support Sustainable and Livable Communities*, New Jersey Department of Transportation and Pennsylvania Department of Transportation;

aerial and street view imagery, map analysis, review of future land use or existing zoning information, and discussions with local governments. The Context Classification Matrix presents the primary and secondary measures thresholds for the eight context classifications.

Appendix B illustrates the eight FDOT context classifications through case studies. These case studies present examples of real-world values for the primary and secondary measures that determine a roadway's context classification.

					Secondary Measures			
Fronting Uses	Location of Off-street Parking	Roadway Connectivity			Allowed Residential Density	Allowed Office/ Retail Density	Population Density	Employment Density
		Intersection Density	Block Perimeters	Block Length				
Yes/No	Description	Intersections/ Square Mile	Feet	Feet	Dwelling Units/ Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No	N/A	N/A	N/A	N/A	<1	N/A	<2	N/A
Yes	Mostly on side or rear; occasionally in front	>100	<3,000	<500	>4	>0.25	N/A	>2
No	Mostly in front; occasionally in rear or side	<100	N/A	N/A	1 to 8	N/A	N/A	N/A
No	Mostly in front; occasionally in rear, or side	<100	>3,000	>660	N/A	<0.75	N/A	N/A
Yes	Mostly on side or rear; occasionally in front	>100	<3,000	<500	>4	N/A	>5	>5
Yes	Mostly on side or rear; occasionally in front, or in shared off-site parking facilities	>100	<2,500	<500	>8	>0.75	>10	>20
Yes	Side or rear; often in shared off-site garage parking	>100	<2,500	<660	>16	>2	>20	>45

2) [2012 Florida TOD Guidebook](#), Florida Department of Transportation;

3) [2009 SmartCode Version 9.2.](#), Duany, Andres, Sandy Sorien, and William Wright; and

4) [2010 Designing Walkable Urban Thoroughfares: A Context Sensitive Approach](#), Institute of Transportation Engineers and Congress for the New Urbanism.

DETERMINING CONTEXT CLASSIFICATION

The distinguishing characteristics and primary and secondary measures provide analytical measurements to evaluate land use characteristics, development patterns, and roadway connectivity and to determine context classification. The data available to quantify existing and future contexts will vary depending on the specificity of the roadway alignments being considered. Many projects conducted by FDOT occur along existing corridors where a single alignment is being considered. The range of alternatives for new roadways also narrows to a single alignment alternative as projects proceed from planning, through PD&E and design. In planning and ETDM screening for existing roadways, and PD&E and design for new roadways, it is possible to analyze both the existing and future conditions to determine context classification of a roadway. For projects involving new roadways in planning and ETDM screening, multiple alternative alignments may be considered over larger areas. For these latter type of projects, a broader understanding of the context classification will be used to inform the planning process and development of alternatives.

To be able to utilize the context-based criteria in the **FDM**, all projects must be informed by their roadway context classification. The context classification will be developed or confirmed at the beginning of each project phase, including planning, PD&E, and design. Each district can assign staff who will oversee the determination of context classification. It is recommended that an interdisciplinary team within each district help determine the context classification. For projects where FDOT currently coordinates with local governments, FDOT will coordinate with those local governments to determine context classification (see Chapter 3 for more information). The final determination of context classification will be made by FDOT. For smaller projects, such as traffic operations push-button projects, the context classification may be determined without additional local coordination (see Chapter 3 for more information). Refer to the **Public Involvement Handbook**, **FDM**, **PD&E Manual**, and **Project Management Handbook** for guidance on local government coordination.

Existing Roadways and Proposed New Roadways in PD&E or Design Phases

Steps for determining the context classification for all projects on existing roadways, and for projects that propose new roadways and are in the PD&E or design phases include:

1. Identify Major Changes in Context

Utilize the distinguishing characteristics based on the Context Classification Matrix to determine if multiple context classifications are necessary due to significant changes in the type or intensity of uses located along the roadway. A context classification segment may be as short as two blocks or, where there is no defined block structure, a quarter-mile in length.

2. Evaluate the Primary Measures

A roadway segment must meet a majority of the primary measures defined for a context classification in order to be assigned that context classification. Table 2-2 describes the primary measures, methodology, and data sources associated with each measure. For the primary measures, two measurement areas — the block and the parcel — are used, as explained in Figures 2-3 and 2-4. The measurement areas used for each measure are identified in Table 2-2. Figure 2-5 through Figure 2-9 provide guidance for evaluating some of the primary measures.

For RRR, Safety, and Traffic Operations projects, each segment identified in step 1 can be evaluated using the primary measures based on existing conditions or future context. Qualifying projects in all phases for existing roadways will be evaluated using the future context of the primary measures. The future context should be clearly documented in a well-defined, community-supported and implementation-focused plan or in policies such as the land use element of the local comprehensive plan, zoning overlays, form-based codes, community redevelopment plans, or permitted development plans.

Qualifying Projects:

Roadway project types that qualify for ETDM screening, per the *ETDM Manual* Section 2.3.1 include:

- Additional through lanes which add capacity to an existing road
- A new roadway, freeway or expressway
- A highway which provides new access to an area
- A new or reconstructed arterial highway (e.g., realignment)
- A new circumferential or belt highway that bypasses a community
- Addition of interchanges or major interchange modifications to a completed freeway or expressway (based on coordination with FHWA)
- A new bridge which provides new access to an area, bridge replacements

Non-qualifying Projects:

Projects that do not go through ETDM screening.

The future desired conditions should be consistently documented across all appropriate local policies and should be well-understood and accepted by local stakeholders. In short, the future conditions should be those that are predictable and that will occur over an anticipated timeframe rather than visionary plans or broad goals and ideas that do not have a clear timeline for actual implementation. Use of a form-based code is one indicator that significant community discussion occurred on a future vision, and that future development is more likely to result based on the adopted form-based code.

3. Evaluate the Secondary Measures

In most cases, especially for RRR, safety, and traffic operations projects, primary measures are sufficient to understand and determine a roadway's context classification. Secondary measures can be used to



An example of a high volume roadway that balances the needs of freight traffic, transit, and pedestrians and bicyclists of varying abilities.

Location: US 98, Polk County, FL

Source: KAI

further understand the context when there is no clear consensus on the context classification based on the primary measures. Secondary measures are also useful in cases where local municipalities have adopted a future vision for a place that is not consistent with the existing context classification. Table 2-3 describes the secondary measures and the methodology and data sources associated with each measure.

The secondary measures quantify the intensity of development. A roadway segment needs to meet only one of the two criteria, either population density or employment density, to be classified within a context classification. Zoning may show that the local municipality intends for the area to be developed into a more intense development form in the future, and therefore does not meet the existing population and employment densities, but will meet them in the future.

TABLE 2-2 PRIMARY MEASURES TO DEFINE CONTEXT CLASSIFICATION

Measure	Description	Methodology	Measurement Area*	Data Source**
Land Use	Land use mix for more than 50% of the fronting uses	Record based on existing or future adopted land uses.	Fronting parcels on either side of the roadway	Field review, GIS files, existing or future land use maps
Building Height	The range in height of the buildings for more than 50% of the properties	Record based on existing buildings or future permitted building height requirements based on land development regulations.	Fronting parcels on either side of the roadway	Field review, internet-based aerial and street view imagery, or land development regulations
Building Placement	Location of buildings in terms of setbacks for more than 50% of the parcels	Measure the distance from the building to the property line or future required building placement based on land development regulations (see Figure 2-5).	Fronting parcels on either side of the roadway	Field review, internet-based aerial and street view imagery, building footprint and parcel GIS files, or land development regulations
Fronting Uses	Buildings that have front doors that can be accessed from the sidewalks along a pedestrian path for more than 50% of the parcels	Record the percent of buildings that provide fronting uses or site design and lot layout requirements in land development regulations that require fronting uses (See Figure 2-6).	Fronting parcels on either side of the roadway	Field review or internet-based aerial and street view imagery, or land development regulations
Location of Off-street Parking	Location of parking in relation to the building: between the building and the roadway (in front); on the side of the building; or behind the building	Record location of off-street parking for majority of parcels or parking requirements based on land development regulations (see Figure 2-7).	Fronting parcels on either side of the roadway	Field review or internet-based aerial and street view imagery, or land development regulations
Roadway Connectivity	Intersection Density	Number of intersections per square mile	Calculate by dividing the total number of intersections by the area of the blocks along both sides of the street, excluding natural features and public parks; consider future roadway connectivity if an approved or permitted development plan is in place (see Figure 2-8).	The block on either side of the roadway; if the roadway and block structure is not complete, the evaluation area should extend 2000' on either side of the roadway
	Block Perimeter	Average perimeter of the blocks adjacent to the roadway on either side	Measure the block perimeter for the blocks adjacent to the roadway on either side and take the average; consider future roadway connectivity if an approved - permitted development plan is in place (see Figure 2-9).	The block on either side of the roadway; if the roadway and block structure are not complete, the evaluation area should extend 2000' on either side of the roadway
	Block Length	Average distance between intersections	Measure the distance along the roadway between intersections with a public roadway, on either side, and take the average; consider future roadway connectivity if an approved or permitted development plan is in place (see Figure 2-9).	Roadway

* The measurement area applies to each context classification segment. Evaluate each measure for each context classification segment. Where characteristics differ for each side of the street, use the characteristics for the side that would yield the higher context classification.

** Land use, zoning, streets, and other GIS data and maps are available from local government agencies, FDOT Efficient Transportation Decision Making (ETDM) Database, and regional agencies.

FIGURE 2-3 MEASUREMENT AREA: THE BLOCK ON EITHER SIDE OF THE ROADWAY

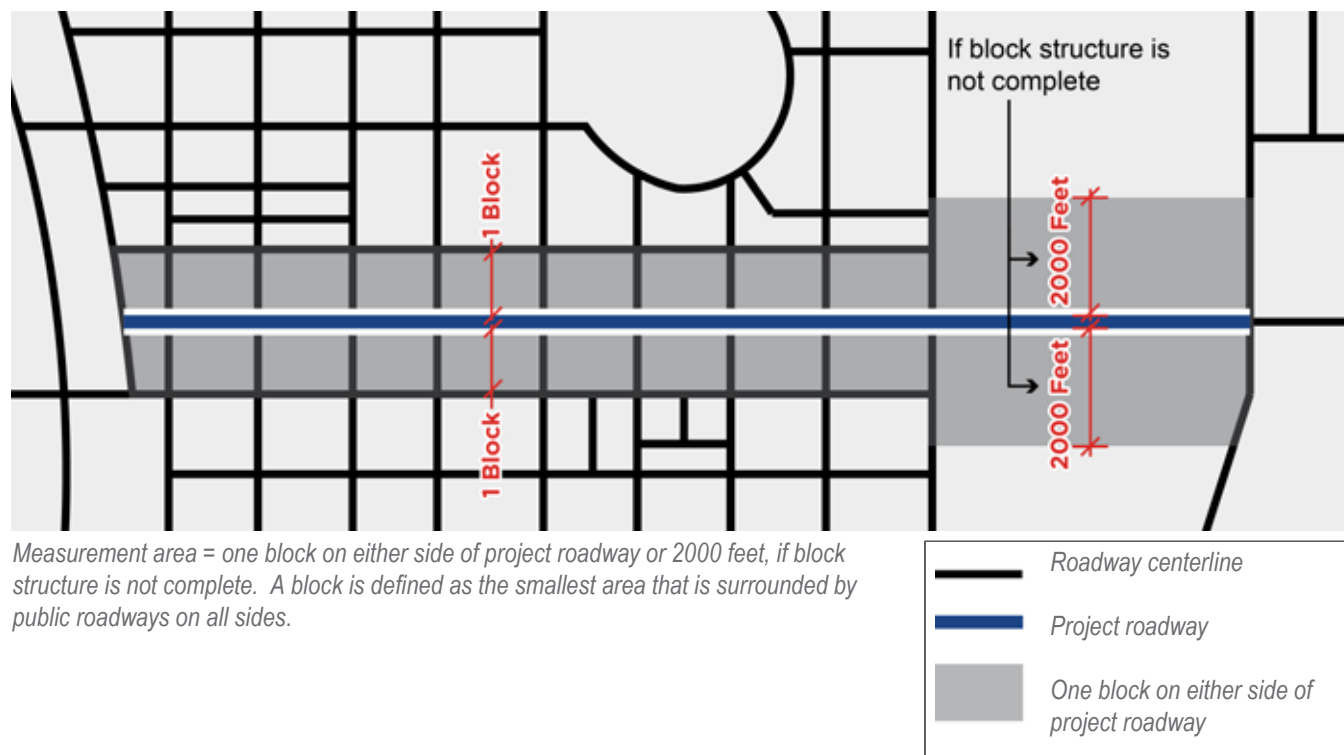


FIGURE 2-4 MEASUREMENT AREA: FRONTING PARCELS ON EITHER SIDE OF THE ROADWAY

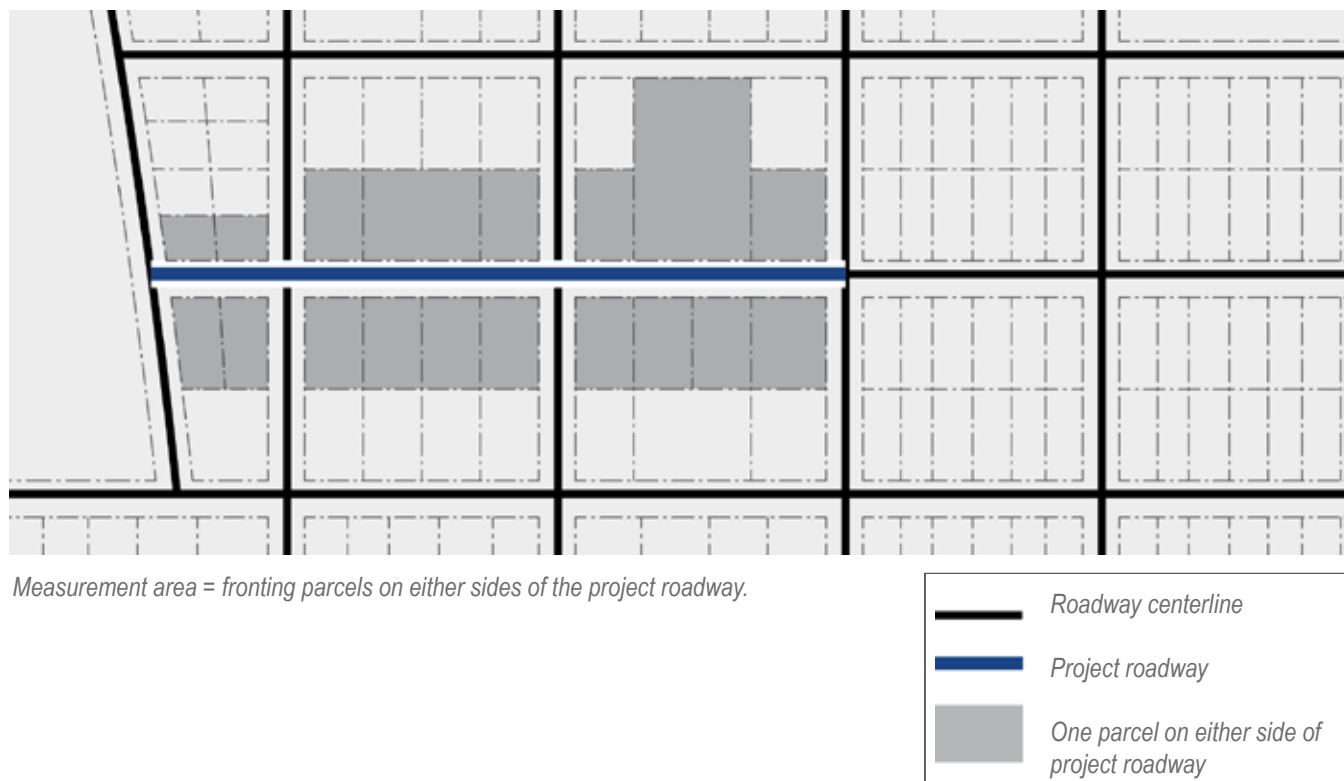


FIGURE 2-5 BUILDING PLACEMENT

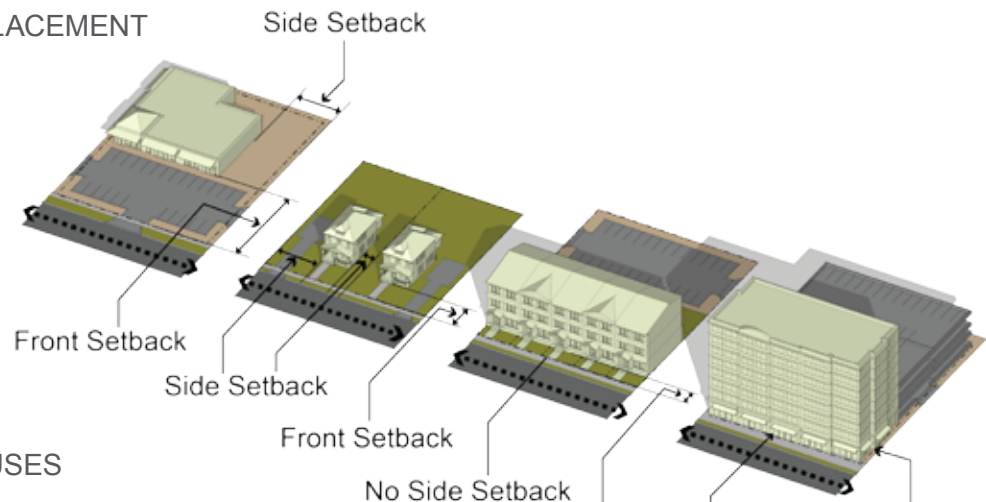


FIGURE 2-6 FRONTING USES

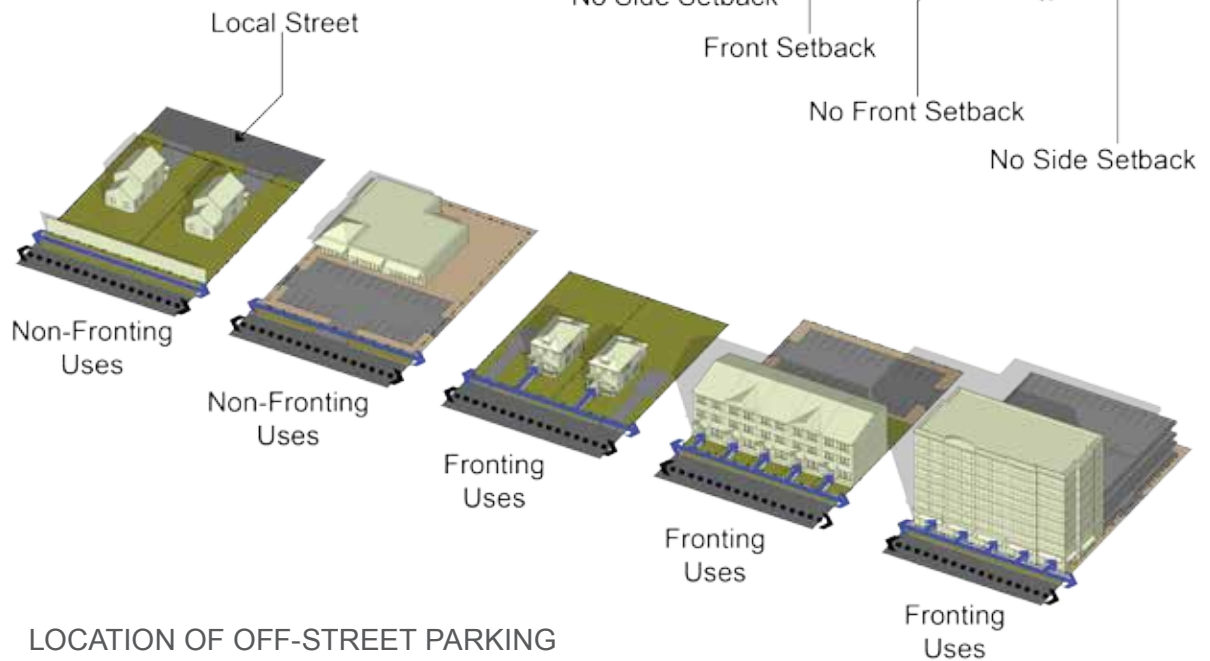


FIGURE 2-7 LOCATION OF OFF-STREET PARKING

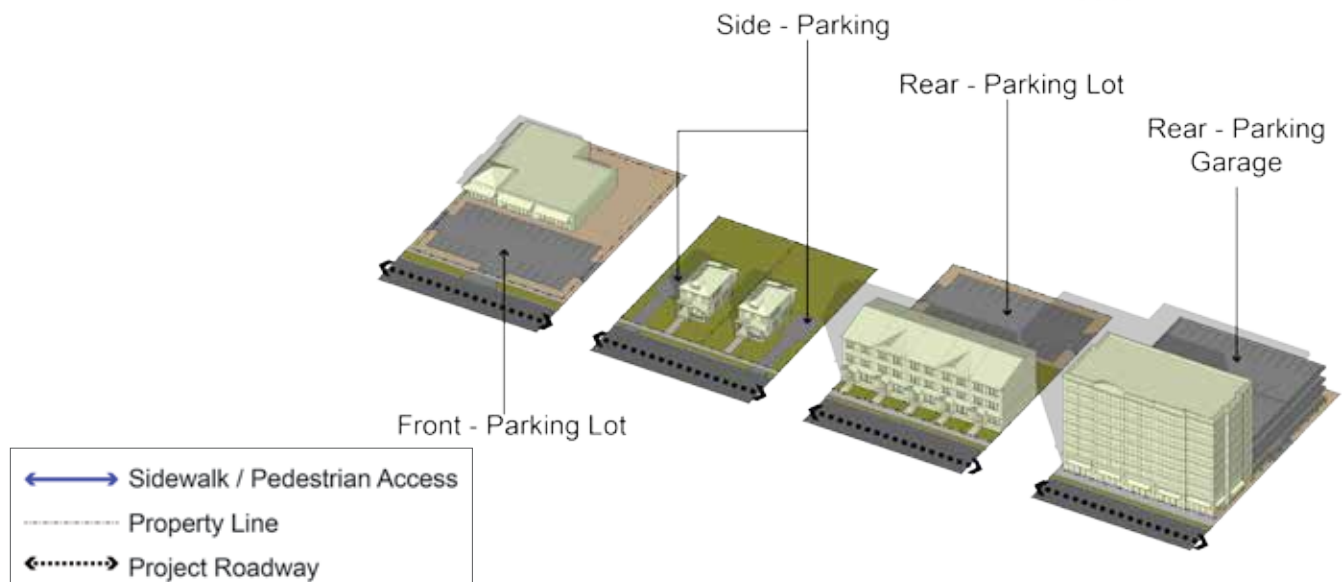


FIGURE 2-8 INTERSECTION DENSITY

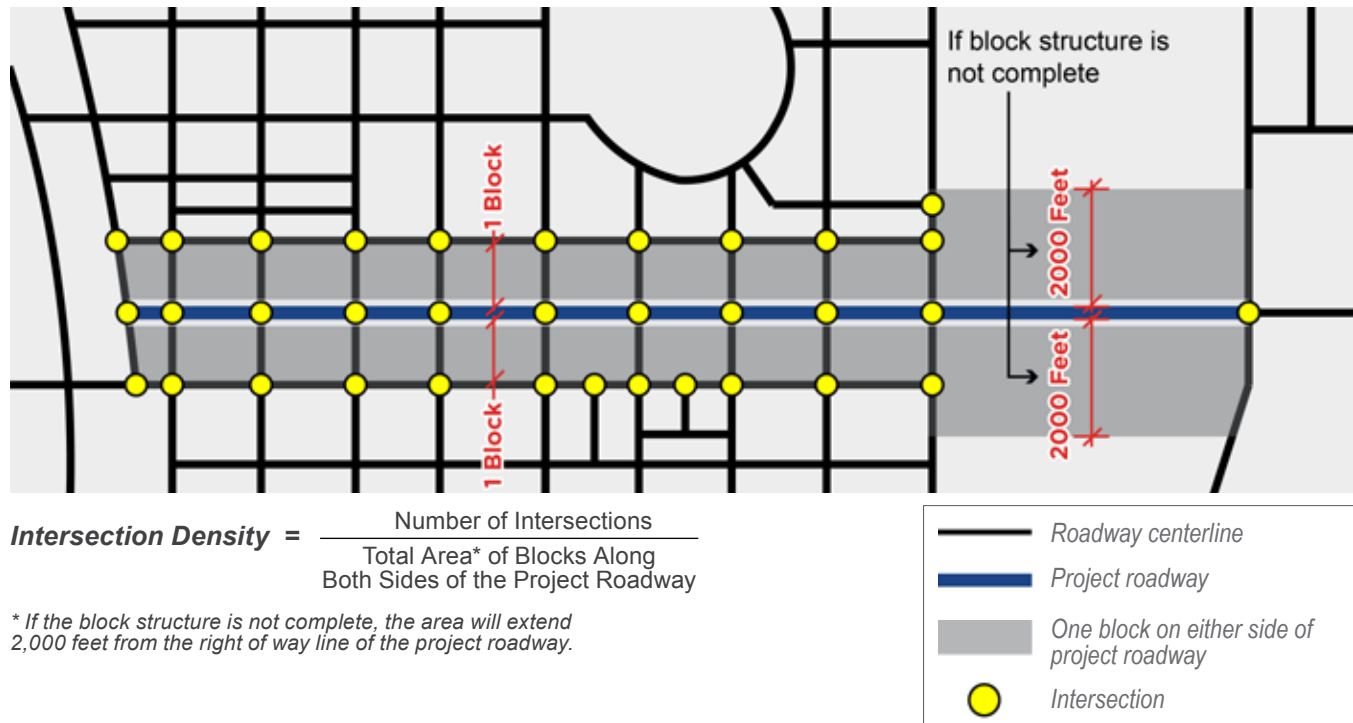


FIGURE 2-9 BLOCK PERIMETER AND BLOCK LENGTH

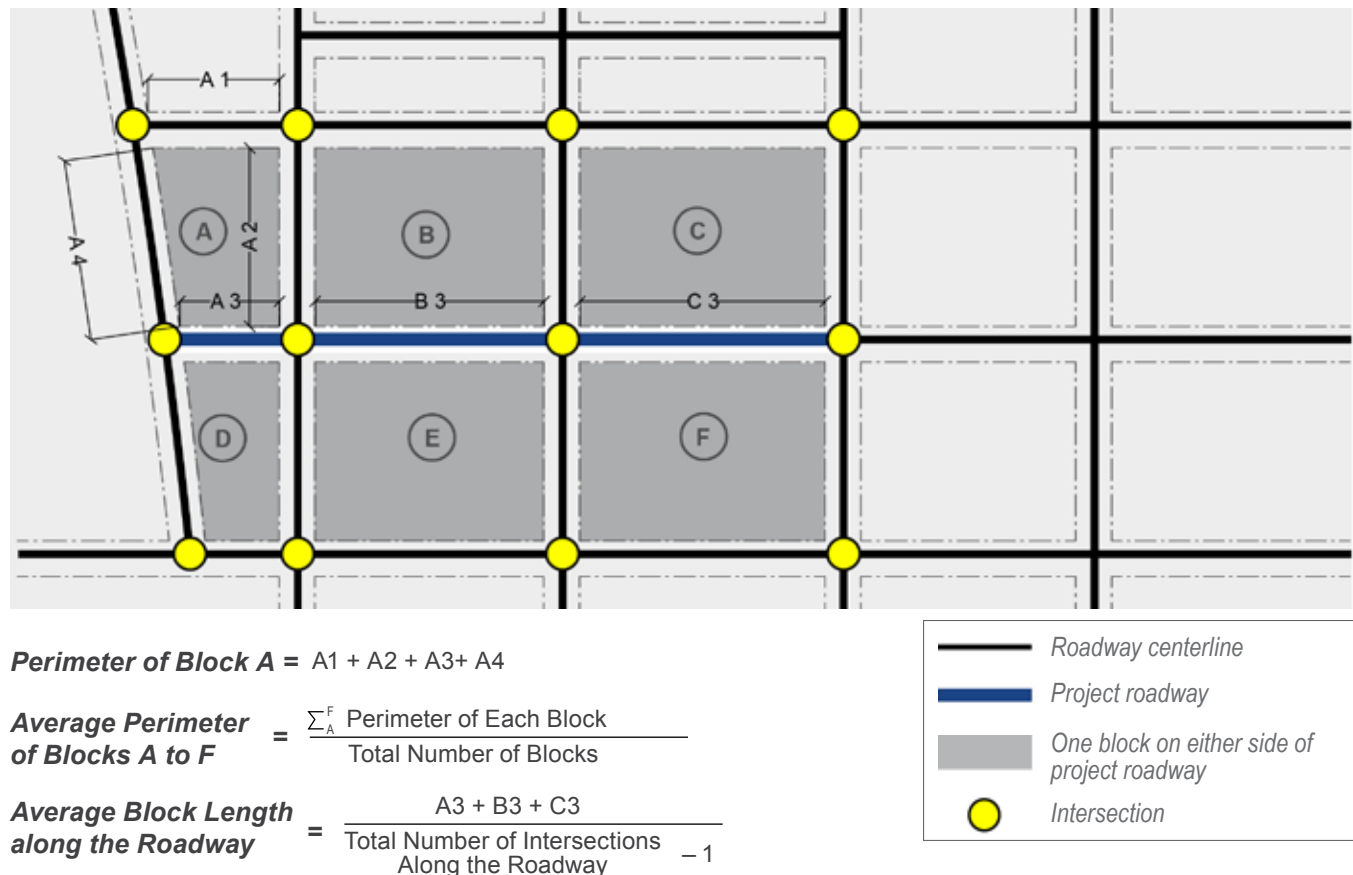


TABLE 2-3 SECONDARY MEASURES TO DEFINE THE CONTEXT CLASSIFICATION

Measure	Description	Methodology	Measurement Area	Data Source
Allowed Residential Density	Maximum allowed residential density by adopted zoning	Identify which zoning district the context classification segment is within, and record maximum allowed residential density for that particular zoning district by dwelling units per acre.	Parcels along either side of the roadway	Zoning code, land development regulations
Allowed Office/Retail Density	Maximum allowed office or retail density in terms of Floor Area Ratio (FAR), or the ratio of the total building floor area to the size of the property on which it is built	Identify which zoning district the context classification segment is within, and record allowed commercial density for that particular zoning district. In some jurisdictions, allowed commercial density might be stated based on specific regulations limiting building height and minimum setbacks. Jurisdictions also regulate minimum parcel size allowed in each zoning district. Maximum allowable FAR for an area can be calculated using site design and height standards (see Appendix C for more details).	Parcels along either side of the roadway	Zoning code, land development regulations
Population Density (existing)	Population per acre based on the census block group	Download census information at the block group level. Divide the population of the census block group by the area of the block group. This area should exclude large natural features and public parks. If the roadway segment is the boundary between two block groups, average the population density of the block groups on either side of the roadway. If the roadway runs through multiple block groups, calculate the population density by the weighted average of roadway within each block group.	Census block group(s) that encompasses the roadway	US Census Bureau decennial data
Population Density (future)	Projected population per acre based on the regional travel demand model traffic analysis zone (TAZ)	Divide the population of the TAZ by the area of the TAZ. If the roadway segment is the boundary between two TAZs, average the population density of the TAZs on either side of the roadway. If the roadway runs through multiple TAZs, calculate the population density by the weighted average of roadway within each TAZ. Use 20-year forecast number from the regional travel demand model. If a regional travel demand model is not available, use University of Florida Bureau of Economic Research (BEBR) population projections.	TAZ(s) that encompasses the roadway. If TAZ population density is not available, use smallest geographic area available from BEBR projections.	Regional travel demand model from MPO, BEBR
Employment Density (existing)	Total number of jobs per acre	Use GIS to map the number of jobs within the blocks adjacent to the roadway utilizing the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) website. Sum the number of jobs within the blocks along either side of the roadway, and divide by the area of the blocks. This area should exclude large natural features and public parks. Blocks can be imported as a shapefile or can be manually drawn on the census website.	One block area adjacent to either side of the roadway. If the block structure is not complete, the evaluation area should extend 500 feet from the property line along the roadway.	U.S. Census Bureau LEHD website
Employment Density (future)	Total number of jobs per acre	Divide the number of jobs of the TAZ by the area of the TAZ. If the roadway is the boundary between two TAZs, average the employment density of the TAZs on either side of the roadway. If the roadway runs through multiple TAZs, calculate the employment density by the weighted average of roadway within each TAZ. Use 20-year forecast number from the regional travel demand model. If a regional travel demand model is not available, use BEBR employment projections.	TAZ(s) that encompasses the roadway. If TAZ employment density is not available, use smallest geographic area available from BEBR projections.	Regional travel demand model from MPO, BEBR

Proposed New Roadways in Planning or ETDM Screening

During planning and ETDM screening for new roadway alignments, a broad understanding of the context classification will be used to inform the planning process. For example, area-wide studies such as the Future Corridors studies would use more general criteria to determine the context classification as compared to a corridor study on an existing roadway for the purposes of defining a concept to be advanced into PD&E or design.

For new roadways in planning and ETDM screening that include multiple alternative alignments, future land use conditions should be used to determine the context classification. The steps for determining the context classification for new roadways in planning or ETDM screening include:

1. Identify Major Changes in Context

Utilize the distinguishing characteristics to determine if multiple context classifications are necessary based on the Context Classification Matrix due to significant changes in the type or intensity of future land uses located along the roadway. The segment lengths should be based on the change in land use or other distinguishing features. Segment lengths can vary, and may be as short as two blocks or, where this is no defined block structure, longer than a mile.

2. Evaluate the Future Land Use

Evaluate the land use along the roadway based on the future land use element of the adopted local comprehensive plan using the land use description provided in Table 2-1.

3. Evaluate the Secondary Measures

Table 2-3 describes the secondary measures, and the methodology and data sources associated with each measure. Future population and employment densities can be quantified based on the data in the regional travel demand model. If no regional model is available, utilize BEBR estimates for future population and employment projections. A context classification segment only needs to meet one of the two criteria, either population density or employment density, to be classified within a context classification.

For the C3C-Suburban Commercial and C3R-Suburban Residential Context Classifications, population and employment densities vary widely throughout the State. Use the allowed residential and office/retail densities, the distinguishing characteristics, and the future land use listed in the Context Classification Matrix to determine if a roadway is within the C3C-Suburban Commercial or CR3-Suburban Residential Context Classification.

Bridges and Tunnels

The context classification of a bridge or tunnel should be based on the higher context classification of the segments on either end of the bridge or tunnel.

Special Districts

Special Districts (SD) are areas that, due to their unique characteristics and function, do not adhere to standard measures identified in the Context Classification Matrix. Examples of SDs include military bases, university campuses, airports, seaports, rail yards, theme parks and tourist districts, sports complexes, hospitals, and freight distribution centers. Due to their size, function, or configuration, SDs will attract a unique mix of users and create unique travel patterns. Planning and engineering judgment must be used to understand users and travel patterns and to determine the appropriate design controls and criteria for streets serving an SD on a case-by-case basis. If an FDOT district believes that an area does not fit within a context classification and an SD designation is required, the district should coordinate that with the State Complete Streets Program Manager.

DOCUMENTING CONTEXT CLASSIFICATION

Context classification will be determined on a project-by-project basis, and will be developed or confirmed at the beginning of each project phase, including planning, PD&E, and design. The districts will be responsible for collecting the context classification information for each project. This information may eventually be stored in an integrated roadway asset identification system, such as the FDOT Enterprise Application RCI, as well as the straightline diagram and the typical section data sheet.

RELATIONSHIP BETWEEN CONTEXT CLASSIFICATIONS AND CNU/SMARTCODE™ TRANSECT SYSTEM

The SmartCode™ is a form-based land development code that incorporates Smart Growth and New Urbanist principles. It is a unified development ordinance, addressing development at all scales of design, from regional planning to building signage. It is based on rural-to-urban transects, rather than separated-use zoning.

FDOT's context classifications generally align with the SmartCode™, with some critical distinctions. The SmartCode™ was developed to describe and codify

desired future visions of development form by local jurisdictions. The key implementation tool for form-based codes is a regulating plan that clearly identifies different transect zones that would guide how future land use development should occur. In contrast, FDOT's context classifications are descriptive, rather than visionary, and therefore include all land areas and types found within the State of Florida, with less local specificity.

The general relationship between the zones used by the transect system and FDOT's context classification is outlined in Table 2-4.

TABLE 2-4 RELATIONSHIP BETWEEN FDOT CONTEXT CLASSIFICATIONS AND THE SMARTCODE™ TRANSECT SYSTEM

FDOT Context Classification	SmartCode™ Transect Zone	Description of SmartCode™ Transect Zone
C1 – Natural	T1- Natural Zone	Lands approximating wilderness conditions
C2 – Rural	T2-Rural Zone	Sparsely settled lands in open or cultivated states
C2T – Rural Town		No corresponding transect zone; may sometimes be coded as a small T5 or T4 hamlet or village
C3R – Suburban Residential C3C – Suburban Commercial	Coded as Conventional Suburban Development (CSD)	The SmartCode™ does not provide for this type of development pattern
FDOT Context Classification does not address this SmartCode™ Transect Zone	T3-Sub-urban Zone	Lower density, primarily single-family residential with very limited non-residential uses, in a limited dispersion and directly within walking distance of a higher transect. Transect Zone T3 will be considered C4-Urban General
C4 – Urban General	T4-General Urban Zone	Mixed use but primarily residential urban fabric in a variety of housing types and densities
C5 – Urban Center	T5- Urban Center Zone	Higher density mixed use buildings that accommodate retail, offices, rowhouses, and apartments
C6 – Urban Core	T6- Urban Core Zone	Highest density and height, with the greatest variety of uses, and civic buildings of regional importance; some T6 areas may belong to FDOT C5 because of FDOT population requirement
SD – Special District	Special Districts	Areas that, by their intrinsic size, function, or configuration, cannot conform to the requirements of any transect zone or combination of zones

TRANSPORTATION CHARACTERISTICS

The transportation characteristics define the role of a particular non-limited-access roadway in the transportation system, including the type of access the roadway provides, the types of trips served, and the users served. The transportation characteristics take into consideration regional travel patterns, freight movement, and SIS designation. Together with context classification, they can provide information about who the users are along the roadway, the regional and local travel demand of the roadway, and the challenges and opportunities of each roadway user.

FUNCTIONAL CLASSIFICATION

Functional classification defines the role a particular roadway plays in serving the flow of vehicular 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 (see Table 2-5).¹

The **AASHTO A Policy on Geometric Design of Highways and Streets, 5th Edition (2011)** presents a discussion of highway functional classifications. **Florida Statutes, Title XXVI, Chapters 334, 335, and 336**, give similar definitions, and establish classifications for roadway design in Florida.

Complete Streets continue to recognize functional classification but also consider the context classification of the street as part of the total picture. For example, the relationship between functional classification and access needs may be less consistent in more urban context classifications where roadways serve a wider variety of purposes beyond moving motor vehicle traffic. In evolving suburban areas, retail and commercial business tend to locate along arterial roadways, requiring access and creating demands for short-distance and local trips that include vehicular trips as well as walking and bicycling trips. Transit service is also often located along arterial roadways, due to retail and commercial uses generating high demands for transit trips and the efficiency of providing higher levels of transit

service along these roadways. At the same time, many state roadways travel through large and small (often historic) town centers that require multimodal mobility and access in order to thrive. Therefore, the context classification provides an important layer of information that complements functional classification in determining the transportation demand characteristics along a roadway, including typical users, trip length, and vehicular travel speeds.

TABLE 2-5 ROADWAY FUNCTIONAL CLASSIFICATION AND ROLE IN THE TRANSPORTATION SYSTEM

Roadway Classification	Role in the Transportation System
Principal Arterial	Serves a large percentage of travel between cities and other activity centers, especially when minimizing travel time and distance is important.
Minor Arterial	Provides service for trips of moderate length, serves geographic areas that are smaller than their higher arterial counterparts, and offers connectivity to the higher arterial system.
Collector	Collects traffic from local streets and connects them with arterials; more access to adjacent properties compared to arterials.
Local	Any road not defined as an arterial or a collector; primarily provides access to land with little or no through movement.

* This Handbook does not address limited-access facilities.

For non-limited-access roadways, the **FDM** provides design criteria and standards based on both context classification and functional classification.

¹ Federal Highway Administration, "Highway Functional Classification Concepts, Criteria and Procedures."

CONTEXT CLASSIFICATION AND STREET USERS

The context classification informs planners and engineers of the types of users and the intensity of use expected along the roadway. For example, in the C6-Urban Core Context Classification, there will be a higher number of pedestrians, bicyclists, and transit users than in a C2-Rural Context Classification. Therefore, reduced speeds, signal spacing, crossing distances, lane widths, and other design elements such as bicycle facilities, on-street parking, and wide sidewalks should be provided to increase the safety and comfort of bicyclists, pedestrians, and transit users. For the C2-Rural Context Classification, vehicles and freight are primary users; however, bicyclists and pedestrians are accommodated with bike lanes, paved shoulders, or sidepaths. A state roadway in C2-Rural Context Classification is expected to have higher speeds, wider lanes, and lower levels of traffic delay.

When determining the roadway typical section to be used, give appropriate consideration for all users of the roadway. Include required elements associated with the context classification of the roadway. The **FDM** contains criteria to be used for each context classification.

HOW TO IDENTIFY ROADWAY-SPECIFIC TRANSPORTATION TRAVEL DEMANDS

While context classification and functional classification can provide general guidelines for the type and activity level of different users, additional information can assist in obtaining a more thorough understanding of the needs of all the intended users. The anticipated users of a roadway and the travel patterns of those users should be determined well before the design phase of a project, and are best explored during the planning and design scoping phase.

The **Traffic Forecasting Handbook** documents data collection efforts to understand vehicular travel patterns. Table 2-6 provides a menu of data sources that could be useful in identifying different needs for different users. Not all of the data presented in Table 2-6 will be required for all projects. The data collected for a project should be tailored to the scale, purpose, and needs of a project.

Depending on the scale, purpose, and needs of the project, the following are some examples of questions that could augment the analysis to better understand transportation travel demand and needs for all users:

- **Land Uses:** What pedestrian, bicycle, or transit generators are located along the roadway? Are there large shopping destinations? Large employers? Public facilities? Are there visitor destinations? How might existing land use patterns change based on approved or planned development? Is there a redevelopment plan for the area? What land use changes are planned or anticipated to occur?
- **Vehicular Trip Types:** What percentage of the vehicular trips are local? What is the average trip length? Is the roadway part of the SIS?
- **Travel Patterns:** Are there unique travel patterns or modes served by the corridor? Will new or emerging transportation services or technologies influence trip-making characteristics (e.g., rideshares, scooters, interregional bus service, bikeshare)?
- **Safety Data:** How many and what types of crashes are occurring along the roadway?
- **Types of Pedestrians:** Are there generators or attractors that would suggest that younger or older pedestrians, or other special user groups, will be using the roadway (e.g., schools, parks, elderly care facilities, assisted living centers)?
- **Types of Bicyclists:** Is the roadway a critical link for the local or regional bicycle network? Does the roadway connect to or cross trails or bicycle facilities? Are bicyclists using the roadway to access shopping, employment, or recreational destinations?
- **Transit:** What type of transit service exists or is planned for the area? Where are transit stops located? Can pedestrians reach these stops from either side of the street without significant diversion of their trip? Are transit stops accessible using the network of existing bicycle and pedestrian facilities?
- **Freight:** What is the percentage and volume of heavy trucks using the roadway? Are there destinations that require regular access by heavy trucks or other large vehicles? Is the roadway part of a designated freight corridor? Where does loading and unloading occur along the roadway?

- **Demographics:** Based on census data, are there areas of high transit, pedestrian, or bicyclist demand? These include areas overrepresented, when compared to the general population, by elderly or low-income residents, or households without access to automobiles.



The anticipated users of a roadway and the travel patterns of those users should inform the purpose and needs of a project.
Location: Fletcher Avenue, Tampa, FL
Source: FDOT

TABLE 2-6 EXAMPLES OF POTENTIAL DATA TO DETERMINE USER NEEDS BY MODE

Mode	Data
 Pedestrian	• Location of signalized pedestrian crossings • Location of marked or signed pedestrian crossings • Posted and operating speeds • Vehicular traffic volumes • Existing sidewalk characteristics (location, width, pavement condition, obstacles or pinch points) • Intersection ramps and alignment/Americans with Disabilities Act (ADA) compliance • Utilities location • Existing landscape buffer and shade trees • Pedestrian counts • Crash data • Lighting levels • Existing and future land use, building form and site layout, development scale and pattern • Existing and future pedestrian generators (e.g. schools, parks)
 Bicyclist	• Local and regional bicycle network • Posted and operating speeds • Vehicular traffic volumes • Number of vehicular travel lanes • Location of bicycle parking • Bicycle user type (see Chapter 4) • Bicyclist counts • Crash data • Location of destinations • Lighting levels • Pavement condition • Existing and future land use, building form and site layout, development scale and pattern
 Car	• Design Traffic (Existing and projected Average Annual Daily Traffic (AADT), K-factor (K), directional distribution (D), and traffic growth projections) • Trip lengths; origin/destination patterns • Turning movement counts • Posted and operating speeds • Signal timing • Location of parking • Crash data • Lighting levels • Pavement condition • Existing and future land use, building form and site layout, development scale and pattern
 Transit	• Existing and future transit routes and stops • Transit service headways • Location and infrastructure at transit stops • Sidewalk connection to transit stops • ADA compliant transit stops • Existing and projected ridership (route or stop level) • Existing and future transit generators and attractors • Type of transit technology • Trip lengths, origin/destination patterns
 Freight	• Designated truck routes • Truck volumes • Vehicle classification counts • Existing and future location of industrial land uses or other generators of freight trips • Freight loading areas/truck parking

STRATEGIC INTERMODAL SYSTEM AND CONTEXT CLASSIFICATION

The SIS was established in 2003 to enhance Florida's economic competitiveness by focusing state resources on the transportation facilities most critical for statewide and interregional travel. The three SIS objectives identified in the **SIS Policy Plan** are:

- **Interregional Connectivity:** Ensure the efficiency and reliability of multimodal transportation connectivity between Florida's economic regions and between Florida and other states and nations.
- **Intermodal Connectivity:** Expand transportation choices and integrate modes for interregional trips.
- **Economic Development:** Provide transportation systems to support Florida as a global hub for trade, tourism, talent, innovation, business, and investment.

The SIS includes the State's largest and most significant commercial service and general aviation airports, spaceports, public seaports, intermodal freight terminals including intermodal logistics centers, interregional passenger terminals, urban fixed guideway transit corridors, rail corridors, waterways, military access facilities, and highways. The SIS includes three types of facilities: hubs, corridors, and connectors.

SIS Highway corridors and connectors traverse varying context classifications. Given the purpose and intent of the SIS, the requirements of a particular context classification may not always align with the function of the SIS highway. In the case of interstates and limited-access facilities, the function of the roadway is considered complete. For all others, there is a need to balance the safety and comfort of users who live and work along the SIS facility with interregional and interstate freight and people trips through the area. This is consistent with the intent of the **SIS Policy Plan**, which specifically calls for the need to improve coordination with regional and local transportation and land use decisions by:

- Better reflecting the context of the human and natural environment;

- Balancing the need for efficient and reliable interregional travel with support for regional and community visions;
- Developing multimodal corridor plans that coordinate SIS investments with regional and local investments; and
- Leveraging and strengthening funding programs for regional and local mobility needs such as the Transportation Regional Incentive Program, Small County Outreach Program, and Small County Road Assistance Program.

This balance could mean that other throughput options to the SIS facility (e.g., a bypass or express lanes) are studied and considered if redesigning the currently designated roadway is needed to conform to the context classification. The **SIS Policy Plan** outlines that SIS improvements should consider the context, needs, and values of the communities serviced by the SIS, which may include flexibility in design and operational standards. Most importantly, communication with all parties involved is key to determining the best solution to realize the intent of both the SIS and a Complete Streets approach within a community.

The **FDM** provides design standards for facilities on the SIS. Appendix D presents proposed design speed ranges for SIS facilities. Roadways located on the SIS require coordination with the District SIS Coordinator during the determination of the facility's context classification.



Accommodations of freight vehicles is an important part of Complete Streets.

Location: Estero Boulevard, Fort Myers Beach, FL

Source: Rick Hall

ENVIRONMENTAL CHARACTERISTICS

Environmental characteristics, including the social, cultural, natural, and physical aspects of an area, play a role in the planning, design, and maintenance of transportation projects. FDOT is focused on responsible stewardship of Florida's environmental resources. The FDOT Mission states that FDOT will provide a safe transportation system that “enhances economic prosperity and preserves the quality of our environment and communities.” Aligning with this mission, FDOT considers the social, cultural, natural, and physical impacts of its investments throughout the planning and design process.

Transportation projects that utilize Federal transportation dollars (or that require a Federal environmental permit such as wetlands or water quality) are subject to review under the ***National Environmental Policy Act of 1969 (NEPA)***. FDOT developed the PD&E process to address how NEPA is evaluated for Federally funded transportation projects in Florida, including the identification and assessment of environmental characteristics for all projects. Public involvement and agency coordination is part of the PD&E process. Chapter 3 of this Handbook discusses how the ETDM and PD&E processes will incorporate the Complete Streets approach. Detailed information on FDOT procedures for environmental review can be found in the following documents:

- PD&E Manual
- ETDM Manual
- Public Involvement Handbook
- Sociocultural Effects Evaluation Process
- Cultural Resource Management Handbook

CONTEXT CLASSIFICATION RELATIONSHIP WITH EXISTING HANDBOOKS AND PROCESSES

The FDOT Complete Streets context-based design approach is compatible with and supported by national guidance documents. The following section describes the relationship between FDOT context classification and contexts defined in existing FDOT and national manuals and handbooks.

AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS

AASHTO recognizes that different places have different characteristics with regard to density and type of land use, density of street and highway networks, nature of travel patterns, and the ways in which these elements are related. ***AASHTO A Policy on Geometric Design of Highways and Streets*** provides design standards based on urban and rural areas, as defined by the FHWA. FHWA identifies urban areas as those places, within boundaries set by the responsible state and local officials, having a population of 5,000 or more. Urban areas are comprised of:

- **Urbanized Areas**, designated as population of 50,000 or more by the U.S. Census Bureau.
- **Small Urban Areas**, designated as population between 5,000 and 49,999, and not within any urbanized area.

Rural encompasses all population, housing, and territory not included within an urban area.

For the purpose of funding considerations and other processes and procedures, FDOT will continue to define urban and rural areas following the FHWA criteria. For design criteria and standards for non-limited-access roadways, FDOT utilizes context classification in the *FDM*. There is no direct relationship between context classification and FHWA's definition of urban and rural. In general, C4-Urban General, C5-Urban Center, and C6-Urban Core will be located in the FHWA urban areas. C1-Natural and C2-Rural will be primarily located in the FHWA rural areas. C2T-Rural Town, C3C-Suburban Commercial, and C3R-Suburban Residential may be found in FHWA-urban or rural areas.

QUALITY/LEVEL OF SERVICE HANDBOOK

The *FDOT Quality/Level of Service Handbook (Q/LOS)* and its accompanying software are intended to be used by engineers, planners, and decision makers in the development and review of street users' quality/level of service and capacity at generalized and conceptual planning levels. The *Q/LOS Handbook* recognizes that motorists have different thresholds for acceptable delay in rural versus urban areas. Four broad area-type groupings are used in *Q/LOS Handbook* and accompanying software:

- **Urbanized Areas** — Areas that meet FHWA's definition of Urbanized Areas. These consist of a densely settled core of census tracts and census blocks that meet minimum population density requirements, along with adjacent densely settled surrounding census blocks that together encompass a population of at least 50,000 people. The *Q/LOS Handbook* further identifies areas with population over 1,000,000 as **Large Urbanized Areas**.
- **Urban Areas** — Areas with a population between 5,000 and 49,999 (mostly used to distinguish developed areas that are not urbanized).
- **Transitioning Areas** — Areas generally considered as transitioning into urbanized/urban areas or areas over 5,000 population and not currently in urbanized areas. These areas can also at times be determined as areas within a

Metropolitan Planning Area, but not within an urbanized area. These areas are anticipated to reach urban densities in a 20-year horizon.

- **Rural Areas** — Areas that are not urbanized, urban, or transitioning. Rural areas are further classified as rural developed areas and cities or developed areas with less than 5,000 population; and rural undeveloped areas in which there is no or minimal population or development.

A direct, one-to-one relationship does not exist between the classification system used in the *Q/LOS Handbook* and the context classifications, but generally C1-Natural, C2-Rural, and C2T-Rural Town areas will be identified as rural areas or transitioning areas, while C4-Urban General, C5-Urban Center, and C6-Urban Core will be identified as urban. C3C-Suburban Commercial and C3R-Suburban Residential can fall into any of the Q/LOS categories.

Future editions of the *Q/LOS Handbook* will be revised to be consistent with the FDOT context classification.

ROADWAY CHARACTERISTICS INVENTORY

The RCI is a database of information related to the roadway environment maintained by FDOT. The database includes information on a roadway's features and characteristics. Feature 124-Urban Classification, Feature 125-Adjacent Land Classification, Feature 145-LOS Input Data, and Feature 481-Highway Maintenance Classification describe land use contexts in different ways.

These categories are not related to the context classification system detailed in this chapter. FDOT is considering recording context classification information in RCI at the time when state roadways are evaluated through FDOT projects. If this occurs, RCI information may be a starting point for future projects in evaluating a roadway's context classification.

For more information on the RCI, refer to the *RCI Features and Characteristics Handbook*.

ACCESS MANAGEMENT CLASSIFICATION

Access management classification reflects the desired access management standards to be followed for each state roadway. These are standards for restrictive medians, median opening separation, and driveway separation. The ranges are from 00-07 and 99. Class 01 reflects the highest amount of access management control (freeways), and Class 07 the lowest. Class 07 is usually found on suburban built-out roadways. Class 99 refers to a special corridor access management plan. Refer to **Florida Administrative Code (FAC), Rule Chapter 14-97.003, Access Management Classification System and Standards** for more information on access management classification.

No direct correlation can be made between access management classification and context classification. It can be generally stated that higher intensities of use, including C2T-Rural Town, C4-Urban General, C5-Urban Center, and C6-Urban Core, as well as roadways with established land use patterns, may require less restrictive access management. In these context classifications, frequent intersections, smaller blocks, and a higher degree of connectivity and access support the multimodal needs of the area. Beyond the context classification, the role of the roadway in the transportation system and safety considerations must also be taken into account to determine access management needs.

The Systems Planning Office is currently studying the relationship between existing access management practices and the implementation of Complete Streets. The Systems Planning Office is reviewing general recommendations to bring the access management classifications documented in **Administrative Rule 14-97** into a closer relationship with the FDOT context classifications. This process will take some time, as it will require an administrative rule change and review of multiple sections by FDOT, the public, and other stakeholders (such as the roadside development industry) before it can be finalized.

Process for Implementing Complete Streets

Complete Streets are not a specific type of project, but rather are an approach to ensuring that projects are pursued based on their contexts. This means that a Complete Streets approach will be implemented consistently for all non-limited-access projects — from capital projects qualifying for ETDM screening to RRR, traffic operations, and safety projects. The successful implementation of Complete Streets requires the identification of a roadway's context classification early in the project development process. Context classification also informs all phases of a project: planning, PD&E, design, construction, and maintenance.

Chapter 2 provides the Context Classification Matrix (see Table 2-1) and outlines the methodology for using it. This chapter details how the context classification will be determined for different types of FDOT projects. Transportation planning related to Complete Streets occurs at the regional level and at the project level. Regional transportation planning is typically conducted by MPOs/TPOs, whereas project level transportation planning can be performed by the FDOT, MPOs/TPOs, or local governments. Local governments are responsible for the land use planning decisions that are intrinsically linked to transportation planning decisions.

REGIONAL TRANSPORTATION PLANNING AND COMPLETE STREETS

Regional transportation planning includes the development of LRTPs by MPOs/TPOs where an outcome is the identification of a series of transportation needs across a region. Traditionally, the LRTP process focuses on the deficiencies of the system in relation to automobile and freight mobility

as defined by a regional travel demand model. In a Complete Streets approach, the needs of all users, including non-motorized users and transit users are incorporated into the identification of potential problems to be addressed. Many MPOs/TPOs and FDOT districts are already beginning to use this latter approach.¹

LRTP needs are often defined in terms of specific solutions such as adding more lanes to an existing roadway or building a new roadway. A successful Complete Streets approach would involve more planning and analysis to determine the actual needs of all users based on a roadway's context classifications, prior to programming a solution for that roadway. This planning analysis is best addressed as part of project-level planning.

LRTP processes are often structured to outline capital projects (e.g. new roadways, new transit service, or widening of roadways), but do not always explore maintenance and smaller scale projects (e.g. resurfacing, maintenance, safety, or intersection improvements). However, many MPOs/TPOs have started to include maintenance and Transportation Systems Management and Operations (TSMO) projects on their Priority Lists. Including these latter set of projects in MPO Priority Lists ensures that the right type of funding is identified early in the project development process to support transportation improvement that addresses the roadway's context and users.

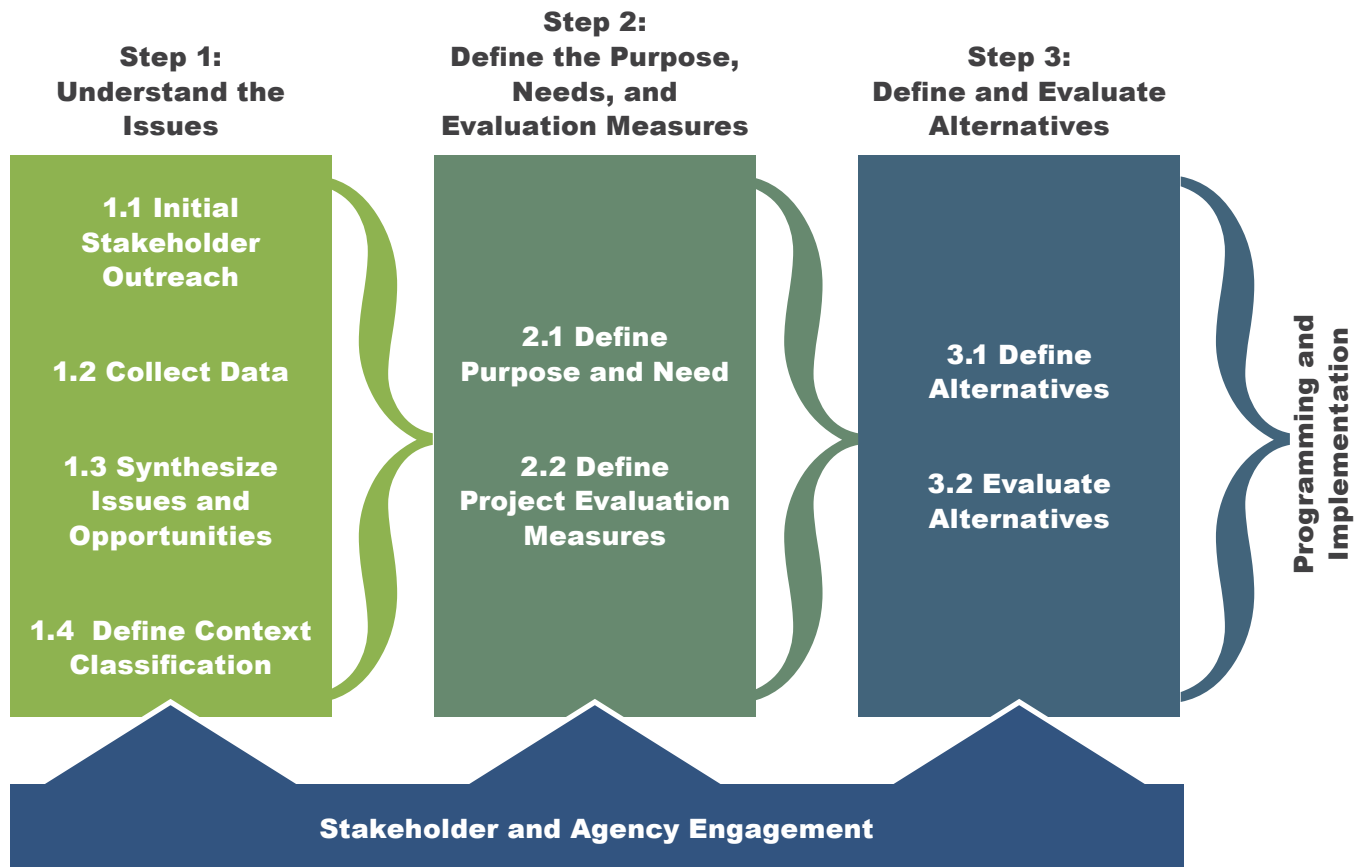
¹ For example, FDOT District 5 is using multimodal transportation and land use screening criteria to identify potential corridor planning studies. These planning studies are meant to better define the transportation opportunities and challenges of all users of a roadway.

PROJECT PLANNING AND COMPLETE STREETS

Project-level transportation planning is conducted to understand the needs of the anticipated users of a roadway and to explore the full range of potential solutions to address those needs. This level of planning typically occurs prior to the PD&E phase and offers an early opportunity to incorporate Complete Streets principles and to establish the framework for a Complete Streets approach for the life of the project. The key steps in project planning are illustrated in Figure 3-1, and include:

1. **Understand the Issues.** This includes collecting and analyzing data, and gathering input from stakeholders to better understand the issues for each user. The context classification will be defined in this step.
2. **Define the Purpose, Needs, and Evaluation Measures.** Informed by the findings in Step 1, this step defines the overall purpose of the transportation investment and the specific needs of the roadway for each of the intended users of the roadway. Project evaluation measures should also be developed that will be used to determine how well different potential alternative solutions meet the needs of all users.
3. **Define and Evaluate Alternatives.** Based on the needs for each user, this step defines a range of alternatives. These alternatives should be analyzed to compare how well each one meets the needs of all intended users.

FIGURE 3-1 COMPLETE STREETS PLANNING APPROACH



Source: Adapted from FDOT District 5 Multimodal Corridor Planning Guidebook

PROJECT EVALUATION MEASURES

Project evaluation measures allow project teams to evaluate alternatives based on the purpose and needs of a project and the roadway's context classification(s). Currently, FDOT utilizes vehicular LOS and safety measures for roadway and area studies. Some projects go beyond these LOS measures and safety, and evaluate accessibility and comfort for all users. Multimodal project evaluation measures can be applied to all projects, including planning studies, new construction, reconstruction, RRR projects, traffic operations, and safety projects.

Project evaluation measures should be tailored to understand each alternative's ability to respond to the project's documented purpose and needs. The extent and type of evaluation may vary depending on the time and resources available — RRR projects, for instance, will have a shorter timeframe than a planning study or new construction project. Judgment should be used in determining the appropriate level of evaluation. Table 3-1 provides a menu of potential project evaluation measures based on Complete Streets best practices. This list is not intended to be exhaustive or prescriptive. The list draws from industry best practices, including the latest guidance and research from FHWA, such as the **FHWA Guidebook for Developing Pedestrian and Bicycle Performance Measures**. Evaluation measures should relate to a project's purpose, needs, and objectives. An example is shown in Table 3-2.

In addition to the evaluation measures listed in Table 3-1, other project measures could be applied over the length of a roadway or at an area-wide level. Some of these include:

- Person throughput (i.e. the total capacity for a roadway based on vehicular, transit, bicycle, and pedestrian throughput)
- Network completeness (i.e. the continuity of sidewalk and bicycle facilities)
- Street connectivity
- Person-miles traveled
- Access to jobs, housing, retail, civic facilities, and recreational facilities
- Mode split

The evaluation measures above and those presented in Table 3-1 focus on transportation-

related elements. Projects may also require detailed evaluation of potential impacts and benefits related to environmental, socio-cultural, economic, and human elements as described in the **PD&E Manual**. Refer to the **PD&E Manual** for details on those evaluation measures.

TABLE 3-1 EXAMPLES OF POTENTIAL PROJECT-LEVEL EVALUATION MEASURES BY MODE

Vehicular

- Vehicular LOS (refer to the **Q/LOS Handbook**)
- Volume-to-capacity ratio
- Estimated potential crash reduction utilizing crash modification factors (CMFs)
- Travel-time reliability
- Peak and off-peak travel time between key origins and destinations
- Project cost and cost effectiveness

Freight

- Travel-time reliability
- Ability to serve freight origins and destinations
- Peak and off-peak travel time
- Project cost and cost effectiveness

Transit

- Transit LOS (refer to the **Q/LOS Handbook**)
- Number of ADA-compliant transit stops
- Travel time
- Travel time reliability
- Percent of population within the study area that are within 1/2 mile network distance from a transit stop
- Project cost and cost effectiveness
- Weekday span of service

Bicycle

- Bicycle LOS (refer to the **Q/LOS Handbook**)
- Bicycle Level of Stress analysis
- Percent of roadway served by an exclusive bicycle facility
- Estimated potential crash reduction utilizing CMFs
- Percent of roadway with bicycle facilities meeting current standards for roadway context
- Bicycle delay at intersections
- Travel time
- Project cost and cost effectiveness

Pedestrian

- Pedestrian LOS (refer to the **Q/LOS Handbook**)
- Pedestrian Level of Stress analysis
- Percent of sidewalk coverage/linear feet of sidewalk
- Average or range of distances between marked pedestrian crossings
- Percent of ADA-compliant pedestrian crossings
- Average or range of pedestrian delay at intersections
- Presence of pedestrian refuge islands
- Sidewalk continuity along the roadway and throughout the surrounding network
- Presence of shade
- Adequate pedestrian-level street lighting
- Estimated potential reduction in crashes utilizing CMFs
- Travel time
- Project cost and cost effectiveness

TABLE 3-2 EXAMPLES OF HOW PROJECT EVALUATION MEASURES CAN BE LINKED TO PROJECT PURPOSE AND NEEDS

Purpose	Needs	Objectives	Evaluation Measures
Serve anticipated future travel demand	An additional 10,000 vehicular trips are projected along the roadway in 20 years	Increase capacity for regional trips	Peak-hour travel times from point A to point B
Provide safe travel options along roadway	Number and percent of rear-end crashes in the last 5 years is higher than statewide averages of similar facilities	Decrease rear-end crashes	Potential reduction in rear-end crashes
	Number of fatal and serious injury crashes in the last 5 years is higher than statewide averages of similar facilities	Decrease the severity of automobile crashes	Potential for reducing the severity of crashes
	Number of fatal and serious injury pedestrian crashes in the last 5 years is higher than statewide averages of similar facilities	Decrease number and severity of pedestrian crashes	Linear feet of roadway with adequate levels of pedestrian lighting
Provide multimodal mobility options that support local economic development goals	10 percent of households in the study area do not have access to an automobile	Increase mobility through walking and bicycling	Percentage of roadway with sidewalks and bicycle facilities meeting current standards for context classification
		Increase ease of transit use	Number of ADA-compliant transit stops Percent of population reached within 0.25 miles of improved transit stops
	A new activity center along a major state roadway will introduce an additional 3,000 new daily vehicular trips	Maintain vehicular mobility	Overall street connectivity
			Intersection LOS Travel-time reliability
Support freight access to businesses	Retail and restaurants along the corridor require daily deliveries	Allow efficient local area delivery	Presence of loading and unloading zones near businesses

Local Vision and Economic Development Goals

Beyond the project evaluation measures identified in Table 3-1, investments should be aligned with local and regional land use and economic development plans and visions to the maximum extent feasible. Developing a roadway design that is consistent with the context classification will help ensure that investments support the local vision. Additionally, the planning process should seek the input of stakeholders, weigh alternatives against a broader community vision, and work to obtain stakeholder buy-in.

Balancing Competing Needs

The context classification informs the types of users and the intensity of uses within each context classification. For almost every project, the needs of users can be addressed in multiple ways. The alternatives developed to respond to those needs should explore a variety of methods and means for meeting them.

Sometimes, due to limited right of way, difficult choices may have to be made for how to serve different users along a roadway. For example, in a higher intensity area such as a C5-Urban Center or C6-Urban Core, local business owners might like to prioritize on-street parking over a dedicated bicycle facility. One way to address such a case would be to look beyond the roadway and consider the larger network in the

development of alternatives. The FDOT Complete Streets policy is founded on the concept of a complete network. Where it is not possible to provide similarly high-quality facilities for all modes along all FDOT roadways, it may be necessary to rely upon parallel networks to provide additional travel options.

The network approach requires close coordination between FDOT and local communities. In the example of prioritizing on-street parking over a dedicated bicycle facility, analysis should be informed by local vision, availability of parallel routes, and the local partner's willingness to invest in and maintain parallel facilities. A decision could also be informed by technical analysis of bicycling trip origins and destinations, the need for bicycling connectivity, safety data, and user input. In many cases, there may not be one clear-cut alternative that equally serves users at the same level of service. Selecting a well-vetted set of evaluation measures that relate to the project purpose and needs will frame a discussion and decision-making process and provide information to help FDOT, the public, and local officials understand the trade-offs among the alternatives. Potential

measures to evaluate the trade-offs in this example might include:

- Understanding the trade-offs between impacts on safety versus convenience of users (e.g., asking motorists to park and walk an extra block to access destinations, versus asking bicyclists to ride in mixed traffic);
- Economic impact (understanding the potential economic development impact of convenient on-street parking spaces versus a bicycle facility adjacent to businesses); and
- How each alternative supports other defined project needs.

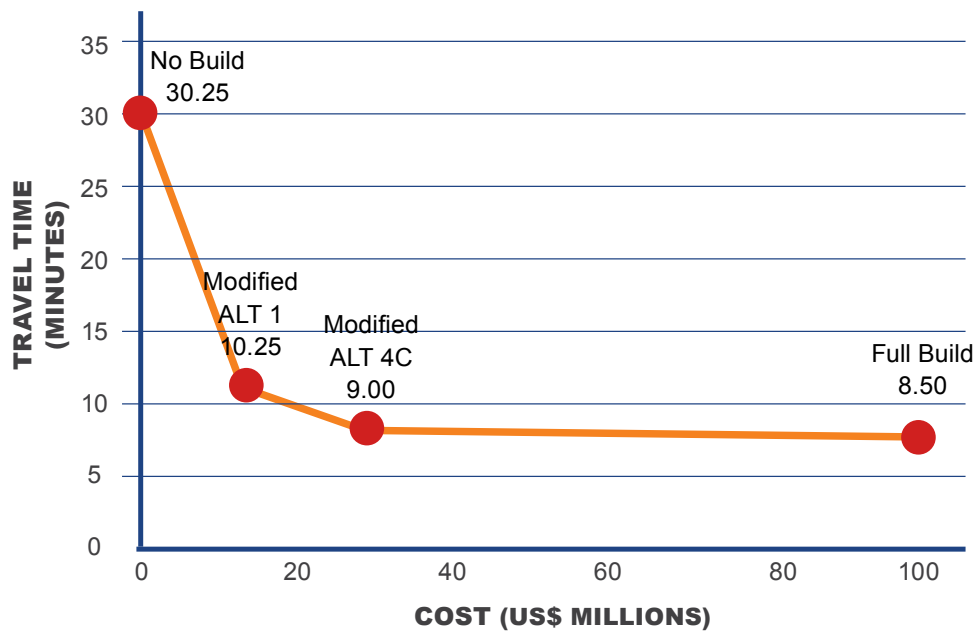
Figures 3-2 and 3-3 illustrate examples of how trade-offs among alternatives can be communicated to decision makers and stakeholders.

Additional guidance for defining the project purpose and needs, and developing and evaluating alternatives that accommodate each user, will be incorporated in the *PD&E Manual*. The guidance will also be

FIGURE 3-2 EXAMPLE OF HOW TO COMMUNICATE RESULTS OF EVALUATING ALTERNATIVES FOR EACH MODE

	Alternative A	Alternative B	Alternative C
 Pedestrian			
 Bicyclist			
 Car			
 Transit			
 Freight			
 Fully Meets Needs	 Partially Meets Needs	 Does Not Meet Needs	

FIGURE 3-3 EXAMPLE OF ILLUSTRATING TRADE-OFFS BETWEEN ALTERNATIVES



Source: Marshalls Creek Study, PennDOT Smart Transportation Case Study

included in the FDOT Alternative Corridor Evaluation (ACE) process which is performed prior to the PD&E phase (see Part 1, Chapter 4, of the PD&E Manual). FDOT uses the ACE process to identify, evaluate, and eliminate alternative corridors on certain types of projects that qualify for ETDM screening prior to the PD&E phase (see Chapter 2 for definition of qualifying and non-qualifying projects).

FDOT District 5 has developed guidance on best practices that can be used during the planning phase of a project. This guidance, the **Multimodal Corridor Planning Guidebook**, provides some best practices and examples of defining the problem, purpose and needs, and developing alternatives that consider the perspectives of all users.

DEFINING CONTEXT CLASSIFICATION IN THE FDOT PROCESS

The context classification of a roadway provides guidance on the anticipated users of the roadway. Understanding the needs of all users at these early phases assures that the project scope of work will define all necessary improvements and that the budget

is adequate for design, right of way, and construction. The context classification and users will inform key design elements, such as the design speeds, lane widths, and types of pedestrian, bicycle, transit, and freight facilities to be included in the design concept.

All FDOT projects on non-limited-access roadways require the evaluation and documentation of context classification early in the life of a project. The context classification will be defined or confirmed at the beginning of each project phase, including planning, PD&E, and design. For RRR projects, which have a more compressed timeframe, the steps to identify context classification may need to be taken ahead of time (where possible) or abbreviated. Context classification evaluation is incorporated as follows:

- For Non-Qualifying Projects: During the work program development cycle and prior to the development of the design scope of work; and
- For Qualifying Projects: During the ETDM screening.

NON-QUALIFYING PROJECTS

For projects not going through ETDM screening, Figure 3-4 outlines the potential steps needed to determine the context classification prior to developing the scope of work for the design phase. This process is not intended to be prescriptive, but rather outlines the key actions needed to define the context classification so that such actions can be incorporated into existing scoping processes. It is imperative that the context classification and corresponding users of the roadway are determined prior to defining the scope of work and developing the concept(s) to be designed. Each district can assign staff who will oversee the determination of context classification. Multiple groups within each district should be involved in determining the context classification (such as Design, Program Management, Intermodal Systems Development, Planning, and other relevant technical experts, as needed). On projects where FDOT currently coordinates with local governments, FDOT will coordinate with local governments to determine context classification. The final determination of context classification will be made by FDOT. Refer to the **Public Involvement Handbook**, **FDM**, **PD&E Manual**, and **Project Management Handbook** for guidance on local government coordination.

RRR projects will be designed and implemented consistently with the context classification evaluation defined in this Handbook and the design criteria outlined in the **FDM**. Any design elements required by the **FDM** criteria that are not typically provided through funding sources for resurfacing activities should be supplemented with additional Federal, State, or local funds. FDOT project managers should coordinate with the Work Program staff in their district to assemble a funding package to meet specific project needs. Additional guidance regarding the eligibility of these funds can be found in the **Work Program Instructions**.

The general steps to determine the context classification and the scope of work for non-qualifying projects are shown in Figure 3-4 and described as follows:

STEP 1: Identify the candidate project.

STEP 2: Collect and assess data, including SIS designation if applicable, to understand the existing conditions and inform the context classification. The

data requirements and methods for determining the context classification are described in detail in Chapter 2 of this Handbook.

STEP 3: Identify a preliminary context classification along with a list of the intended user needs of the roadway.

STEP 4: Engage local governments (for projects that currently involve local governments) and other FDOT technical experts and conduct field reviews, discuss the context classification, and develop preliminary concept(s). It may be beneficial to document context classification discussions through a formal agreement. Appendix E presents a draft sample local agreement, to be used and edited at the discretion of the district.

STEP 5: Confirm and document the context classification and share draft concept(s) and preliminary budget estimates with local governments, when appropriate.

STEP 6: Develop the draft scope of work, schedule, and budget estimates for the draft concept(s). If the proposed project involves work beyond what is required by the design criteria in the **FDM**, initiate agreements with local governments.

STEP 7: Hold internal technical review meetings with FDOT district staff to confirm the final scope of work.

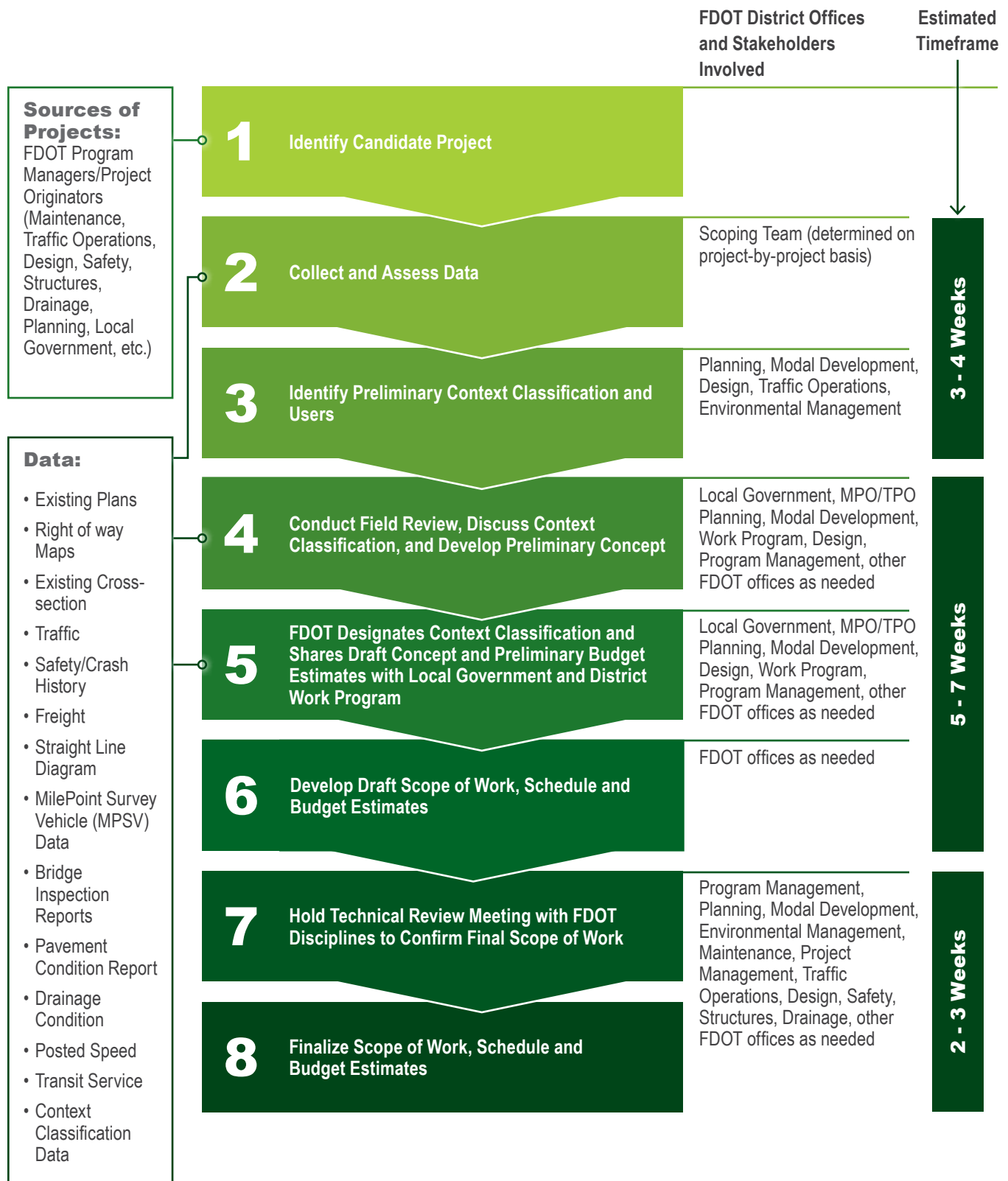
STEP 8: Finalize the scope of work and develop the schedule and budget estimates for the design phase. If local agreements are needed per Step 6, these are then finalized.



Multimodal elements can be incorporated through improvements as part of RRR projects, such as re-striping to narrower vehicle lanes to accommodate buffered bike lanes.

Location: SR A1A, Fort Lauderdale, FL

Source: FDOT

FIGURE 3-4 EXAMPLES OF STEPS TO DEFINE THE CONTEXT CLASSIFICATION AND SCOPE OF WORK FOR NON-QUALIFYING PROJECTS

Multimodal elements of projects should be addressed on all state roadways based on the context classification of the roadway, including RRR, traffic operations, and safety projects. The primary purpose of this process is to facilitate an understanding of the context classification and users before a concept, scope of work, and budget are determined. The general steps shown in Figure 3-4 show a comprehensive evaluation, but smaller projects such as push-button traffic operations may not require an extensive data collection effort or local government engagement.

When multimodal features are required to be built or expanded to meet FDOT criteria, the funding source for those elements must be identified as part of the scoping process. Identifying multimodal elements and potential additional funding needs early in the scoping process will enable funding types and budgets to be assigned appropriately to complement the RRR funding for each project.

FDOT anticipates that some RRR projects will take place on roadways that are either misaligned with the context classification, or where FDOT and local governments do not agree on the context classification. For example, if an RRR project in a C5-Urban Center Context Classification requires that pedestrian or bicycle facilities be provided based on **FDM** criteria and there is no space to accommodate them within the existing curb line or right of way, then discussions within FDOT and with local partners may be needed to determine how each of the roadway users can be accommodated. During the discussion, it will be determined if the RRR project should continue and the timing of the RRR in relationship to potential planning activities (refer to Figure 3-5). The following are two likely scenarios that may occur as a result. Other scenarios are conceivable, but these are anticipated to be the most likely:

- FDOT and the partners may agree that the RRR project will proceed within the existing constraints, and separate planning activities might occur to determine how to incorporate the **FDM**-required elements as a separate project. The level of planning effort will vary on a project-by-project basis. If all elements required in the **FDM** cannot be implemented immediately due to significant right of way limitations or impact to utilities, FDOT district staff will provide documentation through the design variation and exception process.
- FDOT and the partners may agree that the RRR project can incorporate the necessary **FDM** criteria, and that the RRR project will either be implemented within the original work program schedule or implemented later than the original intended work program timeframe. This decision will be coordinated with District Work Program staff.

If additional guidance or suggestions are desired, the district may contact the State Complete Streets Program Manager for assistance.

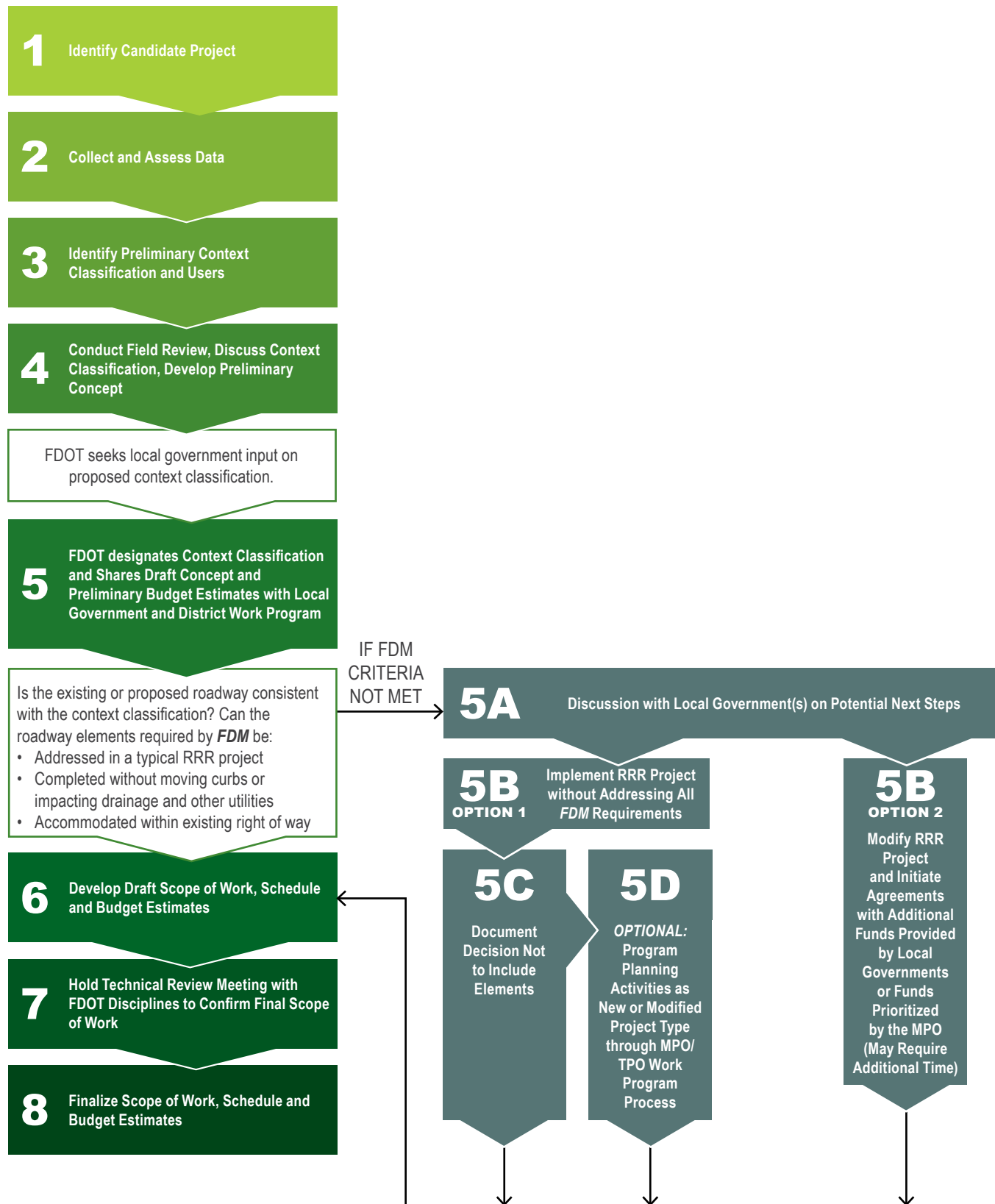


Coordination with local partners can inform context classification and help the project team better understand all the users and needs of a roadway.

Location: Clematis Street, West Palm Beach, FL

Source: FDOT

FIGURE 3-5 POTENTIAL APPROACH FOR RRR PROJECTS WHEN ELEMENTS OTHER THAN RESURFACING ARE REQUIRED FOR THE ROADWAY TO MEET **FDM** DESIGN STANDARDS



QUALIFYING PROJECTS SCREENED THROUGH ETDM SCREENING

Projects identified by MPOs and TPOs for inclusion in LRTPs are usually screened through FDOT's ETDM screening process. Examples of such qualifying projects might include additional through lanes which add capacity to an existing road (see Chapter 2 for definition of qualifying projects). The ETDM screening process provides agencies and other stakeholders with the opportunity for early input and consideration of the environment in transportation planning. The ETDM screening process is composed of the Planning Screen and the Programming Screen. The Planning Screen best occurs when considering projects for inclusion or prioritization within a Cost Feasible LRTP. The Programming Screen supports development of the **FDOT Five-Year Work Program** (see the **ETDM Manual** for details describing the ETDM screening process).

The ETDM Planning Screen and Programming Screen assist in identifying potential environmental constraints and are used to establish and communicate the project context. The ETDM screening contains the Preliminary Environmental Determination (PED) which summarizes the FDOT understanding of environmental issues on the project. The Environmental Technical Advisory Team (ETAT) and other stakeholders participating in the ETDM screening review the PED and provide comments to FDOT.

ETDM Planning Screen and Context Classification

The ETDM Planning Screen occurs prior to and as input into the LRTP/Cost Feasible Plan. The Planning Screen is conducted by either the FDOT District Environmental Management Office or the MPO/TPO, depending on the roadway type and resource constraints of the MPO/TPO.

The preliminary context classification will be identified in the PED and provided for review and comment to the ETAT (State and Federal agencies and tribes) and local governments for review. The results of this screening, including comments received during the screening, are documented in the Planning Screening Summary Report. Figure 3-6 illustrates the steps in the ETDM Planning Screen, including the step at which the context classification could be determined.

ETDM Programming Screen and Context Classification

The ETDM Programming Screen is completed prior to a PD&E Study. The context classification will be identified or updated during this screening. As with the Planning Screen, the context classification will be documented as part of the PED and reviewed by the ETAT, with results incorporated into a report (the Programming Screening Summary Report). Chapter 4 of the **ETDM Manual** provides more details on the Programming Screen. Figure 3-7 illustrates the point at which the context classification will be reviewed and updated as part of the ETDM Programming Screen.

PD&E and Context Classification

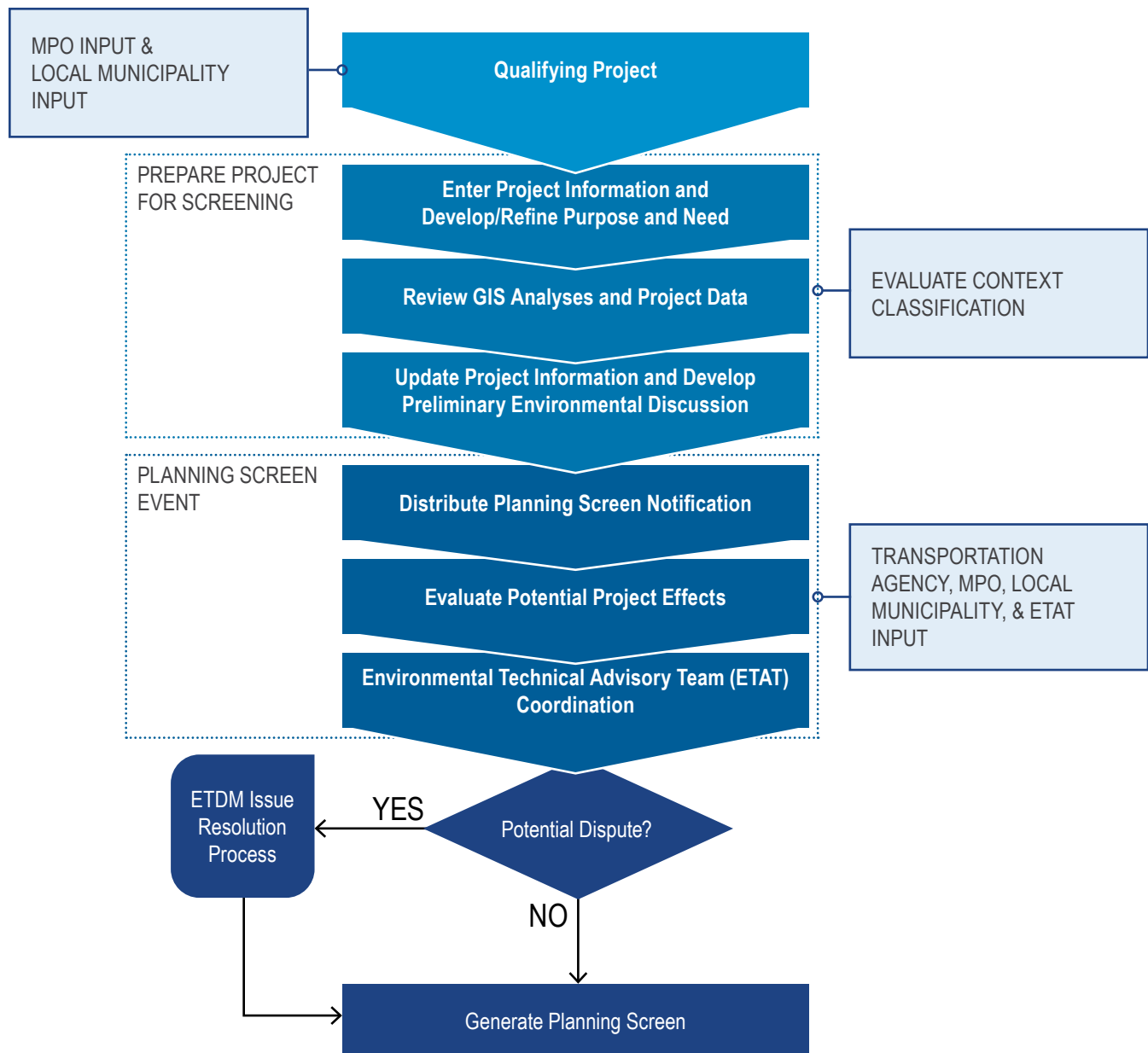
The use of the context classification continues during the PD&E process. The context classification for the project will be stated in the project description. The context classification determined during ETDM screening may be refined following coordination with local governments or if additional land use data becomes available during the PD&E study. Criteria used to determine the context classification will be documented into the existing land use and future land use. The context classification and the intended users will be documented in the Preliminary Engineering Report or other related engineering documentations.



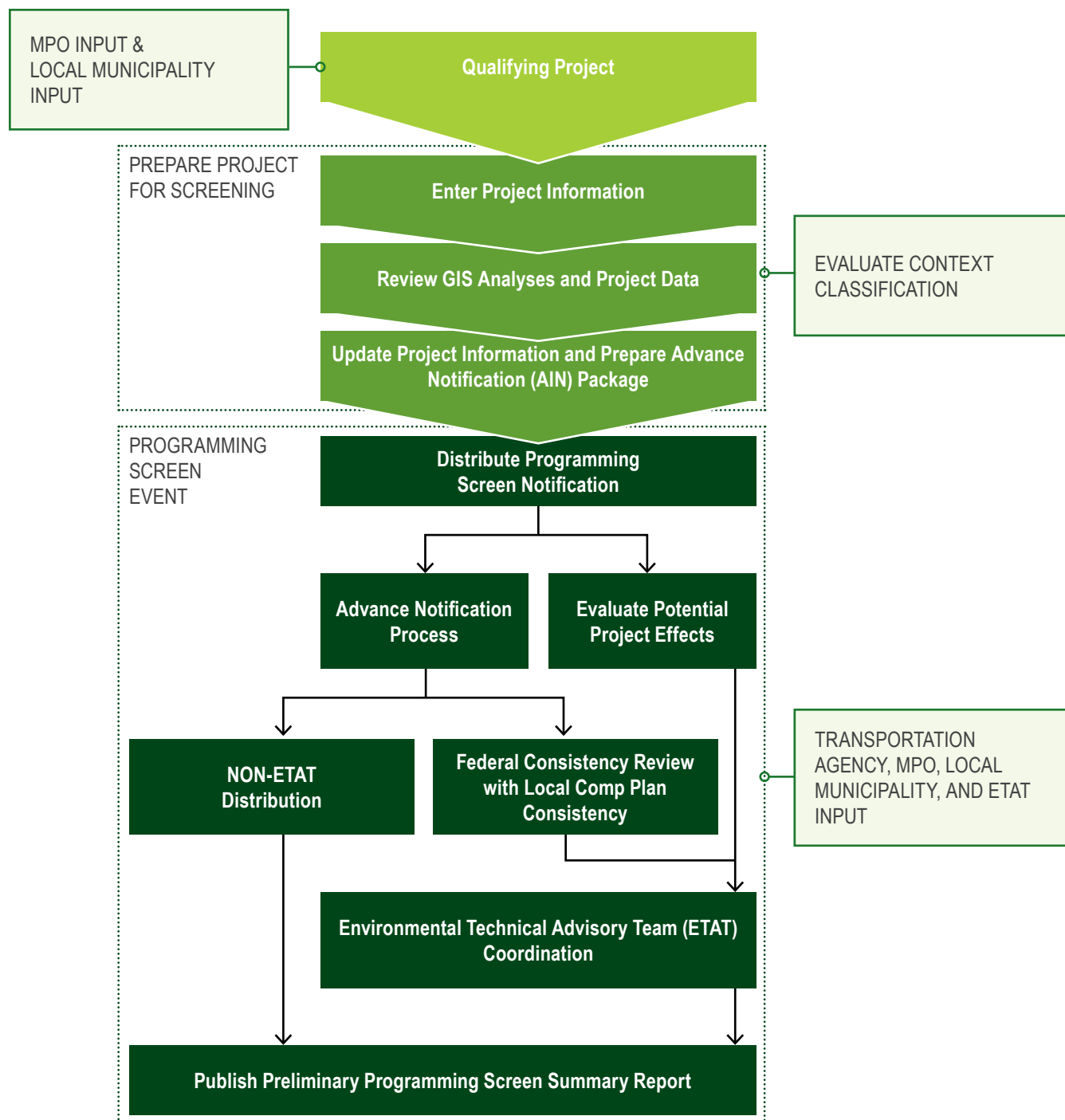
Public engagement in PD&E supports the application of context-based Complete Streets approach.

Source: KAI

FIGURE 3-6 ETDM PLANNING SCREEN AND CONTEXT CLASSIFICATION



Source: Adapted from the FDOT PD&E Manual

FIGURE 3-7 ETDM PROGRAMMING SCREEN AND CONTEXT CLASSIFICATION

Source: Adapted from the FDOT PD&E Manual

IMPLEMENTATION

The determination of a roadway's context classification is required in order to utilize the criteria in the **FDM**. The context-based criteria in the **FDM** will be required on projects that have not begun design by January 1, 2018, and may be applied to active design projects at the discretion of the district. For PD&E projects, implementation of context classification and the **FDM** is required for projects that have the Public Hearing scheduled in April 2018 or later. The 2017 **Plans Preparation Manual (PPM)** will apply through the completion of the PD&E studies for projects that have the Public Hearing scheduled prior to April 2018. Criteria contained in the **FDM** may also be applied earlier at the discretion of the district.

FUNDING AND MAINTENANCE

There is no separate FDOT funding category or FDOT funding source specifically for Complete Streets. Projects that require modifications to comply with criteria associated with the context classification will be funded through the funding programs currently available to Federal, State, and local roadways, as appropriate. The existing MPO funding process will remain the same.

FDOT will fund the maintenance of aspects of transportation projects that are necessary to comply with adopted FDOT design criteria contained in the **FDM**. If local governments or other partners would like to include features that go beyond what is required by FDOT design criteria, funding for the construction and maintenance of those additional components will be the responsibility of the local government or local partner, as defined in a local maintenance agreement. Current elements being maintained by local governments or other partners as part of local maintenance agreements (e.g. traffic signals on state roadways) will continue to be maintained per the agreements in place.

Design Considerations for Complete Streets

FDOT's Complete Streets approach calls for selecting design controls to reflect the roadway context and intended outcomes, and then applying appropriate design criteria based on these design controls. This chapter discusses:

- Context-based design controls and how they influence multimodal travel; and
- Effects of the transportation network on roadway design.

This Handbook is not intended to be a design manual; rather, it offers guidelines for a successful design approach. Refer to the **FDM** for the latest context-based design criteria. FDOT also has a number of handbooks and guidance documents that provide information on tools for implementing Complete Streets. A list of guidance documents is included in Appendix F.



*Consider the range of users in roadway design.
Location: Commonway Road, Orlando, FL
Source: KAI*

CONTEXT-BASED DESIGN CONTROLS

For implementation of context-based planning and design, the **FDM** and other FDOT manuals will provide a range of design controls based on FDOT's context classification and functional classification. The key context-based design controls are:

- Design users
- Design vehicle
- Design speed
- Traffic characteristics

These design controls are described in this Handbook and discussed in detail in the **FDM** and other manuals.

DESIGN USERS

Design users are those anticipated users of a roadway (including drivers, pedestrians, bicyclists, and freight handlers) that form the basis for each roadway's design. Roadway users' varying skills and characteristics introduce a variety of human factors that can influence users' driving, walking, and bicycling capabilities. Design users should be taken into consideration when determining design details such as sidewalk widths, type of bicycle facility, design speed, signal timing and spacing, location of pedestrian crossings, number of vehicular travel lanes, intersection width, and lighting.

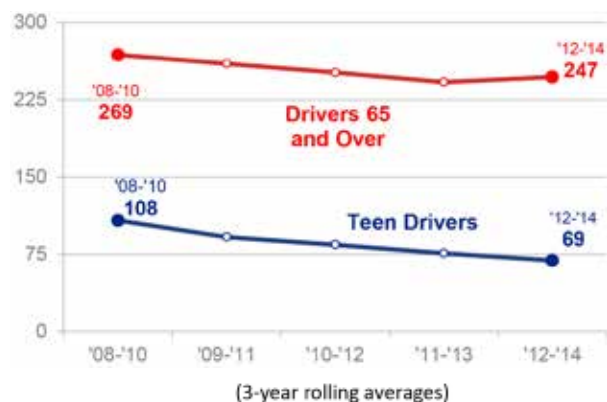


Driver

Driver performance informs roadway design. Designers should pay attention to roadway elements that can influence the safety of at-risk drivers, particularly in areas with higher concentrations of these

at-risk populations. FDOT has identified teen drivers (age 15 to 19) and aging drivers (age 65 and up) as at-risk drivers. The 2010 census reports that these age groups make up almost one-quarter of Florida's population. Fatalities involving teen drivers and aging drivers have historically accounted for approximately one-quarter of all Florida traffic fatalities (see Figure 4-1).¹ As compared to other drivers, older drivers tend to process information more slowly, and have slower reaction time, deteriorated vision and hearing, and limited depth perception.² For additional information, refer to the FHWA publications *Highway Design Handbook for Older Drivers and Pedestrians* and *Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians*.

FIGURE 4-1 FATALITIES IN FLORIDA INVOLVING AT-RISK DRIVERS



Source: FDOT 2015 Performance Report



Pedestrian

Pedestrians are among the most vulnerable roadway users. In 2014, pedestrians made up 24 percent of Florida's transportation fatalities (see Figure 4-2).³ Pedestrian characteristics that serve as design

controls include walking speed, walkway capacity, and the needs of persons with disabilities. The 2010 census reports that 19 percent of the population in the United States had a disability in 2010.⁴ Age plays an important role in how pedestrians use a facility, as older adults are the most vulnerable pedestrians.⁵ The Complete Streets approach considers the pedestrian design user to represent people with a range of abilities, including the elderly, children, and persons with disabilities. This is especially true in context classifications where a higher level of pedestrian activity is expected. People with varying abilities require a continuously paved level surface on both sides of the roadway, a network that allows multiple and direct routes to destinations, short crossing distances, and protection from the weather. Several design elements have been found to assist elderly pedestrians, including simple designs, accommodation for slower walking speeds, and adequate median refuge islands at wide intersections. For additional information, refer to the FHWA publications *Highway Design Handbook for Older Drivers and Pedestrians* and *Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians*.



Consider people with a range of abilities.

Location: West Central Avenue, Lake Wales, FL

¹ Florida Department of Transportation, 2015 Performance Report, 2015, p. 1-10, <http://www.dot.state.fl.us/planning/performance/2015/2015PerformanceReport.pdf>.

² American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 6th Edition, 2011, pp. 2-43.

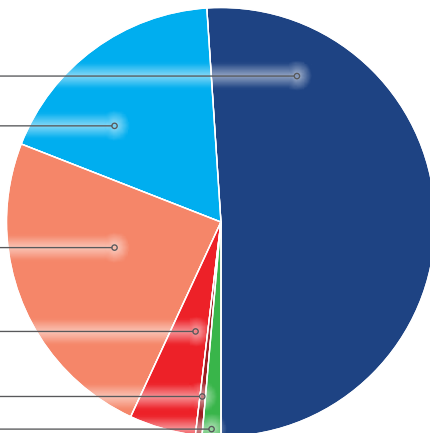
³ Florida Department of Transportation, 2015 Performance Report, (2015), p. 1-6.

⁴ United States Census Bureau, "Nearly 1 in 5 People Have a Disability in the U.S., Census Bureau Reports," July 25, 2012, <https://www.census.gov/newsroom/releases/archives/miscellaneous/cb12-134.html>.

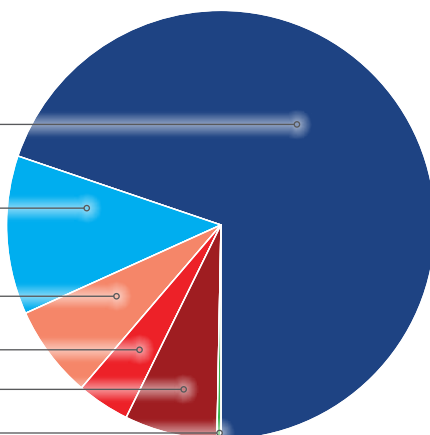
⁵ "Aging Road User," accessed September 22, 2016, <http://www.safeandmobileseniors.org/AgingRoadUser.htm#Bicyclists>.

FIGURE 4-2 FLORIDA TRANSPORTATION FATALITIES AND SERIOUS INJURIES BY MODE, 2014**Fatalities**

Vehicle	51%
Motorcycle	18%
Pedestrian	24%
Bicycle	5%
Transit	0.5%
Others	1.4%

**Serious Injuries**

Vehicle	70%
Motorcycle	12%
Pedestrian	7%
Bicycle	4%
Transit	7%
Others	0.3%



Source: FDOT 2015 Performance Report



The needs of bicyclists vary by age, experience, and trip purpose. Location: US 17/92, Orlando, FL (right), SR A1A, Deerfield Beach, FL (top left), and Alton Road, Miami Beach, FL (bottom left)

**Bicyclist**

Bicyclists pose different safety and geometric considerations and must also be considered in roadway design. Bicyclist characteristics vary by skill level, age, experience, preferences and trip purpose.

Bicycling trip purposes are broadly categorized into utilitarian trips and recreational trips:

- Utilitarian trips are non-discretionary trips needed as part of a person's daily activity, such as commuting to work or shopping.
- Recreational trips include trips for exercise or social interaction. Experienced riders or those who travel regularly, and casual riders or infrequent users all make recreational trips.

Data on trip purpose and experience level provide some information on bicyclist characteristics and preferences. Long distance and experienced adult riders tend to:

- Be more comfortable riding with vehicles on streets. Some will prefer to ride in mixed traffic on lower speed streets, while others will prefer dedicated bicycle facilities
- Ride at speeds up to 25 mph on level ground⁶

Casual, infrequent, and younger riders tend to:

- Prefer a physical separation from vehicular traffic
- Ride on the sidewalk
- Achieve travel speeds of around 8 to 12 mph
- Bicycle shorter distances

The bicyclist design user should reflect the long distance and experienced rider in all context classifications, and the casual and younger rider where possible. The need to accommodate casual and younger riders might be indicated by:

- Origins and destinations that generate bicycle trips along or in close proximity to a roadway, such as schools, parks, high-density residential housing, shopping centers, and transit stops
- Roadways within well-connected street networks

⁶ American Association of State Highways and Transportation Officials, Guide for the Development of Bicycle Facilities Fourth Edition, 2012, p. 15.

- Roadways that connect to local or regional dedicated bicycle facilities
- Data showing that bicyclists are currently riding on the sidewalk
- Public input

AASHTO's *Guide for the Planning, Design and Operation of Pedestrian Facilities* (2004) and *Guide for the Development of Bicycle Facilities* (2012) expand significantly on the *AASHTO A Policy on Geometric Design of Highways and Streets* (*AASHTO Green Book*), presenting factors, criteria, and design controls. See the *FDM* for FDOT criteria related to bicycle and pedestrian facilities.



The roadway design must take the design vehicle into consideration.

DESIGN VEHICLE

FDOT is developing new guidance for freight roadway design that will address selection of the design vehicle based on context and users. Currently, the selection of a design vehicle is controlled by FDOT rules and regulations that reflect the largest vehicle that may be assumed to use the roadway (WB-62FL). The design vehicle must be accommodated on all state roadways. In areas where the context classification suggests a demand for multimodal travel, the turning template of a smaller vehicle may be more appropriate for turning movements at intersections where cross streets will not be expected to have significant levels of truck traffic.

Assuming a WB-62FL design vehicle for all movements at all intersections can result in suboptimal intersection designs for pedestrians (see Figure 4-3). Because WB-62FL turning movements are infrequent in urban contexts and at intersections with

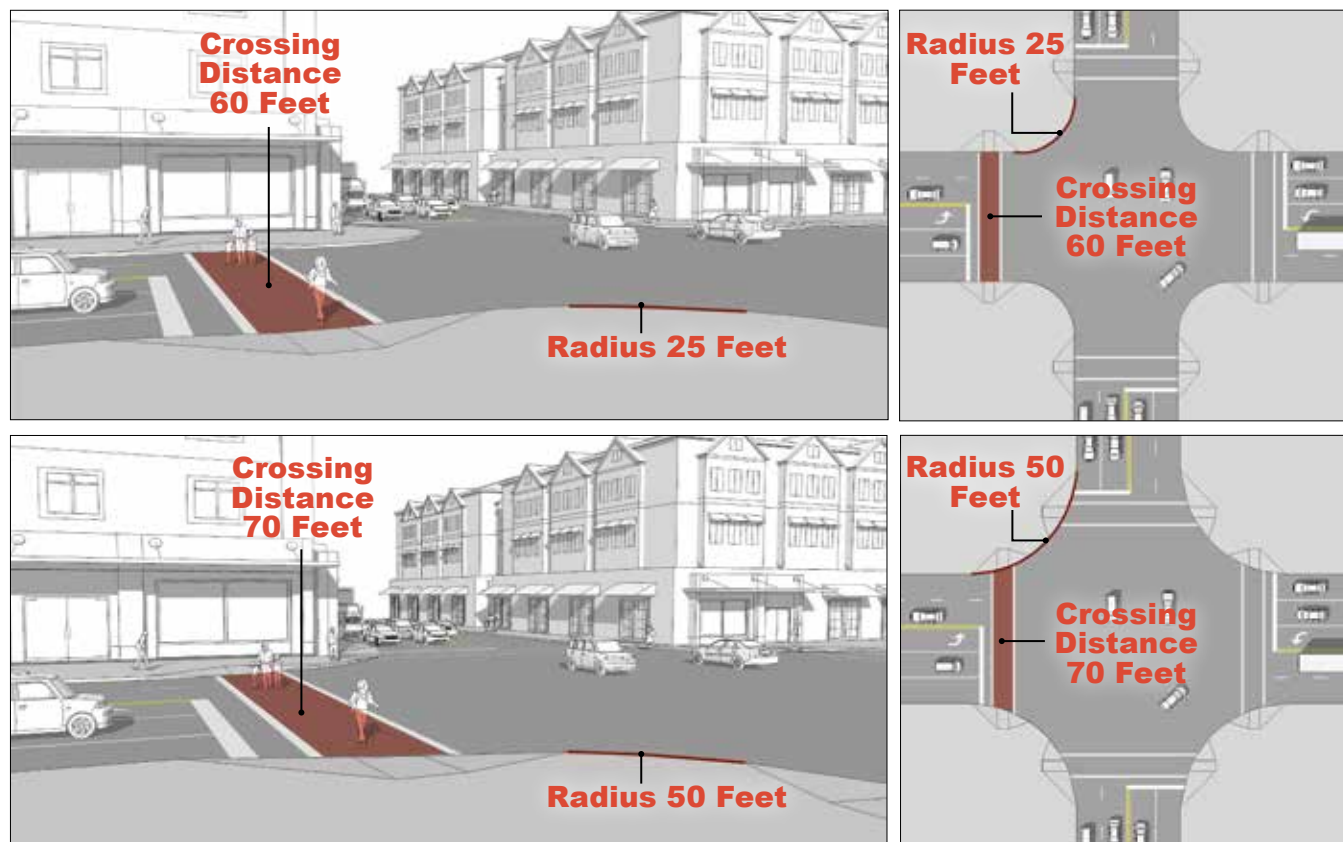
local or collector streets, designs that accommodate a WB-62FL design vehicle without encroachment for all turning movements may result in more pavement and longer pedestrian crossing distances than are necessary for most turning maneuvers. Larger turning radii are difficult to achieve in the constrained conditions that exist in many of the most urban contexts. Such designs also result in higher speeds for turning vehicles of all sizes. Additional pavement increases the capital cost and right of way costs of an improvement, particularly where urban development densities contribute to high property values.

The consideration of a smaller design vehicle for turning movements between designated freight roadways and other roadways can help balance goods movement with access for and comfort of other users. Recommended by the National Association of City Transportation Officials (NACTO), the Institute of Transportation Engineers (ITE), and the CNU, this approach introduces the concept of both a design vehicle and a control vehicle in designing roadways. The control vehicle is the largest vehicle that can be expected to make use of the roadway. In this approach, the current WB-62FL design vehicle is termed a “control vehicle.” A smaller vehicle, such as a transit vehicle expected to make frequent turns, is considered the design vehicle. The design of an intersection should consider the turning movements of both the design vehicle and the control vehicle:

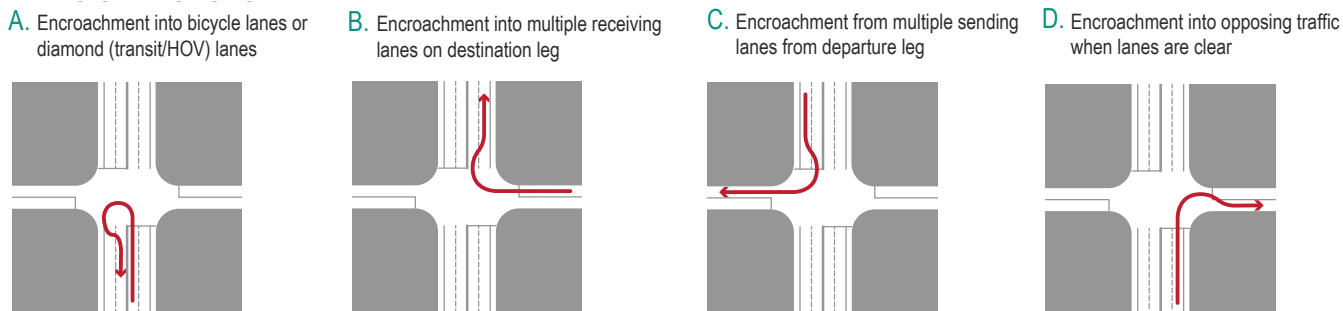
- The design vehicle is the vehicle that must be accommodated without encroachment into opposing traffic lanes.
- The control vehicle is the infrequent vehicle that must be accommodated by allowing:
 - Encroachment into opposing lanes if no raised median is present (see Figure 4-4).
 - Minor encroachment into the street side area if no critical infrastructure (traffic signal, poles, etc.) is present.⁷ This type of encroachment should take into consideration the visibility and safety of non-motorized users.

Further information on the use of the control vehicle will be provided in the upcoming FDOT freight roadway design guidance.

⁷ Florida Department of Transportation District 7, Freight Roadway Design Considerations, 2015.

FIGURE 4-3 RELATIONSHIP BETWEEN CURB RADII AND PEDESTRIAN CROSSING DISTANCE

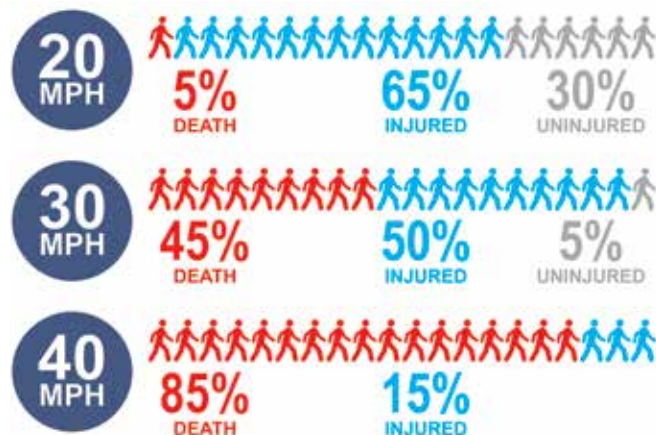
Curb radii has significant influence on the pedestrian crossing distance at intersections. Top and bottom illustrations compare the crossing distances between an intersection with 50 feet and 25 feet curb radius.

FIGURE 4-4 TYPE OF ENCROACHMENT INTO OPPOSING AND ADJACENT LANES THAT CAN OCCUR FOR CONTROL VEHICLE

DESIGN SPEED

Research confirms that lower vehicular speeds are safer, and that lowering speed limits can decrease both crash frequency and severity (see Figure 4-5).⁸ However, speeds cannot be reduced simply by changing posted speed limits. Roadway geometric and cross-sectional elements, in combination with the context, establish a driving environment in which drivers choose speeds that feel reasonable and comfortable.⁹

FIGURE 4-5 VEHICULAR IMPACT SPEEDS AND PEDESTRIAN RISK OF FATALITY AND SERIOUS INJURY



Lower vehicular speeds can decrease both pedestrian crash severity and fatality rates.

Source: "Killing Speed and Saving Lives - The Government's Strategy for Tackling the Problems of Excess Speed on our Roads." London: Department of Transport, November 1992.

Appendix D presents proposed design speed ranges for all arterial and collector state roadways by context classifications. More details on the design speeds and other design controls based on context classification are presented in the **FDM**. Design criteria, as well as application of engineering judgment, will assist in selecting the appropriate design speed for a roadway. Questions that should be asked to determine appropriate design speed include:

- **Average trip length:** How far is the average vehicular trip along the roadway? What percent

of the vehicular trips are coming from and going to destinations along the roadway, and how many trips travel through the roadway? Answers to these questions will help identify the balance of local access versus regional mobility along a roadway.

- **Signal spacing:** What is the average signal spacing along the roadway? How much of the vehicle delay occurs at the signal?
- **Access management:** What is the access management classification?
- **Special user groups:** Is there a special user group along the roadway (e.g. school children, visually impaired, senior population)?
- **Roadway function within the transportation system:** Is the roadway part of the SIS? Is it a designated freight route?
- **Land use/built environment:** Do buildings have shallow setbacks from the roadway and do entrances front the street?

The next release of the **Speed Zone of Highways, Roads, and Streets in Florida (Topic number 750-010-002)** will introduce a new speed concept called target speed. The concept of target speed is to identify a desired operating speed and develop design strategies and elements that help reinforce the operating speeds to be consistent with the posted or proposed speed limits (which may also be the design speed). A target speed should be consistent with the level of multimodal activity generated by adjacent land uses, to provide mobility and safety for all users. Target speed is influenced by elements of roadway design that are governed by design speed, as well as the form and function of the adjacent uses beyond the right of way.

For lower speed roadways, those with design speed 45 mph or less, it is desirable for the posted speed, the operating speed, and the design speed to be identical.

⁸ Federal Highway Administration, "Design Speed," last modified on October 15, 2014, http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_designspeed.cfm.

⁹ Federal Highway Administration, "Design Speed," last modified on October 15, 2014, http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_designspeed.cfm.

The following are roadway elements that could be used to influence operating speed.¹⁰ Some of these elements are not currently utilized on FDOT roadways, but can be considered on lower speed roadways depending on the context classification and transportation characteristics of the roadway. See the **FDM** for criteria related to roadway elements:

- Horizontal deflection (strategic use of roundabouts, splitter islands, location of on-street parking)
- Vertical deflections (such as raised intersections)
- Lane width
- Use of physical measures, such as curb extensions and medians, to narrow the traveled way
- Smaller curb-return radii at intersections and elimination or reconfiguration of high-speed channelized right turns
- Enclosure of a roadway formed by the proximity of a wall of buildings or other vertical built elements
- On-street parking to create side friction
- Proper use of speed limit, warning, and advisory signs, along with other appropriate devices to gradually transition speeds when approaching and traveling through a low-speed environment
- Street trees and other landscape treatments
- Striping of edge lines, bicycle lanes, or parking lanes
- Intersection spacing
- Setting signal timing to moderate progressive speeds from intersection to intersection

Additional information on the use of target speed and design elements to reinforce target speed will be provided in the next edition of the **Traffic Engineering Manual**.



On-street parking creates side friction.
Location: Centre Street, Fernandina Beach, FL
Source: FDOT



Roundabouts provide horizontal deflections.
Location: First Coast Highway, Amelia City, FL
Source: FDOT



Narrower travel lanes help manage speed and provide for wider bike lanes.
Location: Capital Circle NE, Tallahassee, FL
Source: FDOT

¹⁰ Kay Fitzpatrick et al., NCHRP Report 504: Design Speed, Operating Speed, and Posted Speed Practices, Transportation Research Board, 2003, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_504.pdf.

TRAFFIC CHARACTERISTICS

Vehicular traffic volumes and composition of traffic directly influence the selection of geometric design features, including number of lanes, lane widths, alignments, and grades. Design traffic defines the traffic volumes forecasted for the design year of a project, and has historically been the basis for determining the number of vehicular travel lanes (through and turning). Decisions related to design traffic often directly impact the comfort, safety, and convenience of other roadway users and the roadway's ability to successfully support the land uses along it. Consider the following elements to incorporate a context-based Complete Streets approach in roadway design.

Determining the Appropriate Design Year

The design year of a roadway project reflects the projected life of a the planned improvement. The design year is used to estimate future traffic demand and the volume expected along a roadway, and should account for anticipated future land use development. The **FDOT Project Traffic Forecasting Handbook** states that the design year is usually 20 years from the opening year (or the year of the targeted project completion), but may consider a shorter duration for minor safety and operational improvements.

The **AASHTO Green Book** states that estimating traffic volumes for a 20-year design period may not be appropriate for many rehabilitation projects. Due to the uncertainties of predicting traffic, rehabilitation projects may be developed on the basis of a shorter design period (5 to 10 years). The **AASHTO Green Book** further emphasizes that the design year decision is greatly influenced by fiscal realities, where limited resources require a balance between short-term and long-term investments.

Induced Travel of Excess Roadway Capacity¹¹

Induced travel is often characterized as “*If you build it, they will come.*” Induced travel describes the additional demand for travel when the cost of travel decreases, either in time savings or monetary costs. In locations where a variety of transportation options exist, congestion is often self-regulating, such that, when a roadway is congested, users will either choose a different route, travel during a different time of day, choose a different mode, or decide to not make the trip. When the capacity of a roadway is increased, travelers may switch to that roadway to take advantage of the decreased congestion and travel time.

Induced travel has been shown to result in increased Vehicle Miles Traveled (VMT) on the highway system. The overall user benefit per traveler decreases with increased VMT and the resulting increase in congestion. In addition, increased VMT due to new or longer trips can result in increased air and noise pollution. Lastly, building roadways with excess capacity often results in unintended consequences, such as faster vehicle operating speeds and longer pedestrian crossing distances. The impacts of allocating more capacity than is immediately needed for a roadway should be considered in evaluating the overall impacts and benefits of a roadway capacity project.

¹¹ Robert Cervero, “Are Induced Travel Studies Inducing Bad Investments?,” University of California Transportation Center, 2003.

Gilles Duranton and Matthew A. Turner, “The Fundamental Law of Highway Congestion: Evidence from the US,” *American Economic Review*, 2011.

Kent M. Hymel, Kenneth A. Small and Kurt Van Dender, “Induced Demand And Rebound Effects In Road Transport,” *Transportation Research Part B: Methodological* 44, no. 10 (2010): 1220-1241.

Todd Litman, “Generated Traffic and Induced Travel: Implications for Transport Planning,” *ITE Journal* 71, no. 4 (April 2001): 38-47.

LEVEL OF SERVICE

LOS is a quantified stratification used to describe the quality of travel on an A to F scale with LOS A representing the best operation conditions from the traveler's perspective and LOS F the worst. LOS standards have historically been developed and used to describe vehicular LOS, and are used to identify and prioritize transportation needs. Once a LOS threshold is adopted as a policy by a jurisdiction, roadways are designed, operated, and maintained to meet that LOS. Therefore, LOS standards have a varying and significant impact in the type, quantity, and quality of services provided for various modes along a roadway. The following are general principles related to how LOS standards can support Complete Streets.

Vehicular Level of Service

Vehicular LOS standards were intended to be used as a long-term planning tool, applied on a roadway corridor level but not at the intersection or segment level. The **FDM** discusses this understanding of LOS. FDOT's currently adopted vehicular LOS standards for state roadways (**Topic No.: 000-525-006-b**) states that LOS for state roadways during peak travel hours are LOS D in urbanized areas and LOS C outside urbanized areas. Many local agencies in Florida have adopted a similar standard for local roadways. FDOT is considering revisions to the LOS Policy to provide LOS targets instead of LOS standards to provide more flexibility in the application of this planning tool.

Pedestrian, Bicycle, and Transit Level of Service

Measuring the pedestrian experience requires quantifying safety and comfort for the pedestrian, based on pedestrian delay and other roadway attributes. The bicycle experience is generally described by the delay encountered at intersections and the attributes of the bicycle facility itself. Transit LOS is primarily focused on service levels rather than facility characteristics. However, because transit passengers typically must walk or bicycle to and from transit stops on either end of their trip, the quality of the walking experience at the beginning or end of a trip contributes to overall transit LOS.

The FDOT **Q/LOS Handbook** includes methodologies to calculate pedestrian, bicycle and transit LOS. As FDOT continues to update its standards and policies, it is exploring the possibility of working with local governments to establish appropriate LOS targets for multimodal mobility. These targets should be responsive to context, roadway function, network design, and user safety.

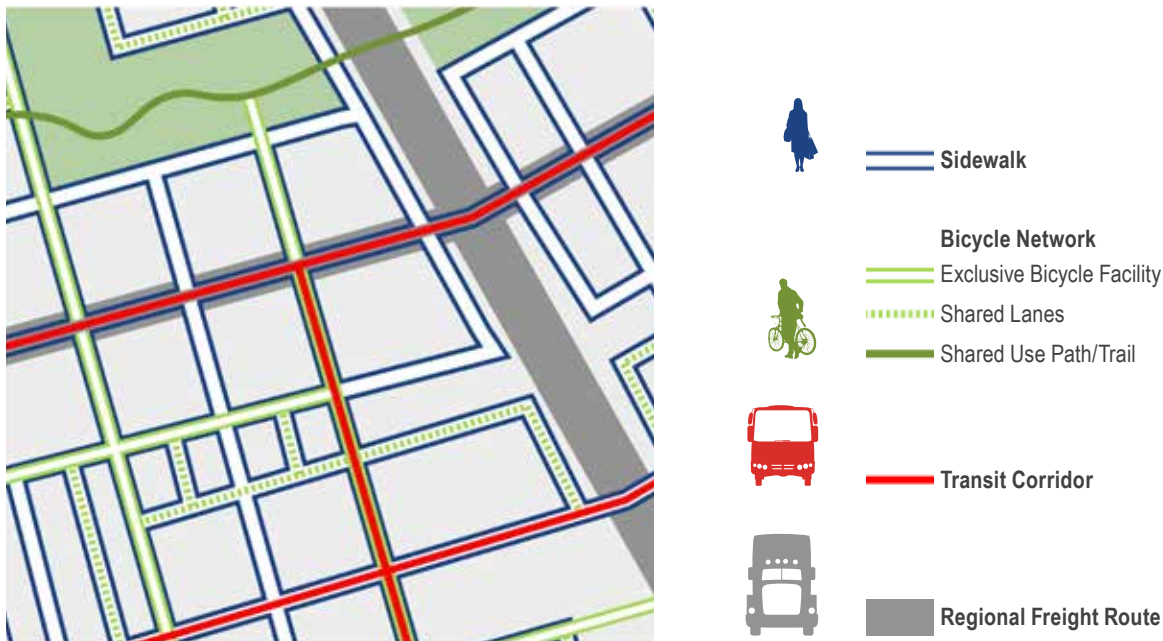
THE ROADWAY AS PART OF A SYSTEM

All roadways function as part of a broader transportation system. The safety, function and efficiency of a roadway are influenced by the other elements in the system. Parallel and connecting multimodal systems will influence the type of users and the travel demand on a roadway. The following section addresses how each roadway's ability to support all users is influenced by the transportation network. It also addresses transition zones needed between context classifications.

BUILDING A COMPLETE STREETS NETWORK

The FDOT policy states that the Department "...will routinely plan, design, construct, reconstruct and operate a context-sensitive **system** of Complete Streets." This Handbook furthers these ideas and emphasizes the need to support all users within a context-sensitive system of complete streets, according to each street's existing and desired future context and transportation characteristics. Figure 4-6 illustrates a conceptual idea of a context-sensitive system of complete streets, where each roadway contributes to the system's ability to serve all users.

Well-designed, connected roadway systems make travel more efficient by providing choice not only in modes, but also in routes. A fine-grained system of roadways and crossing opportunities provides more direct paths to destinations, reduces delay, and creates redundancy of path options for all users. Networks allow pedestrians, bicyclists, and transit riders to find direct routes to their destination or their transit stop. A system of connected roadways also disperses vehicular travel along multiple roadways.

FIGURE 4-6 CONTEXT-SENSITIVE SYSTEM OF COMPLETE STREETS

With multiple intersections and roadways sharing the traffic demand, there is less need to construct wider roadways or large intersections that could potentially create barriers to walking and bicycling and increase crash rates and severity for all users. A fine-grained network allows for roadways to complement each other, with some roadways providing better quality of service for high-speed travel, and other parallel roadways providing comfort, safety, and access for bicyclists and pedestrians.

Many roadways in Florida are built in C3C and C3R Suburban Context Classifications, with limited roadway connectivity and land uses dispersed along large areas of land. In these suburban contexts, the arterial roadway network typically supports both local access and regional mobility, concentrating most vehicular trips onto the state arterial roadways. Critical transit service, major employers, and retail services are also often located on these roadways. As investments are made along major arterial roadways, roadway design elements that support walking, bicycling, and transit use should be integrated. New local roadway connections and shared use paths should also be considered to complement and provide a network alternative to the arterial roadway system.

Due to right of way and financial constraints, it may not be possible to provide a similar level of accommodation for all travel modes, even though minimal accommodation appropriate to context classification is expected. In some locations, it may be desirable to rely upon parallel roadways to provide additional travel options for some modes. The system approach requires collaboration between FDOT and local communities, as all partners work together to develop a network of Complete Streets comprising of state and local roadways.

TRANSITION ZONES

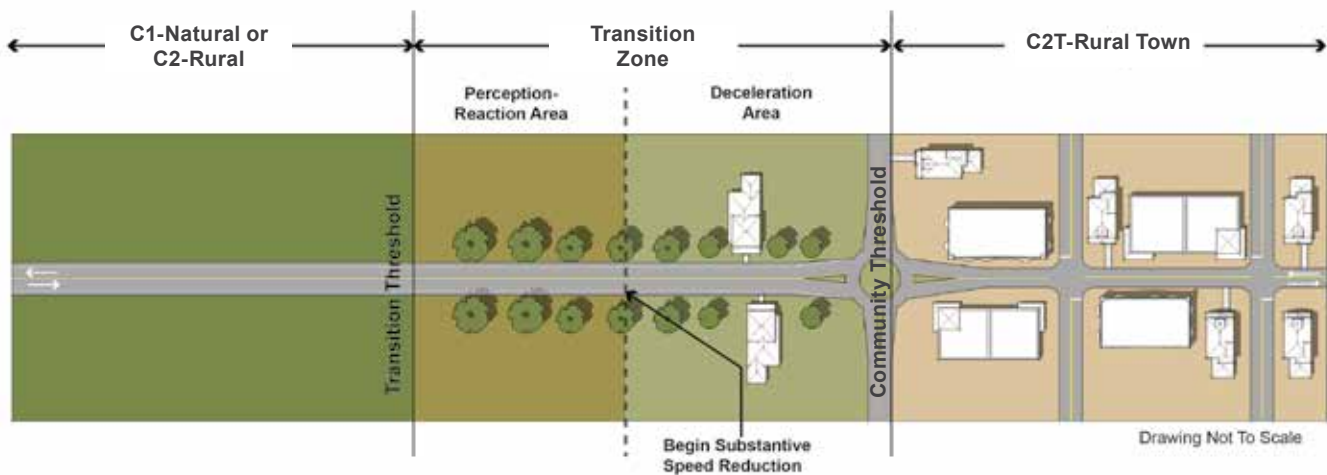
A roadway may traverse a variety of context classifications. As the context changes, the design criteria for the roadway will also change. This occurs across all context classifications, but the transition from C1-Natural or C2-Rural Context Classification to a higher classification such as C2T-Rural Town provides a particularly sharp shift in the recommended design speed and design users. For example, the land use surrounding SR 26 through Newberry, Florida transitions from C2-Rural to C2T-Rural Town over the course of a few blocks (see Figure 4-7). This condition requires a transition zone to alert drivers to the change and allow them to adjust their behavior and expectations accordingly. Changes in speed limit as part of transition zones will continue to comply with the requirement of the ***Speed Zone of Highways, Roads, and Streets in Florida (topic number 750-010-002)***.

NCHRP 737: Design Guidance for High-Speed to Low-Speed Transition Zones for Rural Highways defines two distinct sections in a transition zone: the perception-reaction area and the deceleration area (see Figure 4-8). The perception-reaction area is the portion of the transition zone where drivers are made aware of the need to reduce speed. This section has roadway characteristics similar to the rural context, but will include visual cues to alert the driver of an upcoming deceleration. These cues may include:

- Signage, including warning signs such as “reduce speed ahead” signs, or gateways signs where appropriate.
- Texture or pavement markings; lane narrowing can be highlighted with the use of a wider outside stripe or rumble strips.
- Curb changes, from flush paved shoulders to curbed roadway.
- Architectural elements such as type, location, and spacing of lighting and landscaping.

FIGURE 4-7 EXAMPLE OF A TRANSITION ZONE (SR 26 THROUGH NEWBERRY, FLORIDA)



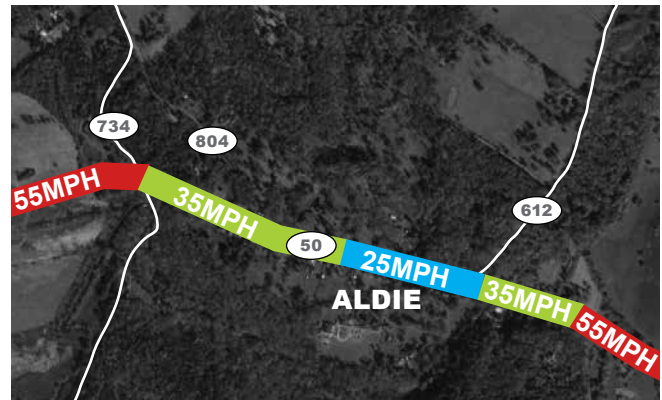
FIGURE 4-8 TRANSITION ZONE FROM C1-NATURAL/C2-RURAL TO C2T-RURAL TOWN CONTEXT CLASSIFICATION

Source: Adapted from NCHRP 737: Design Guidance for High-Speed to Low-Speed Transition Zones for Rural Highways.

The deceleration area is the portion of the transition zone where drivers are expected to decelerate to an operating speed that matches the context of the community being approached. In the deceleration area, there is a noticeable change in roadway characteristics. The length of the deceleration area is a function of design speed, sight distance, and design criteria of the town. Transition from a high-speed to low-speed cross section can be accomplished through a variety of geometrics features, including:

- Horizontal deflection, such as splitter islands, chicanes, or roundabouts
- Lane width narrowing
- Lane elimination
- Transverse pavement markings
- Introduction of curb and gutter
- Street enclosure through vertical landscaping
- Signage or gateway treatments

A combination of elements is more effective for reducing speeds than an individual design element. Figure 4-9 illustrates an example that utilizes horizontal deflection, lane width narrowing, introduction of curb and gutter, and a gateway treatment at the entrance of a rural town.

FIGURE 4-9 EXAMPLE OF A TRANSITION ZONE (SR 50, ENTRANCE TO TOWN OF ALDIE, VIRGINIA)

Transition zones at either side of the Town of Aldie with 35 MPH posted speed limit transitions drivers from 55 MPH posted speed to 25 MPH posted speed. (2016)

Source: Google Earth



Gateway feature, SR 50, Aldie, Virginia (2016)

Source: KAI

UNIQUE DESIGN CONSIDERATIONS

In a large and diverse state such as Florida, there will be locations that do not conform to the context classifications. Or, there may be areas where flexibility beyond the range of criteria contained in the **FDM** and a design variation or design exception is required.

DESIGNING FOR SPECIAL DISTRICTS (SD)

Special Districts are areas that, due to their unique characteristics and function, do not adhere to standard measures identified in the Context Classification Matrix (refer to Chapter 2). Examples include military bases, university campuses, airports, seaports, rail yards, theme parks and tourist districts, sports complexes, hospital campuses, and freight distribution centers. These areas are likely to have a unique set of users and needs when compared to the surrounding context classifications. There is no one set of design controls appropriate for all SDs. Project-specific data collection and engineering judgment should inform the selection of design controls for these areas. To select design controls and criteria in the **FDM**, the project team will select a context classification that best suits the characteristics of the SD. If a district believes that an SD designation is required, the district should coordinate with the State Complete Streets Program Manager.

ADDRESSING DESIGN EXCEPTIONS AND DESIGN VARIATIONS

The **FDM** is context-based and provides design flexibility through lower design speeds and the inclusion of criteria for low speed roadways. It is anticipated this flexibility will decrease the need for Design Exceptions and Design Variations; however, there may be areas where right of way, funding constraints, or other considerations require flexibility beyond the range of criteria contained in the **FDM**. The **FDM** includes a chapter that outlines the exception and variation processes. When referring to AASHTO A Policy on Geometric Design of Highways and Streets for evaluation of design exceptions, FDOT will continue to define urban and rural areas following the FHWA criteria.

STRATEGIC INTERMODAL SYSTEM

The design speeds along SIS facilities should be informed by their context classification, but should still preserve the ability for the SIS facilities to allow “for high-speed and high-volume traffic movements within the State” (**Section 163.380110 F.S.**). To follow the Complete Streets approach without compromising the function of the SIS, an alternate facility for SIS designation, if available, should be considered when the context classification does not align with the function of the SIS facility and the proposed design speeds shown in Appendix D. The **FDM** provides context-specific design controls and criteria for the SIS.

Appendix A

LAND USE TOOLS TO SUPPORT SAFE AND COMFORTABLE MULTIMODAL TRAVEL

HOW LAND USE CAN SUPPORT COMPLETE STREETS

The transportation system and development pattern (including land use, development density and intensity, building design, building height, building setback, and site layout) are inextricably linked. Each plays a significant role in creating a human-scale environment that invites walking, bicycling, and transit and that supports community economic development. Thoughtful application of context-based design provides for all modes of transportation.

Transportation and land use both have an effect on roadway network connectivity. An extensive, connected network provides route options for goods delivery and vehicular access to land uses, as well as the foundation for safe and comfortable multimodal travel. A fine-grained roadway network with the appropriate design elements also provides multiple pedestrian and bicycling routing, shortens trip distances, and reduces the need to widen intersections and roadways, which may impact ease of walking and bicycling.

Similarly, development form and pattern complete the necessary elements of a multimodal environment. A mix of uses, located where people live, work, shop, and spend leisure time, that are thoughtfully integrated within a building, a parcel, or a few blocks, provides multiple destinations within walking and bicycling distance. Buildings located at the back of sidewalks with active store fronts, such as restaurants and retail, provide a comfortable sense of enclosure, visual interest, passive surveillance, and comfortable access to destinations. Direct, logical, and comfortable connections between destinations encourage walking and bicycling. The best multimodal transportation strategy is the right land use strategy.¹



A complete street environment requires both transportation and land use strategies.

Source: (top to bottom) FDOT, Rick Hall, KAI

¹ Charlotte-Mecklenburg Planning Department, "Centers, Corridors, Wedges Growth Framework", (August 10, 2010).

LOCAL GOVERNMENTS

Complete Streets rely on collaborative investments throughout the transportation network, from private site development, to local roadway network, to regional thoroughfares. Local governments are responsible for land use and transportation planning that supports a context-sensitive system of Complete Streets through supportive infrastructure and development patterns. Local government land use and transportation planning should also work to preserve the capacity of important regional roadways through the creation of a well-connected roadway network that accommodates short-distance and local trips, thus removing these trips from the regional roadways.

FDOT will plan and design transportation projects to be consistent with the existing or proposed land use context of the areas served. However, this process is not a one-sided relationship in which State roadways

are constantly expected to respond to land-use-generated travel demands. In a truly integrated land use and transportation planning approach, one that can result in Complete Street systems, potential transportation changes should be anticipated and should help inform decision making related to land uses. Land use decisions should be made to help manage travel needs and support the desired mobility patterns of a community. For example, if a community desires a higher level of transit investment, land use decisions should be made to encourage the intensity and density of transit-supportive development. Figure A-1 illustrates collaborative land use and transportation investments that support Complete Streets.

FIGURE A-1 COLLABORATIVE INVESTMENTS TO SUPPORT A CONTEXT-SENSITIVE SYSTEM OF COMPLETE STREETS



Many state arterials serve as the only alternative for local and regional mobility. The roadway may be over capacity but cannot be widened because of physical, financial, or environmental realities. However, growth is still desired by local governments searching for new tax base. These conditions are requiring FDOT and partner agencies to explore solutions that go beyond widening — solutions that are multimodal and integrate land use planning.



Partnerships with landowners, developers, municipal leaders, and others can help achieve solutions that go beyond the right of way, such as adding and connecting to the local roadway network. The new network can allow new growth but with a different development pattern. This more compact mixture of uses can reduce trip lengths and total number of trips, and would allow for pedestrian, bicycling, and transit to become viable alternatives.

Source: Adapted from PennDOT Smart Transportation Training Materials

Local governments have a number of tools available to support a Complete Streets network. Some of these tools include:

Local Network Connectivity. In new development areas and large-scale redevelopment areas, local governments may recommend a block length of 300 to 800 feet and/or develop internal or external street connectivity ratios or intersection densities that will create a well-connected street network (see Figure A-2).

Investments in Local Multimodal Infrastructure. Local governments can encourage or require property owners and developers to provide infrastructure for all modes, such as sidewalks and crosswalks, bicycle facilities, streetscapes, and bicycle parking, as part of new development and redevelopment. A complete pedestrian network includes direct, convenient, and safe connections from the public sidewalk to the building (see Figure A-3).

FIGURE A-2 EXAMPLE OF LOCAL NETWORK CONNECTIVITY



Local governments can build local network connectivity by using regulatory tools such as requiring maximum block lengths or minimum intersection densities.

Source: LEED Neighborhood Development (ND) Reference Guide

FIGURE A-3 EXAMPLE OF INVESTMENTS IN LOCAL MULTIMODAL INFRASTRUCTURE



FDOT District 5 is working with local governments to plan for multimodal connectivity around SunRail commuter rail stations. This plan illustrates how multimodal investments can support transit-oriented development and expand SunRail's ridership area.

Source: FDOT

Multimodal Network Plans. Many local and regional governments prepare multimodal network plans that outline a long-term commitment to provide a well-connected multimodal system (see Figure A-4).

FIGURE A-4 EXAMPLE OF MULTIMODAL NETWORK PLAN



Many regions around the State are incorporating transit and multimodal investments as part of regional long range transportation plans. The example above is from Southeast Florida.
Source: 2040 Southeast Florida Regional Transportation Plan

Zoning. Single-use zoning (Euclidean zoning) codes can lead to a separation of land uses that creates long distances between residents and jobs, services, and recreational activities. One alternative tool is form-based code, which uses physical form, rather than separation of land uses, as the organizing principle.¹ Another option is to introduce more mixed-use districts and development of higher intensity and density activity centers, or arrange land uses in closer proximity, to reduce the overall demand for vehicular trips.



Mixed-use zoning districts allow for arrangement of various land uses within close proximity, thus encouraging travel by various modes.

Source: KAI

¹ Form-Based Codes Institute, <http://formbasedcodes.org/>

Site Design and Building Placement.

Large building setbacks surrounded by parking increase walking distances and create isolated and unwelcoming environments for pedestrians and bicyclists. In areas where local municipalities would like to support multimodal travel, cities should consider building scales, placement, and design that support pedestrian activity. Form-based codes can be used to address site design and building placement requirements.

Land development regulations can require building design, site design, and lot layout to support a pedestrian-friendly street environment.

Source: KAI

Access Management Standards. Where development occurs along State roadways, local governments can use land use policies and regulations to address access management. This can be in the form of requiring multiple roadways to access a development or allowing for cross-access easement and shared driveways between different properties. This not only helps to accommodate improved traffic flow along roadways but also helps to reduce the number of curb cuts along a roadway, improving walking and bicycling conditions. A more connected network of roadways also allows for internal site circulation by multiple modes (see Figure A-5).



FIGURE A-5 CROSS-ACCESS EASEMENTS



Parking Standards. Large surface parking lots are a barrier to connectivity, as these can create longer distances between destinations and contribute to an uncomfortable walking environment. Some local governments are beginning to implement parking maximum requirements instead of parking minimum requirements. Establishing a maximum allowable amount of parking can prevent developers from building excessively large lots, or limit the parking supply in an area based on community priorities. Communities looking to increase tax revenue through redevelopment of parking lots, improve pedestrian safety and comfort downtown, or reduce stormwater runoff and heat island impacts of parking can also consider parking maximums as a way to achieve those goals.² Establishing parking maximums, combined with allowing for shared parking across properties and uses, can also support a park-once environment to support multimodal travel.



Parking policies such as allowing for shared use parking can support a park-once environment.

Source: KAI

² Metropolitan Area Planning Council, "Maximum Parking Allowances," last modified March 8, 2010, <http://www.mapc.org/resources/parking-toolkit/strategies-topic/parking-allowances>.

Appendix B

CONTEXT CLASSIFICATIONS CASE STUDIES

Context Classification System: Comprised of eight context classifications, it broadly identifies the various built environments in Florida, based on existing or future land use characteristics, development patterns, and roadway connectivity of an area. In FDOT projects, the roadway will be assigned a context classification(s). The context classification system is used to determine criteria in the *FDM*.

The eight context classifications and their general descriptions are:

C1-Natural	Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.
C2-Rural	Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.
C2T-Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.
C3R-Suburban Residential	Mostly residential uses within large blocks and a disconnected/ sparse roadway network.
C3C-Suburban Commercial	Mostly non-residential uses with large building footprints and large parking lots. Buildings are within large blocks and a disconnected/ sparse roadway network.
C4-Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor and/or behind the uses fronting the roadway.
C5-Urban Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of the civic or economic center of a community, town, or city.
C6-Urban Core	Areas with the highest densities and building heights and within FDOT classified Large Urbanized Areas (population > 1,000,000). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadways, and are within a well-connected roadway network.



C1-NATURAL: FL 24, CEDAR KEY SCRUB STATE RESERVE, LEVY COUNTY

Primary Measures

Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Open Space				Not developed			



Aerial Satellite Image

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
Not Allowed	Not Allowed	0	0

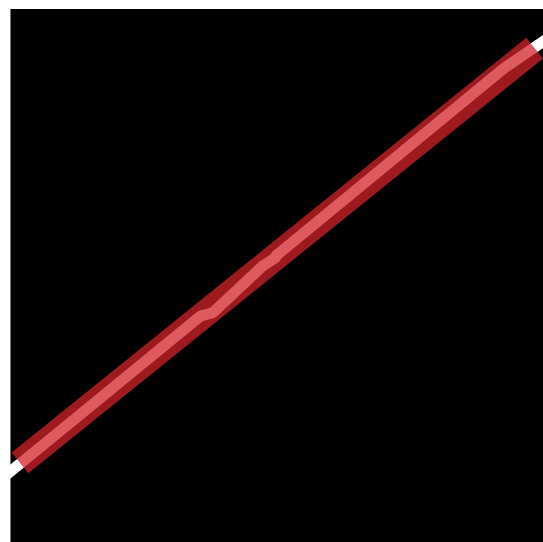


Street View



Bird's Eye View

Open Space 



Streets and Blocks Network



Existing Land Use

C2-RURAL: SR 52, SOUTH OF DADE CITY, PASCO COUNTY

Primary Measures

Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Agricultural, Single-Family Residential, and Retail	1	Detached buildings with no consistent pattern of setbacks	No	No consistent pattern	58	NA	NA

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
1	NA	1	<1



Street View



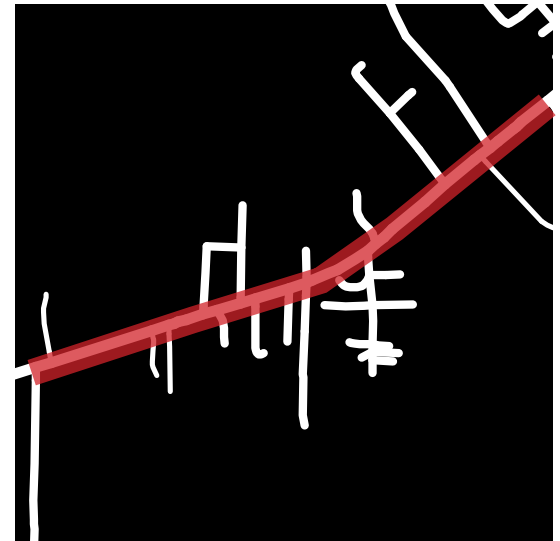
Bird's Eye View

Single-Family Residential	Light Green
Multi-Family Residential	Yellow
Commercial	Red
Agriculture	Light Green
Open Space	Dark Green
Vacant	White

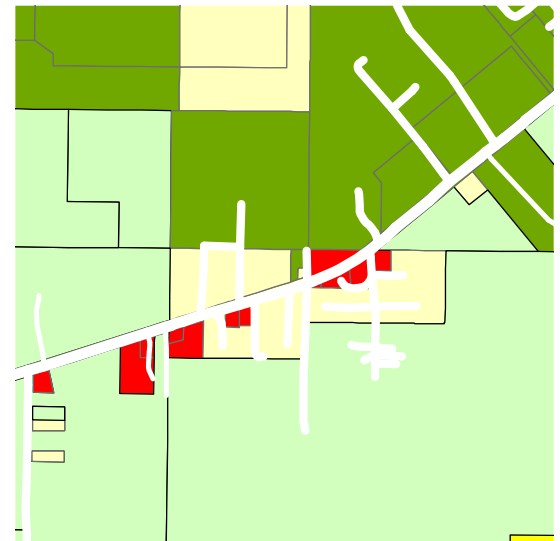
0 0.5 1 Miles



Aerial Satellite Image



Streets and Blocks Network



Existing Land Use

C2T-RURAL TOWN: MAIN ST, HAVANA, GADSDEN COUNTY

Primary Measures

Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Retail and Commercial	1 - 2	Mostly attached buildings with no setbacks	Yes	Mostly in rear, occasionally on side	325	1,520	330

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
27	1.2	0.3	4



Street View



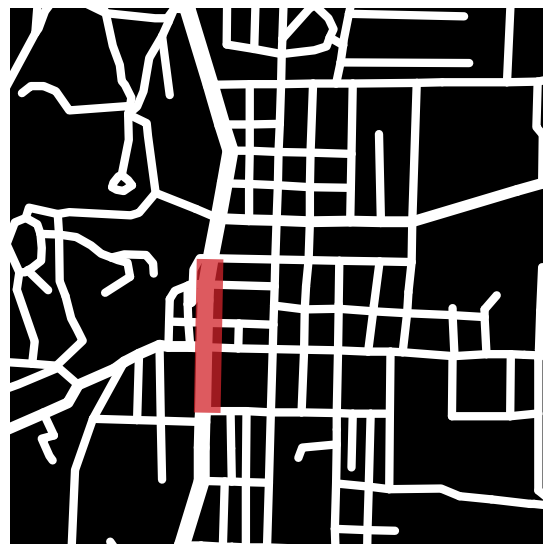
Bird's Eye View

Single-Family Residential	Yellow
Multi-Family Residential	Orange
Commercial	Red
Retail	Dark Red
Agriculture	Light Green
Institutional/Government	Blue
Industrial	Dark Blue
Open Space	Green
Vacant	White

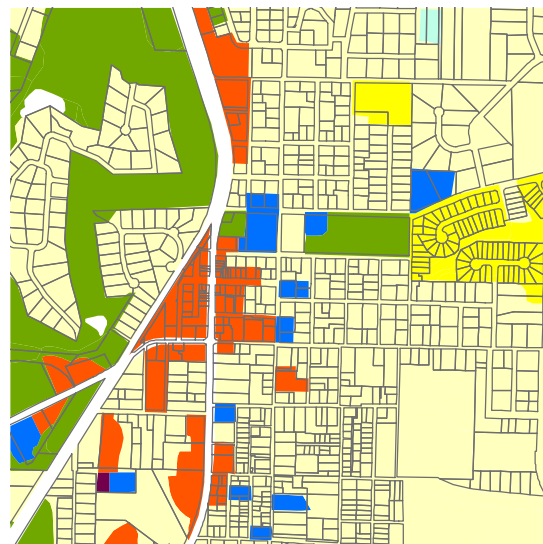
0 0.5 1 Miles



Aerial Satellite Image



Streets and Blocks Network



Future Land Use

C3R-SUBURBAN RESIDENTIAL: SR 70, LAKEWOOD RANCH, MANATEE COUNTY

Primary Measures

Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Single-Family Residential and Institutional	1 - 2	Detached buildings with medium (10' to 24') to large (> 24') setbacks on all sides	No	Front	40	6,040	1,140

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
1	0.23	0.4	0

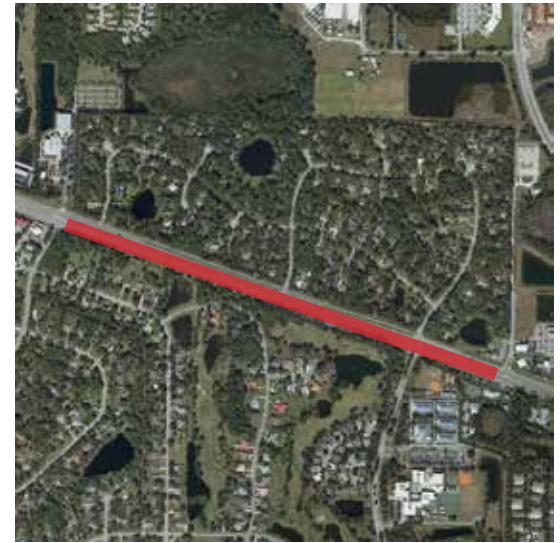
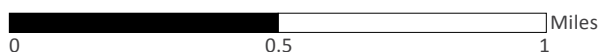


Street View



Bird's Eye View

Single-Family Residential	
Multi-Family Residential	
Commercial	
Retail	
Institutional/Government	
Open Space	
Vacant	



Aerial Satellite Image



Streets and Blocks Network



Existing Land Use

C3C-SUBURBAN COMMERCIAL: US 441, BROWARD COUNTY

Primary Measures

Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Retail, Commercial, and Light Industrial	1 - 2	Detached buildings with large (> 24') setbacks on all sides	No	Surrounded by parking on all sides	94	3,320	680

Secondary Measures

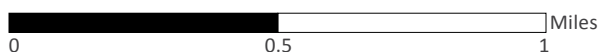
Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
Not Applicable	0.7	8.5	7



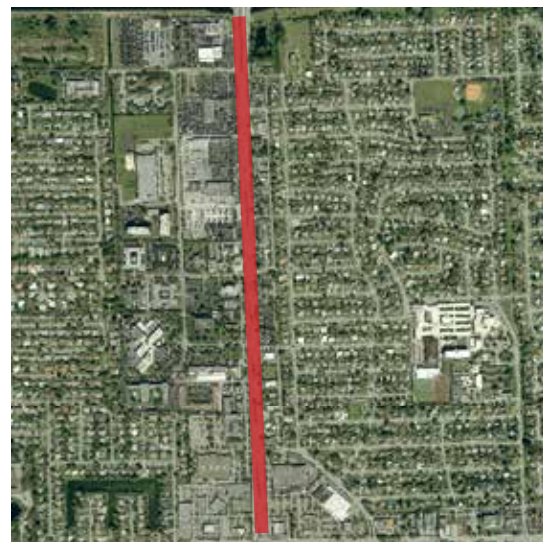
Street View



Bird's Eye View



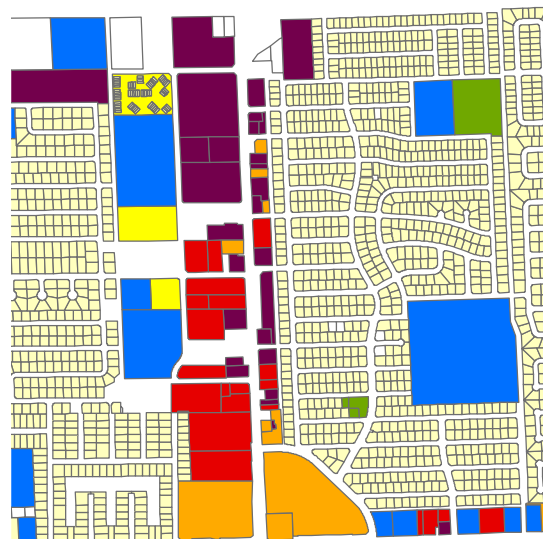
Single-Family Residential	Yellow
Multi-Family Residential	Orange
Commercial	Red
Retail	Dark Red
Institutional/Government	Blue
Industrial	Purple
Open Space	Green
Vacant	White



Aerial Satellite Image



Streets and Blocks Network



Existing Land Use

C4-GENERAL URBAN: DR. MLK JR. BLVD, EAST TAMPA, TAMPA, HILLSBOROUGH COUNTY

Primary Measures

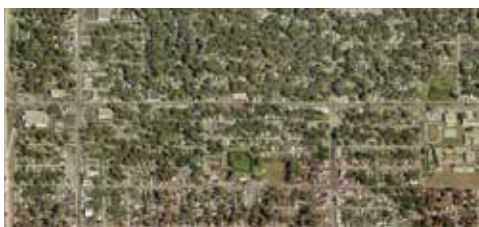
Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Single-Family and Multi-Family Residential, Neighborhood Scale Retail, and Office	1 - 2	Detached buildings with small (<10') to medium (10' to 24') front and side setbacks	Yes	Mostly in side, occasionally in rear or front	230	1,760	490

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
12	1.5	8.5	3

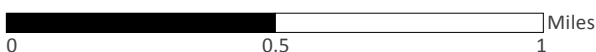


Street View

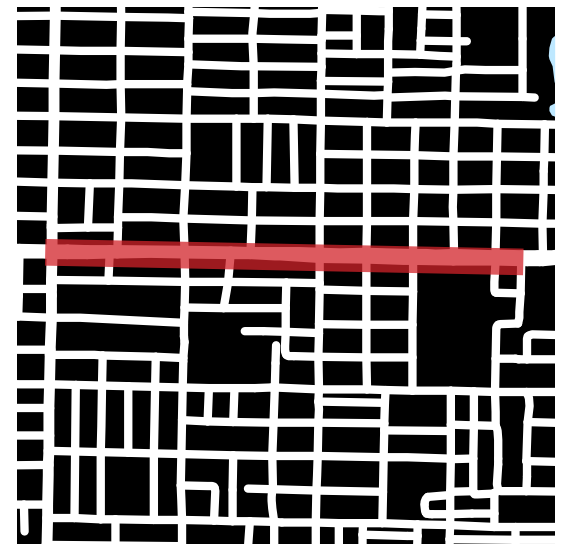


Bird's Eye View

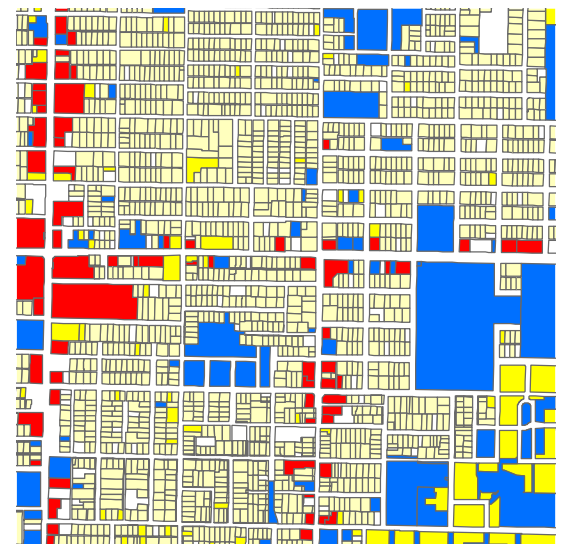
Single-Family Residential	Yellow
Multi-Family Residential	Orange
Commercial	Red
Retail	Dark Red
Institutional/Government	Blue
Open Space	Green
Vacant	White



Aerial Satellite Image



Streets and Blocks Network



Existing Land Use

C5-URBAN CENTER: MONROE ST, DOWNTOWN TALLAHASSEE, LEON COUNTY

Primary Measures

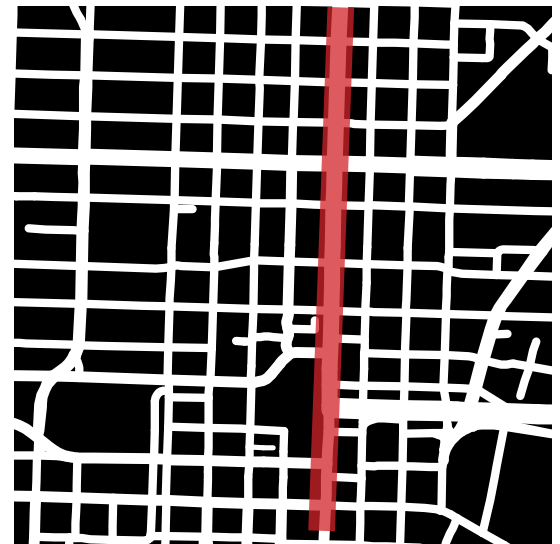
Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Retail, Office, Institutional, Commercial	1 - 5 with some taller buildings	Mostly attached buildings with no setbacks or with few having shallow setbacks	Yes	Rear and garage	180	1,770	380

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
150	8	2.4	90



Aerial Satellite Image



Streets and Blocks Network

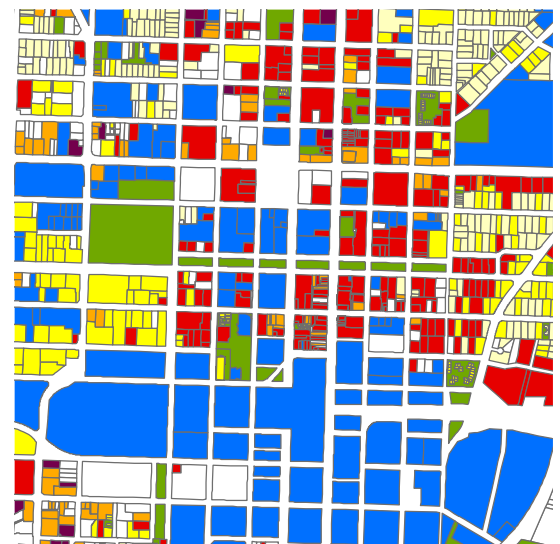


Street View

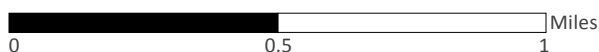


Bird's Eye View

Single-Family Residential	
Multi-Family Residential	
Commercial	
Retail	
Institutional/Government	
Industrial	
Open Space	
Vacant	



Existing Land Use



C6-URBAN CORE: ORANGE AVE, DOWNTOWN ORLANDO, ORANGE COUNTY

Primary Measures

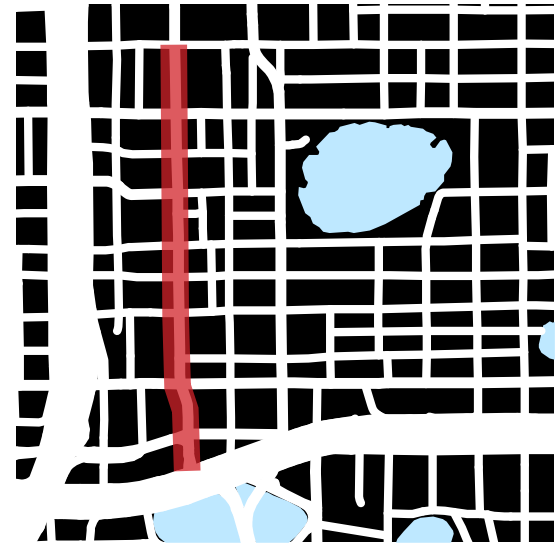
Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
					Intersection Density	Block Perimeter	Block Length
Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Retail, Office, Institutional, and Multi-Family Residential	> 4 with some shorter buildings	Mostly attached buildings with no setbacks	Yes	Rear and garage	220	1,910	450

Secondary Measures

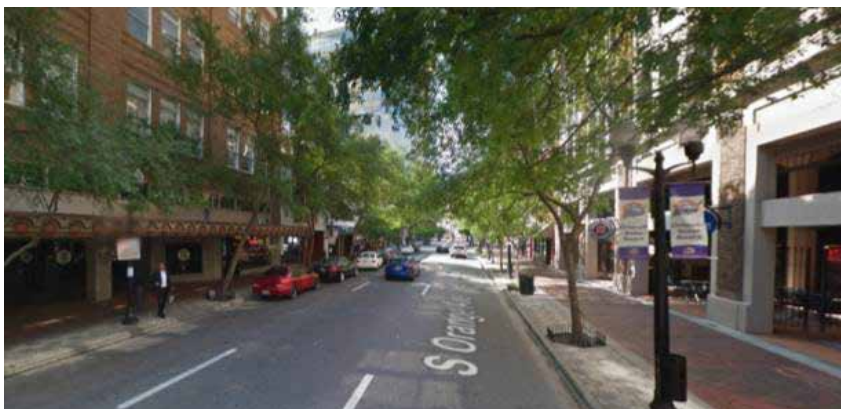
Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
200	3	8.5	170



Aerial Satellite Image



Streets and Blocks Network



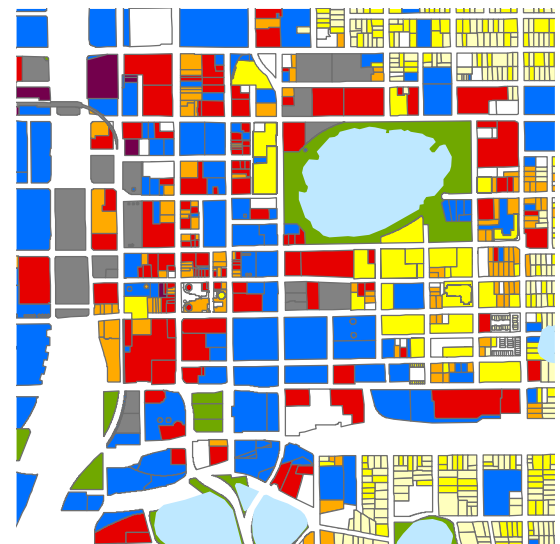
Street View



Bird's Eye View

Single-Family Residential	
Multi-Family Residential	
Commercial	
Retail	
Institutional/Government	
Industrial	
Open Space	
Vacant	

0 0.5 1 Miles

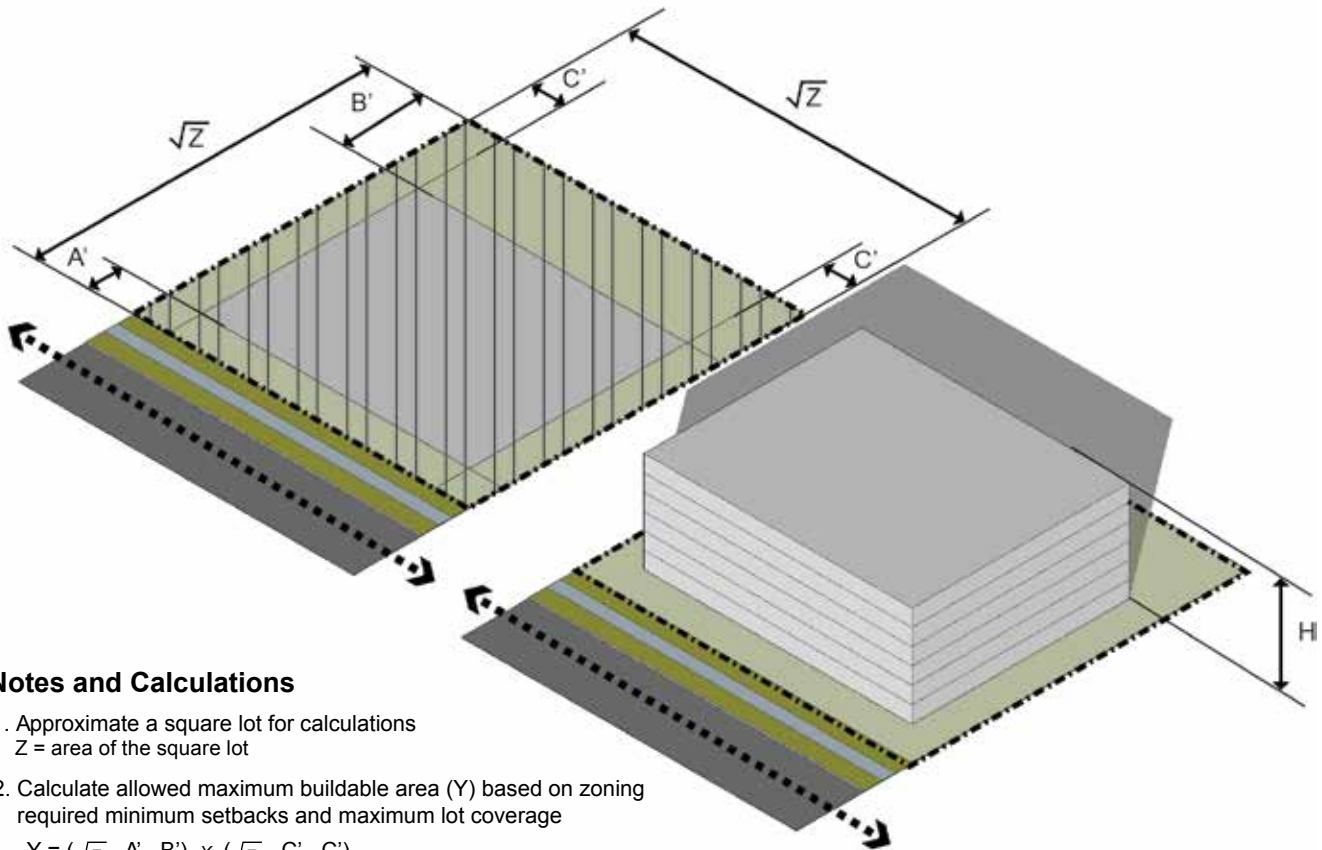


Existing Land Use

Appendix C

HOW TO CALCULATE FLOOR AREA RATIO IF NOT DEFINED IN ZONING CODE

FAR can be calculated using these various site design and height standards. For example, assuming floor height of 10 feet, total number of floors can be calculated based on maximum building height measure. Based on minimum parcel size, and minimum setbacks, maximum floor plate area can be calculated. Multiplying maximum floor plate area by total number of floors will give total building floor area. Finally, dividing total building floor area by minimum parcel size will provide FAR.



Notes and Calculations

1. Approximate a square lot for calculations
 Z = area of the square lot
2. Calculate allowed maximum buildable area (Y) based on zoning required minimum setbacks and maximum lot coverage
 $Y = (\sqrt{Z} - A' - B') \times (\sqrt{Z} - C' - C')$
or
 $Y = (\text{Maximum lot coverage area in (\%)} \text{ allowed by zoning code}) \times (Z)$
Use the smaller of the two values as Y
3. Calculate total floor levels based on zoning allowed maximum height (J)

$$\frac{H}{\text{Height of a floor level}^*}$$
* Assume 12' for commercial land use or 10' for residential land use
4. Calculate Floor Area Ratio (FAR)

$$\text{Floor Area Ratio (FAR)} = \frac{Y \times J}{Z}$$

Y = Maximum allowed buildable area in square feet

A = Minimum allowed front setback in feet based on zoning code

B = Minimum allowed rear setback in feet based on zoning code

C = Minimum allowed side setback in feet based on zoning code

H = Maximum allowed height allowed by zoning code in feet



Appendix D

PROPOSED *FDM* DESIGN SPEED RANGES BY CONTEXT CLASSIFICATIONS FOR NON-LIMITED-ACCESS FACILITIES

Context Classification	Allowable Design Speed Range for Non-SIS (mph)	Minimum Design Speed for SIS (mph)
C1-Natural	55-70	65
C2-Rural	55-70	65
C2T-Rural Town	25-45	40
C3-Suburban	35-55	50
C4-Urban General	30-45	45
C5-Urban Center	25-35	35
C6-Urban Core	25-30	30

Refer to the *FDM* for design criteria and refer to the *SIS Procedure 525-030-260-b* for SIS standards.

Appendix E

DRAFT SAMPLE CONTEXT CLASSIFICATION LETTER OF AGREEMENT WITH LOCAL GOVERNMENTS

The successful implementation of Complete Streets requires the identification of a roadway's context classification early in the project development process. Context classification informs all phases of a project: planning, PD&E, design, construction, and maintenance. Chapter 2 of the Complete Streets Handbook provides the Context Classification Matrix (see Table 2-1 in the Complete Streets Handbook) and outlines the methodology for using it.

On projects where FDOT currently coordinates with local governments, FDOT will coordinate with local governments to determine context classification; however, the final determination of context classification will be made by FDOT. Refer to the **Public Involvement Handbook**, **FDM**, **PD&E Manual**, and **Project Management Handbook** for more guidance on needed local government coordination.

To ensure clarity and consistency throughout the project development process, it may be beneficial to document the agreement reached among FDOT and local partners on the context classification(s) of a roadway. This is most useful early in the project development process (see Figure 3-5 in the Complete Streets Handbook), but can be executed at any point in the life of a project.

The following is a sample Letter of Agreement that can be tailored to the needs of a project.

The following notes apply to the sample Letter of Agreement:

- If there is no FN Number, the associated phrase in the declarations section of the sample Letter of Agreement can be deleted.
- Replace COUNTY and CITY with the full county or city name, wherever they are not previously defined. Note that separate Letter of Agreements with multiple parties may be needed if the project extends through multiple jurisdictions.
- Maps, drawings, and other project information may be appended to the Letter of Agreement as exhibits.

SAMPLE CONTEXT CLASSIFICATION LETTER OF AGREEMENT

Sample Context Classification Letter of Agreement to Come

Appendix F

LIST OF HANDBOOKS AND GUIDANCE DOCUMENTS THAT INCLUDE TOOLS FOR IMPLEMENTING COMPLETE STREETS

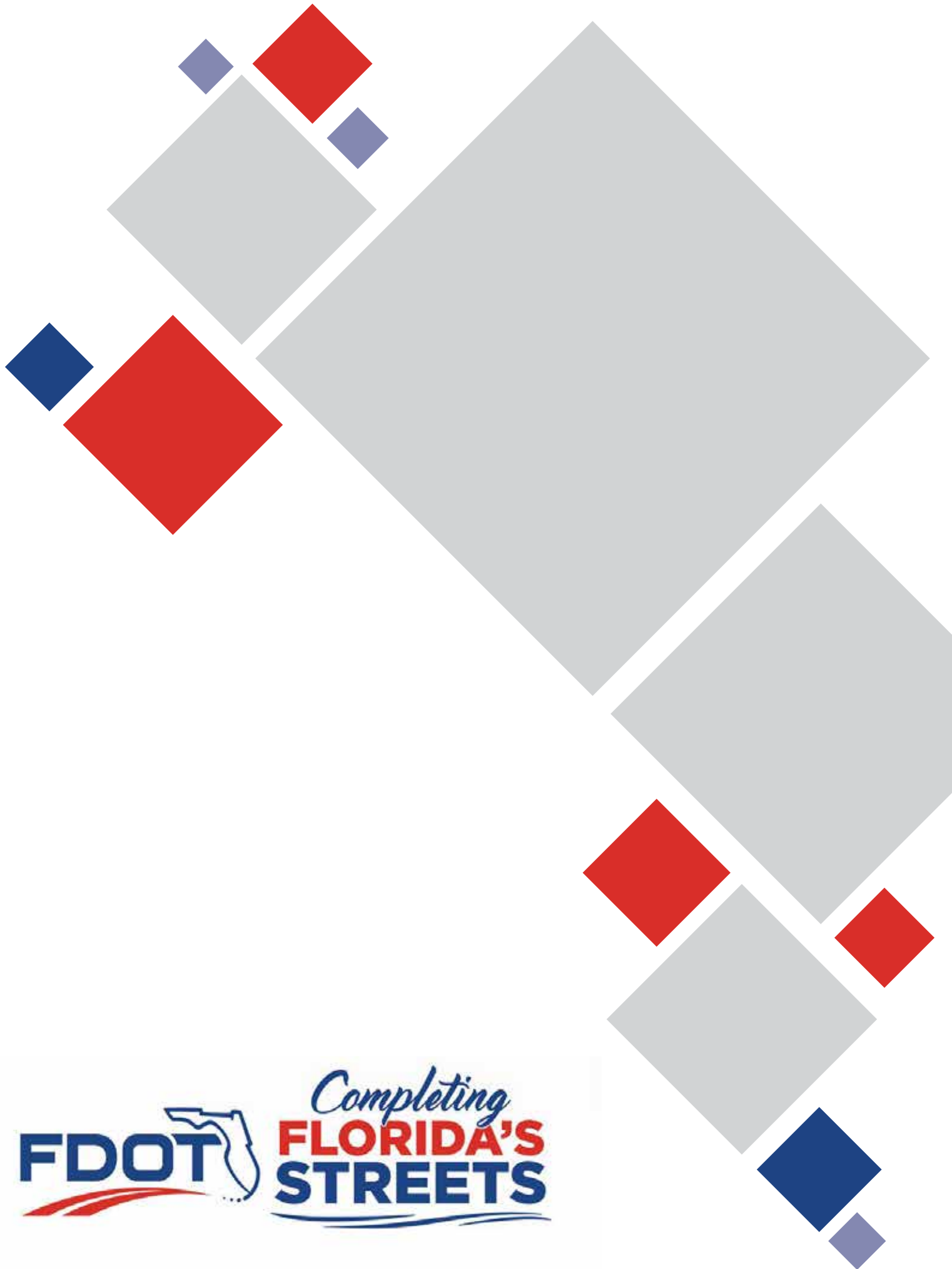
HANDBOOKS AND MANUALS

- 2014 Traffic Analysis Handbook-A Reference for Planning and Operations
- Accessing Transit: Design Handbook for Florida Bus Passenger Facilities (Version III, 2013)
- Cultural Resource Management Handbook
- Efficient Transportation Decision Making (ETDM) Planning and Programming Manual
- Florida Highway Landscape Guide
- Florida Scenic Highway Program Manual
- Guide for Roadside Vegetation Management
- Historic Highway Bridges of Florida
- Local Agency Program (LAP) Program Manual
- Project Development and Environment (PD&E) Manual
- Public Involvement Handbook
- Quality/Level of Service Handbook
- Manual for Speed Zoning of Highways, Roads & Streets
- Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (commonly referred to as the "Florida Greenbook")
- Traffic Engineering Manual

Latest versions of FDOT Handbook and Manuals listed above can be accessed here: <http://www.fdot.gov/publications/publications.shtm>

GUIDANCE

- Statewide Lane Elimination Guidance Parts 1
- Statewide Lane Elimination Guidance Parts 2
- Sociocultural Effects Guidance
- FDOT Transit-Oriented Development Guidebook
- Typical Sections for Exclusive Transit Running Ways





FDOT *Completing*
FLORIDA'S
STREETS



CONTEXT CLASSIFICATION GUIDE



February 2022

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Message from the Secretary

July 26, 2021

The mission of the Florida Department of Transportation is clear. We are to provide a safe transportation system that accommodates all who use it – including motorists, freight handlers, transit users, pedestrians, and cyclists – and we are passionate about our work. FDOT remains committed to ensuring that Florida's roadways are safe for everyone, whether embracing and implementing new technologies or planning for our state's growing population.

Using a 360° approach that considers both location characteristics and user needs, FDOT plans, designs, constructs, and operates context-sensitive roadways that prioritize safety and are tailored to the unique areas of Florida. This commitment echoes in our Complete Streets and context classification principles that are the foundation of the **FDOT Design Manual**, which governs every department project. Complete Streets also encompass FDOT's Vital Few by improving safety, enhancing mobility, and inspiring innovation.

Our Complete Streets mission is to inform, educate, inspire, and implement. FDOT is dedicated to accommodating our state's ever-evolving mobility needs. We will continue to lead the way in the advancement of Complete Streets, an essential part of enhancing safety and improving everyone's quality of life.



Kevin J. Thibault, P.E.
Secretary, Florida Department of Transportation

Chapter 1

Complete Streets 360°

INTRODUCTION

FDOT has embarked on a department-wide shift in transportation planning, design, and decision making. This approach is described as “putting the right street in the right place” or, more succinctly, **Complete Streets 360°**, representing that FDOT’s effort is all-encompassing. This effort is ambitious and comprehensive, based on the evolving view of roadways as valuable public spaces for all users, including those using the non-motorized modes of walking and bicycling.

Complete Streets 360° is FDOT’s response to today’s transportation challenges. Florida is the third most populous state in the nation, and we continue to grow by nearly 1,000 people each day. Our population is diverse, and the impacts of emerging technologies, an aging population, and consistent societal evolution are changing the way Floridians move in and around their communities. Aside from its increasing number of residents, the State has also seen strong growth in visitors. The number of visitors to Florida surged from 82 million in 2010 to more than 131 million in 2019.¹ This growth is coupled with shifting transportation demands led by demographic changes; the rise in pedestrian and bicycling fatalities on state roads²; declining local and Federal funding streams requiring more creativity and partnerships to implement projects; rapidly changing technologies that can lead to travel patterns different from historical trends; growth focused in urban centers and rural employment centers; and increasing development pressure on the State’s unique natural environment.³ These are the challenges of the 21st century, and **Complete Streets 360°** is how FDOT is addressing these realities.

This Guide provides background and overarching guidance for why and how FDOT policies, standards, and procedures are being refined to implement **Complete Streets 360°** through the context classification system. It provides guidance on how context classification can be used, describes the measures to determine the context classification of a roadway, and describes how context classification relates to the **FDOT Design Manual (FDM)** and other FDOT guidance.

COMPLETE STREETS POLICY

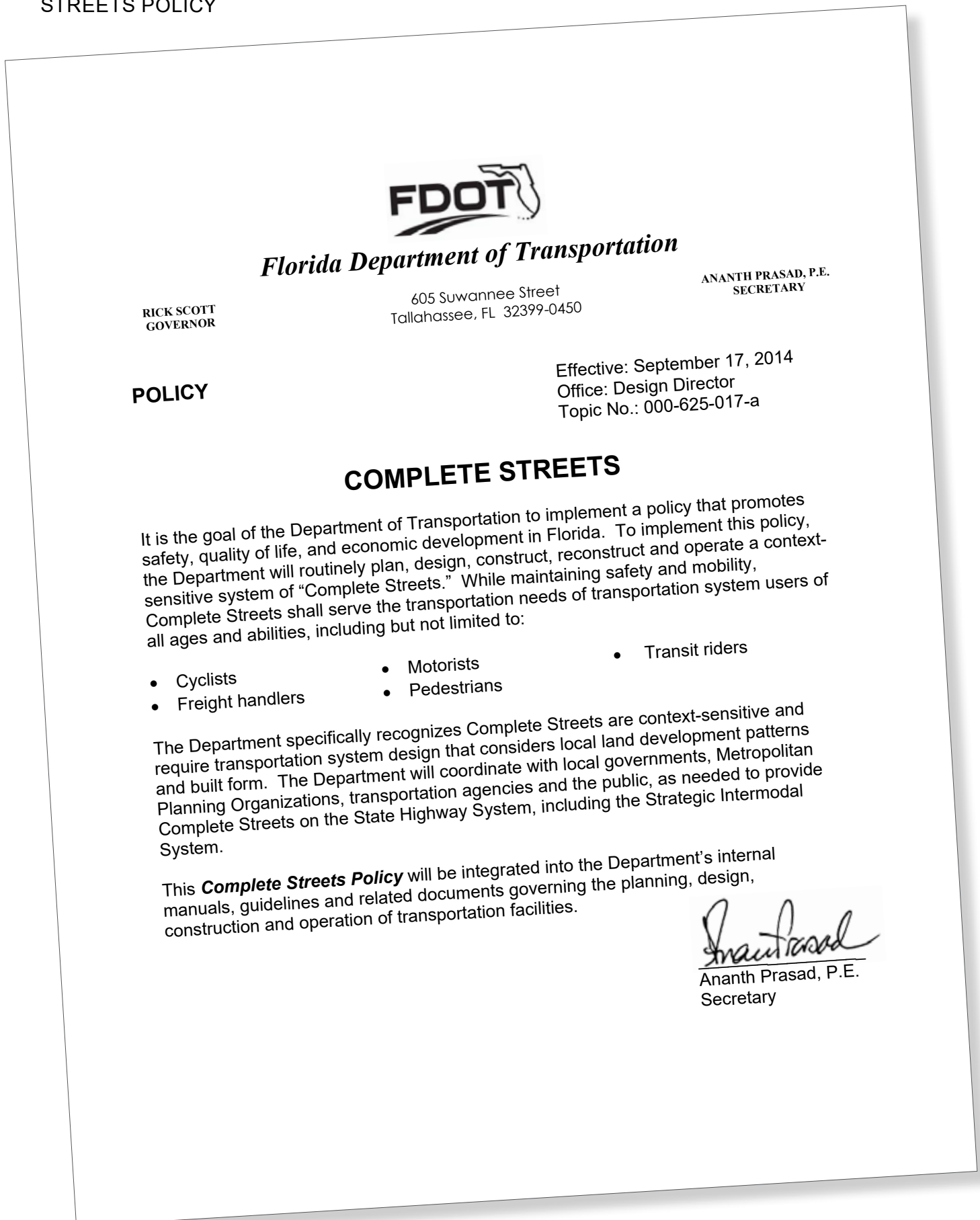
In September 2014, FDOT adopted the Statewide Complete Streets Policy (Topic No. 000-625-017) (see **Figure 1**), making a commitment to planning, designing, and operating their transportation system for all users. The Policy was a formal acknowledgment that each roadway location is unique, requiring its own customized solution through context-sensitive Complete Streets.

¹ Florida Department of Transportation, Florida Strategic Highway Safety Plan, March 2021.

² Both pedestrian and bicycle fatalities have increased since 2017. In 2018, Florida had the most bicycle fatalities of any US state. Florida Department of Transportation. (2021). Strategic Highway Safety Plan.

³ Florida Department of Transportation, Florida Transportation Plan Vision Element, 2015.

FIGURE 1 FDOT COMPLETE STREETS POLICY



COMPLETE STREETS ACCOMPLISHMENTS TO DATE

The journey to complete Florida's streets...

Florida is a leader in Complete Streets and has been for decades. As our state's population has grown and evolved over the years, so has our approach to transportation planning.



1984

Florida was the second state in the nation to adopt a statewide “routine accommodation” law, requiring that bicyclists and pedestrians be considered in road construction projects. This same statute also charged the state with developing a statewide “integrated system of bicycle and pedestrian ways.” According to a study published in the American Journal of Public Health (AJHP), after adoption of this law concluded: “Florida’s pedestrian fatality rates decreased significantly...resulting in more than 3,500 lives saved across 29 years.”

1999

FDOT adopted its Transportation Design for Livable Communities (TDLC) policy, requiring transportation designers to consider each specific community’s needs when selecting features for a roadway, as well as prioritizing the safety of all transportation users – including pedestrians, bicyclists, motorists, and public transit users. This balancing of community values and mobility needs became the foundation of FDOT’s context-sensitive design today.



2014

FDOT adopted an official Complete Streets Policy, a formal acknowledgment that each location is unique, requiring its own customized solution through context-sensitive Complete Streets. Further, the Policy was integrated into FDOT's manuals to govern the planning, design, construction, and operation of Florida's transportation facilities at the local level as well as within the State Highway System. This ensured that context-sensitive design and Complete Streets principles are the standard for all FDOT projects.

2018

After two years of development, FDOT published a new Design Manual that incorporates context-based design criteria and decision making. The new manual helps provide more context-sensitive roads throughout Florida by putting "the right street in the right place."



COMPLETE STREETS 360°

In 2021, FDOT officially rolled out **Complete Streets 360°**, emphasizing consideration of all roadway users as well as the context of the road. For example, the needs of Floridians who live, work, and play among the forests, prairies, and rivers of the Nature Coast are significantly different than the needs of Floridians in downtown Fort Lauderdale.

For FDOT, Complete Streets are not a specific type of project. Instead, the Department utilizes a 360° approach to ensure that all roadway projects are context-sensitive and consider the needs of all users, regardless of age and ability. This means that everything the Department undertakes – whether developing an entirely new corridor or resurfacing an existing road – is done to help promote safety, enhance mobility, improve quality of life, and promote economic development based on the roadway's context.

2018 – Today

With an average of 1,000 people moving to the Sunshine State each day, FDOT remains committed to enhancing the safety and mobility of all of our residents and visitors of all ages and abilities. Over the past several years, in addition to updating the Design Manual, we've made the following changes to integrate context classification and Complete Streets:

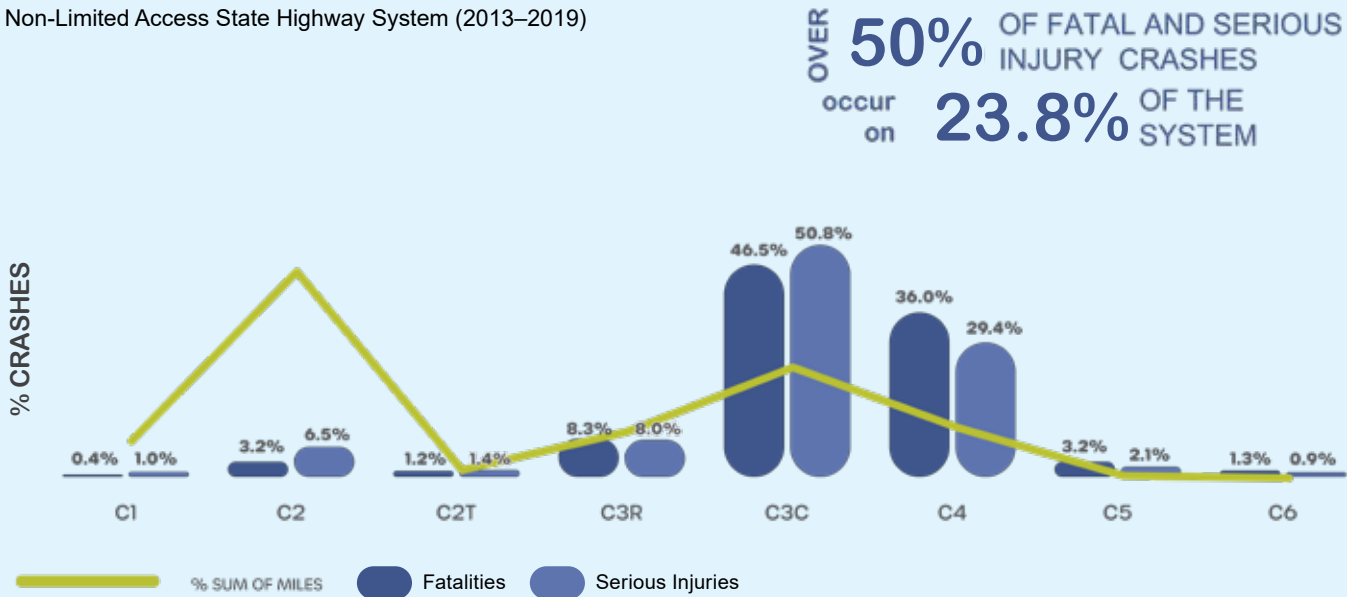
- Updated the **FDOT Traffic Engineering Manual (TEM)**
- Updated the **FDOT Access Management Guidebook**
- Introduced revisions to the **Project Development and Environment Manual (PD&E Manual)**
- Updated the **FDOT Lane Repurposing Guidebook**
- Released the Context Classification Framework for Bus Transit
- Developed preliminary context classification designation for all state roadway segments and kept an up-to-date database as part of the FDOT Roadway Characteristics Inventory (RCI)
- Launched **Complete Streets 360°** website at www.FLcompletestreets.com
- Launched ConnectPed
- Conducted comprehensive internal FDOT training

TARGET ZERO

Florida’s safety vision is simple: to eliminate all transportation-related fatalities and serious injuries for all modes of travel. This priority includes pedestrians, bicyclists, motorcyclists, micromobility device users, drivers, freight handlers, and transit users using the roadway system, as well as connections between the roadway system and other modes of transportation.

The personal and societal costs of traffic crashes in Florida today are unacceptably high. Additionally, bicycle and pedestrian crashes are not evenly distributed across roadway types and context classifications within Florida. According to the Florida Pedestrian and Bicycle Strategic Safety Plan, pedestrian and bicyclist exposure and risk on the non-limited access state highway system shows that corridors with C3C or C4 context classification, higher posted speeds, and higher transit frequency have the highest likelihood of bicycle and pedestrian crashes based on the exposure and risk in these areas. For example, although only 24% of the state roadway system is classified as C3C-Suburban commercial, 50% of fatal bicycle and pedestrian crashes occur on these roadway miles (see **Figure 2**).¹

FIGURE 2 CRASHES BY CONTEXT CLASSIFICATION



Source: Florida Pedestrian and Bicycle Strategic Safety Plan

¹ Florida Department of Transportation, Florida Pedestrian and Bicycle Strategic Safety Plan, September 2021

SAFE SYSTEM APPROACH

The **FDOT Strategic Highway Safety Plan (SHSP)** calls for the development of a systematic approach for identifying locations and behaviors related to fatal and serious injury crashes, including locations and behaviors prone to pedestrian and bicycle crashes, to implement multi-disciplinary countermeasures. The Safe System approach aims to eliminate fatalities & serious injuries for all road users through a holistic view of the road system.¹

Safe System

The Safe System approach aims to eliminate fatalities and serious injuries of all users of the transportation system through a holistic model of multiple elements working together to safeguard against tragic crash outcomes. There are five elements of the Safe System: Safe Road Users, Safe Vehicles, Safe Speeds, Safe Roads, and Post-Crash Care. Each element is interrelated, and weaknesses in one element may be compensated with strengths in another.

The criteria within the **FDM** have been developed with the Safe System approach in mind as related to Safe Speeds and Safe Roads. The term “Safe System” may not be specifically mentioned; however, it is inherent within the criteria and important to keep in mind when making engineering decisions that vary from the criteria. The Safe System approach begins with a foundational acknowledgment that transportation system users, as humans, will inevitably make mistakes. These mistakes may lead to crashes on our transportation system. FDOT’s Target Zero goal is to eliminate fatalities and serious injuries.

To achieve zero fatalities and serious injuries, crash forces induced on the human body must be kept below the tolerable limits. When designing and operating the transportation system, it is critical to manage crash kinetic energy. Human error is to be expected; therefore, the transportation infrastructure should be designed and operated to eliminate fatalities and serious injuries. This may be achieved by first reducing the risk of error and secondly, when crashes do occur, to maintain collision forces on the human body within tolerable levels by managing speed and crash angles to reduce injury severity.

The following are six foundational principles for understanding and applying the Safe System approach:

- 
Fatalities and serious injuries are unacceptable – While no crashes are desirable, the Safe System approach emphasizes a focus on crashes resulting in fatalities and serious injuries. Regardless of road users’ socio-economic backgrounds, their abilities, and the modes of transportation they use, no one should experience fatalities or serious injuries when using the transportation system.
- 
Humans make mistakes – Road users will inevitably make mistakes, and those mistakes can lead to crashes. The Safe System approach expects the transportation system be planned, designed, and operated to be forgiving of inevitable human error, so that fatal and serious injury outcomes are unlikely to occur.
- 
Humans are vulnerable – Humans have a limited ability to tolerate the energy involved in crash impacts. Although the exchange of kinetic energy in collisions among vehicles, objects, and road users has multiple determinants, applying the Safe System approach involves managing the kinetic energy of crashes to avoid fatal and serious injury outcomes.

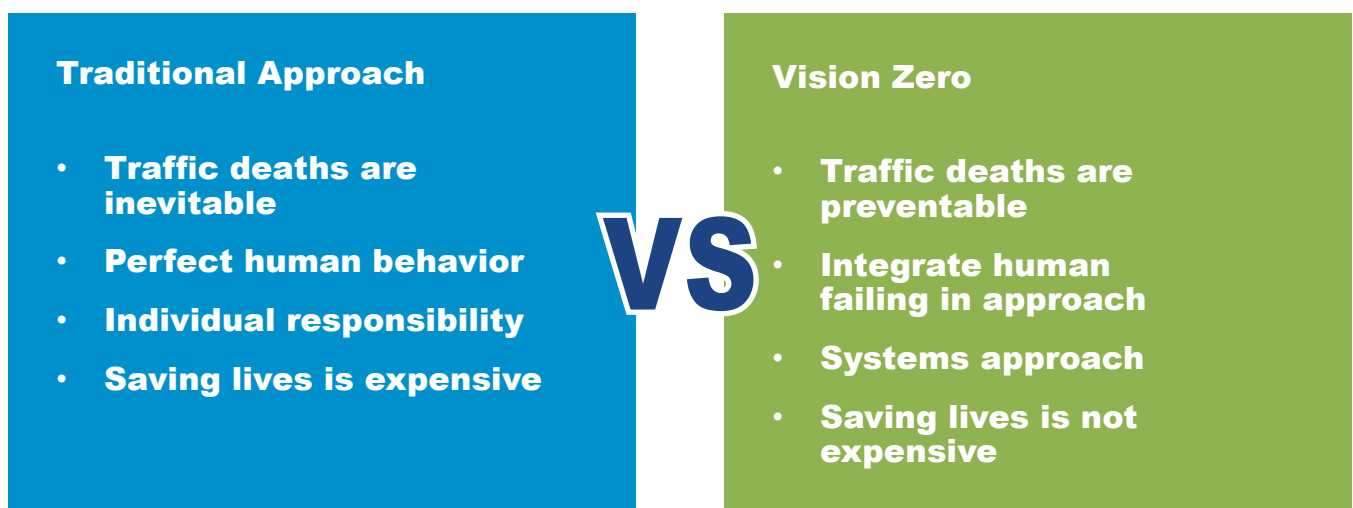
¹ Federal Highway Administration. The Safe Systems Approach. Accessed on September 25, 2021. https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf

- 4 Responsibility is shared** – All stakeholders (transportation system users and managers, vehicle manufacturers, emergency responders, etc.) must work collaboratively to ensure that crashes do not lead to fatalities or serious injuries.
- 5 Safety is proactive** – Proactive and data-driven tools should be used to identify and mitigate latent risks in the system, rather than waiting for crashes to occur and reacting afterwards.
- 6 Redundancy is crucial** – Reducing the risk of severe crash outcomes requires all parts of the system be strengthened so that if one element fails, the others protect transportation system users.

When you consider the vulnerability of a pedestrian or bicyclist without the protection of a vehicle—especially one equipped with safety technologies design to protect the passengers—reduced speeds and increased visibility have significant impacts on the severity of injuries and likelihood of surviving a crash. Nearly 22% of all fatalities on FDOT streets are pedestrians.²

When a Safe System approach is taken, the inevitability of human mistakes is anticipated and accommodated, resulting in less severe injury crashes. Safe Systems acknowledges the responsibility that rests with transportation planners and engineers as well as policymakers in designing and maintaining a safe system for people to function within. Everyone shares the responsibility to abide by the systems, laws, and policies set. If safety problems persist, then the responsibility comes back to the designers and policymakers to take further measures to improve safe conditions. A Safe Systems approach is a paradigm shift in approaching roadway safety as an “upstream” systemic issue, not one simply resting with individual users of the roadways. It is the crux of what makes Target Zero a different and effective approach to saving lives.

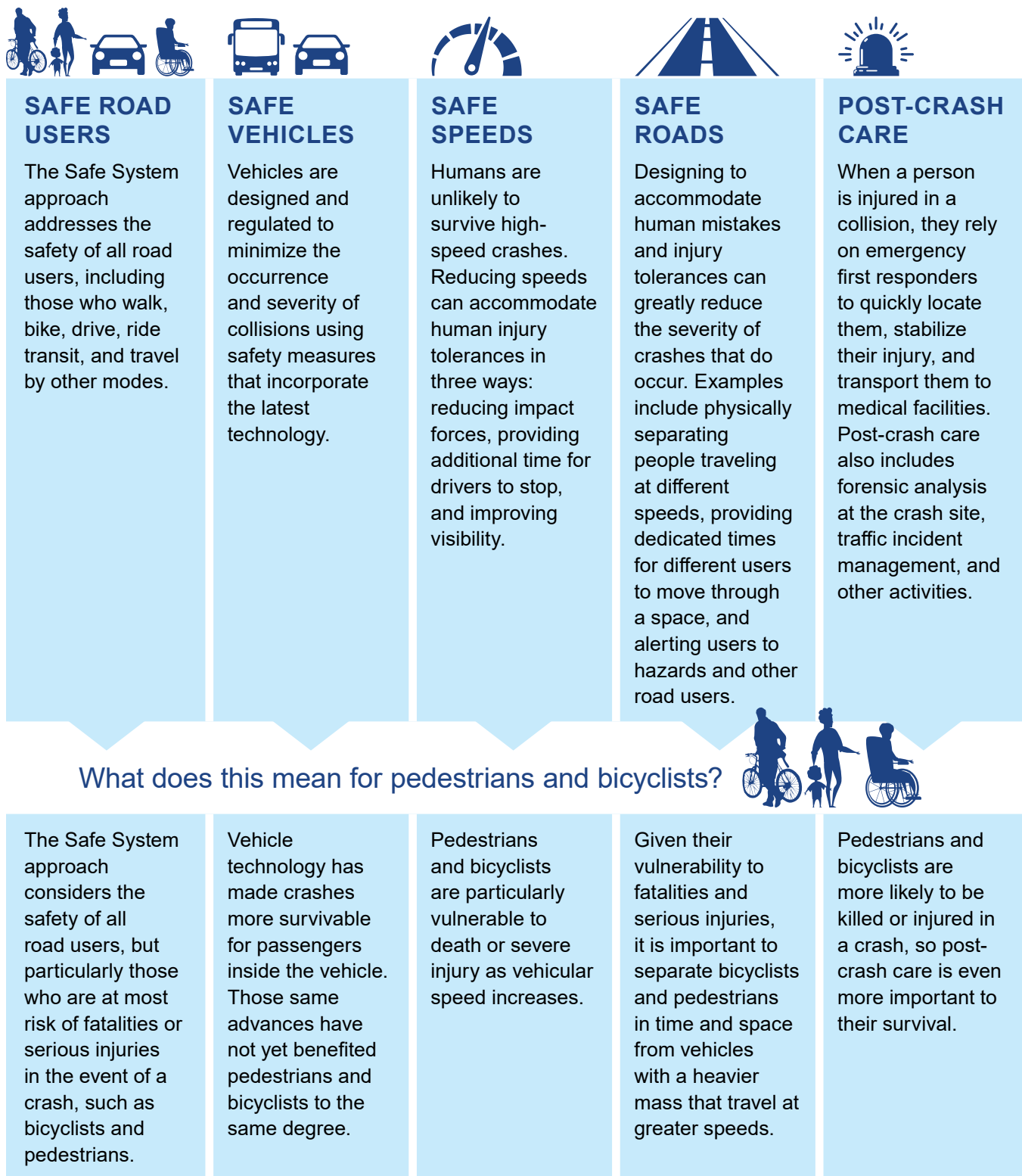
FDOT can leverage the context classification system, as described in this Guide, to implement this proactive approach to safety. Context classification can inform the types of users anticipated, what their travel needs may be, and typical safety challenges. Through this, FDOT can more proactively implement safety treatments to systematically improve the safety of our roadways for all users, even before evidence of occurrence of safety challenges.



Source: Adapted from Vision Zero Network

² E. Goughnour et al.. Primer on Safe System Approach for Pedestrians and Bicyclists. Federal Highway Administration. May 2021.

FIGURE 3 THE FIVE ELEMENTS OF THE SAFE SYSTEM APPROACH AND THEIR RELEVANCE TO PEDESTRIANS AND BICYCLISTS



Source: Adapted from FHWA (2020) *The Safe System Approach* [FHWA-SA-20-015]

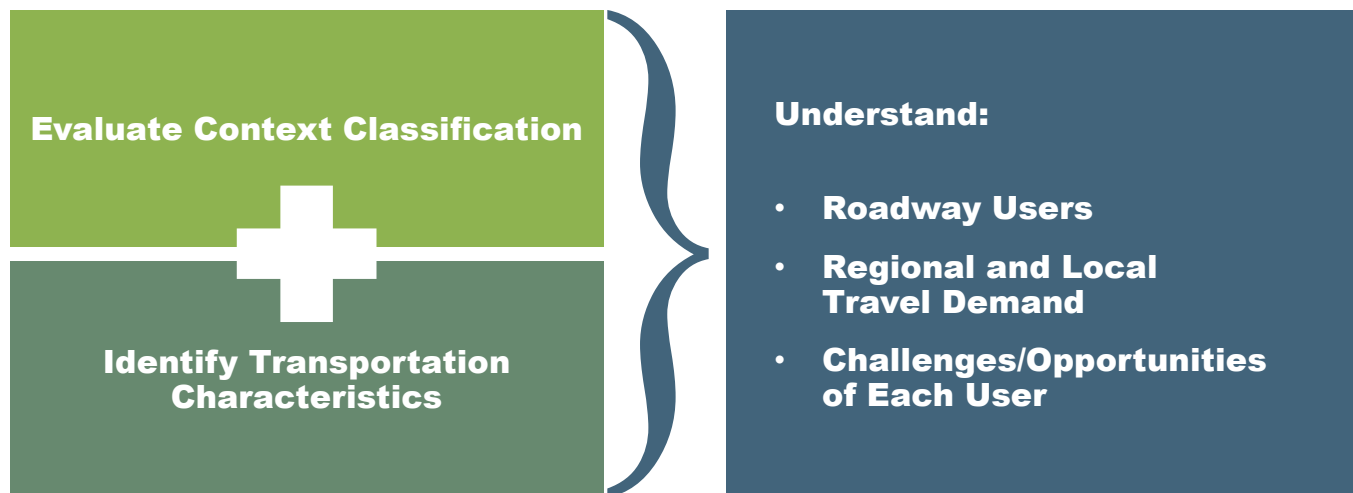
“Complete
Streets means
putting the right
road in the right
place.”

Chapter 2

FDOT Context Classification

To support the implementation of **Complete Streets 360°**, FDOT uses a context-based approach to planning, designing, and operating the state transportation network. FDOT has adopted a roadway classification system comprised of eight context classifications for all non-limited access state roadways. The context classification of a roadway must be considered, along with its transportation characteristics and the built form to understand who the users are, what the regional and local travel demand of the roadway is, and the challenges and opportunities of each roadway user (see **Figure 4**). The context classification and transportation characteristics of a roadway will determine key design criteria for all non-limited access state roadways.

FIGURE 4 STEPS TO UNDERSTANDING USES AND USERS OF THE CORRIDOR PRIOR TO DESIGN

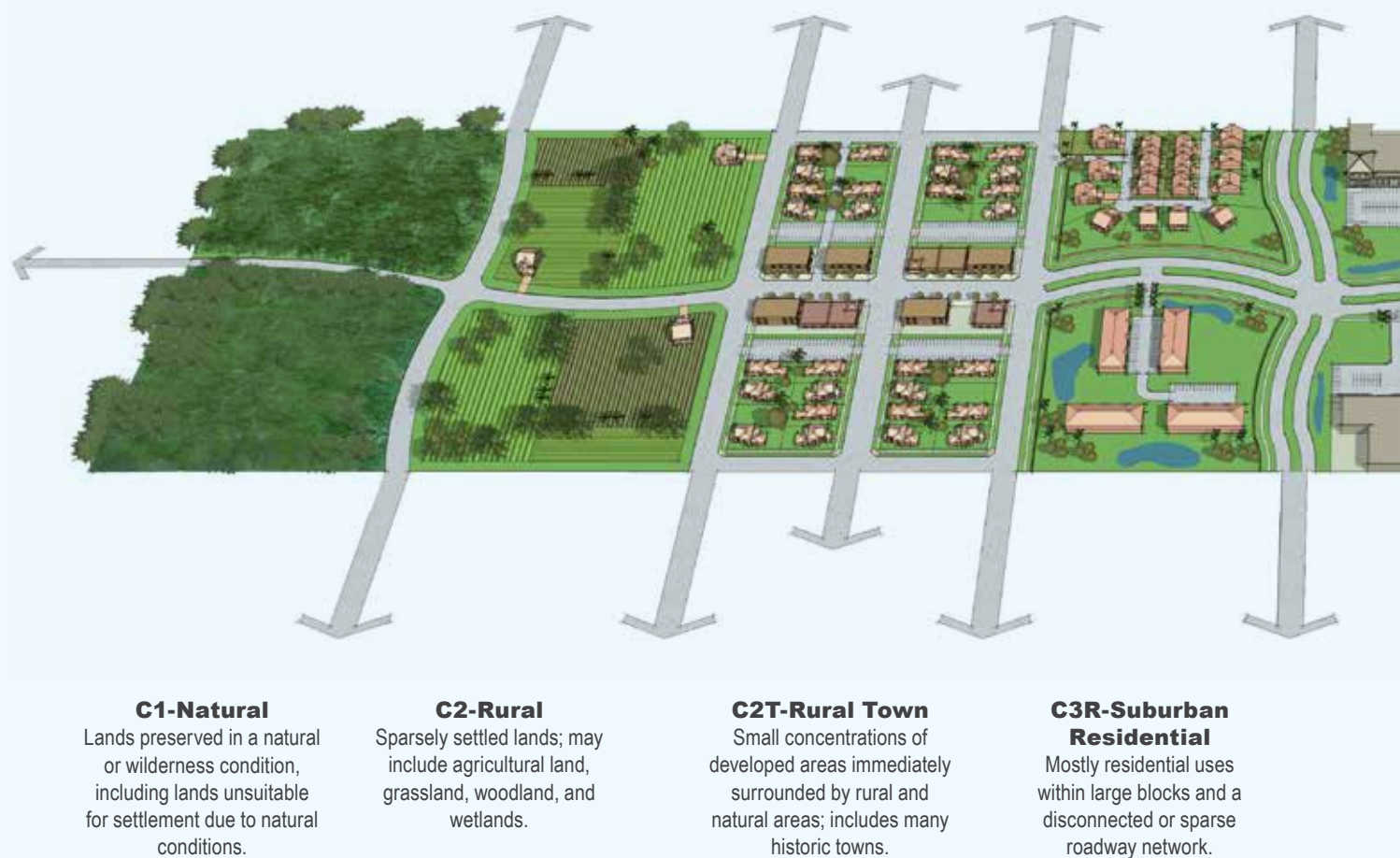


INTRODUCTION TO CONTEXT CLASSIFICATION

The context classification system broadly identifies the various built environments existing in Florida, as illustrated in **Figure 5**. State roadways extend through a variety of context classifications. FDOT's context classification system describes the general characteristics of the land use, development patterns, and roadway connectivity along a roadway, providing cues as to the types of uses and user groups that will likely utilize the roadway.

Figure 5 should not be taken literally to imply all roadways will have every context classification or that context classifications occur in the sequence shown. Identifying the context classification is a step in the planning and design processes, as different context classifications will have different design criteria and standards.

FIGURE 5 FDOT CONTEXT CLASSIFICATIONS



The use of context classifications to determine criteria for roadway design elements is consistent with national best practices and direction, including the **2018 American Association of State Highway and Transportation Officials (AASHTO) Green Book** and the **National Cooperative Highway Research Program (NCHRP) Report 855: An Expanded Functional Classification System for Highways and Streets**, which proposes a similar context-based approach to design that incorporates context, user needs, and transportation functions into the design process. This research was born out of a need to better define contexts beyond urban and rural classifications, and to incorporate multimodal needs into the existing functional classification system. Ongoing NCHRP research projects continue to refine the system and outline context-based design criteria.

This chapter outlines the steps to determine a roadway's context classification, including measures used to determine the context classification.



C3C-Suburban Commercial

Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.

C4-Urban General

Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.

C5-Urban Center

Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.

C6-Urban Core

Areas with the highest densities and building heights, and within FDOT classified Large Urbanized Areas (population greater than one million). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.

HOW CONTEXT CLASSIFICATION INFORMS PROJECTS

Context classification helps identify the anticipated users of the roadway. As such, a roadway's context classification informs decisions made during FDOT's various project development phases, so that each state roadway is planned, designed, constructed, and maintained to support safe and comfortable travel for its anticipated users.

Project Origins

It is important that roadway users and their respective needs are understood early in the life of a project. Understanding the needs of all users at these early phases can help assure that the project scope of services defines all necessary improvements and that the budget is adequate for design, right-of-way, and construction. The context classification and users inform key design elements, such as the design speeds, lane widths, and types of pedestrian, bicycle, transit, and freight facilities to be included in the design concept.

Projects go through various phases of the project development process. The context classification should be determined and/or confirmed at the beginning of each project phase, including planning, PD&E, and design.

Projects that *go through* PD&E

It is helpful to understand the context classification prior to the start of PD&E to understand the needs of the anticipated users of a roadway and to ensure that a full range of potential solutions to address these needs is explored during PD&E. This can be accomplished through a streamlined project-level transportation planning phase that identifies the context classification, the needs of anticipated users, and recommends a target speed. This level of planning offers an opportunity to incorporate Complete Streets principles and establish the framework for a Complete Streets approach for the life of the project.

Projects that *do not go through* PD&E

There are many FDOT projects, including rehabilitation (RRR), traffic operations, and safety projects, that do not qualify for an Efficient Transportation Decision Making (ETDM) screening and may or may not have a formal planning phase. Context classification and target speed must still be identified, and these should be established prior to the development of the scope of services for the project's design phase. Understanding the context classification and target speed will inform roadway elements and criteria that can significantly improve the safety of all users. Knowing this information at the early stages of any project will ensure that project budgets are accurate from the beginning and will help stabilize the work program.

Preliminary Context Classification Designations

Preliminary existing context classification designations have been developed for the state roadway system by each FDOT District. These districtwide assessments serve as the foundation for understanding the context classification for state roadways from a system perspective and are intended to be refined on a project-by-project basis.

The districtwide preliminary context classification was developed with a subset of the measures specified in the Context Classification Matrix (**Table 2**), based on each District's available GIS data. Before the design criteria are applied to a project, the preliminary context classification of a project roadway should be evaluated based on the most recent data available, with the complete set of context classification measures outlined in the matrix, and using the steps outlined in the following sections. This project-level evaluation confirms the most appropriate context classification for a roadway reflecting up-to-date existing and/or future conditions as precisely as possible (see **Table 1**). To ensure statewide consistency, contact the State Complete Streets Program Manager if the District believes a modification to this approach is needed for any reason.

Statewide Context Classification Database in the RCI

The Roadway Characteristics Inventory (RCI) is a database of information related to the roadway environment maintained by FDOT Central Office. The database includes information on a roadway's features and characteristics*. The preliminary context classification is stored in the RCI as Feature 126 – Preliminary Context Classification. This feature includes two characteristics:

Preliminary Context Classification

This feature was initially populated with the preliminary context classification from each districtwide data set. Each District will update this dataset with the project-level context classification as project-level evaluations are completed.

Future Context Classification

This characteristic contains the future context classification. It is populated by the District, as applicable, when project-level future context classifications are completed. Not all roadway segments will have a future context classification assigned.

RCI information may be a starting point for research and planning purposes in evaluating a roadway's context classification. However, as this dataset is dynamic and constantly being updated, project-level context classification information must be confirmed with the District Complete Streets Coordinator.

*Feature 124-Urban Classification and Feature 481-Highway Maintenance Classification may describe land use contexts in different ways but do not contain context classification.

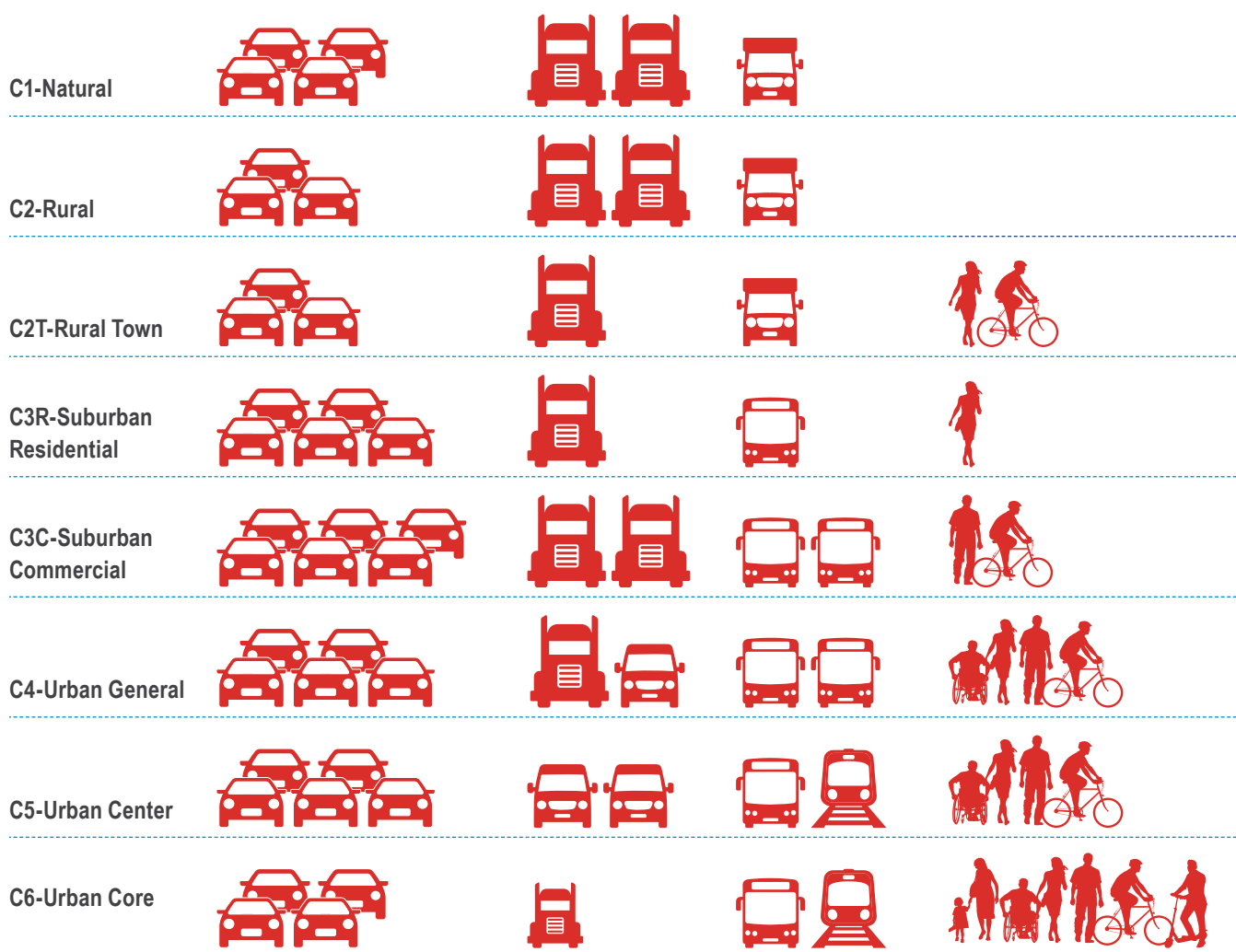
TABLE 1 CONTEXT CLASSIFICATION DESIGNATIONS

Time Period	Preliminary Method	Project-Level Method
Existing	Districtwide evaluation based on existing conditions, using readily available GIS data	Project specific evaluation based on existing conditions, using the most recent data available
Future	Districtwide evaluation based on future conditions, using readily available GIS data	Project specific evaluation based on forecasted/planned future conditions, using the most recent data available

CONTEXT CLASSIFICATION AND ROADWAY USERS

The context classification of a roadway informs planners and engineers of the types of users and the intensity of use expected along the roadway. **Figure 6** illustrates the user types and intensities expected in each context classification. For example, the C6-Urban Core Context Classification is anticipated to have more pedestrians, bicyclists, and transit users than in a C2-Rural Context Classification. Therefore, design and posted speeds towards the lower end of the speed range, signal spacing, crossing distances, lane widths, and other design elements such as bicycle facilities, on-street parking, and wide sidewalks should be provided to increase the safety and comfort of bicyclists, pedestrians, and transit users. For the C2-Rural Context Classification, vehicles and freight are primary users; the infrequent bicyclists and pedestrians are accommodated with paved shoulders or sidepaths. A state roadway in C2-Rural Context Classification is expected to have relatively higher speeds, wider lanes, and fewer pedestrian and bicycle crossings.

FIGURE 6 EXPECTED USER TYPES IN DIFFERENT CONTEXT CLASSIFICATIONS

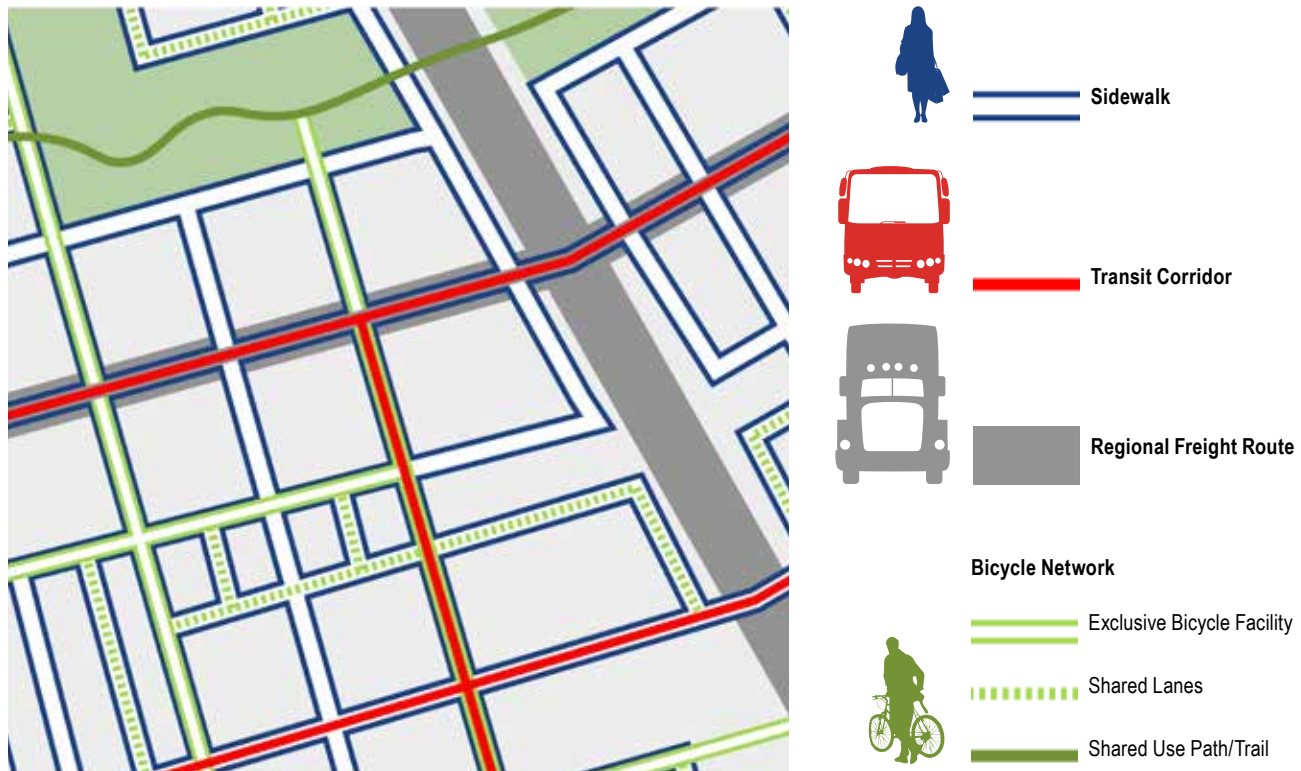


BUILDING A COMPLETE STREETS NETWORK

Every Complete Street is uniquely planned and designed to serve the context of that roadway. Although Complete Streets focus on the safety of all users, each Complete Street will strike a different balance of user comfort, based on existing and desired future contexts. For instance, in urban contexts, where high volumes of pedestrians, bicyclists, and transit users are expected or desired, a roadway may include wide sidewalks, special bus lanes, and transit shelters. The **FDOT Design Manual**, **Traffic Engineering Manual**, and **Access Management Guide** contain standards, criteria, and guidance to be used for planning, designing, and operating roadways in each context classification.

Figure 7 illustrates a conceptual idea of a complete network of roadways, where each roadway contributes to the system's ability to serve all users.

FIGURE 7 CONTEXT-SENSITIVE SYSTEM OF COMPLETE STREETS



Well-designed, connected roadway networks make travel more efficient by providing choice not only in modes, but also in routes. Pedestrians, bicyclists, and transit riders are especially motivated to find direct routes to their destination or their transit stop. A fine-grained network of roadways and crossing opportunities provides more direct paths to destinations, reduces delay, and creates redundancy of path options for all users. A network of connected roadways also disperses vehicular travel along multiple roadways.

With a number of intersections and roadways sharing the traffic demand, there is reduced need to construct wider roadways and large intersections that can potentially create barriers to walking and bicycling and increase crash rates and severity for all users. Lastly, a fine-grained network allows for roadways to complement each other, with some roadways providing better quality of service for high-speed travel, and other parallel roadways providing comfort, safety, and access for bicyclists and pedestrians.

Many roadways in Florida are built in suburban contexts (C3R-Suburban Residential and C3C-Suburban Commercial), with limited roadway connectivity and land uses dispersed over large areas of land. In these suburban contexts, the existing arterial roadway network supports both local access and regional mobility, concentrating most vehicular trips, both local and regional, onto the arterial roadways. Critical transit service, major employers, and retail services are also often located on these roadways, even though the large setbacks on large lots and wide, high-speed roadways may not be optimal for pedestrian circulation. Therefore, as investments are made along the major arterial roadways, design elements that support walking, bicycling, and transit use should be integrated. In addition to these on-roadway investments, network alternatives in the form of new local roadway connections and shared use paths should be developed to complement the arterial roadway system, to provide high quality, safe, and comfortable travel for all modes.

Due to local context, right-of-way, and financial constraints, it may not be possible to provide similar levels of high quality facilities for all modes along all FDOT roadways. In some locations, it may be necessary to rely upon parallel networks to provide additional travel options for all modes. The network approach requires close coordination between FDOT and local communities, as all partners work together to develop a system of Complete Streets comprised of State and local roadways.

DETERMINING PROJECT-SPECIFIC CONTEXT CLASSIFICATION

CONTEXT CLASSIFICATION MATRIX

Table 2 Context Classification Matrix presents a framework to determine the context classifications along state roadways. This Context Classification Matrix outlines (1) distinguishing characteristics, (2A/B) primary measures, and (2C) secondary measures. The distinguishing characteristics give a broad description of the land use types and street patterns found within each context classification. The primary and secondary measures provide more detailed assessments of the existing or future conditions along the roadway. The primary measures can be evaluated through a combination of a field visit, internet-based aerial, and street view imagery. The secondary measures require map analysis and review of future land use or zoning information, which may not be readily available on every project. The Context Classification Matrix presents the thresholds for the primary and secondary measures for the eight context classifications.

Appendix A illustrates the FDOT context classifications through case studies. These case studies illustrate real-world values for the primary and secondary measures that determine a roadway’s context classification.

The context classification will be updated or confirmed at the beginning of each project phase, including planning, PD&E, and design. Each District can assign staff to oversee the determination of context classification. It is recommended that an interdisciplinary team within each District help determine the context classification. For projects where FDOT currently coordinates with local governments, FDOT will coordinate with those local governments to confirm context classification. The final determination of context classification will be made by FDOT District staff. For smaller projects, such as traffic operations push-button projects, the context classification may be determined without additional local coordination. Refer to the *Public Involvement Handbook*, *FDM*, and *PD&E Manual* for guidance on local government coordination.

When to Use Existing Versus Future Context Classifications

The measures in **Table 2** can be evaluated based on existing or future conditions. In general, the horizon year for the context classification should match the horizon year for the traffic analysis being conducted on projects. Districts may choose to use future context classification for other projects at their discretion. Some Districts have completed a districtwide preliminary future context classification assessment. The preliminary future context classification can serve as a starting point for many projects, and may be an efficient way to explore future conditions.

Project types that qualify for ETDM screening, per the ETDM Manual Section 2.3.1, are considered qualifying projects (see **Figure 8**). These are projects that go through the PD&E process. Qualifying projects in all project development phases should evaluate future conditions of the measures and utilize future context classification. See page 16 for more discussion on evaluating context classification for new roadways.

Non-qualifying projects, or projects that do not go through ETDM screening, may be evaluated based on existing conditions, and utilize existing context classification. However, Districts may choose to use future context classification based on a longer project timeline. For example, a Resurfacing, Restoration, and Rehabilitation (RRR) project with an expected 15-year design life may consider future conditions expected in that time frame. See page 10 for more information about determining future context classification.

Figure 8 lists a sample of qualifying and non-qualifying projects. This is not a complete list of qualifying and non-qualifying projects. Please review the ETDM Manual for a complete list: <https://www.fdot.gov/environment/pubs/etdm/etdmmanual.shtm>.

FIGURE 8 CONTEXT CLASSIFICATION DESIGNATIONS

Qualifying Projects

- A highway which provides new access to an area
- New roadway
- New or reconstructed arterial highway (e.g. realignment)
- New circumferential highway that bypasses a community
- New bridge which provides access to an area/bridge replacements

Conduct a future context classification evaluation

Non-qualifying Projects

- Projects that do not go through ETDM screening
- RRR
- Lighting
- Intersection Improvement
- New or reconstruction of bicycle and pedestrian facilities

Conduct an existing context classification evaluation

TABLE 2 CONTEXT CLASSIFICATION MATRIX

Context Classification	(1) Distinguishing Characteristics	(2 A/B) Primary Measures			
		Roadway Connectivity			Land Use
		Intersection Density	Block Perimeters	Block Length	
		Intersections/ Square Mile	Feet	Feet	
C1-Natural	Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.	N/A	N/A	N/A	Conservation Land, Open Space, and/or Park
C2-Rural	Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.	<20	N/A	N/A	Agricultural and/or Single-Family Residential
C2T-Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.	>100	<3,000	<500	Retail, Office, Single-Family Residential, Multi-Family Residential, Institutional, and/or Industrial
C3R-Suburban Residential	Mostly residential uses within large blocks and a disconnected or sparse roadway network.	<100	N/A	N/A	Single-Family and/or Multi-Family Residential
C3C-Suburban Commercial	Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.	<100	>3,000	>660	Retail, Office, Multi-Family Residential, Institutional, and/or Industrial
C4-Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.	>100	<3,000	<500	Single-Family or Multi-Family Residential, Institutional, Neighborhood Scale Retail, and/or Office
C5-Urban Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.	>100	<2,500	<500	Retail, Office, Single-Family or Multi-Family Residential, Institutional, and/or Light Industrial
C6-Urban Core	Areas with the highest densities and building heights, and within FDOT classified Large Urbanized Areas (population > one million). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.	>100	<2,500	<660	Retail, Office, Institutional, and/or Multi-Family Residential

The thresholds presented in Table 2 are based on the following sources, with modifications made based on Florida case studies:

- 1) [2008 Smart Transportation Guidebook: Planning and Designing Highways and Streets that Support Sustainable and Livable Communities](#), New Jersey Department of Transportation and Pennsylvania Department of Transportation;
- 2) [2012 Florida TOD Guidebook](#), Florida Department of Transportation;
- 3) [2009 SmartCode Version 9.2](#), Duany, Andres, Sandy Sorlien, and William Wright; and
- 4) [2010 Designing Walkable Urban Thoroughfares: A Context Sensitive Approach](#), Institute of Transportation Engineers and Congress for the New Urbanism.
- 5) Colors correspond to flowchart in Figure 9.

(2 C) Secondary Measures

Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
Floor Levels	Description	Yes/No	Description	Dwelling Units/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1 to 2	Detached buildings with no consistent pattern of setbacks	No	N/A	<1	N/A	<2	N/A
1 to 2	Both detached and attached buildings with no or shallow (<20') front setbacks	Yes	Mostly on side or rear; occasionally in front	>4	>0.25	N/A	>2
1 to 2, with some 3	Detached buildings with medium (20' to 75') front setbacks	No	Mostly in front; occasionally in rear or side	1 to 8	N/A	N/A	N/A
1 (retail uses) and 1 to 4 (office uses)	Detached buildings with large (>75') setbacks on all sides	No	Mostly in front; occasionally in rear or side	N/A	<0.75	N/A	N/A
1 to 3, with some taller buildings	Both detached and attached buildings with no setbacks or up to medium (<75') front setbacks	Yes	Mostly on side or rear; occasionally in front	>4	N/A	>5	>5
1 to 5, with some taller buildings	Both detached and attached buildings with no or shallow (<20') front setbacks	Yes	Mostly on side or rear; occasionally in front, or in shared off-site parking facilities	>8	>0.75	>10	>20
>4, with some shorter buildings	Mostly attached buildings with no or minimal (<10') front setbacks	Yes	Side or rear; often in shared off-site garage parking	>16	>2	>20	>45

STEP-BY-STEP GUIDE FOR DETERMINING CONTEXT CLASSIFICATION

This page and **Figure 9** outline a step-by-step process on how to evaluate context classification at the project level. Detailed methodology for segmenting roadways, evaluating context classification measures, and common data sources needed to evaluate measures are described on the following pages. In many cases, a subset of the primary measures is sufficient to determine a roadway segment’s context classification and not all measures outlined in **Table 2** may always need to be evaluated. **Figure 9** illustrates the process to evaluate context classification, focusing on the most important measures that can distinguish between context classifications.

● **Step 1**

Review distinguishing characteristics as described in **Table 2** to identify major changes in land use types and street patterns along the project corridor. Where a major change happens, a roadway should be segmented and each segment evaluated separately.

● **Step 2A**

Once segments are defined, utilize the measures pertaining to roadway connectivity (intersection density, block perimeter, and block length) to determine if a roadway segment is in one of these three context classification groupings:

C2T, C4, C5, or C6

C3R or C3C

C1 or C2

● **Step 2B**

Use the land use measures to further refine the evaluation.

C2T, C4, C5, or C6

Determine if the land uses along the roadway segment are surrounded by rural or natural land.

- **Yes:** this can be classified as C2T context classification.
- **No:** then further evaluate using building setback measure.

Determine if non-C2T segments have less than 20’ setbacks.

- **Yes:** further evaluate in Step 2C.
- **No:** this segment can be classified as C4 context classification.

C3R or C3C

Review the land uses along the roadway. Are they predominantly residential?

- **Yes:** this segment can be classified as C3R context classification. Many C3R segments have fences, walls, or landscaping immediately along the state road with residential uses behind the barrier.
- **No** (land uses are primarily commercial and/or industrial): this segment can be classified as C3C context classification. Many C3C segments have residential land use one or more blocks off the segment, but the primary land use along the segment is commercial and/or industrial.

C1 or C2

Determine if the roadway segment is surrounded by conservation land, such as a park or wildlife refuge.

- **Yes:** this can be classified as C1 context classification.
- **No:** this can be classified as C2 context classification.

● **Step 2C**

Use the land use measures to further refine the evaluation.

C5 or C6

Evaluate if within a Large Urbanized Area.

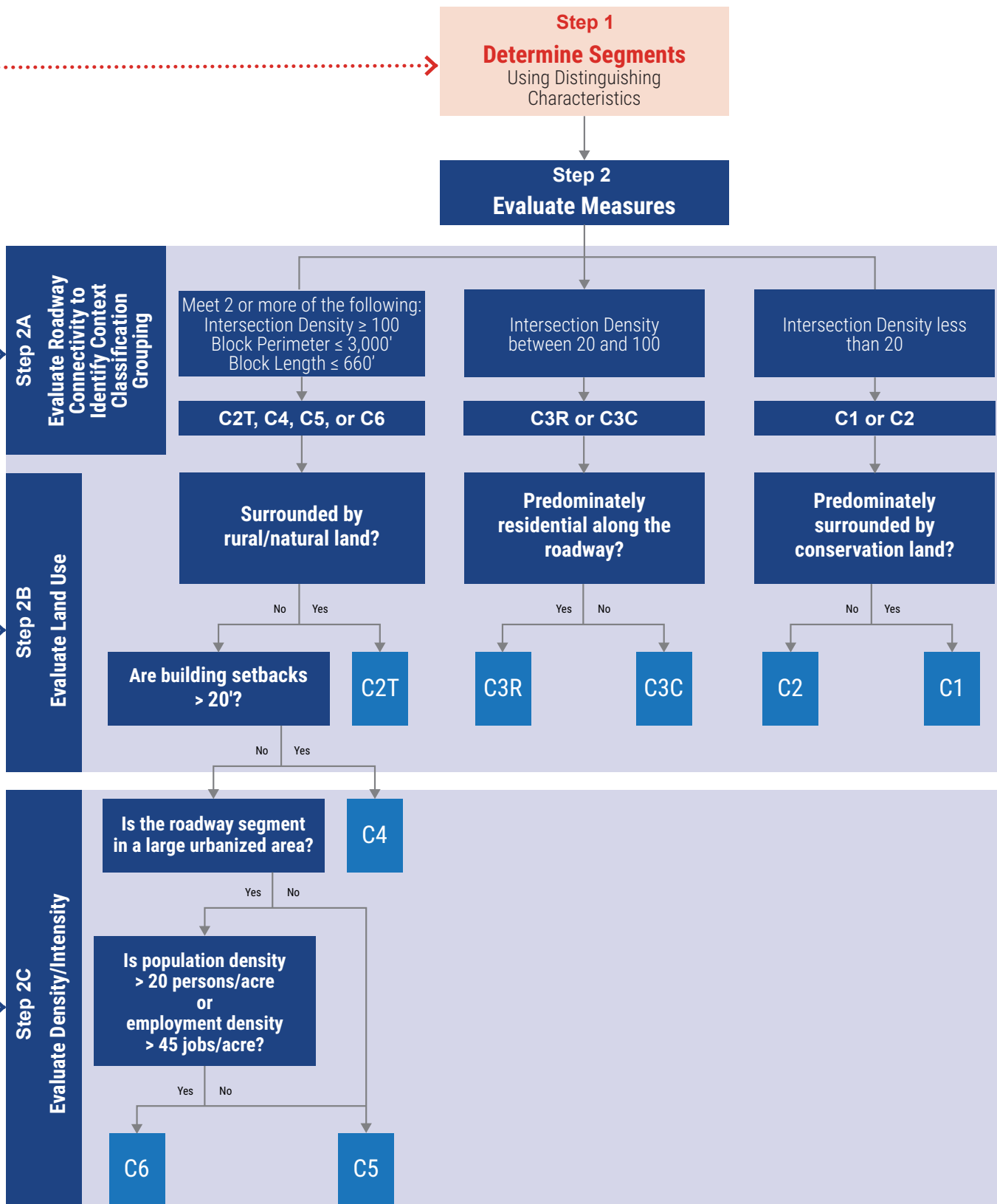
- **Yes:** further evaluate using population and employment density.
- **No:** this segment can be classified as C5 context classification.

Population and employment density can be used to distinguish between the C5 and C6 context classifications in Large Urbanized Areas. Is either the population density greater than or equal to 20 persons per acre or the employment density greater than or equal to 45 jobs per acre?

- **Yes:** this segment can be classified as C6 context classification.
- **No:** this segment can be classified as C5 context classification.

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FIGURE 9 STEP-BY-STEP GUIDE FOR DETERMINING CONTEXT CLASSIFICATION

Note: Large urbanized refers to an MPO urbanized area greater than one million in population. The population threshold refers to the MPO urbanized area not the individual city or town. For example, parts of Tampa could be considered a C6 because the MSA population is greater than one million even though the population of the City of Tampa is not one million.

CONTEXT CLASSIFICATION

DETAILED METHODOLOGY

The distinguishing characteristics, primary measures, and secondary measures provide analytical measurements to evaluate land use characteristics, development patterns, and roadway connectivity to determine context classification. These land use and transportation measures differentiate between different contexts. Other measures were originally considered by FDOT, but ultimately not included in the methodology. Transit service, for example, can be an indicator of multimodal need since all riders are at one point a pedestrian or a bicyclist, but levels of transit service and occurrence of transit stops do not always relate to adjacent development patterns. Frequent transit service can be present in both suburban and urban contexts, and even some rural towns.

The data available to characterize existing and future context classifications will vary depending on the specificity of the roadway alignments being considered. Many projects conducted by FDOT occur along existing corridors where a single alignment is being considered. The range of alternatives for new roadways also narrows to a single alignment alternative as qualifying projects proceed from planning through PD&E and design. In planning and ETDM screening for existing roadways, and in PD&E and design for new roadways, it is possible to analyze both the existing and future conditions to determine the context classification of a roadway. For projects involving new roadways in planning and ETDM screening, multiple alternative alignments may be considered over larger areas. For these latter types of projects, a broader understanding of the context classification will be used to inform the planning process and development of alternatives.

The following are the two key steps for determining context classification at the project level:



1 Define Segments by Identifying Major Changes in Context

Context classification segments are based on land development pattern changes, as characterized by land use, development density, and roadway connectivity changes. A new segment starts where the land development patterns change. Project-limits do not define the segmentation for context classification. Like access management classification, there may be several context classification segments within a single project, and the limits of those segments may extend beyond the project limits.

Use the distinguishing characteristics described in the Context Classification Matrix to identify if multiple context classifications are present along a project roadway and if a long roadway corridor needs to be segmented. Where a block structure, or grid network, is present, a context classification segment may be as short as two blocks in length. Where there is no defined block structure, a context classification segment may be as short as a quarter mile in length.

Figure 10 and **Figure 11** demonstrate cases where roadway segmentation can change based on major changes in land use and roadway connectivity.

FIGURE 10 DISTINGUISHING CONTEXT CLASSIFICATION SEGMENTS BY DEVELOPMENT INTENSITY AND ROADWAY NETWORK



— C2T
— C3C
— C2

A context classification change occurs where the development patterns change between the natural land and the concentrated developed land and again when the roadway network changes from a sparse, disconnected network to a well-connected grid network.

FIGURE 11 DISTINGUISHING CONTEXT CLASSIFICATION SEGMENTS BY TYPE OF LAND USE



— C3R
— C3C
— C4

There is a context classification change in the suburban environment where the land use changes from predominantly residential to commercial and the block structure changes.

2 Evaluate the Measures

A roadway segment must meet most of the measures defined for a context classification in order to be assigned that context classification.

Table 3 and **Table 4** describe the methodology and data sources associated with the primary and secondary measures, respectively. Two measurement areas — the block and the parcel — are used, as explained in **Figures 12** and **13**. **Figures 14** through **18** provide guidance for evaluating some of the primary measures.

The distinction between primary and secondary measures is based on the availability of data and does not imply intended sequence of evaluation or relative importance. The primary measures can be evaluated through a combination of a field visit, internet-based aerial, and street view imagery. The secondary measures require map analysis and review of zoning information, which may not be available on every project.

Evaluation of the measures for each segment can be done based on existing conditions or updated with future conditions, if needed. For existing context classification, consider existing plus committed roadway network when evaluating roadway connectivity and existing land use plus permitted development when evaluating land use measures.

For future context classification, consider the adopted future cost-feasible metropolitan transportation plan (MTP), also known as the long range transportation plan (LRTP), and programmed local roadway network projects when evaluating roadway connectivity. Future land use should be clearly documented in a well-defined, community-supported, and implementation-focused plan or in policies such as zoning overlays, form-based codes, or community redevelopment plans. These plans detail short- and mid-term changes to the roadway and built form using established mechanisms for implementation.

The future desired conditions should be consistently documented across all appropriate local policies and should be well-understood and accepted by local stakeholders. In short, the future conditions should be those that are predictable and that will occur over an anticipated time frame rather than visionary plans or broad goals and ideas that do not have a clear timeline for actual implementation. Use of a form-based code is one indicator that significant community discussion occurred on a future vision and that future development is more likely to result based on the adopted form-based code. See page 21 for more discussion on evaluating future context classification for new roadways.



Districts with a districtwide preliminary context classification may have calculated some of the measures as part of the districtwide evaluation. Use this as a starting point where possible, adding new or updated data and measures that were not gathered during the districtwide evaluation.

TABLE 3 PRIMARY MEASURES TO DEFINE CONTEXT CLASSIFICATION

Measure	Description	Methodology	Measurement Area*	Data Source**
Roadway Connectivity	Intersection Density	Number of intersections per square mile	Calculate by dividing the total number of intersections by the area of the blocks along both sides of the street, excluding natural features and public parks; consider future roadway connectivity if an approved or permitted development plan is in place (see Figure 14).	The block on either side of the roadway; if the roadway and block structure is not complete, the evaluation area should extend 2000' on either side of the roadway
	Block Perimeter	Average perimeter of the blocks adjacent to the roadway on either side	Measure the block perimeter for the blocks adjacent to the roadway on either side and take the average; consider future roadway connectivity if an approved or permitted development plan is in place (see Figure 15).	The block on either side of the roadway; if the roadway and block structure are not complete, the evaluation area should extend 2000' on either side of the roadway
	Block Length	Average distance between intersections	Measure the distance along the roadway between intersections with a public roadway, on either side, and take the average; consider future roadway connectivity if an approved or permitted development plan is in place (see Figure 15).	Roadway
Land Use	Land use mix for more than 50% of the fronting uses	Record based on existing or future adopted land uses.	Fronting parcels on either side of the roadway	Field review, GIS files, existing land use, or future land use clearly documented in a well-defined, community-supported, and implementation-focused plan or in policies such as zoning overlays, form-based codes, or community redevelopment plans.
Building Height	The range in height of the buildings for more than 50% of the properties	Record based on existing buildings or future permitted building height requirements based on land development regulations.	Fronting parcels on either side of the roadway	Field review, internet-based aerial and street view imagery, or land development regulations
Building Placement	Location of buildings in terms of setbacks for more than 50% of the parcels	Measure the distance from the building to the property line or future required building placement based on land development regulations (see Figure 16).	Fronting parcels on either side of the roadway	Field review, internet-based aerial and street view imagery, building footprint and parcel GIS files, or land development regulations
Fronting Uses	Buildings that have front doors that can be accessed from the sidewalks along a pedestrian path for more than 50% of the parcels	Record the percentage of buildings that provide fronting uses or site design and lot layout requirements in land development regulations that require fronting uses (see Figure 17).	Fronting parcels on either side of the roadway	Field review or internet-based aerial and street view imagery, or land development regulations
Location of Off-Street Parking	Location of parking in relation to the building: between the building and the roadway (in front); on the side of the building; or behind the building	Record location of off-street parking for majority of parcels or parking requirements based on land development regulations (see Figure 18).	Fronting parcels on either side of the roadway	Field review or internet-based aerial and street view imagery, or land development regulations

* The measurement area applies to each context classification segment. Evaluate each measure for each context classification segment. Where characteristics differ for each side of the street, use the characteristics for the side that would yield the higher context classification.

** Land use, zoning, streets, and other GIS data and maps are available from local government agencies, FDOT Efficient Transportation Decision Making (ETDM) Database, and regional agencies.

TABLE 4 SECONDARY MEASURES TO DEFINE CONTEXT CLASSIFICATION

Measure	Description	Methodology	Measurement Area	Data Source
Allowed Residential Density	Maximum allowed residential density by adopted zoning	Identify which zoning district the context classification segment is within, and record maximum allowed residential density for that particular zoning district by dwelling units per acre.	Parcels along either side of the roadway	Zoning code, land development regulations
Allowed Office/Retail Density	Maximum allowed office or retail density in terms of Floor Area Ratio (FAR), or the ratio of the total building floor area to the size of the property on which it is built	Identify which zoning district the context classification segment is within, and record allowed commercial density for that particular zoning district. In some jurisdictions, allowed commercial density might be stated based on specific regulations limiting building height and minimum setbacks. Jurisdictions also regulate minimum parcel size and building area allowed in each zoning district. Maximum allowable FAR for an area can be calculated using site design and height standards (see Appendix B for more details).	Parcels along either side of the roadway	Zoning code, land development regulations
Population Density (existing)	Population per acre based on the census block group	Download census information at the block group level. Divide the population of the census block group by the area of the block group. This area should exclude large natural features and public parks. If the roadway segment is the boundary between two block groups, average the population density of the block groups on either side of the roadway. If the roadway runs through multiple block groups, calculate the population density by the weighted average of roadway within each block group.	Census block group(s) that encompasses the roadway	US Census Bureau decennial data. If the census data is more than 5 years old, the latest American Community Survey data can be used.
Population Density (future)	Projected population per acre based on the regional travel demand model traffic analysis zone (TAZ)	Divide the population of the TAZ by the area of the TAZ. If the roadway segment is the boundary between two TAZs, average the population density of the TAZs on either side of the roadway. If the roadway runs through multiple TAZs, calculate the population density by the weighted average of roadway within each TAZ. Use 20-year forecast number from the regional travel demand model. If a regional travel demand model is not available, use University of Florida Bureau of Economic and Business Research (BEBR) population projections.	TAZ(s) that encompasses the roadway. If TAZ population density is not available, use smallest geographic area available from BEBR projections.	Regional travel demand model from MPO, BEBR
Employment Density (existing)	Total number of jobs per acre	Use GIS to map the number of jobs within the blocks adjacent to the roadway utilizing the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) website. Sum the number of jobs within the blocks along either side of the roadway, and divide by the area of the blocks. This area should exclude large natural features and public parks. Blocks can be imported as a shapefile or can be manually drawn on the census website.	One block area adjacent to either side of the roadway. If the block structure is not complete, the evaluation area should extend 500 feet from the property line along the roadway.	U.S. Census Bureau LEHD website
Employment Density (future)	Total number of jobs per acre	Divide the number of jobs of the TAZ by the area of the TAZ. If the roadway is the boundary between two TAZs, average the employment density of the TAZs on either side of the roadway. If the roadway runs through multiple TAZs, calculate the employment density by the weighted average of roadway within each TAZ. Use 20-year forecast number from the regional travel demand model. If a regional travel demand model is not available, use BEBR employment projections.	TAZ(s) that encompasses the roadway. If TAZ employment density is not available, use smallest geographic area available from BEBR projections.	Regional travel demand model from MPO, BEBR

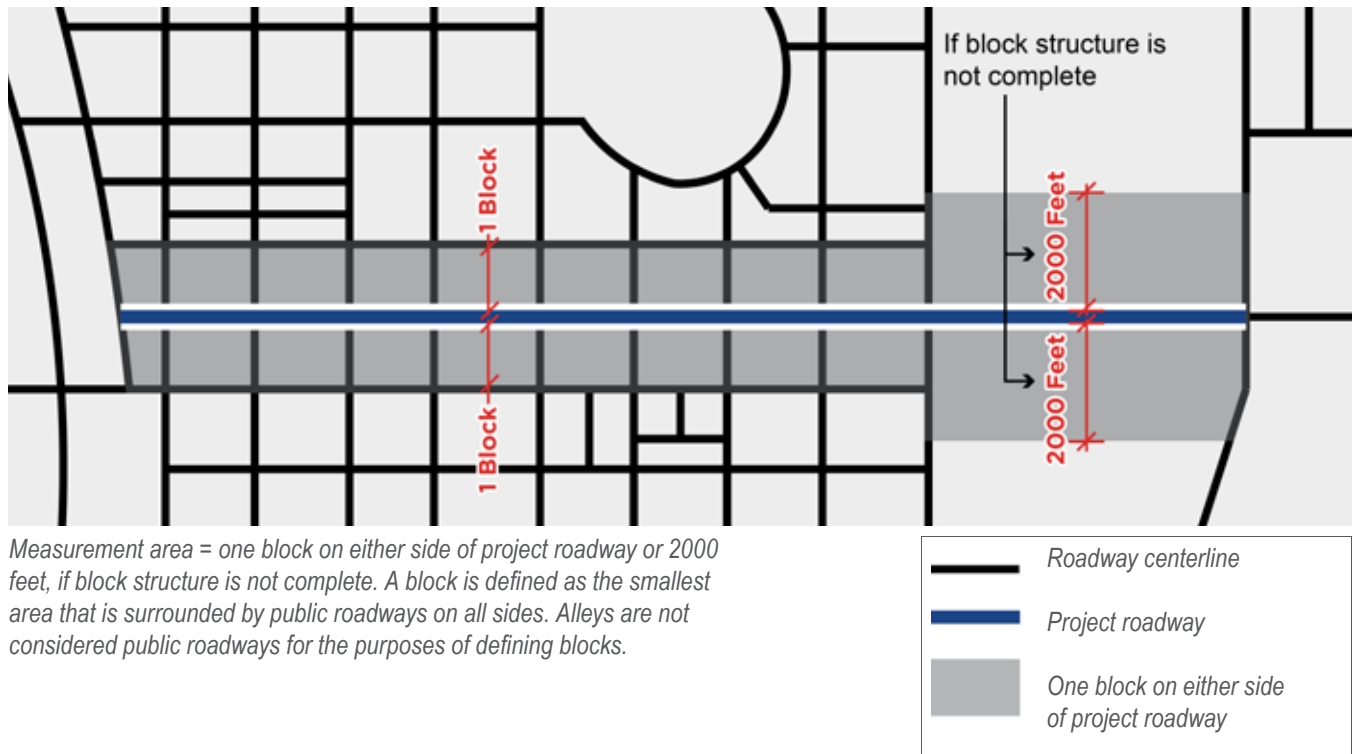
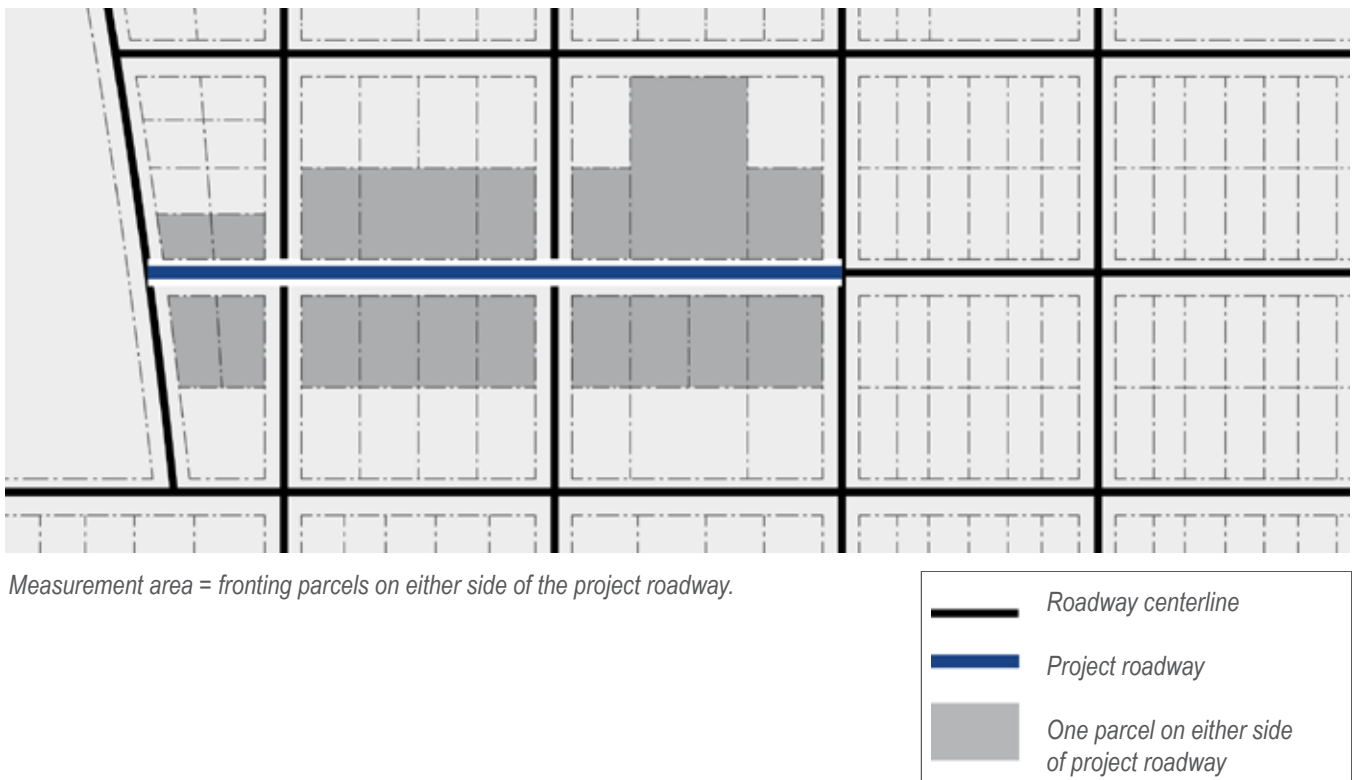
FIGURE 12 MEASUREMENT AREA: THE BLOCK ON EITHER SIDE OF THE ROADWAY**FIGURE 13** MEASUREMENT AREA: FRONTING PARCELS ON EITHER SIDE OF THE ROADWAY

FIGURE 14 INTERSECTION DENSITY

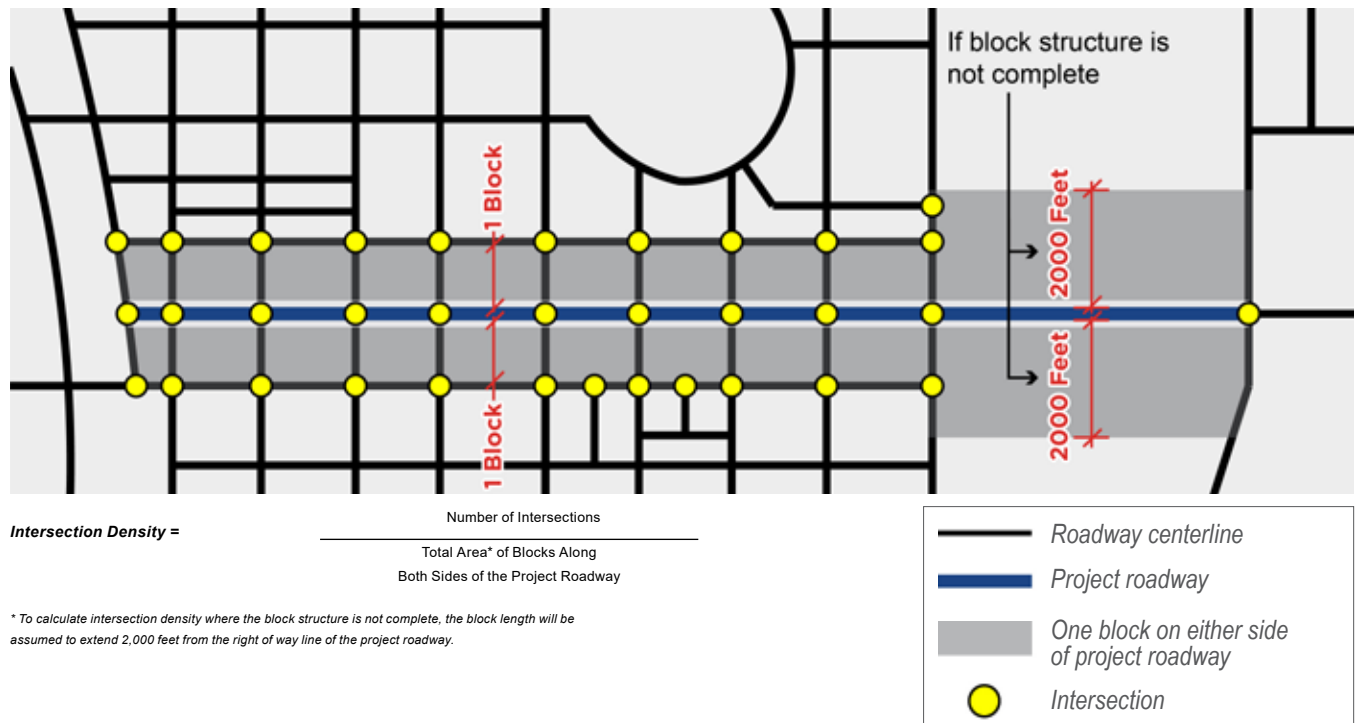


FIGURE 15 BLOCK PERIMETER AND BLOCK LENGTH

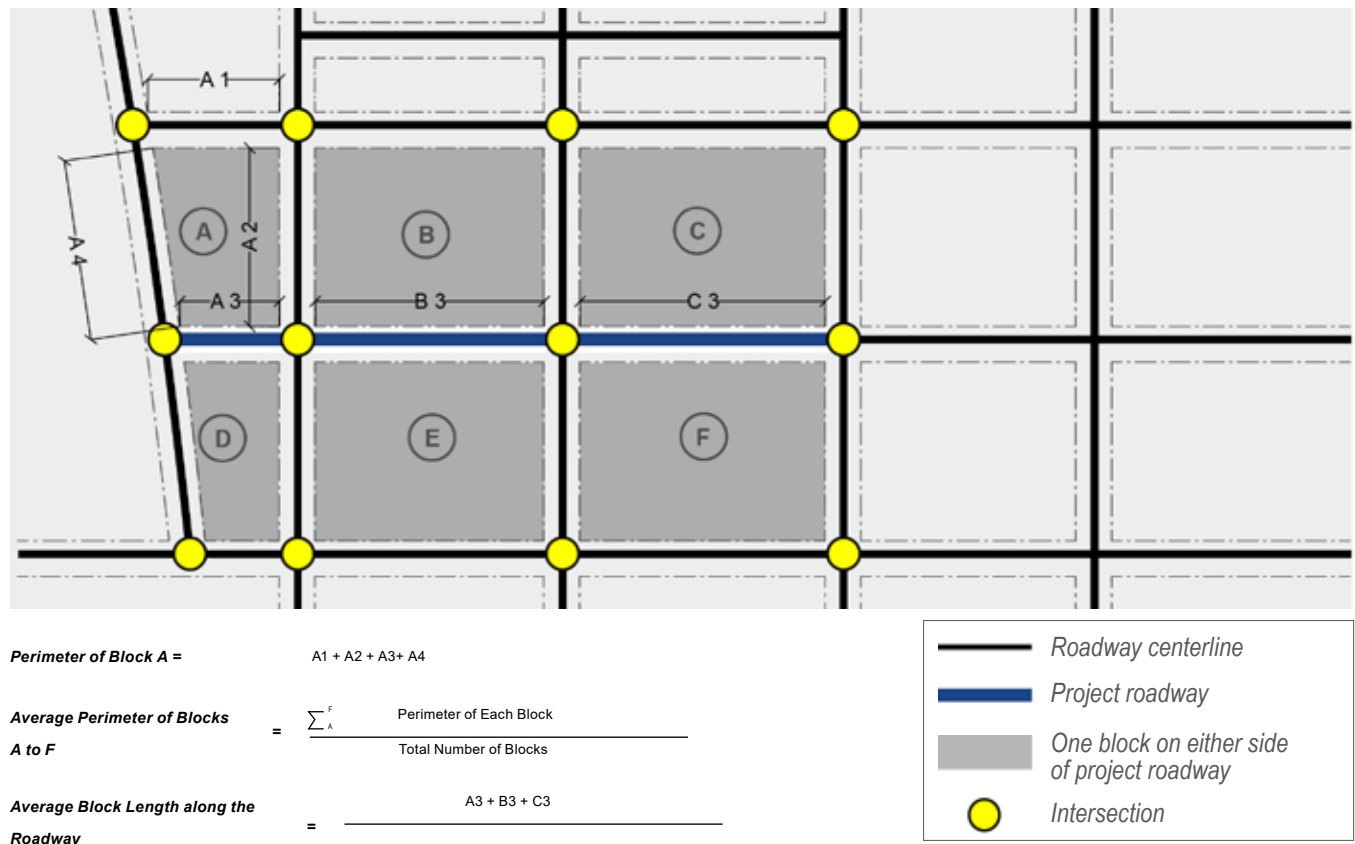
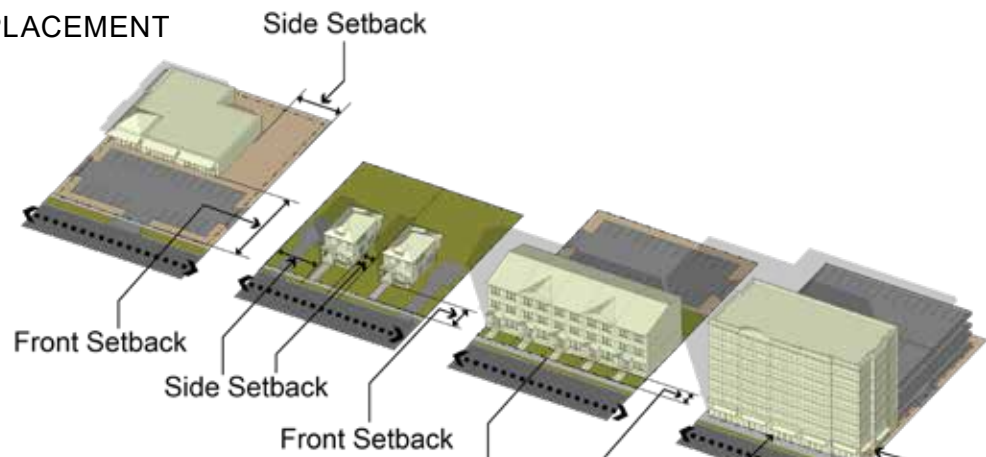
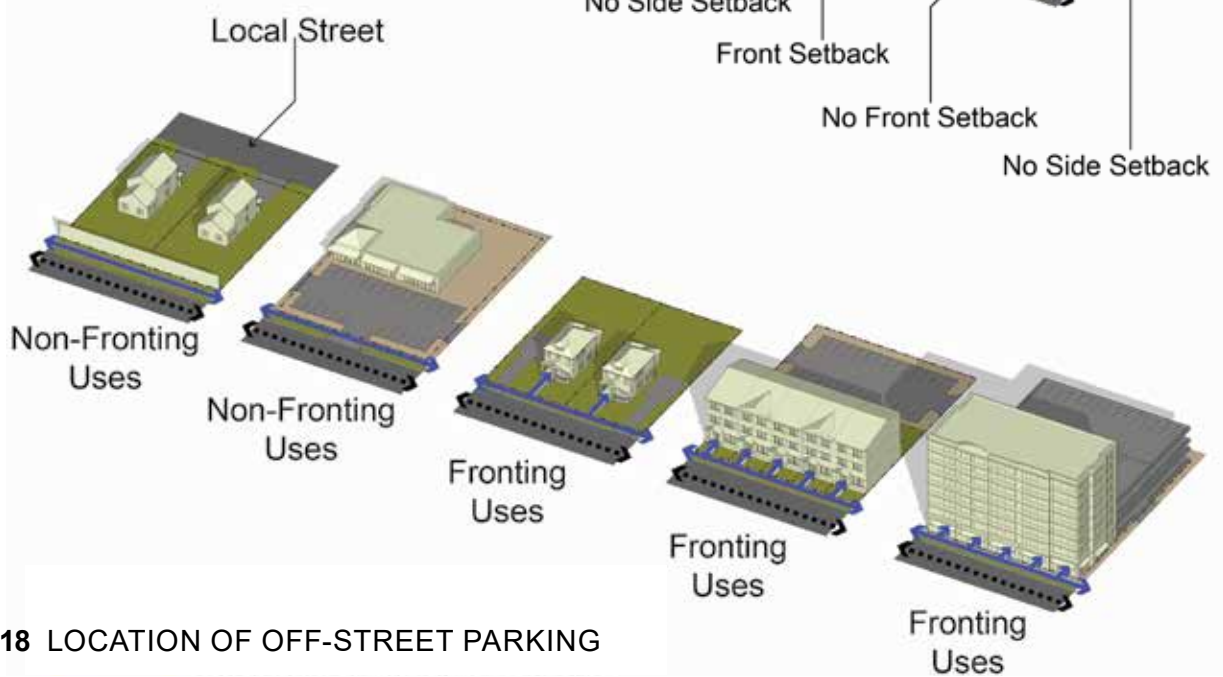
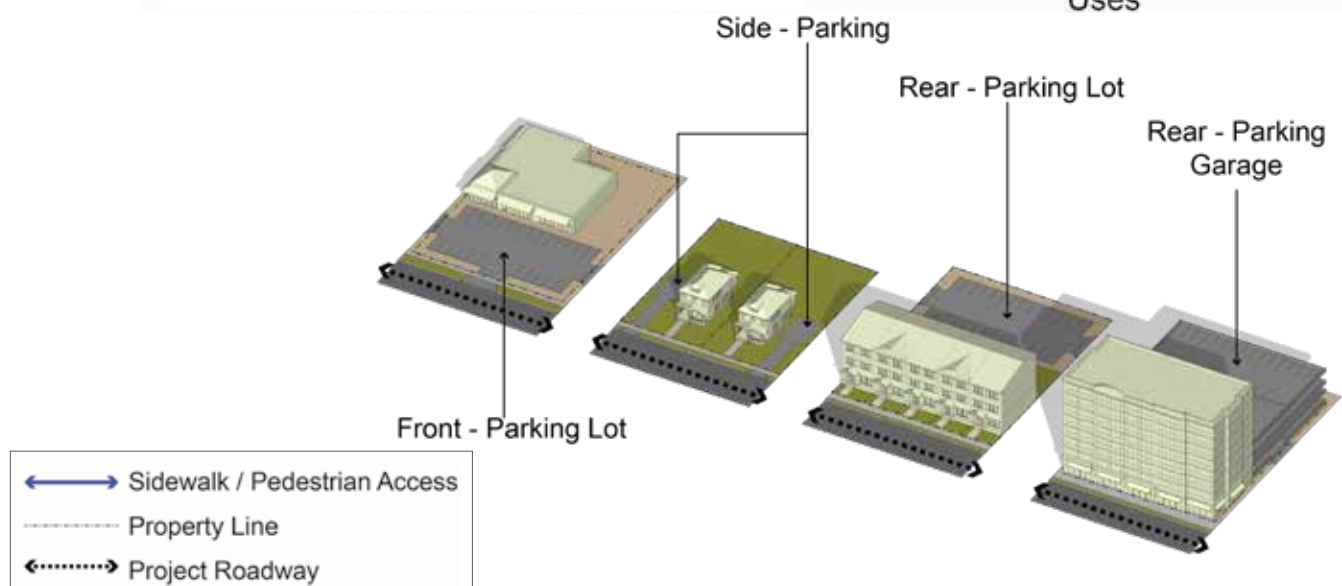


FIGURE 16 BUILDING PLACEMENT**FIGURE 17 FRONTING USES****FIGURE 18 LOCATION OF OFF-STREET PARKING**

DISTINGUISHING BETWEEN C3R AND C3C SUBURBAN CONTEXT CLASSIFICATIONS

The distinction between Suburban Residential (C3R) and Suburban Commercial (C3C) is an important one because the different land uses result in different roadway users and usage patterns.

C3R corridors are characterized by low-density residential land uses and typically do not have any land uses directly fronting or accessed from the state road. Buildings are often set back from the state road with fences, walls, and/or heavy landscaping between the roadway and the residences. C3R development tends to be static and less likely to change over time. Where a roadway is more consistent with a C3C on one side and a C3R on the other, default to the higher context classification which is C3C.

In C3C corridors, the development fronting the roadway (immediately adjacent) is commercial uses, typically with large building footprints and large surface parking lots in front of buildings. C3C environments generally attract trips to and from retail and commercial establishments and have more transit ridership and transit service than C3R. As a result of transit activity and the commercial uses, C3C corridors also experience higher bicycle and pedestrian activity compared to C3R environments. Some C3C corridors also have intermittent multi-family apartments generating trips to and from the commercial uses. C3C development tends to be more dynamic, with commercial and retail uses changing over time.

With different user types (all modes), trip types (short and long trips), and vehicle speeds (through trips and local trips accessing establishments) in C3C context classifications, crashes between motorists and bicyclists/pedestrians are more prevalent than in C3R areas. In these corridors, the combination of frequent vehicle turning movements, commercial driveways, differing operating speeds, and large blocks with long distances between crosswalks contribute to increased exposure for bicyclists and pedestrians. Large blocks, a disconnected roadway network, and the location of transit stops encourage pedestrians to cross at mid-block crossing locations.



In general, on C3C corridors, commercial land uses are the most prevalent and front the roadway, with residential land uses behind these.



In C3C environments, bicycle, pedestrian, and transit users are typically expected.



C3C corridors generally experience more bicycle and pedestrian activity compared to C3R environments.

OTHER CONDITIONS

Bridges and Tunnels

The context classification of a bridge or tunnel should be based on the higher context classification of the segments on either end of the bridge or tunnel.

Constrained Corridors/ Barrier Islands

Geographic constraints, such as water or railroad lines, may naturally limit a roadway's ability to meet the roadway connectivity measures characteristic of more urban context classifications. However, some of these constrained roadway networks still experience development density and intensity and user types commonly found in urban context classifications. These conditions often occur on barrier islands where beach access and amenities on the inland side of the roadway create high pedestrian and bicycle demand, like that found in the urban contexts. In these conditions, the mix of land uses, built form, and population and job density thresholds should be the key measures used to identify the context classification. Even if the roadway connectivity measures are not met, it may be appropriate to classify roadways on barrier islands and similarly constrained corridors as a C2T, C4, C5, or C6 context classification based on the mix of land uses, built form, and population or employment density.

Trails

According to the **FDM**, shared use paths, or trails, are appropriate in C1 and C2 context classifications as it is anticipated there will be a lower volume of non-motorists than there are in other contexts, and in C3 where higher vehicle speeds are anticipated. A simplified context classification evaluation may be determined for trails and shared use paths moving into the design phase to determine their level of appropriateness. In cases where the shared use path or trail is not running along a roadway, assume that the trail or shared use path segment being evaluated is the corridor. Engineers and planners can follow **Figure 9** to identify the context classification grouping. In most cases, knowing the grouping provides enough information to inform trail design and an official context classification determination may not be needed.

Special Districts

Special Districts (SD) are areas that, due to their unique characteristics and function, do not adhere to standard measures identified in the Context Classification Matrix. Examples of SDs include military bases, university campuses, airports, seaports, rail yards, theme parks and tourist districts, sports complexes, hospitals, and freight distribution centers. Due to their size, function, or configuration, SDs will attract a unique mix of users and create unique travel patterns. Planning and engineering judgment must be used to understand users and travel patterns, and to determine the appropriate design controls and criteria for streets serving an SD on a case-by-case basis. If an FDOT district believes that an area does not fit within a context classification and an SD designation is required, the district should coordinate that with the State Complete Streets Program Manager. The most appropriate context classification will be determined and applied to the segment and indicated as "SD" with the appropriate context classification in RCI (e.g., SD-C4). The district will internally record both the original classification and the Special District Classification, in the event there are questions about the designation at a later time.

Local Roadways

The **FDOT Context Classification Guide** was developed for state roadways. Local governments may wish to adapt the FDOT context classifications for use on their streets. However, local communities should consider that the FDOT Context Classification Matrix reflects state roadways, which are primarily arterial roads. As such, if these are applied to local roadways, the measures and thresholds may need to be recalibrated to reflect the wider range of functional classes including collector and local streets. These roadways can be designed for lower traffic volumes, much lower speeds, and smaller design vehicles compared to State roadways in many cases.

Local governments seeking to apply context classification to their roadways should also refer to the 2018 **Florida Greenbook** for design criteria and further information on how to use these or other locally developed context classifications to implement context-based design.

Proposed New Roadways

Proposed new roadways are qualifying projects for which future context classification is determined, as seen in the flowchart of **Figure 9**. During planning phases and ETDM screening for new roadway alignments, a broad understanding of the context classification will be used to inform the planning process. For new roadways in planning and ETDM screening that include multiple alternative alignments, future land use conditions should be used to determine the context classification. The steps for determining the context classification for new roadways in planning or ETDM screening include:

1

Identify Major Changes in Context

Utilize the distinguishing characteristics to determine if multiple context classifications exist due to significant changes in the type or intensity of future land uses located along the roadway. The segment lengths should be based on the change in land use, change in density of the roadway network, or other distinguishing features. Segment lengths can vary and may be as short as two blocks or, where there is no defined block structure, longer than a mile.

2

Evaluate the Future Land Use

Evaluate the land use along the roadway based on a clearly documented, well-defined, community-supported, and implementation-focused plan such as zoning overlays, form-based codes, community redevelopment plans, or permitted development plans. These plans detail short- and mid-term changes to the roadway and built form using established mechanisms for implementation. For example, minimum block sizes indicated in a form-based code will determine the level of network connectivity in new development, which in turn will help bracket, if not determine outright, the future context classification of the area at build-out. Requirements for building orientation and setbacks in a form-based code also provide important information about the future context classification. Where well-defined, implementation-focused plans are not available, review the future land use element of the adopted local comprehensive plan using the land use description provided in **Table 2**.

3

Evaluate the Secondary Measures

Table 4 describes the secondary measures and the methodology and data sources associated with each measure. Future population and employment densities can be quantified based on the data in the regional travel demand model. If no regional model is available, utilize Bureau of Economic and Business Research (BEBR) estimates for future population and employment projections. A segment only needs to meet one of the two criteria, either population density or employment density, to be classified within a context classification. For the C3C-Suburban Commercial and C3R-Suburban Residential Context Classifications, population and employment densities vary widely from one community to another. Use the allowed residential and office/retail densities, the distinguishing characteristics, and the future land uses listed in the Context Classification Matrix to determine if a roadway is within the C3C-Suburban Commercial or C3R- Suburban Residential Context Classification.

RELATIONSHIP BETWEEN CONTEXT CLASSIFICATIONS AND CNU/SMARTCODE™ TRANSECT SYSTEM

The SmartCode™ is a form-based land development code that incorporates Smart Growth and New Urbanist principles formed by the Congress for the New Urbanism (CNU). It is a unified development ordinance, addressing development at all scales of design, from regional planning to building signage. It is based on rural-to-urban transects, rather than separated-use zoning.

FDOT's context classifications generally align with the SmartCode™, with some critical distinctions. The SmartCode™ was developed to describe and codify desired future visions of development form by local jurisdictions. The key implementation tool for form-based codes is a regulating plan that clearly identifies different transect zones that would guide how future land use development should occur. In contrast, FDOT's context classifications are descriptive, rather than visionary or regulatory, and therefore include all land areas and types found within the State of Florida, with less local specificity. In addition, FDOT's context classifications are specific features associated with the roadway, analogous to functional classification or access management classification, and are not intended to describe overall land use patterns, provide land use controls, or serve as a regulating plan.

The general relationship between the zones used by the transect system and FDOT's context classification is outlined in **Table 5**.

TABLE 5 RELATIONSHIP BETWEEN FDOT CONTEXT CLASSIFICATIONS AND THE SMARTCODE™ TRANSECT SYSTEM

FDOT Context Classification	SmartCode™ Transect Zone	Description of SmartCode™ Transect Zone
C1 – Natural	T1 - Natural Zone	Lands approximating wilderness conditions
C2 – Rural	T2 - Rural Zone	Sparsely settled lands in open or cultivated states
C2T – Rural Town		No corresponding transect zone; may sometimes be coded as a small T5 or T4 hamlet or village
C3R – Suburban Residential	Coded as Conventional Suburban Development (CSD)	The SmartCode™ does not provide for this type of development pattern
C3C – Suburban Commercial		
FDOT context classification does not address this SmartCode™ Transect Zone	T3 - Sub-urban Zone	Lower density, primarily single-family residential with very limited non-residential uses, in a limited dispersion and directly within walking distance of a higher transect. Transect Zone T3 will be considered C4-Urban General
C4 – Urban General	T4 - General Urban Zone	Mixed use but primarily residential urban fabric in a variety of housing types and densities
C5 – Urban Center	T5 - Urban Center Zone	Higher density mixed use buildings that accommodate retail, offices, row houses, and apartments
C6 – Urban Core	T6 - Urban Core Zone	Highest density and height, with the greatest variety of uses, and civic buildings of regional importance; some T6 areas may belong to FDOT C5 because of FDOT population requirement
SD – Special District	Special Districts	Areas that, by their intrinsic size, function, or configuration, cannot conform to the requirements of any transect zone or combination of zones

TRANSPORTATION CHARACTERISTICS

The transportation characteristics define the role of a particular non-limited access roadway in the transportation system, including the type of access the roadway provides, the types of trips served, and the users served. The transportation characteristics consider regional travel patterns, freight movement, transit operations, and SIS designation. Together with context classification, transportation characteristics can provide information about who the users are along the roadway, the regional and local travel demand of the roadway, and the challenges and opportunities of each roadway user.

The context classification designations affect more than the appropriate design criteria for roadways. Roadways with the same context classification may have very different transportation characteristics. For example, a C3C with frequent transit service will have more multimodal activity than a similar corridor without transit. Corridors with frequent transit service should be planned, designed, and operated for pedestrians and bicyclists, in addition to transit vehicles. Both the context classification and transportation characteristics must be considered to understand users' needs.

FUNCTIONAL CLASSIFICATION

Functional classification defines the role that a particular roadway plays in serving the flow of vehicular 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 (see **Table 6**).¹

The AASHTO *A Policy on Geometric Design of Highways and Streets, 7th Edition (2018)* presents a discussion of highway functional classifications. *Florida Statutes, Title XXVI, Chapters 334, 335, and 336* give similar definitions and establish classifications for roadway design in Florida.

Functional classification and context classification should be considered together when determining the role and function of a roadway. For example, the relationship between functional classification and access needs may be less consistent in more urban context classifications where roadways serve a wider variety of purposes beyond moving motor vehicle traffic. In evolving suburban areas, retail and commercial businesses tend to be located along arterial roadways, thereby requiring access and creating demands for short-distance and local trips that include vehicular trips as well as walking and bicycling trips. Transit service is also often located along arterial roadways due to retail and commercial uses generating high demand for transit trips. At the same time, many state roadways travel through large and small (and often historic) town centers that require multimodal mobility and access in order to thrive. Therefore, the context classification provides an important layer of information that complements functional classification when determining the transportation demand characteristics along a roadway, including typical users, trip length, access needs, and appropriate vehicular travel speeds.

¹ Federal Highway Administration, "Highway Functional Classification Concepts, Criteria and Procedures."

**TABLE 6 ROADWAY FUNCTIONAL CLASSIFICATION AND
ROLE IN THE TRANSPORTATION SYSTEM**

Roadway Classification	Role in the Transportation System
Principal Arterial	Serves a large percentage of travel between cities and other activity centers, especially when minimizing travel time and distance is important
Minor Arterial	Provides service for trips of moderate length, serves geographic areas that are smaller than their higher arterial counterparts, and offers connectivity to the higher arterial system
Collector	Collects traffic from local streets and connects them with arterials; more access to adjacent properties compared to arterials
Local	Any road not defined as an arterial or a collector; primarily provides access to land with little or no through movement

** Federal Highway Administration, "Highway Functional Classification Concepts, Criteria and Procedures."
Context classification is not applied to limited access facilities. For non-limited access roadways, the FDM
provides design criteria and standards based on both context classification and functional classification.*

HOW TO IDENTIFY PROJECT-SPECIFIC TRANSPORTATION DEMANDS

While context classification and functional classification can provide a general understanding of the type and activity level of different users, additional data related to travel patterns and user demographics can help identify user needs and inform solutions to meet those needs. The anticipated users of a roadway and their travel patterns should be determined well before the design phase of a project and are best explored during the planning phase and prior to the design scoping phase. In addition, context classification often has implications for transportation and land use planning decisions, and not just roadway design decisions. For instance, C3C and C3R have the same design speed ranges and minimum lane-width requirements; however, corridors with either designation will differ in terms of land development, site design, access management, or transit considerations, among other features.



The anticipated users of a roadway and the travel patterns of those users should inform the needs and the alternatives developed for a project. Location: Fletcher Avenue, Tampa, FL

Source: FDOT

The ***Traffic Forecasting Handbook*** outlines data-collection efforts that can help planners and designers understand vehicular travel patterns. **Table 7** provides a menu of useful data sources for identifying different needs for different users. Not all the data presented in **Table 7** will be required for all projects. The data collected for a project should be tailored to the scale of the project and the users the project needs to serve.

TABLE 7 EXAMPLES OF POTENTIAL DATA TO DETERMINE USER NEEDS BY MODE

Mode	Data
 Pedestrian	• Location of signalized pedestrian crossings • Location of marked or signed pedestrian crossings • Posted, design, and operating speeds • Vehicular traffic volumes • Existing sidewalk characteristics (location, width, condition, obstacles or pinch points, gaps, separation from vehicles) • Intersection ramps and alignment/Americans with Disabilities Act (ADA) compliance • Utilities location • Existing landscape buffer and shade trees • Pedestrian counts • Crash data • Lighting levels • Existing and future land use, building form and site layout, development scale and pattern • Existing and future pedestrian generators (e.g. schools, parks, transit stops) • Problems/needs identified on the Safety Needs List Dashboard • Activity levels (StreetLight, Strava, etc) • Transit ridership (stop level)
 Bicyclist	• Local and regional bicycle network • Posted, design, and operating speeds • Vehicular traffic volumes • Number of vehicular travel lanes • Location and availability of bicycle parking • Bicycle user type • Existing bicycle facility characteristics (location, width, obstacles or pinch points, separation from vehicles) • Bicyclist counts • Crash data • Location of destinations • Lighting levels • Pavement condition • Existing and future land use, building form and site layout, development scale and pattern • Problems/needs identified on the Safety Needs List Dashboard • Activity levels (StreetLight, Strava, etc)" • Transit ridership (stop level)
 Automobile	• Design Traffic [existing and projected Average Annual Daily Traffic (AADT), K-factor (K), directional distribution (D), and traffic growth projections] • Trip lengths and origin/destination patterns • Turning movement counts • Posted, design, and operating speeds • Signal timing • Location and availability of parking • Crash data • Lighting levels • Pavement condition • Existing and future land use, building form and site layout, development scale and pattern • Problems/needs identified on the Safety Needs List Dashboard
 Transit	• Existing and future transit routes and stops • Transit service headways • Location and infrastructure at transit stops • Sidewalk and bicycle facility connection to transit stops • ADA compliant transit stops • Existing and projected ridership (route or stop level) • Existing and future transit generators and attractors • Type of transit technology • Trip lengths, origin/destination patterns
 Freight	• Designated truck routes • Truck volumes • Vehicle classification counts • Existing and future location of industrial land uses or other generators of freight trips • Freight loading areas/truck parking

Depending on the scale, purpose, and needs of the project, the following are some examples of questions that could augment the analysis to better understand transportation travel demand and needs for all users:

- **Land uses:** What pedestrian, bicycle, or transit generators are located along the roadway? Are there large shopping destinations? Large employers? Public facilities? Are there visitor destinations? How might existing land use patterns change based on approved or planned development? Is there a redevelopment plan for the area? What land use changes are planned or anticipated to occur?
- **Demographics:** Based on census data, are there indicators that people living near the corridor will want or need to travel by walking, biking and/or transit? These include areas overrepresented—when compared to the general population—by elderly or low-income residents or households without access to automobiles.
- **Vehicular trip characteristics:** What percentage of the vehicular trips are local? What is the average trip length? Is the roadway part of the SIS?
- **Travel patterns:** Are there unique travel patterns or modes served by the corridor? Will new or emerging transportation services or technologies influence trip-making characteristics (e.g., rideshares, scooters, interregional bus service, bikeshare)?
- **Safety data:** How many and what types of crashes are occurring along the roadway? Does crash data identify bicycle or pedestrian crashes? What is the severity of crashes?
- **Types of pedestrians:** Are there generators or attractors that would suggest that younger or older pedestrians, or other special user groups, will be using the roadway (e.g., schools, parks, elderly care facilities, assisted living centers)?
- **Types of bicyclists:** Is the roadway a critical link for the local or regional bicycle network? Does the roadway connect to or cross trails or bicycle facilities? Are bicyclists using the roadway to access shopping, employment, or recreational destinations?
- **Transit:** What type of transit service exists or is planned for the area? Where are transit stops located? Can pedestrians reach these stops from either side of the street without out-of-direction travel and delays? What amount of out-of-direction travel is required? Are transit stops accessible using the network of existing bicycle and pedestrian facilities?
- **Freight:** What is the percentage and volume of heavy trucks using the roadway? Are there destinations that require regular access by heavy trucks or vehicles with wide wheelbases? Is the roadway part of a designated freight corridor? Where does loading and unloading occur along the roadway?



The two photos above are from the same roadway and illustrate an example of a high-volume roadway that balances the needs of freight traffic, transit, and pedestrians and bicyclists of varying abilities. The corridor includes a shared use path, bicycle lanes, bus pull-outs, bus shelters with benches, and other amenities. Location: US 98, Polk County, FL Source: KAI

ENVIRONMENTAL CHARACTERISTICS

Environmental characteristics, including the social, cultural, natural, and physical aspects of an area, play a role in the planning, design, and maintenance of transportation projects. FDOT is focused on responsible stewardship of Florida's environmental resources. The FDOT Mission states that FDOT will provide a safe transportation system that "enhances economic prosperity and preserves the quality of our environment and communities." Aligning with this mission, FDOT considers the social, cultural, natural, and physical impacts of its investments throughout the planning and design process.

Transportation projects that utilize federal transportation dollars (or that require a federal environmental permit such as wetlands or water quality) are subject to review under the **National Environmental Policy Act of 1969 (NEPA)**. FDOT developed the PD&E process to address NEPA for federally-funded transportation projects in Florida, including the identification and assessment of environmental characteristics for all projects.

Public involvement and agency coordination are required by NEPA and are part of the PD&E process. Detailed information on FDOT procedures for environmental review can be found in the following documents:

- **PD&E Manual**
- **ETDM Manual**
- **Public Involvement Handbook**
- **Sociocultural Effects Evaluation Process**
- **Cultural Resource Management Handbook**

STRATEGIC INTERMODAL SYSTEM AND CONTEXT CLASSIFICATION

The SIS was established in 2003 to enhance Florida's economic competitiveness by focusing State resources on the transportation facilities most critical for statewide and interregional travel. The three SIS objectives identified in the **SIS Policy Plan** are:

- **Interregional connectivity**
Ensure the efficiency and reliability of multimodal transportation connectivity between Florida's economic regions and between Florida and other states and nations.
- **Intermodal connectivity**
Expand transportation choices and integrate modes for interregional trips.
- **Economic development**
Provide transportation systems to support Florida as a global hub for trade, tourism, talent, innovation, business, and investment.

The SIS includes Florida's largest and most significant commercial service and general aviation airports, spaceports, public seaports, intermodal freight terminals including intermodal logistics centers, interregional passenger terminals, urban fixed guideway transit corridors, rail corridors, waterways, military access facilities, and highways. The SIS includes three types of facilities: hubs, corridors, and connectors.



*Accommodation of freight vehicles is an important part of context-based design. Location: Estero Boulevard, Fort Myers Beach, FL
Source: Rick Hall*

SIS Highway corridors and connectors traverse varying context classifications. Given the purpose and intent of the SIS, the requirements of a particular context classification may not always align with the function of the SIS highway. In the case of interstates and limited access facilities, the function of the roadway is considered complete. For all others, there is a need to balance the safety and comfort of users who live and work along the SIS facility with interregional and interstate freight and people trips through the area. This is consistent with the intent of the **SIS Policy Plan**, which specifically calls for the need to improve coordination with regional and local transportation and land use decisions by:

- Better reflecting the context of the human and natural environment.
- Balancing the need for efficient and reliable interregional travel with support for regional and community visions.
- Developing multimodal corridor plans that coordinate SIS investments with regional and local investments.
- Leveraging and strengthening funding programs for regional and local mobility needs such as the Transportation Regional Incentive Program, Small County Outreach Program, and Small County Road Assistance Program.

The **SIS Policy Plan** outlines that SIS improvements should consider the context, needs, and values of the communities serviced by the SIS, which may include flexibility in design and operational standards. Most importantly, communication with all parties involved is key to determining the best solution to realize the intent of both the SIS and a context-based approach within a community.

The **FDM** provides design standards for facilities on the SIS. Roadways located on the SIS require coordination with the District SIS Coordinator during the determination, update, or confirmation of the facility's context classification.

Chapter 3

Context Based Speeds

Vehicle speed concepts can be classified into four types:



Design speed—the selected speed used to determine various geometric elements of the roadway.¹



Operating speed—the speed at which drivers are observed traveling during free flow conditions.²



Posted speed limit—established by methods described in the Speed Zoning for Highways, Roads, and Streets in Florida Manual. This manual is adopted by Rule 14-15.012, F.A.C.



Target speed—the highest speed at which vehicles should operate in a specific context, consistent with the level of multimodal activity generated by adjacent land uses, to provide both mobility for motor vehicles and a supportive environment for pedestrians, bicyclists, and public transit users.³

Target speeds should be within the design speed range provided in the **FDM** for each context classification, as shown in **Table 8**. Ideally, the target speed, design speed, and posted speed are all the same where speeds are 45 mph or less. When these speeds are different, it can result in inconsistent driver expectation about the intended operating speed. The concept of target speed is to identify a desired operating speed and develop design strategies and elements that reinforce operating speed. Design speed and posted speed may take time to change and may need to be changed over the course of several projects.

The target speed is influenced by context classification and should be selected to provide for both the safety and mobility needs of all anticipated users.

TABLE 8 FDOT CONTEXT-BASED DESIGN SPEEDS FOR ARTERIALS AND COLLECTORS

CONTEXT CLASSIFICATION	ALLOWABLE DESIGN SPEED RANGE (MPH)	SIS MINIMUM (MPH)
C1 Natural	55-70	65
C2 Rural	55-70	65
C2T Rural Town	25-45	40
C3 Suburban	35-55	50
C4 Urban General	25-45	45
C5 Urban Center	25-35	35
C6 Urban Core	25-30	30

¹ American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 6th Edition, 2011

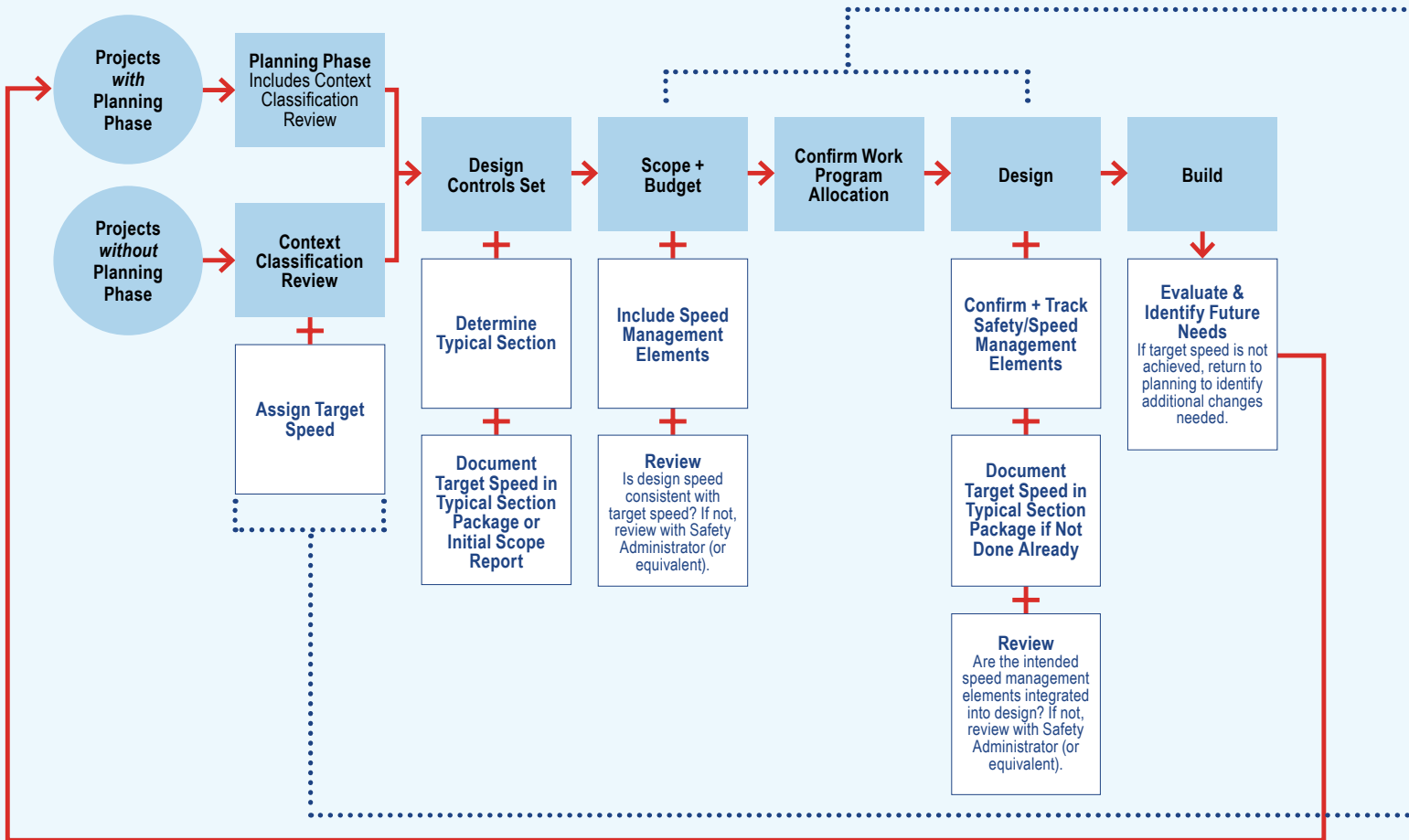
² American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 6th Edition, 2011

³ FDOT Design Manual, 2021.

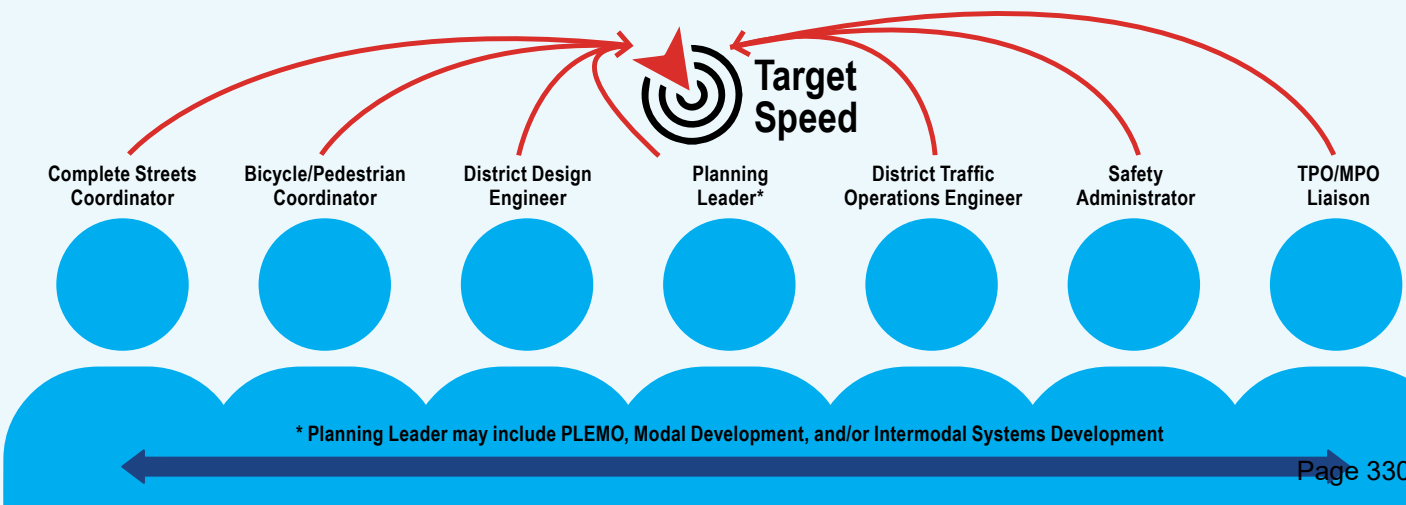
DETERMINING THE TARGET SPEED

The target speed must be identified early in the development process to inform and influence the selection and establishment of the design speed. Each District should define its own process for setting target speeds, including the individuals responsible. **Figure 19** shows an example process that identifies target speeds during the planning phase of the project and at the same time that the context classification is determined. Many datapoints used to define context classification also aid in determining target speed. **Districts should develop and adjust the process as needed to meet their unique needs, maintaining the key element of identifying and documenting target speed early in the process and prior to scope development.**

FIGURE 19 EXAMPLE PROCESS TO DETERMINE TARGET SPEED



The target speed should be identified by a multidisciplinary group of engineers and planners. This group can work together to set the target speed and make sure the elements identified to achieve the target speed are carried through scoping, design, and implementation.



- Include design elements to achieve the target speed in project scopes to limit changes after scoping. During design, scoped safety and speed management elements should be tracked for inclusion in the final project design. If elements are removed, they should be discussed with the District Safety Administrator or equivalent.

Within the design speed range, use the steps below to assign a target speed. The first two steps can be used to determine an initial target speed and may serve as a reasonable stopping point. Steps 3 through 5 help refine the target speed and arrive at a target speed that is more likely to be achieved based on project constraints.

STEPS TO DETERMINING TARGET SPEED

1. **DETERMINE FDM CONSISTENCY:** Identify context classification, current design and posted speed, SIS designation, and **FDM** design speed range

2. **IDENTIFY STARTING POINT FOR TARGET SPEED:**

↓ In C1 and C2, start at the high end of the design speed range and **justify reduction**.

↑ In C2T, C3R, C3C, C4, C5, and C6 start at the low end of the design speed range and **justify increase**.

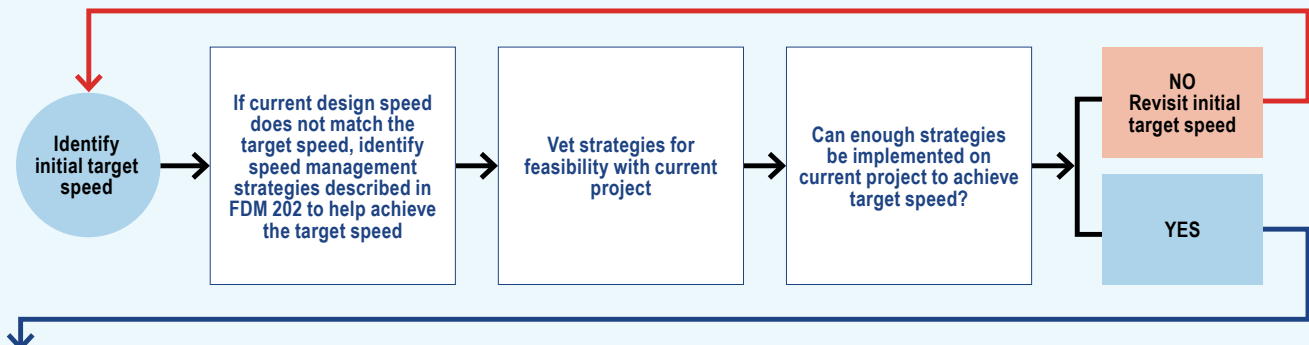


3. **IDENTIFY PROJECT NEEDS:** Refine the target speed using the following questions:

- a. Who are the intended users? Are pedestrians, bicyclists, and transit riders traveling along or across the roadway?
- b. What are potential safety challenges? Are safety needs identified on the Safety Needs List Dashboard? Does crash data identify bicycle or pedestrian crashes? What is the frequency, severity, and key crash patterns of auto crashes?
- c. Are there special population groups using the corridor (lower income, 0-car households, aging population, school age children)?
- d. What is the level of community support? Has the community requested lower speeds?
- e. What is the transportation role of the roadway in the network? Is it used to access destinations? What is the density of driveways, side streets, and signals?

Under a safe system approach, the absence of crashes does not mean the current posted speed is appropriate. Characteristics such as conflict points and separation of users can inform potential safety challenges. The FDM allows design flexibility to support the safe system approach and proactive safety efforts.

4. **REVIEW POTENTIAL COUNTERMEASURES:**



5. **DOCUMENT TARGET SPEED:** If the initial recommended target speed value is not feasible to attain in a single project, the target speed should be as close to the initial target speed values as can be achieved within the constraints of the project.

DESIGNING TO THE TARGET SPEED

Multiple design modifications may be necessary to achieve the target speed in a single project. In some cases, it may take multiple projects. For example, on a resurfacing project, it may not be feasible to move the curb line to significantly lower the target speed, but other treatments can be added to move toward the target speed. If the roadway is reconstructed in the future, the curb line could be moved to further reduce speeds.

After a project is complete, the project team can conduct a speed study in accordance with the Speed Zoning Manual to measure the operating speed and determine if the target speed has been achieved. If the target speed has not been achieved, another project may need to be programmed with additional speed management treatments. If after all feasible roadway design and operational modifications have been tried and the target speed has not been achieved, the speed limit should be posted per the FDOT Speed Zoning Manual. The roadway should continue to be prioritized for future projects to continue to work toward the target speed.

If the target speed is not met, increased emphasis should be placed on providing facilities that can achieve safe travel at the higher operating speed. Examples include:

- 1 More frequent controlled crossings for pedestrians and bicyclists.
- 2 Enhanced parallel facilities for pedestrians and bicyclists
- 3 Greater separation between vehicle traffic and bicycle and pedestrian facilities.



The Explorer Tool on the FDOT Complete Streets Website provides examples of speed management tools for each context classification. For example, as shown in **Figure 20**, in C2T-Rural Town treatments including terminated vistas, raised crosswalks, and street trees can be used to help achieve target speeds. In C3C-Suburban Commercial treatments including raised medians, raised barriers between vehicle traffic and bicycle facilities, and median noses at intersections can be used to help achieve target speeds, as shown in **Figure 21**. Refer to **FDM 202** for additional speed management tools by context classification and design speed.

FIGURE 20 C2T-RURAL TOWN SPEED MANAGEMENT



- 1 Terminated vista
- 2 Raised crosswalk
- 3 Shared lanes with sharrows
- 4 Street trees

FIGURE 21 C3C-SUBURBAN COMMERCIAL SPEED MANAGEMENT



- 1 Lane narrowing
- 2 8' sidewalk
- 3 Separated bicycle lanes
- 4 Green-colored pavement markings
- 5 Intersection refuge islands

Chapter 4

Linking Context Classification to the FDM and Other Documents

The FDOT context-based design approach is compatible with and supported by national guidance documents. The following section describes the relationship between FDOT context classification and other FDOT and national manuals and handbooks.

AASHTO'S A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS

The AASHTO *A Policy on Geometric Design of Highways and Streets (Green Book)*, 7th Edition (2018) provides geometric design guidance based on established practices that are supplemented by recent research. AASHTO recognizes that different places have different characteristics regarding density and type of land use, density of street and highway networks, nature of travel patterns, and the ways in which these elements are related. AASHTO's *Guide for the Planning, Design and Operation of Pedestrian Facilities* (2004) and *Guide for the Development of Bicycle Facilities* (2012) expand significantly on the *AASHTO Green Book*, presenting factors, criteria, and design controls for pedestrian and bicycle facilities.

Functional classification and context classification make up the framework for geometric design, presented in the *Green Book*. In the 7th Edition, Chapter 1 was rewritten, expanding the consideration of two land use contexts (urban and rural) to five land use contexts: rural, rural town, suburban, urban, and urban core. The context classifications considered in the *Green Book* were initially presented in *NCHRP Report 855*, which also influenced the FDOT context classifications. Design guidance for the context classifications presented in the *Green Book* is preliminary, with more comprehensive guidance planned for the 8th edition of the *Green Book*.

The rewritten Chapter 1 encourages flexible design by asking engineers to move beyond nominal design criteria. Instead of merely meeting minimum values, engineers should consider the influence of project-specific conditions on design dimensions. Land use context (existing and future) is considered an element of the geometric design process and focuses the consideration of multimodal needs in design. In some cases, the need to serve pedestrians may conflict with the need to serve other transportation modes (*Section 1.6.1.3*). Designers should find an appropriate balance among the needs of all users, suitable for the conditions at each specific location. The *Green Book* identifies some general changes between context classifications that may aid in finding an appropriate balance among the needs of all users (*Section 1.5.2.1*).

Considerations as Roadways Transition between Contexts

As a roadway transitions from rural to a rural town:

-  Design speed is reduced
-  Pedestrian and bicyclist flows increase
-  Need to blend in with the community increases
-  Importance of parking increases

As a roadway transitions from suburban to more urban and eventually to urban core:

-  Emphasis on high operating speed is reduced
-  Pedestrian and bicyclist flows increase
-  Importance of parking increases

Design speed is a key design control that impacts the geometric design features of the roadway. Speed expectations and the typical level of pedestrian, bicycle, and transit activity vary between the different context classifications. The **Green Book** provides general ranges for design speeds based on context classification, shown in the table below, as well as provides guidance in the selection of design speed. The selection of design speed should consider a combination of safety, mobility, environmental impacts, economics, aesthetics, and social or political impacts (*Section 2.3.6.3, p.2-23*). The selected design speed should reflect the needs of all transportation modes expected to use a particular facility (*Section 2.3.6.3, p.2-24*). Control devices and congestion regulate the traveled speed in some contexts, especially in urban areas. In these locations, arterials should be designed to permit running speeds of 20–45 mph in urban areas (*Section 2.3.6.3, p.2-26*). Streets through crowded business areas should be designed for a lower running speed, which in some cities is between 15–25 mph (*Section 2.3.6.3, p.2-27*).

TABLE 9 DESIGN SPEED RANGES BY CONTEXT FROM THE GREENBOOK

Facility Type	Rural	Rural Town	Suburban	Urban	Urban Core
Collector (Sections 6.2.1.1, 6.3.1.1)	≥50 mph	≤45 mph	35–50 mph	30–40 mph	25–35 mph
Arterial (Sections 7.2.2.1, 7.3.2.1)	≥45 mph (based on terrain)	20–45 mph	30–55 mph	25–45 mph	≤30 mph

Note: The design speed ranges from the **Greenbook are similar but not identical to the FDOT design speed ranges.*

The **Green Book** acknowledges that the context classification may vary along a given corridor. Each portion of a project should be designed in accordance with its corresponding context classification and with appropriate transitions between different context classifications (*Section 1.5.3*). The **Green Book** especially emphasizes the transition that occurs when rural highways enter a small town (*Section 1.5.1.2*). In the rural town context, it is important that a roadway meets the needs of both the community and through travelers. The **Green Book** provides specific guidance related to the transition of roadways from rural context to rural town context. The transition area should be designed to encourage speed reduction. Design treatments that may be implemented include: center islands, raised medians, roundabouts, roadway narrowing, lane reductions, transverse pavement markings, colored pavements, and layered landscaping (*Sections 6.2.10, 7.2.19*).

Other decisions impacted by context classification include:

- The appropriate level of service, which is also affected by functional classification, community goals, and adjacent land use types. In general, the level of service for motor vehicles in rural contexts is expected to be higher than in other contexts (*Table 2-3, p.2-37*).
- In suburban, urban, and urban core contexts, sidewalk construction should be considered as part of any street improvement (*Section 2.6.2, p.2-51*).

- High rates of superelevation are generally undesirable on high-volume roads where vehicles may need to slow substantially, such as roadways in the suburban, urban, and urban core contexts (*Section 3.3.2.1*).
- Lighting along roadways in rural contexts may be desirable, but it typically has a lower need than lighting on roadways in urban contexts. In suburban, urban, and urban core contexts where there are concentrations of pedestrians and roadside intersectional interferences, fixed-source lighting tends to reduce crashes (*Section 3.6.3, p.3-188*).

FDOT DESIGN MANUAL (FDM)

In order to design the various elements of a roadway, including its alignment and cross section, the designer must understand the basic design controls associated with the roadway to implement context-based planning and design. Context classification is used to select project standards so that facilities will function safely for all expected users (*Section 110.4, 5*). Chapter 2 of the **FDM** presents design criteria based on context classification, functional classification, and design speed (*Section 200.1, 1*). The selected design speed should be context-appropriate, to attain a desired degree of safety, mobility, and efficiency (*Section 201.5.1, 8*). Design speed was covered in more detail in the previous chapter. This section focuses on the design user and design vehicle.

THE DESIGN USER

Roadway users' varying skills and abilities should influence roadway design. The physical characteristics of the young, the aging, and people with different physical abilities introduce a variety of human factors that can influence driving, walking, and cycling abilities. Design users should be taken into consideration when determining design details such as sidewalk width, type of bicycle facility, design speed, signal timing and spacing, location of pedestrian crossings, number of vehicular travel lanes, intersection width, and lighting.

Driver performance informs roadway design.

FDOT has identified teen drivers (ages 15–19) and aging drivers (age 65 and up) as at-risk drivers. The 2019 American Community Survey reports that 5.7 percent of Florida's population was 15–19 years old, and 20.9 percent of Florida's population was 65 years old or older. Historically, fatalities involving teen drivers and aging drivers typically account for around one-quarter of all Florida traffic fatalities. Compared to younger drivers, older drivers tend to process information slower and have slower reaction times, deteriorated vision and hearing, and limited depth perception.¹ For additional information, refer to FHWA publications **Highway Design Handbook for Older Drivers and Pedestrians** and **Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians**.

Consider the pedestrian design user.

Pedestrians are among the most vulnerable roadway users. In 2019, Florida led the state rankings in annual pedestrian fatalities per 100,000 people with a recorded 5,433 pedestrian fatalities between 2008 and 2017.² Pedestrian characteristics that serve as design controls include walking speed, walkway capacity, and the needs of persons with disabilities. According to the U.S. Census Bureau, 27 percent of the population in the United States had a disability in 2014.³ Age plays an important role in how pedestrians use a facility, as older adults are the most vulnerable pedestrians.⁴

¹ American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011, 2–43.

² Smart Growth America, *Dangerous by Design 2019*

³ United States Census Bureau, "Americans With Disabilities: 2014," November 2018 <https://www.census.gov/content/dam/Census/library/publications/2018/demo/p70-152.pdf>.

⁴ "Aging Road User," accessed September 22, 2016, <http://www.safeandmobileseniors.org/AgingRoadUser.htm#Bicyclists>.

Context-based design considers the pedestrian design user to represent people with a range of abilities, including the elderly, children, and persons with disabilities. This is especially true in context classifications C2T-Rural Town, C3C-Suburban Commercial, C4-Urban General, C5-Urban Center, and C6-Urban Core where a higher level of pedestrian activity is expected. People with varying abilities require a continuously paved level surface on both sides of the roadway, a network that allows multiple and direct routes to destinations, short crossing distances, and protection from the weather including shade. Several design elements have been found to assist elderly pedestrians, including accommodation for slower walking speeds and adequate median refuge islands at wide intersections. For additional information, refer to FHWA publications *Highway Design Handbook for Older Drivers and Pedestrians* and *Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians*.

Bicyclist characteristics vary by user skill level, which varies by age, experience, and trip purpose. Bicycling trip purposes are broadly categorized into utilitarian trips and recreational trips:

- Utilitarian trips are non-discretionary trips needed as part of a person's daily activity, such as commuting to work, school, or shopping.
- Recreational trips include trips for exercise or social interaction. Experienced riders, regular travelers, casual riders, and infrequent users all make recreational trips.

Bicyclists pose different safety and geometric considerations and must also be considered in roadway design. Bicyclist characteristics, preferences, and trip purposes may vary from rider to rider. However, in most cases the design user should reflect the casual and younger rider. Data on trip purpose and experience level provide some



information on bicyclist characteristics and preferences.

Casual and younger riders tend to:

- Prefer a physical separation from vehicular traffic.
- Ride on the sidewalk.
- Achieve travel speeds of around 8–12 mph.
- Bicycle shorter distances.

Experienced adult riders tend to:

- Be more comfortable riding with vehicles on streets. Some will prefer to ride in mixed traffic on lower speed streets, while others will prefer dedicated bicycle facilities.
- Ride at speeds up to 25 mph on level ground.⁵

For bicyclists, the design user should reflect the casual and younger rider in most cases. Data that may indicate the need to accommodate casual and younger riders include:

- Origins and destinations that generate bicycle trips along or within proximity to a roadway, such as schools, parks, high-density residential housing, shopping centers, and transit stops.
- Data that indicate propensity of bicycle crashes.
- Roadways within well-connected street networks.
- Roadways that connect to local or regional dedicated bicycle facilities.
- Data that indicate bicyclists are currently riding on the sidewalk.
- Public input.

See the **FDM** for current FDOT criteria related to bicycle and pedestrian facilities.

⁵ American Association of State Highway and Transportation Officials, *Guide for the Development of Bicycle Facilities* Fourth Edition, 2012, 15.

DESIGN VEHICLE

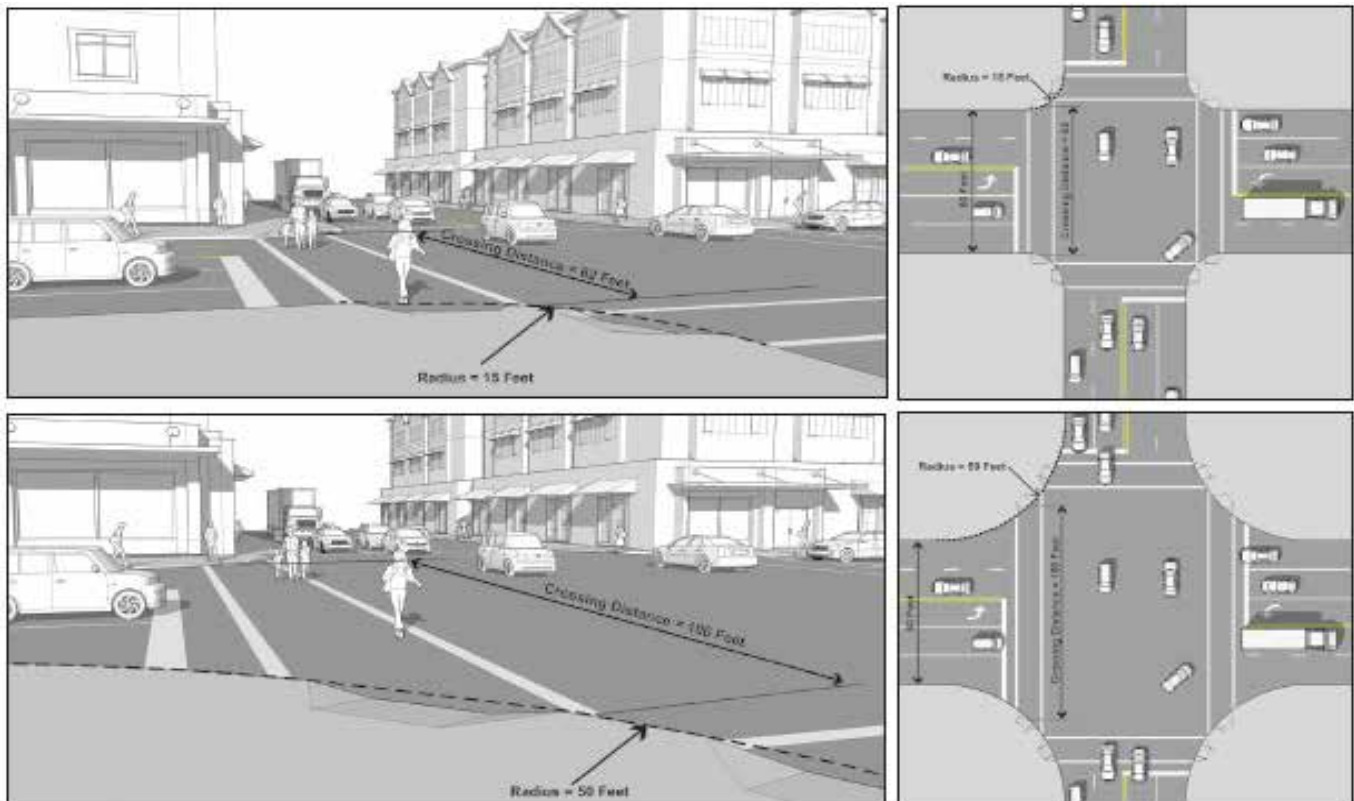
The type of design vehicle is influenced by the functional and context classification of a roadway (Section 201.6, 13). This guide builds on existing guidance from the **FDM** and the [FDOT District 7 Draft Freight Roadway Design Considerations](#) in determining the design vehicle based on context and users. The type of design vehicle is influenced by the functional and context classification of a roadway, the role of the roadway in the network, and the land uses served. The design vehicle is the largest vehicle that is accommodated without encroachment on to curbs (when present) or into adjacent travel lanes. The WB-62FL is often used as the design vehicle on state roadways. In areas where the context classification suggests a need for multimodal travel, a smaller vehicle turning template may be more appropriate for turning movements at intersections where cross streets will not be expected to have significant levels of heavy truck traffic.

All movements at all intersections may not need to be designed for WB-62FL turning movements, which are rare in urban contexts and at intersections with local or collector streets. Designs that accommodate a WB-62FL without encroachment for all turning movements may result in consequences including:

- Increased pavement resulting in higher capital and right-of-way costs, particularly in dense or constrained areas with high property values.
- Increased pedestrian crossing distances.
- Higher turning speeds for all vehicles of all sizes.
- Reduced pedestrian comfort and convenience.

The consideration of a smaller vehicle for turning movements between designated freight roadways and lower-classified urban streets can help balance goods movement with user access and comfort (see Figure 22). To address this, the **FDM** calls for using both a design vehicle and a control vehicle when designing roadways.

FIGURE 22 RELATIONSHIP BETWEEN CURB RADII AND PEDESTRIAN CROSSING DISTANCE



Curb radii has significant influence on the pedestrian crossing distance at intersections. Top and bottom illustrations compare the crossing distances between an intersection with 50 feet and 15 feet curb radius.

The control vehicle is the largest vehicle that can be expected to make use of the roadway. In this approach, the current FDOT design vehicle could be used as the control vehicle for curbed roadways within C4, C5, and C6 context classifications (*Section 201.6.1, 14*). For the purposes of turning movements, the control vehicle is expected to make a turn only rarely. A smaller vehicle, expected to make frequent turns to lower-class side streets, is designated the design vehicle. The intersection turning movement considers both the design vehicle and the control vehicle (see **Figure 23**):

- The **design vehicle** is the vehicle that must be accommodated without encroachment onto curbs (where present) or into opposing traffic lanes.
- The **control vehicle** is the vehicle that is infrequent and is accommodated by allowing:
 - Encroachment into opposing lanes if no raised median is present (see **Figure 24**).
 - Minor encroachment into the street side area if no critical infrastructure (traffic signal, poles, etc.) is present.

FIGURE 23 INTERSECTION DESIGN SHOULD CONSIDER BOTH DESIGN VEHICLE AND CONTROL VEHICLE

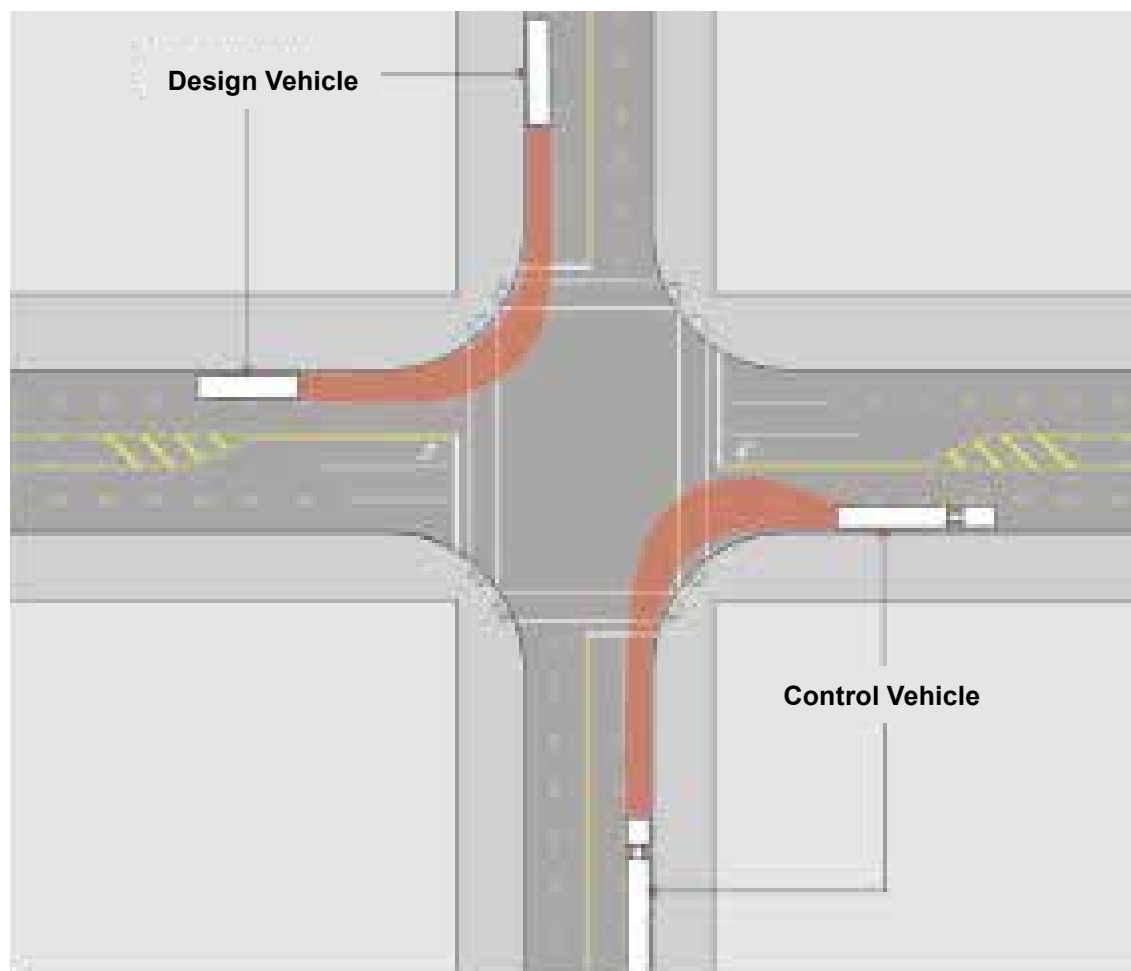
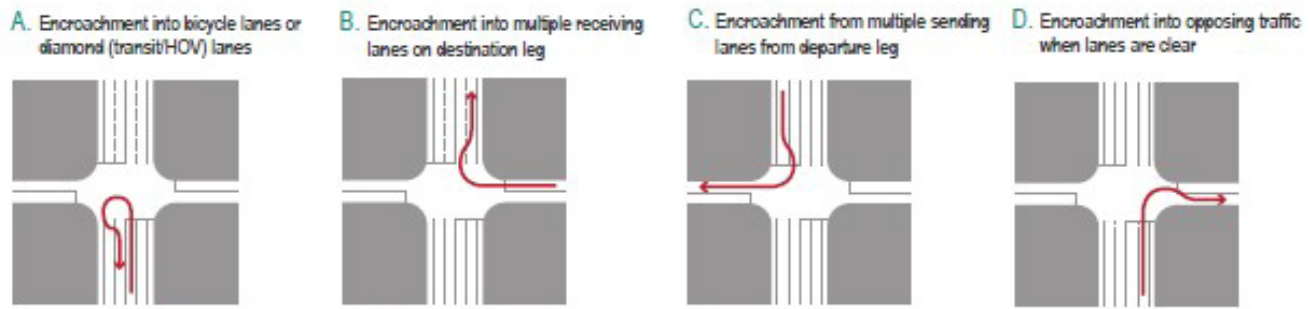


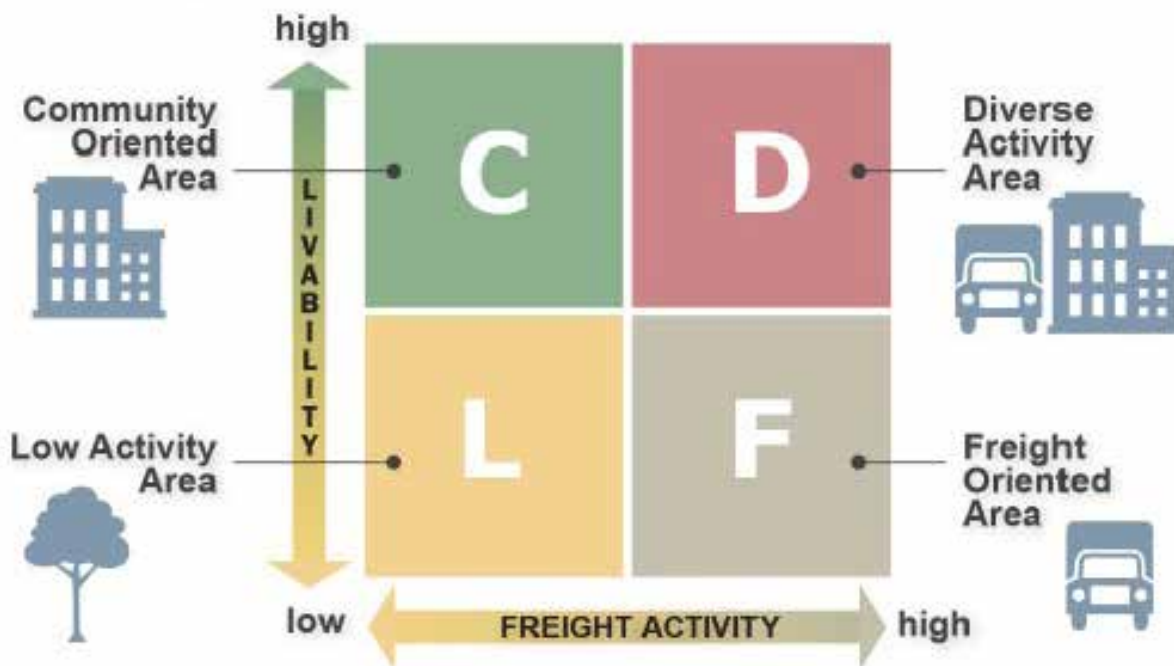
FIGURE 24 AN INFREQUENT CONTROL VEHICLE ENCROACHMENT INTO OPPOSING AND ADJACENT LANES



Source: FDOT District 7 Draft Freight Roadway Design Considerations.

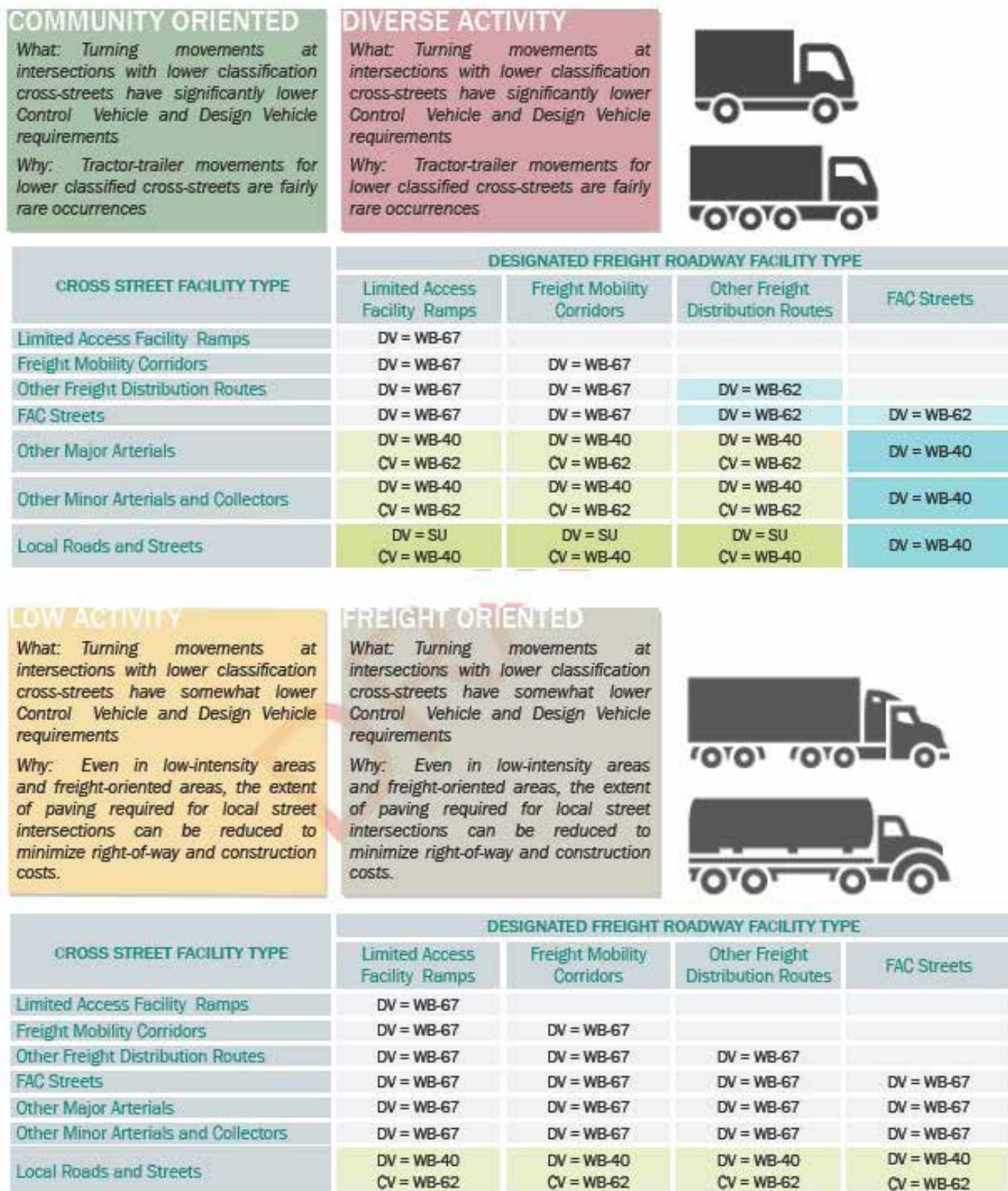
FDOT District 7 Draft Freight Roadway Design Considerations outlines a context-sensitive design approach and strategies for freight accommodations. The report identifies four general area types characterized by the land uses and activities that exist or are anticipated in areas throughout the Tampa Bay region (see **Figure 25**). The report defines four freight roadway facility types and seven cross-street facility types. **Figure 26** presents the recommended design vehicle and control vehicle for the intersection of each freight roadway facility type with each cross-street facility type within four different contexts. For more information on the District 7 design vehicle and control vehicle recommendations and the type of encroachment permissible in different contexts, refer to the [FDOT District 7 Draft Freight Roadway Design Considerations](#).

FIGURE 25 FDOT DISTRICT 7 DRAFT FREIGHT ROADWAY DESIGN CONSIDERATIONS: GENERAL AREA TYPES



Source: FDOT District 7 Draft Freight Roadway Design Considerations.

FIGURE 26 DRAFT FDOT DISTRICT 7 FREIGHT DESIGN CONSIDERATIONS FOR DESIGN VEHICLE AND CONTROL VEHICLE AT INTERSECTIONS



Source: FDOT District 7 Draft Freight Roadway Design Considerations.

OTHER DESIGN CRITERIA



Sidewalk Criteria influenced by context classification in the **FDM** include:

- Need to demonstrate demand for use of sidewalk in C1, C2, and C3C context classifications (*Section 222.2.1, 3*).
- Sidewalk width (*Table 222.1.1, 4*).
- Choice of the use of pedestrian fencing or railing at pedestrian drop-off hazards (*Section 222.4, 16*).
- Sidewalk width across bridge structures (*Section 260.2.2, 6*).



Bicycle Facility Criteria influenced by context classification in the **FDM** include:

- Marking a paved shoulder as a bicycle facility (*Section 223.2.2, 7*).
- Substitution of a shared use path for a bicycle lane in C1, C2, or C3 context classifications (*Section 223.2.3, 8*).

Other Design Criteria influenced by context classification in the **FDM** include:

- Speed management treatments (*Section 202 and Table 202.3.1*).
- Lane widths of travel, auxiliary, and two-way left turn lanes (*Table 210.2.1, 3*).
- Presence of on-street parking, which is a key element of urban contexts C4, C5, and C6 but also may be found in C2T. Where on-street parking is not present in C4, C5, or C6, it should be considered if in alignment with local plans, speed management needs, or parking needs (*Section 210.2.3, 4*).
- Median widths along curbed and flush shoulder roadways (*Table 210.3.1, 18*).
- Channelization island design (*Section 210.3.2.1, 20*).
- Border width along curbed and flush shoulder roadways (*Table 210.7.1, 48*).
- Maximum grade (*Table 210.10.1, 58*).
- Minimum clearance from the bottom of the roadway base course to the Base Clearance Water Elevation (*Section 210.10.3 (2), 61*).
- Intersections should be designed to accommodate the placement of trees and other vegetation in urbanized context classifications (*Section 212.11.6, 27*).
- Corner radii (*Section 212.12.1, 40*) and design of channelized right turn lanes (*Section 212.12.2, 42*).
- Requirements for external lighting of overhead signs (*Section 230.2.4, 3*).
- Guidelines for the installation of ITS support infrastructures and vehicle detection systems (*Section 233.4, 11; 233.9, 20*).

FDOT ACCESS MANAGEMENT GUIDEBOOK

The **FDOT Access Management Guidebook** provides standards for medians, median openings, and driveways along state roads. Roadways are assigned an access management classification to determine the applicable standards. Access management classifications range from 00 to 07 and 99. Class 01 reflects the highest amount of access management control (freeways), and Class 07 reflects the lowest. Class 07 is usually found on urban or suburban built-out roadways. Class 99 is assigned to roadways with a special corridor access management plan. Refer to Florida Administrative Code (FAC), Rule Chapter 14-97.003, Access Management Classification System and Standards, for more information on access management classification.

Context classification is based, in part, on the characteristics and spacing of cross-street intersections. In general, higher intensities of use, including C2T, C4, C5, and C6 may require less restrictive access management. In these context classifications, frequent intersections, smaller blocks, and a higher degree of connectivity and access support the multimodal needs of the area. More restrictive median and connection spacing is typically found in C1, C2, C3C, C3R, and in some cases, C2T. Beyond the context classification, the role of the roadway in the transportation system and safety considerations must also be considered to determine access management needs.

The guidebook identifies the context classifications that typically occur within each access management classification. The access management classification defines the allowable median type, median opening spacing, driveway spacing, and signal spacing (*Section 2.4, Table 3*). Other parameters, such as median width are set in consideration of the context classification (*Section 3.4.1, Table 9*).

Additionally, the guidebook assigns modal priorities for the design of medians and driveways (*Section 3.8, Table 14 and Table 15*). In context classifications C4, C5, and C6 it is especially important to balance large vehicle needs and pedestrian needs (*Section 3.4.1, Table 9*). The modal priorities are complementary to the expected user types in different context classifications presented previously in **Figure 6**. The guidebook also identifies specific considerations regarding medians and driveways by context classification (*Section 3.8, Table 14 and Table 15*).

Other decisions that are affected by context classification include:

- The radial return or presence of turn lanes at driveways (*Section 2.2.1, 14*).
- The types of delivery areas that are available to freight traffic (*Section 7.6.1, 129*).
- Appropriateness of higher speed driveways in C1, C3, and C3C (*Section 4.2.3, 65*).
- Recommendations for offset left-turn lanes in C4, C5, and C6 (*Section 5.4.2, 91*).
- Consideration for right turn lanes at driveways (*Section 6.2.1, 98*).

FDOT TRAFFIC ENGINEERING MANUAL

The **FDOT Traffic Engineering Manual (TEM)** provides traffic engineering standards and guidelines for the State Highway System. The manual outlines the process on how traffic engineering standards and guidelines are adopted as well as provides chapters devoted to roadway signs, traffic signals, markings, and specialized operational topics.

The **TEM** establishes context-based criteria for the consistent installation and operation of marked pedestrian crosswalks at midblock and unsignalized intersections. The 2021 **TEM** requires an engineering study to install marked crosswalks at midblock or unsignalized crossing locations. Pedestrian volume data is not needed to place a marked crosswalk in context classifications C2T, C3C, C4, C5, and C6 (*Section 5.2.5.1 (2c)*).

The **TEM** allows the DTOE to implement Leading Pedestrian Intervals (LPIs) at their discretion in context classifications C2T, C4, C5, and C6. In context classifications C1, C2, C3R, and C3C additional analysis is required to determine if an LPI is appropriate (*Section 3.11.4*).

The **TEM** aligns several additional decisions with consideration of context classification, including:

- If a site warrants a pedestrian hybrid beacon (PHB), the PHB may be substituted with a midblock traffic control signal using Warrant 8 of the MUTCD, in context classifications C4, C5, and C6 (*Section 5.2.5.2 (2e)*).
- Context classification should be considered when reviewing requests for bicycle signs (*Section 2.11.2 (4a)*).

FDOT QUALITY/LEVEL OF SERVICE HANDBOOK

The *FDOT Quality/Level of Service Handbook (Q/LOS Handbook)* and the Generalized Service Volume Tables are intended to be used by engineers, planners, and decision makers in the development and review of street users' quality/level of service and capacity at generalized and conceptual planning levels. The *Q/LOS Handbook* recognizes that motorists have different thresholds for acceptable delay in rural versus urban areas.

Four broad area-type groupings are used in the *Q/LOS Handbook* and the Generalized Service Volume Tables:

- **Urbanized Areas**—Areas that meet FHWA's definition of Urbanized Areas, as well as the surrounding geographic area likely to become urbanized within the next 20 years, as agreed on by FDOT, FHWA, and the Metropolitan/Transportation Planning Organization (MPO/TPO). These areas consist of densely developed territory that contains 50,000 or more people. The *Q/LOS Handbook* further identifies areas with population over one million as Large Urbanized Areas.
- **Urban Areas**—A place with a population between 5,000 and 50,000 and not in an urbanized area. This definition helps distinguish developed areas that are not urbanized.
- **Transitioning Areas**—Areas generally considered as transitioning into urbanized/urban areas or areas with a population over 5,000 and not currently in urbanized areas. These areas can also at times be determined as areas within a Metropolitan Planning Area, but not within an urbanized area. These areas are anticipated to reach urban densities in a 20-year horizon.
- **Rural Areas**—Areas that are not urbanized, urban, or transitioning. Rural areas are further classified as rural developed areas and rural undeveloped areas. Generally, rural developed areas are populated areas with a population less than 5,000, and rural undeveloped areas are rural areas with no or minimal population or development.

For the purpose of funding considerations and other processes and procedures, FDOT will continue to define urban and rural areas following the FHWA criteria. A direct, one-to-one relationship does not exist between the classification system used in the *Q/LOS Handbook* and the context classifications, but generally C1-Natural, C2-Rural, and C2T-Rural Town areas will be identified as rural areas or transitioning areas, while C4-Urban General, C5-Urban Center, and C6-Urban Core will be identified as urban. C3C-Suburban Commercial and C3R-Suburban Residential can fall into any of the *Q/LOS Handbook* categories.

FDOT SPEED ZONING MANUAL

The FDOT Manual on Speed Zoning for Highways, Roads, and Streets in Florida (Speed Zoning Manual) provides guidelines and recommended procedures for establishing uniform speed zones on state, municipal, and county roadways throughout Florida. The manual encourages the consideration and implementation of facilities that are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Paramount to this effort is careful evaluation (or re-evaluation) of speed zone locations and proper selection of target speeds and appropriate posted speed limits.

This manual includes guidelines and procedures for performing traffic engineering investigations related to speed zoning. It also includes information on the philosophy of speed zoning and the identification of some of the factors to be considered in establishing realistic, safe, and effective speed zones to which meaningful enforcement can be applied.

FLORIDA GREENBOOK

The *Draft 2018 Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highway (Florida Greenbook)* encourages context-based transportation planning and design and aligns with the FDOT context classification system. The 2018 *Florida Greenbook's* Context-Based Design policy captures three core concepts:

- Serve the needs of transportation system users of all ages and abilities, including pedestrians, bicyclists, transit riders, motorists, and freight handlers.
- Design streets and highways based on local and regional land development patterns and reflect existing and future context.
- Promote safety, quality of life, and economic development.

This context-based approach builds on flexibility and innovation to ensure that all streets and highways are developed based on their context classification, as determined by the local jurisdiction to the maximum extent feasible.

The *Florida Greenbook* identifies functional classification and context classification as playing important roles in setting expectations for and measuring outcomes for safety. Context classification may be used to evaluate relative safety and the implementation of safety improvements and programs (*Section 1C.1, p.1-9*). The degree and type of access permitted on a facility is dependent upon its intended function and context (*Section 1C.3, p.1-9*).

The *Florida Greenbook* identifies several strategies to promote the creation of context-sensitive high quality interconnected streets, including (*Section 2A, p.2-2*):

- Design for target speed.
- Design geometry to achieve sufficient sight distance and appropriate cross section.
- Provide right of way for uses including pedestrian features and stormwater facilities.
- Provide reasonable control of access.

For areas that meet the description of a traditional neighborhood development, Chapter 19 of the *Florida Greenbook* provides design criteria appropriate to C2T, C4, C5, and C6 context classifications. See Chapter 19 and the *FDOT Traditional Neighborhood Communities Handbook* (<https://www.fdot.gov/design/publicationslist.shtm>) for more information.

FDOT LANE REPURPOSING GUIDEBOOK

The ***FDOT Lane Repurposing Guidebook*** is intended to serve as a resource for FDOT and local agency planners and engineers. The guidebook includes analysis processes, factors to consider prior to the design and implementation of a lane repurposing project, and a summary of the related documentation requirements and FDOT processes.

Context classification does not directly affect the lane repurposing process; however, it is important to understand both the current and future context classification of the roadway. This understanding aids in assessing what user needs the roadway may have. Different uses for the repurposed lane may be appropriate in different context classifications as well.

FDOT TRANSPORTATION SITE IMPACT HANDBOOK

The ***FDOT Transportation Site Impact Handbook*** was developed to assist FDOT staff in their review of developments. The review of developments is intended to be broader than traffic analysis and include the review of local government comprehensive plans, community planning responsibilities, and multimodal transportation. The handbook acknowledges that every project should consider the unique context it is in and highlights the important role intersections play in Complete Streets. The Intersection Control Evaluation (ICE) process can be used to assess intersection control alternatives considering multiple objectives, including community needs and transportation needs.

FDOT INTERSECTION CONTROL EVALUATION

The ***FDOT Intersection Control Evaluation Manual*** was developed to implement the Intersection Control Evaluation (ICE) procedure on the State Highway System. The purpose of ICE is to consistently consider multiple context-sensitive intersection control strategies when planning a new or modifying an existing intersection. The context classification is considered during Stage 1 evaluations (p. C-1). The selected intersection control type should serve all roadway users.

Chapter 5

Emerging Uses for Context Classification

In order to truly integrate Complete Streets and leverage the context classification system to its best use, FDOT must continuously evaluate its approach and evolve its established culture to respond to the changing transportation landscape. While FDOT's current focus is on addressing the shifting transportation demands and concerns over safety of all users, tomorrow will bring new challenges related to emerging technologies, the vulnerability of our infrastructure, and shifting demands once again as the nation responds to a pandemic. This chapter provides insights into some of the next challenges and what FDOT has started doing to prepare for the future.

CAV TECHNOLOGY

Connected and autonomous vehicles (CAV) technologies hold promise to provide significant benefits to safety, mobility, and economic development throughout the state. FDOT's CAV Business Plan identifies specific short-term to long-term action items needed to fulfill safety, mobility, and economic development goals in Florida. These include policies/governance, program funding, education/outreach, partnerships, standards/specifications, implementation readiness, and implementation/deployment. Each of the seven priority focus areas can be impactful on context classification.

Initial CAV deployment and integration plans address all context classifications and how technologies can be implemented in different built environments. These technologies are not only beneficial to urban context, but they can also be beneficial to rural and suburban communities. Additionally, CAV technologies can impact and change the future context classification of a facility due to possibilities such as land use changes, reduced parking needs, development densification, and potential for sprawl.

FDOT's CAV plan focuses on coordination with local, regional, and metropolitan planning agencies. This integrated approach will help create regionally-specific partnerships and allow a more nuanced approach to addressing challenges and opportunities related to emerging technologies in different contexts. FDOT's ***Considerations and Applications for Integrating CAV into Complete Streets*** is available on the Resources tab at www.FLcompletestreets.com

RESILIENCY

Resiliency includes the ability of the transportation system to adapt to changing conditions and prepare for, withstand, and recover from disruption. Disruptions are events and conditions that are often characterized as shocks and stresses. While weather and natural hazards such as hurricanes, wildfires, and sustained environmental changes such as sea level rise are often the most identified disruptions, other events such as cyberattacks and longer-term stresses such as economic downturns and pandemics also impact the transportation system.

FDOT Policy 000-525-053, **Resiliency of State Transportation Infrastructure** (<https://www.fdot.gov/planning/policy/resilience/default.shtm>), states:

“It is the policy of the Florida Department of Transportation to consider resiliency of the State’s transportation system to support the safety, mobility, quality of life, and economic prosperity of Florida and preserve the quality of our environment and communities.”

A variety of factors influence the resiliency of our network:

- Since 2000, tidal flooding across Florida has increased by 352 percent.
- The amount of precipitation during heavy rainstorms has increased by 27 percent in the Southeast over the last 60 years.
- Florida is impacted by 40 percent of all U.S. hurricanes.
- Long-haul freight is expected to increase by 40 percent by 2040.
- Cyberattacks, including the 2017 attack on CSX’s Jacksonville headquarters, threaten to shut down entire transportation systems.

It is essential to plan and prepare Florida’s transportation system to adapt and recover from a wide array of disruptions and stresses. Though resiliency is important in all context classifications, we also know there are various strategies needed in each context classification. Urban contexts may focus on multimodal transportation options as a way to reduce single occupant vehicle trips and emissions. Rural and suburban transitioning contexts may have more challenges associated with conveying water with new impervious surfaces.

As we plan for the future of our transportation system, FDOT is incorporating resiliency into all areas of FDOT’s business. The **Resilience Subject Brief** provides a brief overview of planning for resiliency and how FDOT is advancing resiliency. In addition, resiliency is a cross-cutting topic shaping the overarching goals and strategies in ***The Florida Transportation Plan***, the state’s long-range plan guiding Florida’s transportation future.

Appendix A

CONTEXT CLASSIFICATION CASE STUDIES

Context Classification System: Comprised of eight context classifications, it broadly identifies the various built environments in Florida, based on existing or future land use characteristics, development patterns, and roadway connectivity of an area. In FDOT projects, the roadway will be assigned a context classification(s). The context classification system is used to determine criteria in the *FDM*.

The eight context classifications and their general descriptions are:

C1-Natural	Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.
C2-Rural	Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.
C2T-Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.
C3R-Suburban Residential	Mostly residential uses within large blocks and a disconnected/ sparse roadway network.
C3C-Suburban Commercial	Mostly non-residential uses with large building footprints and large parking lots. Buildings are within large blocks and a disconnected/ sparse roadway network.
C4-Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor and/or behind the uses fronting the roadway.
C5-Urban Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of the civic or economic center of a community, town, or city.
C6-Urban Core	Areas with the highest densities and building heights and within FDOT classified Large Urbanized Areas (population greater than one million). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadways, and are within a well-connected roadway network.



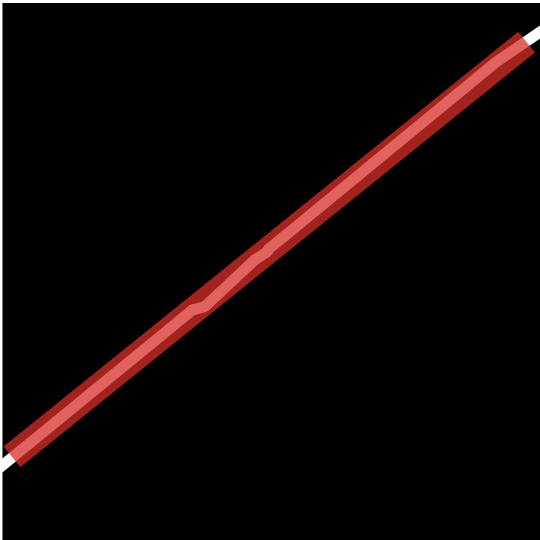
C1-NATURAL: FL 24, CEDAR KEY SCRUB
STATE RESERVE, LEVY COUNTY

Primary Measures								
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
		Floor Levels	Description	Yes / No		Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/ Sq Mile	Feet	Feet
Lands unsuitable for settlement due to natural conditions	Open space			Not developed				



Aerial Satellite Image

Secondary Measures			
Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
Development not allowed	Development not allowed	0	0



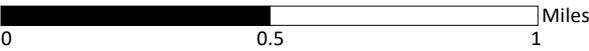
Streets and Blocks Network



Street View



Bird's Eye View



Existing Land Use

C2-RURAL: S.R. 52, WEST OF DADE CITY, PASCO COUNTY

Primary Measures

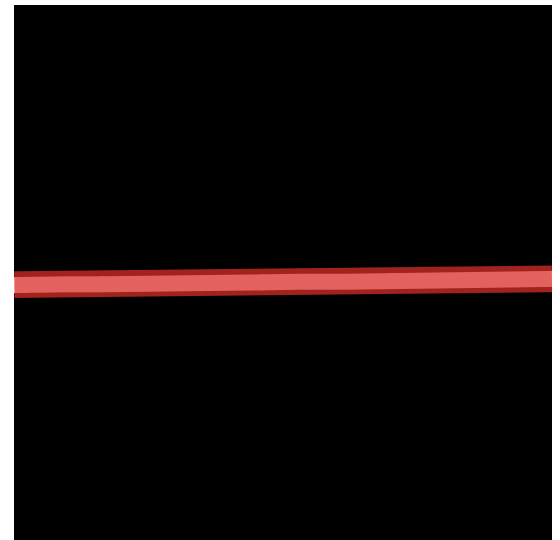
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Sparsely settled lands surrounded by agricultural lands	Agricultural	1	Detached buildings with no consistent pattern of setbacks	No	No consistent pattern	<1	No defined block pattern	



Aerial Satellite Image

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
0.1 (1 per 10 Acres)	Office and retail uses are not allowed	0.08	0



Streets and Blocks Network

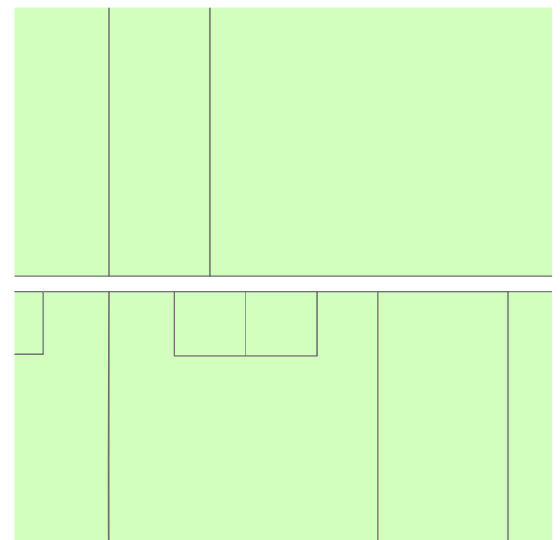


Street View



Bird's Eye View

Agriculture 



Existing Land Use

0 0.5 1 Miles



C2T-RURAL TOWN: MAIN ST, HAVANA, GADSDEN COUNTY

Primary Measures

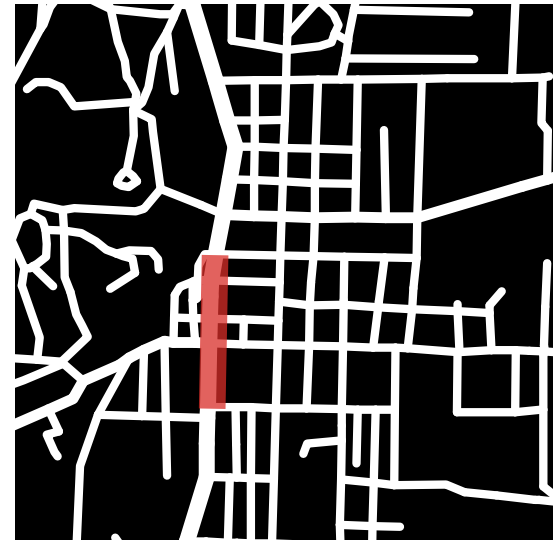
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Small concentration of developed area immediately surrounded by rural areas	Retail and commercial	1 - 2	Mostly attached buildings with no setbacks	Yes	Mostly in rear, occasionally on side	325	1,520	330



Aerial Satellite Image

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
27	1.2	0.3	4



Streets and Blocks Network

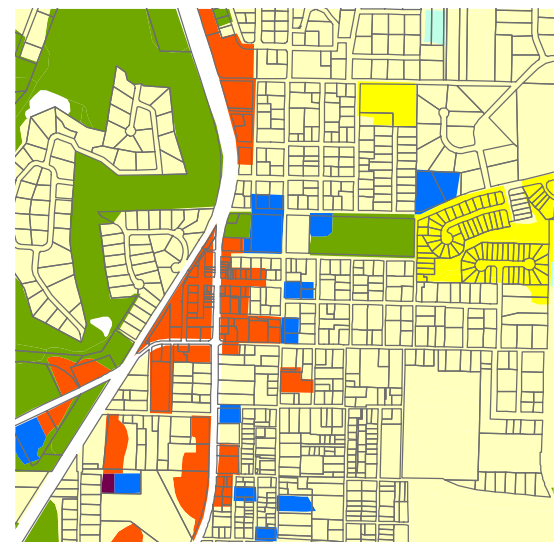
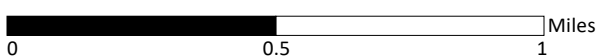


Street View



Bird's Eye View

Single-Family Residential	Light Yellow
Multi-Family Residential	Yellow
Commercial	Red
Retail	Orange
Agriculture	Light Green
Institutional/Government	Blue
Industrial	Dark Purple
Open Space	Dark Green
Vacant	White



Future Land Use

C3R-SUBURBAN RESIDENTIAL: S.R. 70, LAKEWOOD RANCH, MANATEE COUNTY

Primary Measures

Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
		Floor Levels	Description	Yes / No	Description	Intersection Density	Block Perimeter	Block Length
Mostly residential uses on both sides of the road with a disconnected roadway network	Single-family residential and institutional	1 - 2	Detached buildings with medium (20' to 75') setbacks on all sides	No	Front	40	6,040	1,140

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
1	0.23	0.4	0



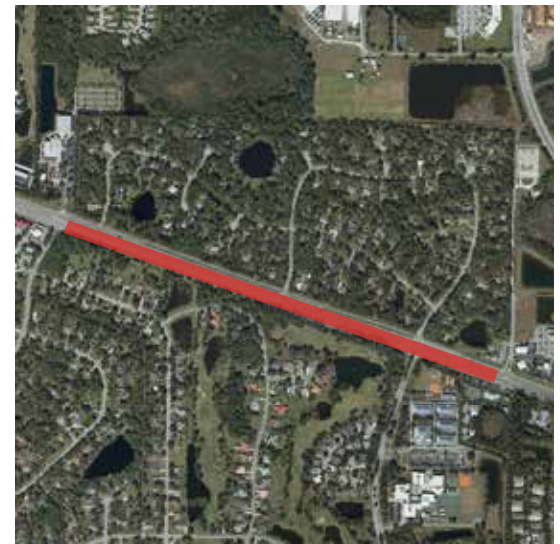
Street View



Bird's Eye View

Single-Family Residential	
Multi-Family Residential	
Commercial	
Retail	
Institutional/Government	
Open Space	
Vacant	

0 0.5 1 Miles



Aerial Satellite Image



Streets and Blocks Network



Existing Land Use

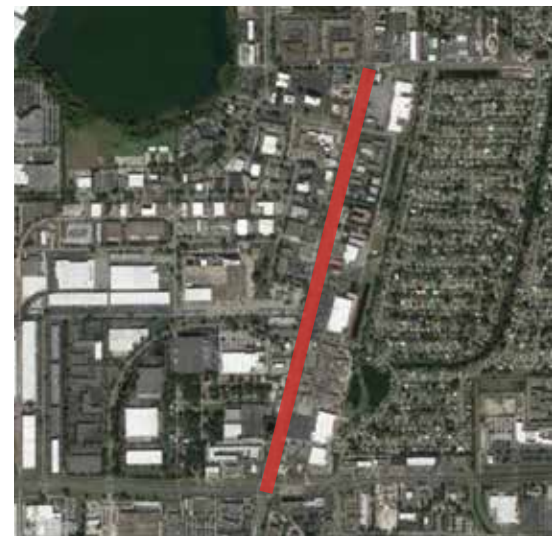
C3C-SUBURBAN COMMERCIAL: ORANGE BLOSSOM TRAIL, ORLANDO, ORANGE COUNTY

Primary Measures

Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Mostly non-residential uses immediately fronting the roadway, with a disconnected roadway network	Commercial and industrial	1 - 3	Detached buildings with large (> 75') setbacks on both sides	No	Mostly in front; occasionally in the rear or side	60	5,000	800

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
Not Applicable	0.75	2	28



Aerial Satellite Image



Streets and Blocks Network



Street View

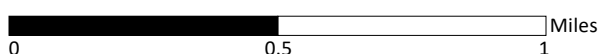


Bird's Eye View

Single-Family Residential	Yellow
Commercial	Red
Institutional/Government	Blue
Industrial	Purple
Open Space	Green
Vacant	White



Existing Land Use



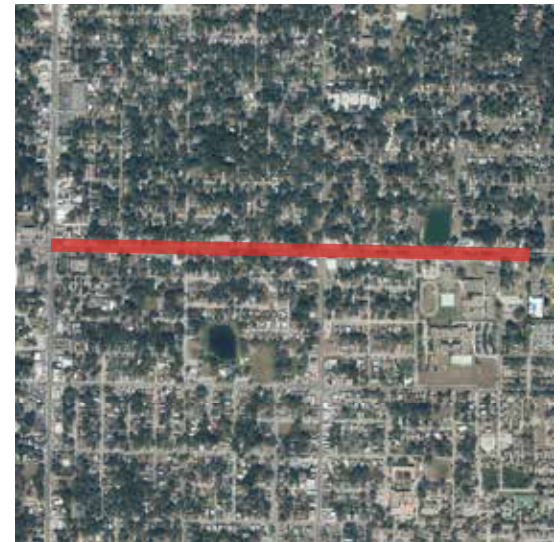
C4-URBAN GENERAL: DR. MLK JR. BLVD, EAST TAMPA, TAMPA, HILLSBOROUGH COUNTY

Primary Measures

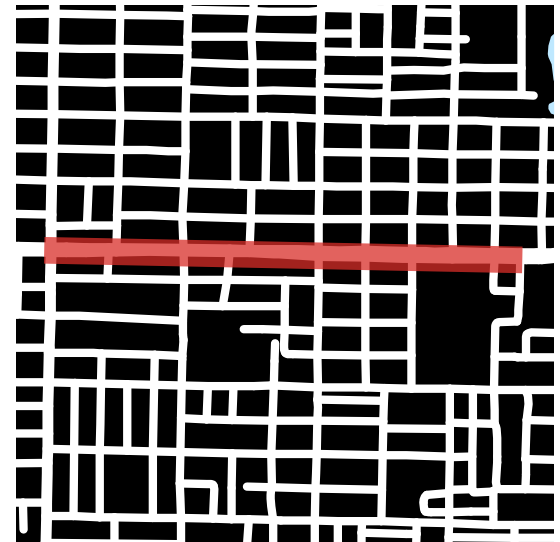
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/ Sq Mile	Feet	Feet
Mix of uses set within small blocks with a well-connected roadway network. The roadway network connects to residential neighborhoods immediately along the corridor and behind the uses fronting the roadway.	Single-family and multi-family residential, neighborhood-scale retail, and office	1 - 2	Detached buildings with minimal to shallow (10' to 20') front and side setbacks	Yes	Mostly in side, occasionally in rear or front	230	1,760	490

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
12	1.5	8.5	3



Aerial Satellite Image



Streets and Blocks Network

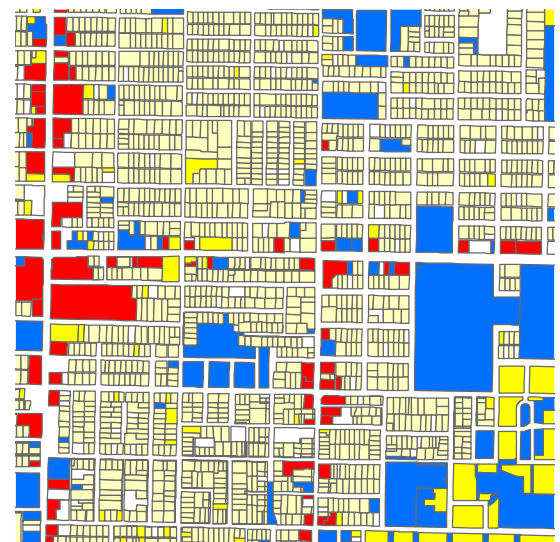


Street View

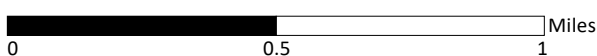


Bird's Eye View

Single-Family Residential	
Multi-Family Residential	
Commercial	
Retail	
Institutional/Government	
Open Space	
Vacant	



Existing Land Use



C5-URBAN CENTER: MONROE ST, DOWNTOWN TALLAHASSEE, LEON COUNTY

Primary Measures

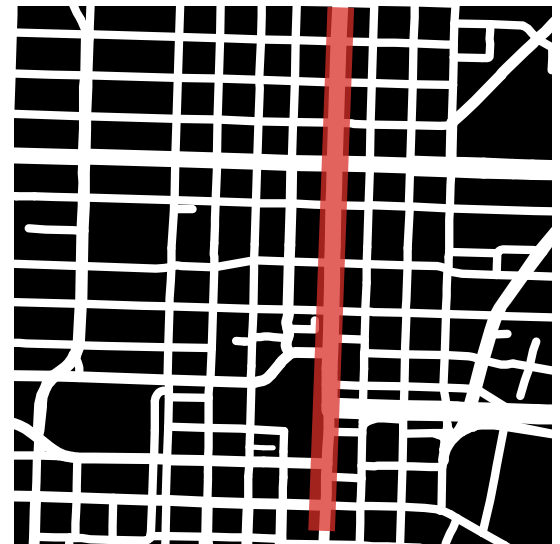
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
Mix of uses set within small blocks with a well-connected roadway network, and part of the civic and economic center of Tallahassee	Retail, office, institutional, commercial	1 - 5 with some taller buildings	Mostly attached buildings with no setbacks and a few buildings with minimal (<10') setbacks	Yes	Rear and garage	180	1,770	380

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
150	8	2.4	90



Aerial Satellite Image



Streets and Blocks Network

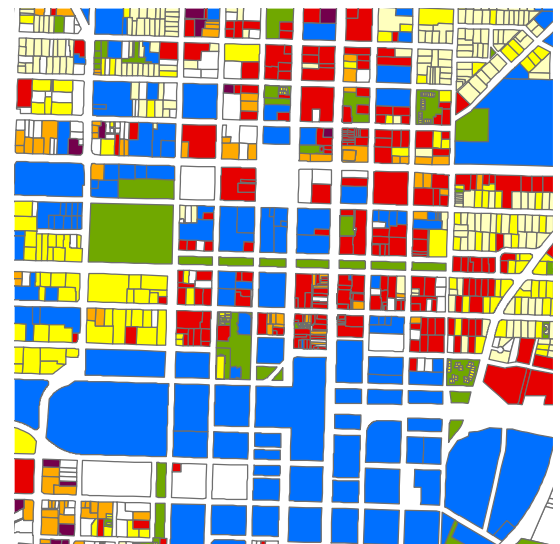


Street View

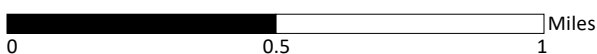


Bird's Eye View

Single-Family Residential	Light Yellow
Multi-Family Residential	Yellow
Commercial	Red
Retail	Orange
Institutional/Government	Blue
Industrial	Purple
Open Space	Green
Vacant	White



Existing Land Use



C6-URBAN CORE: ORANGE AVENUE, DOWNTOWN ORLANDO, ORANGE COUNTY

Primary Measures

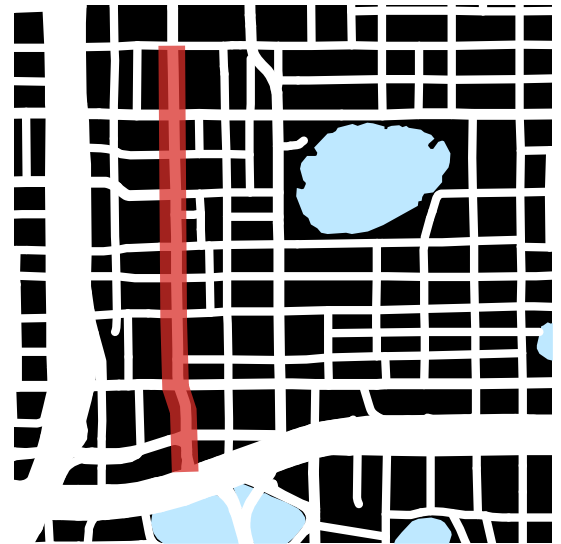
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
In an MPO urbanized area with population greater than 1,000,000. Multi-story buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.	Retail, office, institutional, and multi-family residential	> 4 with some shorter buildings	Mostly attached buildings with no setbacks	Yes	Rear and garage	220	1,910	450

Secondary Measures

Allowed Residential Density	Allowed Office/Retail Density	Population Density	Employment Density
DU/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
200	3	8.5	170



Aerial Satellite Image



Streets and Blocks Network

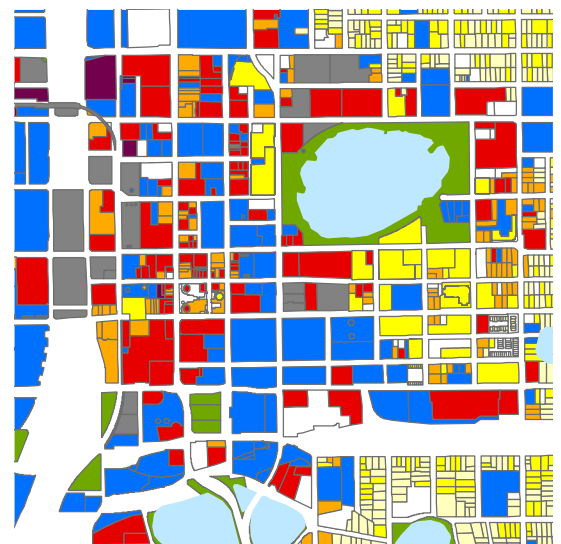


Street View

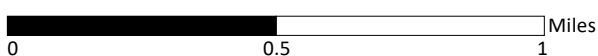


Bird's Eye View

Single-Family Residential	
Multi-Family Residential	
Commercial	
Retail	
Institutional/Government	
Industrial	
Open Space	
Vacant	

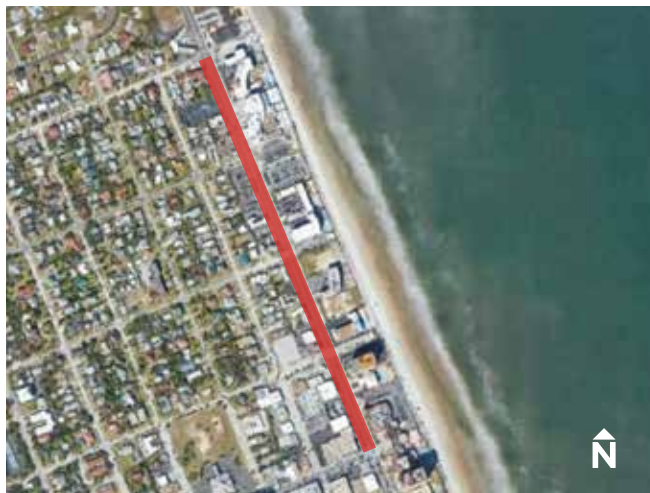


Existing Land Use



CONSTRAINED CORRIDORS/BARRIER ISLANDS

A constrained facility has a geographic barrier that can prevent roadway connectivity measures from meeting higher context classifications. This requires special attention to the land use, employment, and population densities during context classification evaluations. This example shows S.R. A1A in Daytona Beach, Volusia County. The corridor is along a barrier island where the segment does not meet the roadway connectivity measures for a C4-Urban General context classification, but the building height, building placement, fronting uses, and location of off-street parking measures do. In this case, the C4-Urban General context classification is appropriate and acknowledges the users and user needs present.



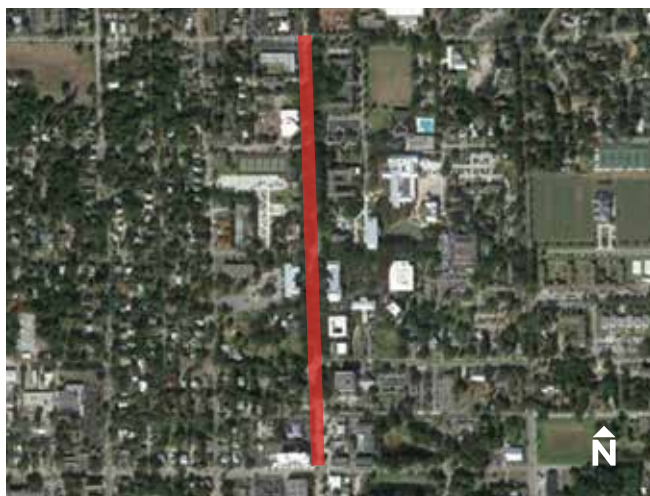
Aerial Satellite Image



Street View

SPECIAL DISTRICT

S.R. 15 through Stetson University in DeLand, Volusia County is an example of a Special District (SD). While the measures are consistent with a C4-Urban General context classification, engineering and planning judgment was used to identify this corridor as a Special District based on the university's land use, roadway users' needs, and proximity to downtown DeLand. This segment of the roadway was designated a C5-Urban Center because it is part of the civic or economic center for this community.



Aerial Satellite Image



Street View

FIGURE 27 POTENTIAL TARGET SPEEDS FOR CASE STUDIES

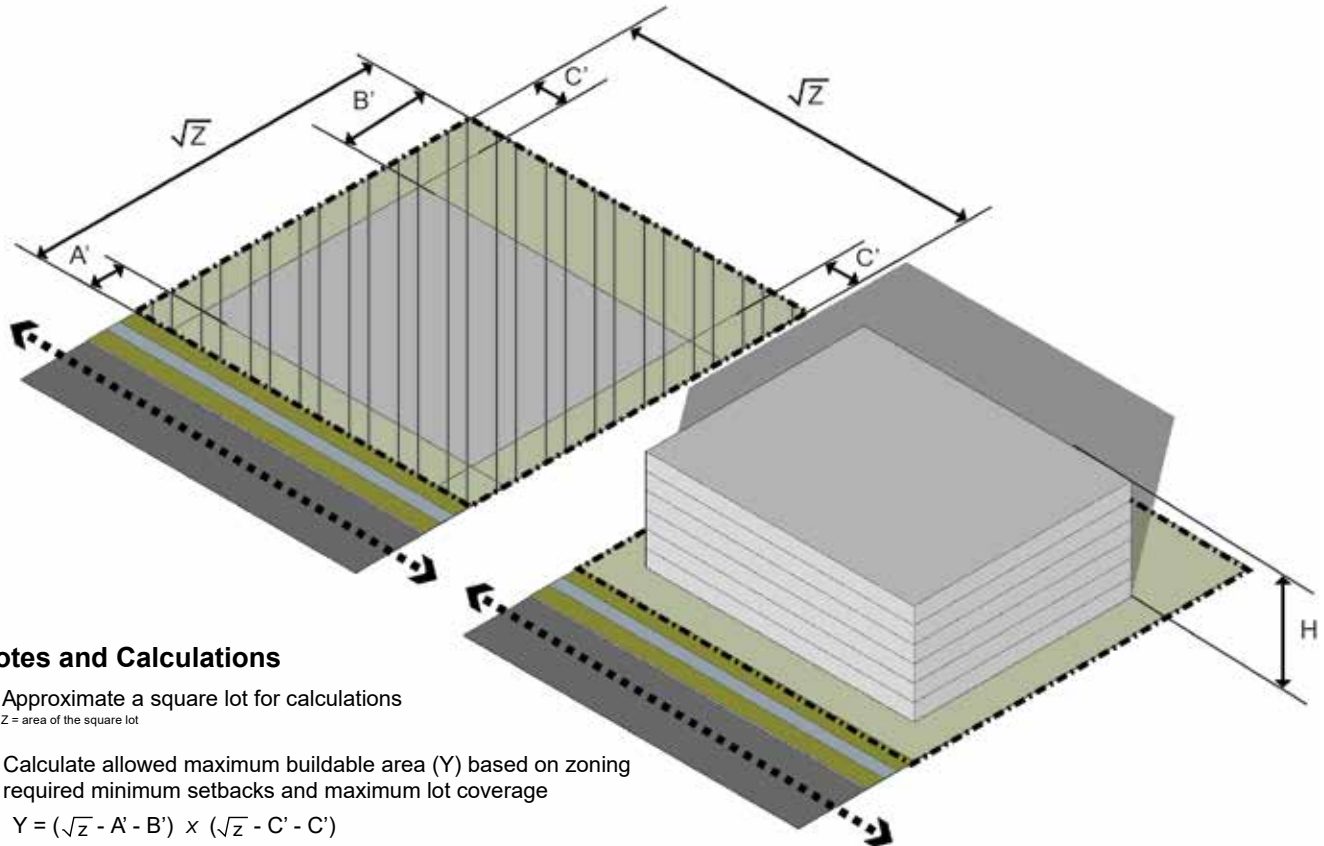
Context Classification	Location	Fronting Uses	Population Density	Vulnerable Users	Cross Section Elements	Access Classification	Transit Service	Pedestrian and Bicycle Generators	Existing Posted Speed	Target Speed
C1-NATURAL	FL 24, CEDAR KEY SCRUB STATE RESERVE, LEVY COUNTY	N/A	Low	Low N/A	Paved shoulder	4	None	None	60	60
C2-RURAL	S.R. 52, WEST OF DADE CITY, PASCO COUNTY	No	Low	Low N/A	Paved shoulder	3	None	None	55	55
C2T-RURAL TOWN	MAIN ST, HAVANA, GADSDEN COUNTY	Most parcels fronting street	Low	Medium Low median income	No dedicated bicycle facility (cyclists share lanes)	6	None	Downtown Havana, Havana Community Park, public library, private K-12 school	30	30
C3R-SUBURBAN RESIDENTIAL	S.R. 70, LAKEWOOD RANCH, MANATEE COUNTY	No	Low	Medium Presence of elementary and middle school students	Paved shoulder	3	None	Elementary & middle school	50	50
C3C-SUBURBAN COMMERCIAL	ORANGE BLOSSOM TRAIL, ORLANDO, ORANGE COUNTY	No	Low	Medium Presence of high school students	No dedicated bicycle facility (cyclists share lanes)	6	High frequency local service (3 routes, 4 buses per hour)	Charter high school	40	35
C4-URBAN GENERAL	DR. MLK JR. BLVD, EAST TAMPA, TAMPA, HILLSBOROUGH COUNTY	Most parcels fronting street	High	High Low median income, high poverty rate, and presence of elementary and middle school students	No dedicated bicycle facility (cyclists share lanes)	7	Lower frequency local service (One route, hourly service)	Elementary & middle school, Ragan Park, community lake, public pool, baseball fields, and tennis courts	40	30
C5-URBAN CENTER	MONROE ST, DOWNTOWN TALLAHASSEE, LEON COUNTY	Most parcels fronting street	Medium	Low	On-street parking, no dedicated bicycle facility (cyclists share lanes)	7	High frequency local service (3 local routes, 5 buses per hour)	Downtown Tallahassee, LeMoyne chain of parks, high school, Florida State Capitol, university basketball arena	25	25
C6-URBAN CORE	ORANGE AVE, DOWNTOWN ORLANDO, ORANGE COUNTY	Most parcels fronting street	High	Medium High poverty rate	No dedicated bicycle facility (cyclists share lanes)	7	High frequency local service (7 local routes, 9 buses per hour) and regional rail	Downtown Orlando, Lake Eola Park, professional basketball arena, private charter school	30	25

Appendix B

FREQUENTLY ASKED QUESTIONS

How is floor area ratio calculated if not defined in zoning code?

Floor area ratio (FAR) can be calculated using these various site design and height standards. For example, assuming floor height of 10 feet, total number of floors can be calculated based on maximum building height measure. Based on minimum parcel size and minimum setbacks, maximum floor plate area can be calculated. Multiplying maximum floor plate area by total number of floors will give total building floor area. Finally, dividing total building floor area by minimum parcel size will provide FAR.



Notes and Calculations

1. Approximate a square lot for calculations
Z = area of the square lot
2. Calculate allowed maximum buildable area (Y) based on zoning required minimum setbacks and maximum lot coverage

$$Y = (\sqrt{Z} - A' - B') \times (\sqrt{Z} - C' - C')$$
 or

$$Y = (\text{Maximum lot coverage area in (\%)} \text{ allowed by zoning code}) \times (Z)$$
 Use the smaller of the two values as Y
3. Calculate total floor levels based on zoning allowed maximum height (J)

$$\frac{H}{\text{Height of a floor level}}$$
 * Assume 12' for commercial land use or 10' for residential land use
4. Calculate Floor Area Ratio (FAR)

$$\text{Floor Area Ratio (FAR)} = \frac{Y \times J}{Z}$$

..... Property Lot Line

.....➔ Project Roadway

Y = Maximum allowed buildable area in square feet

A = Minimum allowed front setback in feet based on zoning code

B = Minimum allowed rear setback in feet based on zoning code

C = Minimum allowed side setback in feet based on zoning code

H = Maximum allowed height allowed by zoning code in feet

Who makes the final context classification determination?

FDM 120.2.3.2(8) indicates the FDOT District staff determine context classification, which includes concurrence from the District Intermodal Systems Development (ISD) Manager or Environmental Management Administrator. The Typical Section Package includes a checkbox and signature block for the concurrence signatures. For State projects, the project manager (or designee, such as the Complete Streets coordinator, community planning coordinator, a scoping team member, growth management liaison, or MPO/TPO liaison) is responsible for coordinating with affected local and regional governments and agencies during the determination of the context classification. Collaboration with the local and regional agencies and governments associated with a project is the key for successful projects.

Are future conditions reviewed for existing context classification evaluations?

The existing context classification looks at the measures listed in the Context Classification Matrix. Existing context classification evaluations consider permitted developments. Qualifying projects are reviewed using planned future conditions, but the Districts have the discretion to use future context classification on other appropriate projects.

How is a context classification decided on a corridor with both suburban commercial and suburban residential land uses?

In suburban environments, the land uses fronting the roadways are the distinguishing factor when designating a C3R-Suburban Residential or C3C-Suburban Commercial context classification. Typically, C3R corridors are predominantly made up of residential uses only, while C3C corridors have a greater mix of residential and commercial land uses, and residential developments are fewer or found behind the commercial land uses fronting the roadway. In C3C environments, there is expected to be a greater presence of pedestrians, bicyclists, and transit users; large building footprints with surface parking lots fronting the roadway; and a disconnected roadway network. If one side of the roadway is C3C and the other side is C3R, default to the highest context classification which is C3C.

Where are the districtwide context classification datasets stored?

The Roadway Characteristics Inventory (RCI) is a database of information related to the roadway environment maintained by FDOT. The preliminary existing context classification is stored in the RCI as Feature 126—Preliminary context classification. Each district will update this characteristic with the project-level existing context classification as project-level evaluations are completed. The future context classification characteristic is populated by the district, as applicable, when future project-level context classification evaluations are conducted. Not all roadway segments will have a future context classification assigned. Each District regularly sends updated context classification datasets to the RCI system. Preliminary context classifications for planning purposes (not to be used for design projects) can be seen using the ConnectPed GIS web application, found at <http://www.flcompletestreets.com/>.

Does context classification determine all the design decisions for a roadway?

Identifying context classification is the primary step in understanding the users along a roadway and will inform key design elements, such as the design speeds and lane widths. The transportation characteristics of a roadway are equally as important to understand when making design decisions such as the types of pedestrian, bicycle, transit, and freight facilities to be included in the design concept.

What should we do if the roadway network indicates a certain context classification, but land uses and development indicate another?

As shown in **Figure 9**, roadway connectivity measures should be reviewed first to understand the subset of context classifications that may be applied. Land use characteristics should then be used to identify the particular context classification within that subset.

Can we apply context classification on local roadways?

The context classification system was created to describe the state roadway network. Local governments may choose to adapt the context classification system to apply a similar evaluation to local roads, with roadway connectivity and land use measures calibrated to their roadway systems. Local governments' findings should be shared with the District to improve the context classification network. Local governments must also recognize that their local roadway networks will have a greater variety of roadway types compared to the State Highway System and be prepared to incorporate this diversity within their context classification-based criteria. For instance, yield streets, nine-foot travel lanes, and cul-de-sacs are all appropriate within a local network but would not be applied to the State Highway System. Local governments should avoid, therefore, simply replacing their local roadway standards with the **FDOT Design Manual** criteria. Local governments should consult the latest edition **Florida Greenbook** for additional guidance on the use of context classification.

Why do some measures have undefined thresholds in the Context Classification matrix?

Context Classification	Building Height, Building Placement, Fronting Uses	Location of Off-street Parking	Roadway Connectivity			Allowed Residential Density	Allowed Office/ Retail Density	Population Density	Employment Density
			Intersection Density	Block Perimeters	Block Length				
C1-Natural	No development along roadway		Sparse roadway network			No development along roadway			
C2-Rural		No consistent pattern of parking	Sparse roadway network				No consistent pattern of allowed office/ retail density	Some office/ retail may be present along the roadway	
C2T-Rural Town								Population will vary based on mix of single- and multi-family residential	
C3R-Suburban Residential				No consistent block pattern			No consistent pattern of allowed office/ retail density	Population will vary based on mix of single- and multi-family residential	Some office/ retail may be present along the roadway
C3C-Suburban Commercial						No consistent pattern of allowed residential density		Population will vary based on presence of multi-family residential	Varies based on intensity of commercial development along the roadway
C4-Urban General							No consistent pattern of allowed office/ retail density		





Agenda Item # 2022-739

1. Annual Christmas Luncheon
2. Pace Water System
3. WWTP Expandability

MEETING DATE

October 20, 2022

PREPARED BY

Dawn Molinero, City Clerk

BACKGROUND

1. The Employee Executive Committee would like to hold the Annual Christmas Luncheon on Wednesday, December 14, 2022 at the Clyde L. Gracey Community Center between the hours of 11 AM and 1 PM. During this time, we would like to close the city offices so all employees have an equal opportunity to attend.
2. Discussion item
3. Discussion item

SUMMARY

1. The Employee Executive Committee would like to hold the Annual Christmas Luncheon on Wednesday, December 14, 2022 at the Clyde L. Gracey Community Center between the hours of 11 AM and 1 PM. During this time, we would like to close the city offices so all employees have an equal opportunity to attend.
2. Discussion item
3. Discussion item

RECOMMENDATION

Recommend approval for the Annual Christmas Luncheon

ATTACHMENTS

1. Christmas Luncheon
2. CoW10_20



City of Milton

September 22, 2022

To: City Council and City Manager

RE: Annual Christmas Luncheon

The Employee Executive Committee would like to hold the Annual Christmas Luncheon on Wednesday, December 14, 2022 at the Clyde L. Gracey Community Center between the hours of 11 am and 1pm, upon your approval we would like to close the City offices down during this time for all the employees to have an equal opportunity to attend.

Thank You,

A handwritten signature in blue ink that reads "Christie Haarmann". The signature is written in a cursive, flowing style.

Christie Haarmann
Employee Executive Committee
Chairman

Points of clarification on two items raised during the Council meeting of Oct. 12th.

From Pace Water System's Operating Permits available via FDEP's Oculus System

Pace Water System's Wastewater Permit was issued on June 30, 2020. They are permitted to operate a 5.0 MGD system. The flow is divided to either of two treatment plants. According to the permit, there is a 2.0 MGD plant that "is currently inactive" and a 3.0 MGD 3-stage plant.

Pace Water System's discharge is covered in two separate permits. The first, under the treatment plant permit, allows 1.0 MGD discharge directly into "Pace Swamp (Simpson River of Escambia River System), Class III Fresh waters". The second aspect is up to 5 MGD "slow-rate public access reuse system, which consists of a golf course, residential lawns, parks and playgrounds, wastewater plant irrigation and washdown and Rapid Infiltration Basins. The boundaries of the re-use area are the utility franchise area. What this means is treated affluent is reused as non-potable water. Our new plant will have this ability and we have had discussions with potential users.

The second permit is specifically for the RIB's system and was issued on July 31, 2020. Pace Water is permitted to discharge 1.87 MGD into 19 RIB's within an area of 20.22 acres.

The City of Milton's RIB permit application is requesting to discharge 1.256 MGD into 20 RIB's with basin area of 11.5 acres. Thus, the city is utilizing 9.156 Acres/MDG compared to Pace's 10.81 Acres/MDG. The City's RIB design and capacity is more efficient than Pace's.

There are 2 aspects of this that maybe misunderstood – the acreage of a piece of property could be confused with the surface area of the RIB's. They are not the same and are not comparable. According to the Property Appraiser's website, just a quick search of Pace's RIB's property total over 1,006 acres.

Second – the RIB's do not all have to be at the same location or on the same piece of property. Pace's 1,006 acres is over 6 different parcels of land. This does not include the smaller RIB's located in neighborhoods as presented during the presentation. As stated in 2 different sections of the presentation (slide 7 & 24), additional land for more RIB's will be identified, acquired, designed, permitted & constructed within our timeline.

The other item I wanted to comment on was a reference to the expandability of the treatment plant and an expression found in a document dated 2011.

We have sought and can't identify the document referenced. However, there are four documents from that timeframe the following is reference to the potential subject matter found in those documents.

While in some cases the City's existing infrastructure could accommodate additional connections associated with early phases of the proposed developments, the later phases would begin to overwhelm parts of the system.

Intent of what certain statements referred to:

Existing infrastructure = Downtown Plant and all collection system components.
Proposed Developments = Growth through the different phases of new subdivisions.

The final **Preliminary Engineering Report** (PER) issued on 6-15-2011 but dated 4-15-2011, does not have any such disclaimer. You have to go to page 24 to find anything about a site not being large enough for future expansions and that is discussing the existing Downtown Plant.

An **Environmental Report** (ER) that was issued at the same time, I believe as an attachment to the previously mentioned PER also does not make such a disclaimer. However, if you go to page 7 of that document there is a paragraph that discusses the inability of the existing plant to meet future phases of development.

A 2011 **Facility Plan** required for a SRF loan application. On page 3 of that document, you will find another reference to a site not being able to accommodate expansion. That was also referencing the Downtown Plant.

A **Preliminary Design Report** (PDR) was published in 2010 and on page 2 there is a paragraph that again mirrors what the previous three documents have stated.

If there is another document being referenced I/we cannot locate it.