



# CONTEXT CLASSIFICATION GUIDE



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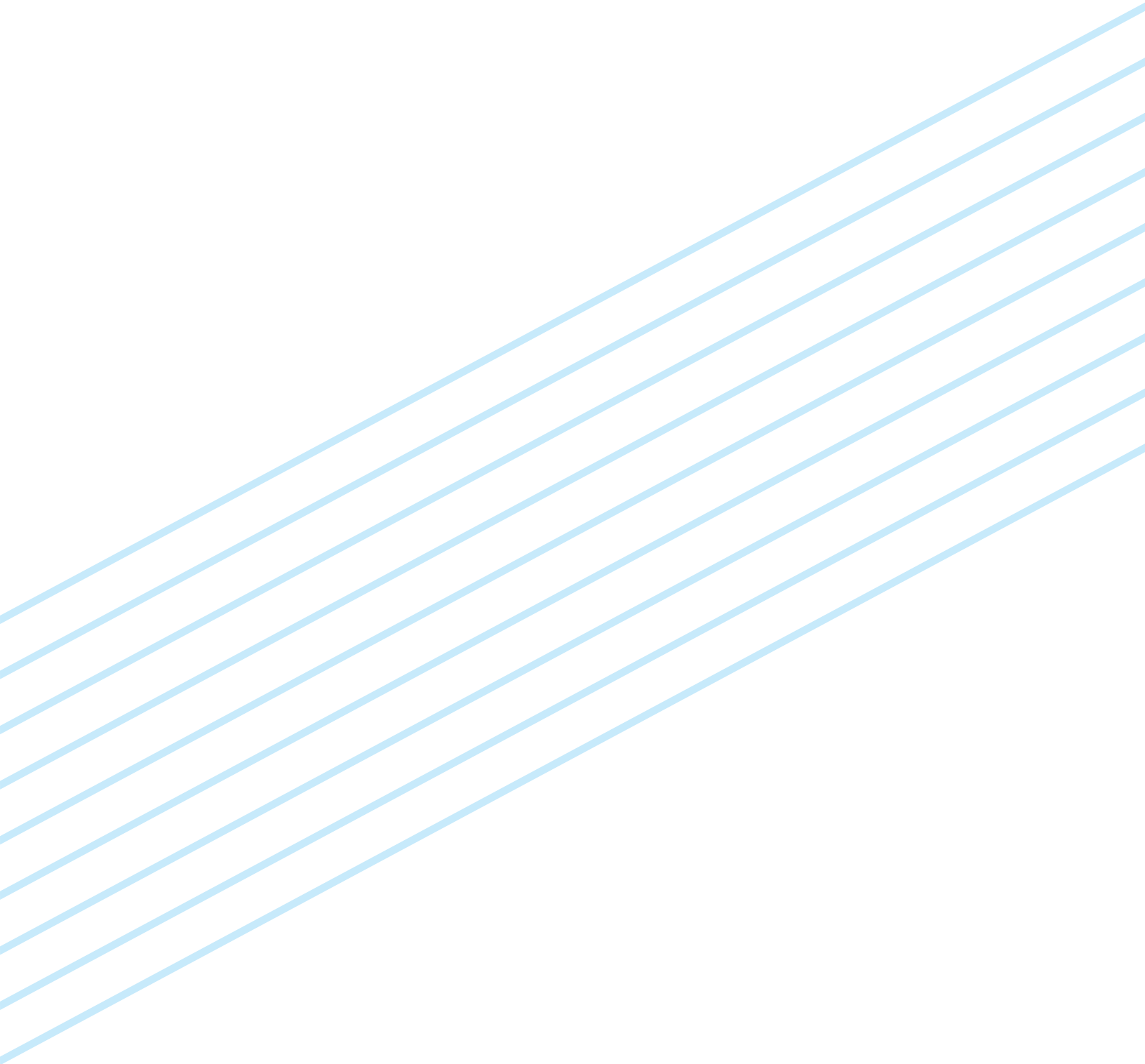
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# Chapter 1

# Context-Based Solutions

## 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, Context-Based Solutions. 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.

Context-Based Solutions 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.<sup>1</sup> This growth is coupled with shifting transportation demands led by demographic changes; the rise in pedestrian and bicycling fatalities on state roads<sup>2</sup>; declining local 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.<sup>3</sup> These are the challenges of the 21st century, and Context-Based Solutions 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 Context-Based Solutions 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.

<sup>1</sup> Florida Department of Transportation, Florida Strategic Highway Safety Plan, March 2021.

<sup>2</sup> 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.

<sup>3</sup> Florida Department of Transportation, Florida Transportation Plan Vision Element, 2015.

# CONTEXT-BASED SOLUTIONS OVERVIEW

Context-Based Solutions advances Florida's commitment to Target Zero - the reduction of traffic fatalities and serious injuries and further aligns Florida Department of Transportation (FDOT or the Department) with the U.S. Department of Transportation's SAFE ROADS Initiative. At its core, Context-Based Solutions ensures that Florida's roads are built for their surroundings - whether urban, suburban, rural, or freight-intensive - delivering the right design for the right place.

Traditional, one-size-fits-all roadway design can result in inappropriate speeds, increased crash risk, and inefficient use of infrastructure. Context-based design corrects this by aligning roadway features - such as lane width, speed, and pedestrian facilities - with the land use, travel behavior, traffic demand, and safety needs of each roadway.

Context-Based Solutions is a granular, practical, data-driven, and safety-focused policy that enhances the performance, reliability, and safety of Florida's transportation system. It reflects FDOT's responsibility to deliver modern infrastructure solutions that work - on every road, in every setting, for every Floridian. With an average of 1,000 people moving to the Sunshine State each day, the FDOT remains committed to enhancing the safety and mobility of our residents and visitors of all ages and abilities.

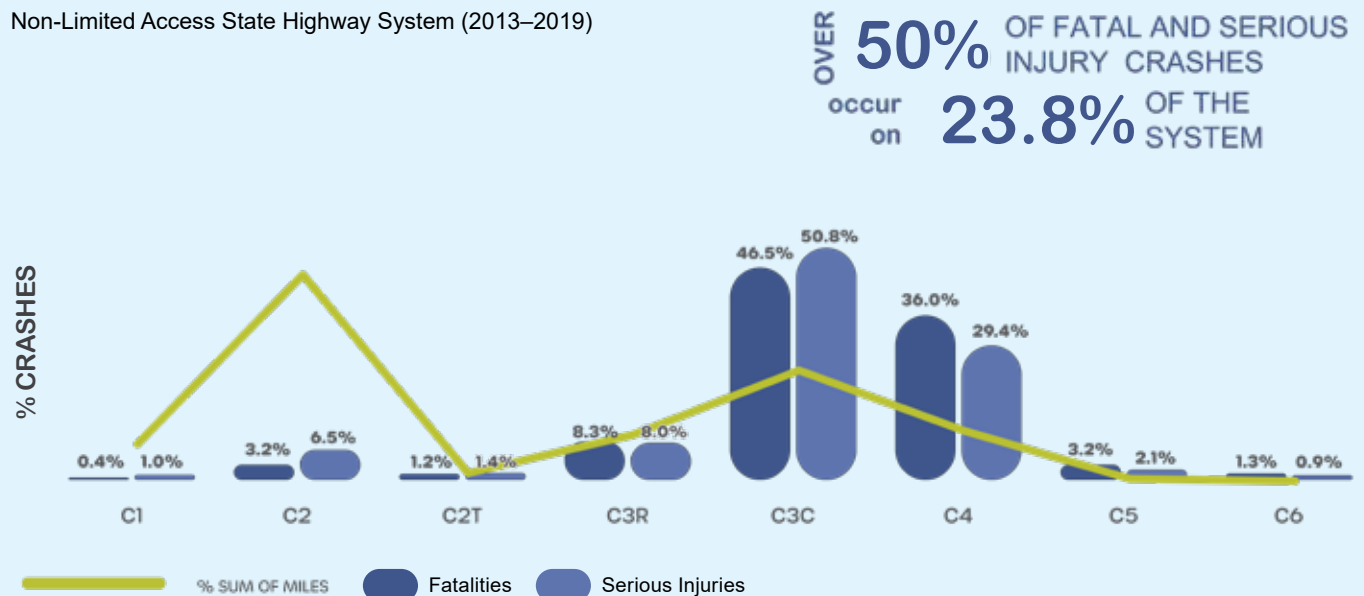
# TARGET ZERO

Florida's safety vision is simple: to eliminate all transportation-related fatalities and serious injuries from all modes of travel. This includes pedestrians, bicyclists, motorcyclists, micromobility device users, drivers, freight handlers, and transit users utilizing 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, particularly for people walking and biking. Despite representing only about 4% of total crashes within Florida, bicyclists and pedestrians represent 27% of fatal crashes<sup>1</sup>. Bicycle and pedestrian crashes are not evenly distributed across roadway types and context classifications. 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-Suburban Commercial or C3R-Suburban Residential context classification, higher posted speeds, and higher transit frequency have the highest likelihood of bicycle and pedestrian crashes. 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 1**).<sup>2</sup>

**FIGURE 1** Crashes by Context Classification

Non-Limited Access State Highway System (2013–2019)



Source: Florida Pedestrian and Bicycle Strategic Safety Plan

<sup>1</sup> Florida Department of Transportation, Pedestrian & Bicycle Crash Facts 2017-2021 Signal Four (S4) Analytics

<sup>2</sup> Florida Department of Transportation, Florida Pedestrian and Bicycle Strategic Safety Plan, September 2021.

## SAFE SYSTEM APPROACH

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<sup>1</sup>. There are five elements of the Safe System: Safe Road Users, Safe Vehicles, Safe Speeds, Safe Roads, and Post-Crash Care (see **FIGURE 2**). Each element is interrelated, and weaknesses in one element may be compensated with strengths in another.

**FIGURE 2** Safe System Approach



The following are six foundational principles for understanding and applying the Safe System Approach:

- 1 Fatalities and serious injuries are unacceptable** – While no crashes are desirable, the Safe System Approach prioritizes the elimination of crashes resulting in fatalities and serious injuries.
- 2 Humans make mistakes** – Road users will inevitably make mistakes, and those mistakes can lead to crashes. The transportation system can be planned, designed, and operated to account for inevitable human error, so that fatal and serious injury outcomes are less likely to occur.
- 3 Humans are vulnerable** – Humans have a limited ability to tolerate the energy involved in crash impacts. Applying the Safe System Approach involves managing the kinetic energy of crashes to avoid fatal and serious injury outcomes.
- 4 Responsibility is shared** – All stakeholders (transportation system users and managers, vehicle manufacturers, emergency responders, etc.) must work collaboratively to prevent crashes that 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 to be strengthened so that if one element fails, the others still protect transportation system users.

<sup>1</sup> 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](https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf)

When the Safe System Approach is taken, the inevitability of human mistakes is anticipated and accommodated, resulting in less severe 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 safety conditions. The Safe Systems Approach is a paradigm shift in addressing 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.

The criteria within the **FDM** have been developed to support Safe Speeds and Safe Roads. The term “Safe System” may not be specifically mentioned in the **FDM**; however, it is inherent within the criteria and important to keep in mind when making engineering decisions that vary from the criteria.

A risk-based approach to safety integrates the aspects of Safe Speeds and Safe Roads in a proactive manner. While historical crash analysis looks at the crashes at a particular location and identifies countermeasures to prevent or mitigate those crashes, this risk-based approach looks at the root causes of crashes, identifies roadway features that are more likely to exhibit higher crash rates, and applies safety countermeasures proactively. This approach evaluates potential risks within the system to inform design decisions. It systematically identifies, assesses, and prioritizes crash risks based on their likelihood and potential impact. Through this risk-based approach, FDOT has been able to identify certain contexts and roadway features that have a disproportionate number of crashes when compared to their representation in the system. From this analysis, countermeasures can be applied to roadways with high-risk characteristics. The risk-based analysis is intended to prevent crashes before they occur.

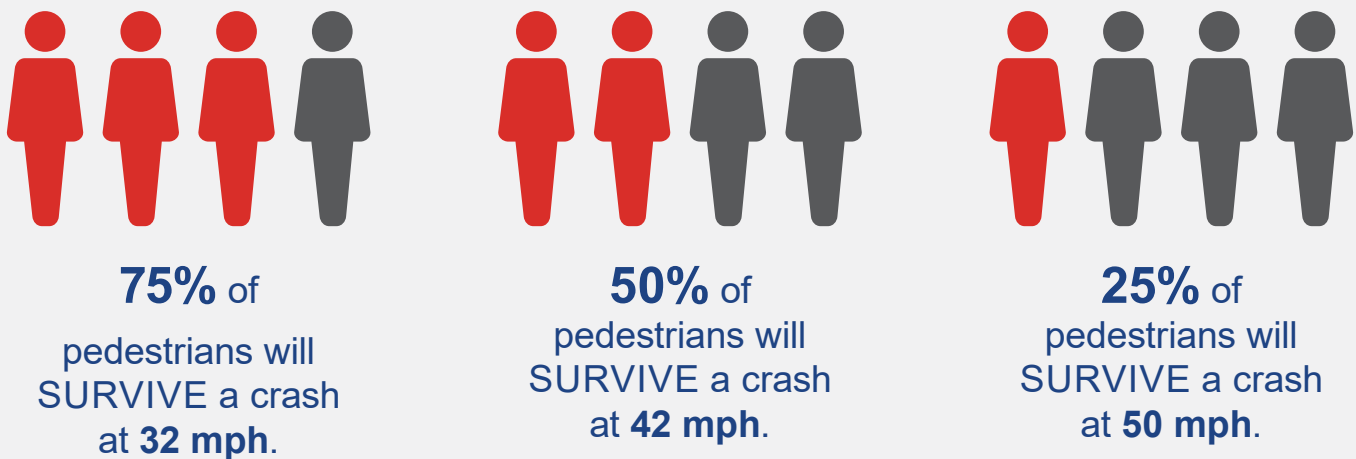
## Safe Speeds

One proven way to reduce traffic fatalities and injuries is to adjust vehicle speeds to better reflect the mix of users on a roadway<sup>1</sup>. This might involve working toward a target speed or using speed management techniques to encourage drivers to operate at safe speeds reflecting the context of the community.

Considering the vulnerability of a pedestrian or bicyclist without the protection of a vehicle, reduced speeds and increased visibility have significant impacts on the severity of injuries and likelihood of surviving a crash. Only 50% of pedestrians are expected to survive a crash involving a vehicle traveling at 42 mph (see **FIGURE 3**). This is especially important in Florida, where 91% of state roadways are posted at speeds of 40 mph or above<sup>2</sup>.

**FIGURE 3** Safe Speeds

## HIGHER SPEEDS DECREASE THE CHANCE THAT A PEDESTRIAN WILL SURVIVE A CRASH.



Source: Adapted from Florida Pedestrian and Bicycle Strategic Safety Plan (2021)

## Safe Streets

Roadway design strongly influences how people use roadways. Thoughtful roadway design can reduce or eliminate “human error” by accounting for human limitations and behavior patterns. Designing to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur. Examples include physically separating people traveling at different speeds, providing dedicated times for different users to move through a space, and alerting users to hazards and others operating on the roadway. When allocating limited resources, Florida must prioritize projects that reduce traffic fatalities and serious injuries to reach Target Zero.

FDOT can leverage the context classification system, as described in this Guide, to implement a proactive approach to safer streets. 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 safety challenges are documented through crash data.

<sup>1</sup> Tefft, B.C. (2011). Impact Speed and a Pedestrian’s Risk of Severe Injury or Death (Technical Report). Washington, D.C.: AAA Foundation for Traffic Safety.

<sup>2</sup> Florida Department of Transportation, Florida Pedestrian and Bicycle Strategic Safety Plan, September 2021

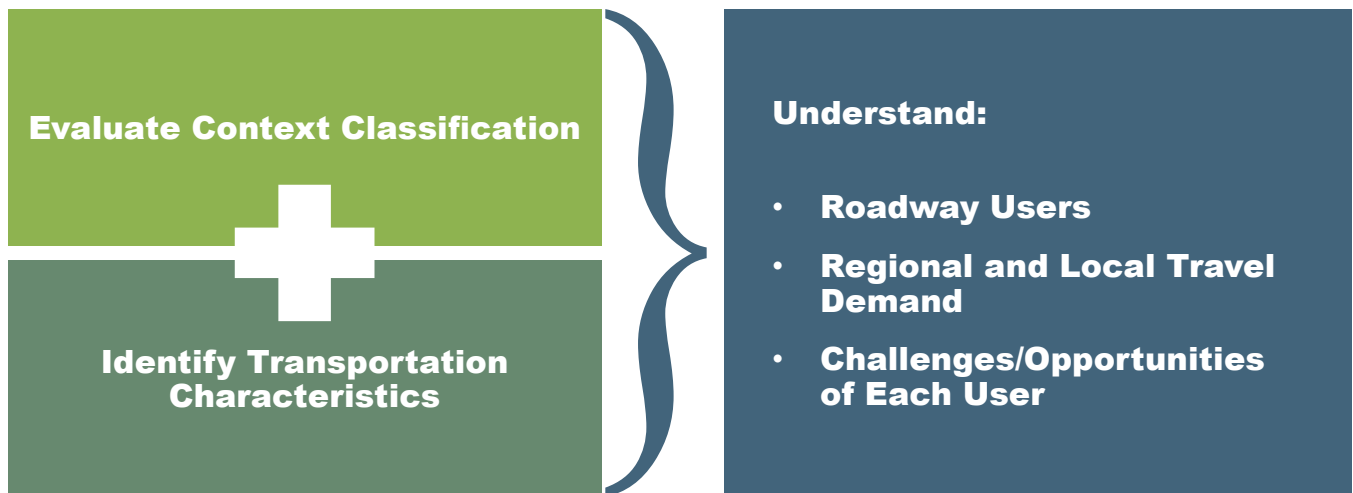
**Context-Based  
Solutions  
means putting  
the right road in  
the right place.**

# Chapter 2

## FDOT Context Classification

FDOT implements Context-Based Solutions across the Department through 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



**C1-Natural**  
Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.

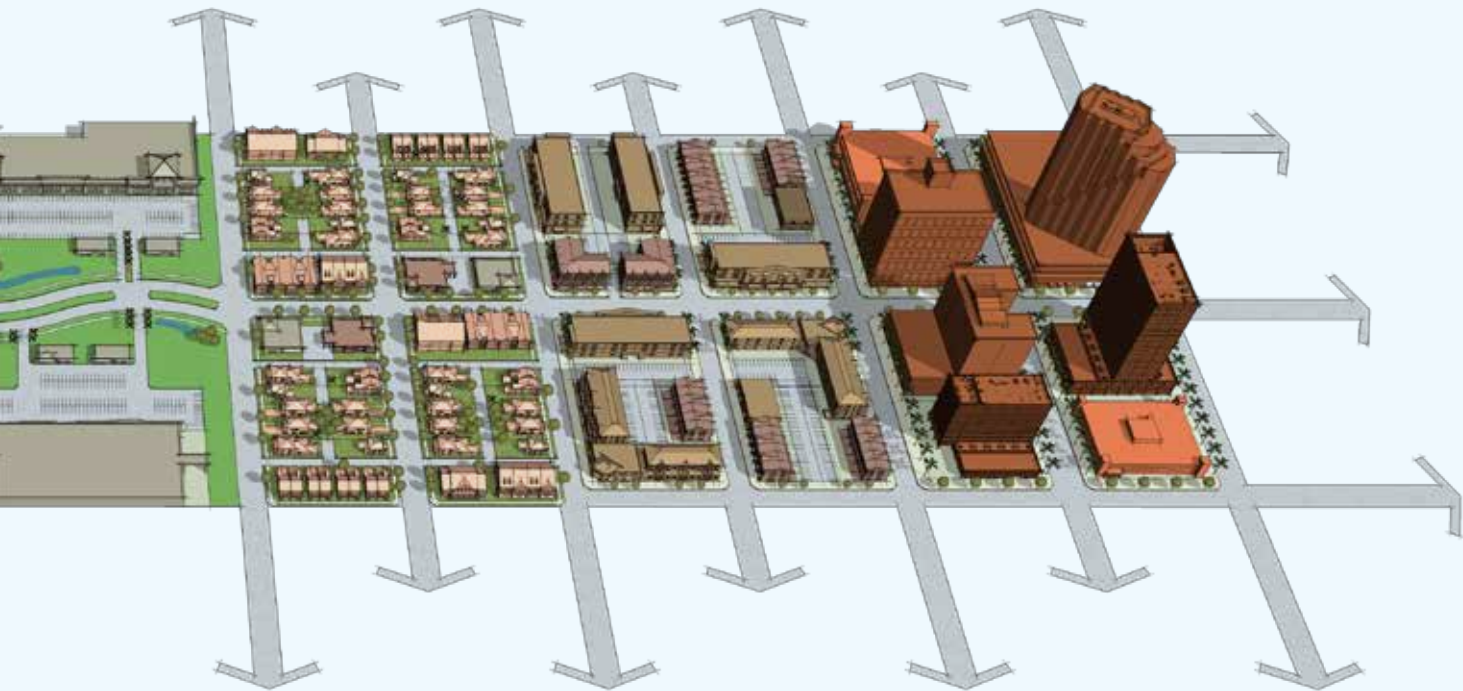
**C2-Rural**  
Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.

**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.

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.

## 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 1**), 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, 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. To ensure statewide consistency, contact the FDOT Central Office Roadway Design Office 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.<sup>1</sup> The preliminary context classification is stored in the RCI as Feature 126 – Preliminary Context Classification. This feature includes four 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.

### Preliminary Context Classification Date

Districts should update the date as project-level existing context classifications are completed and to differentiate from the original preliminary context classification.

### Future Context Classification

This characteristic 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.

### Future Context Classification Date

Districts should update the date as project-level future context classifications are completed.

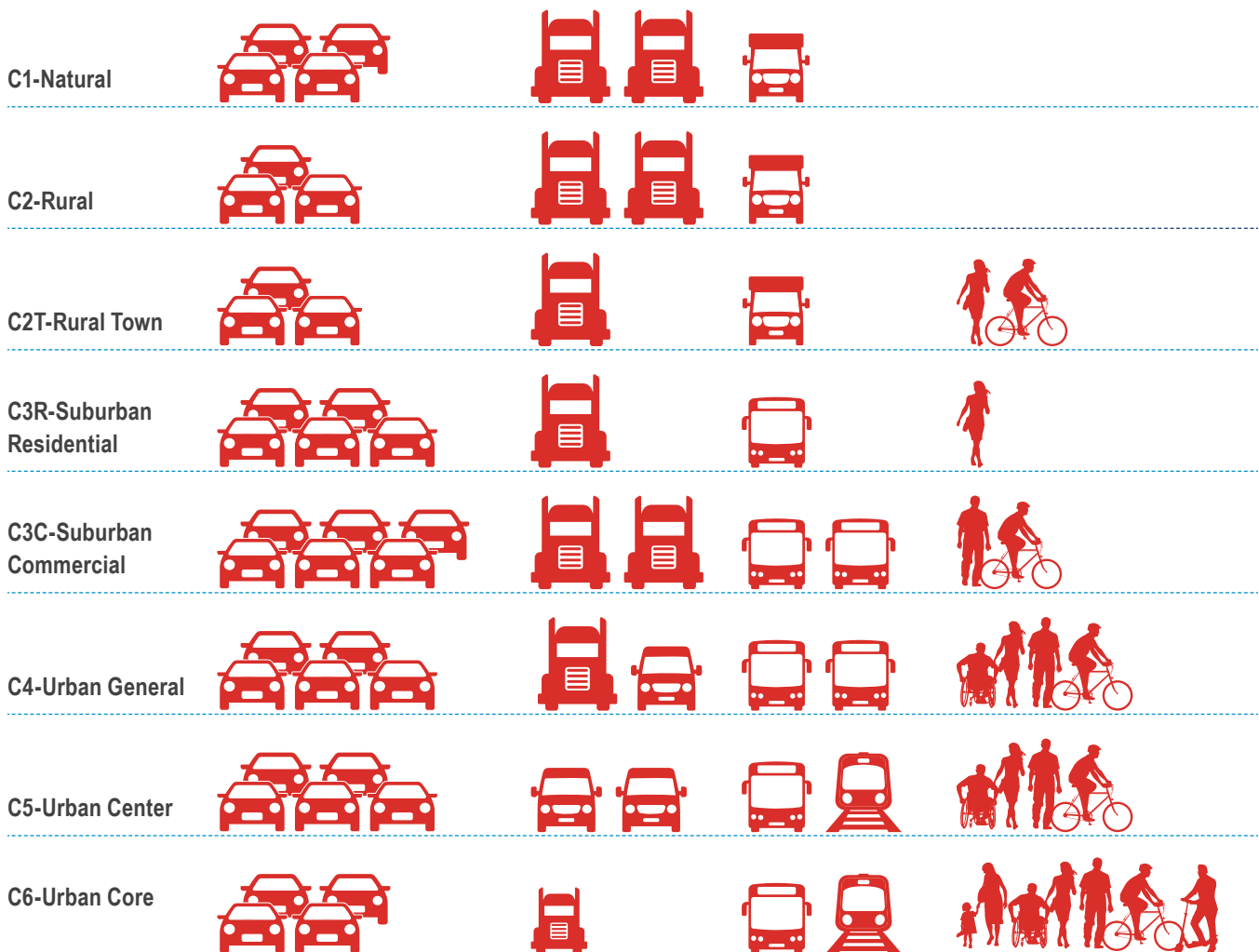
<sup>1</sup> Feature 124-Urban Classification and Feature 481-Highway Maintenance Classification may describe land use contexts in different ways but do not contain context classification.

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. The District can update RCI as project-level evaluations are completed or periodically, such as quarterly or annually.

## 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

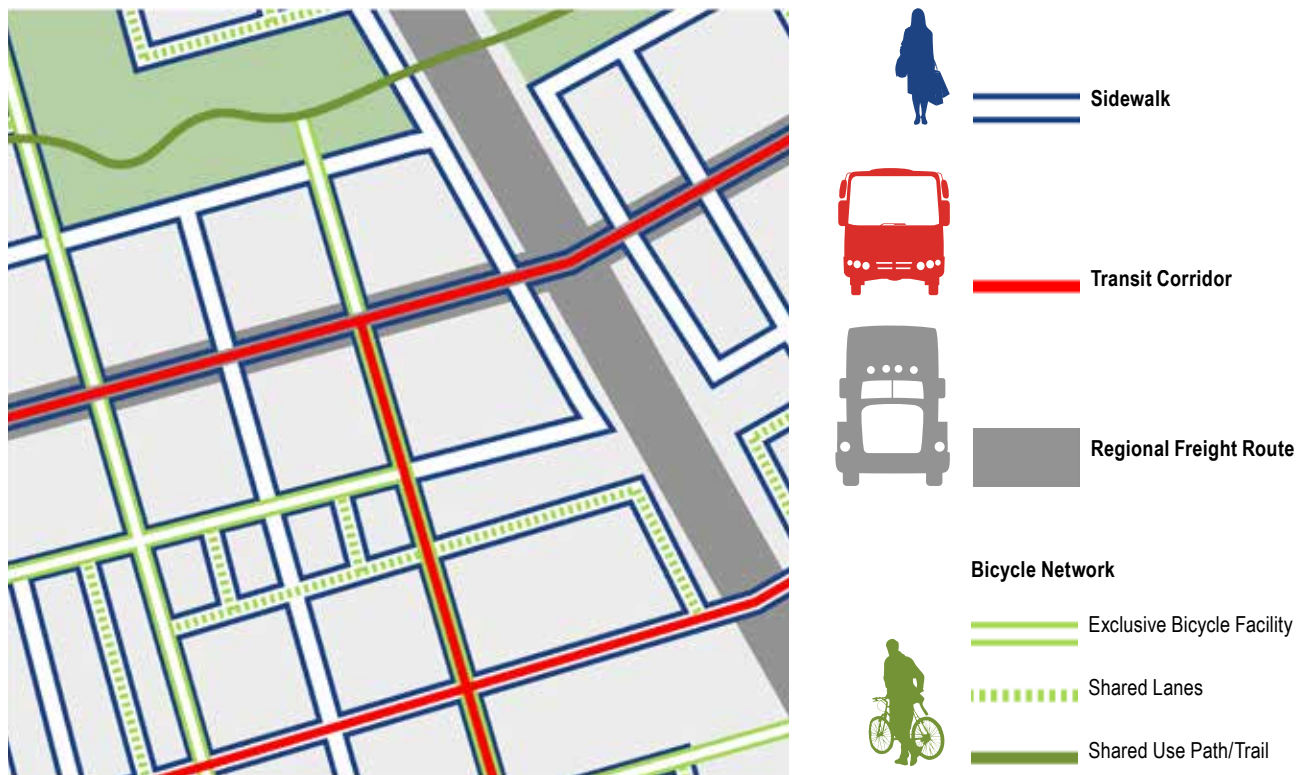


# BUILDING A NETWORK

Every street and road is uniquely planned and designed to serve the context of that roadway. Although Context-Based Solutions focuses on the safety of all users, each street strikes a different balance of user needs, 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 network of roadways, where each roadway contributes to the system’s ability to serve all users.

**FIGURE 7** Context-Sensitive System of Streets to Drive Connectivity



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 well-connected and appropriate State and local roadways.

## DETERMINING PROJECT-SPECIFIC CONTEXT CLASSIFICATION

### CONTEXT CLASSIFICATION MATRIX

**TABLE 1** 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.

**TABLE 1** Context Classification Matrix

Context Classification	(1) Distinguishing Characteristics	(2 A/B) Primary Measures			
		Roadway Connectivity			
		Intersection Density	Block Perimeters	Block Length	Land Use
		Intersections/ Square Mile	Feet	Feet	Description
<b>C1-Natural</b>	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
<b>C2-Rural</b>	Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.	<20	N/A	N/A	Agricultural and/or Single-Family Residential
<b>C2T-Rural Town</b>	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
<b>C3R-Suburban Residential</b>	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
<b>C3C-Suburban Commercial</b>	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
<b>C4-Urban General</b>	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
<b>C5-Urban Center</b>	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
<b>C6-Urban Core</b>	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 10.

## (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

## Determining Context Classification for Different Project Origins

It is important that roadway users and their respective needs are understood early in the life of a project. This is ideally done prior to a project being added to the work program in case a planning phase is needed. Understanding the needs of all users at these early phases can help create a project scope of services that defines all necessary improvements and that the budget is adequate for design, right-of-way, and construction. The context classification and users' needs 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.

As projects go through the 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. Project types that qualify for Efficient Transportation Decision Making (ETDM) screening, per the ETDM Manual Section 2.3.1, are considered **qualifying projects** (see **FIGURE 8**). The ETDM process occurs during the planning phase and allows for review of projects that may have environmental effects.

**FIGURE 8** Project types

### Qualifying Projects

It is helpful to understand the context classification for projects that qualify for ETDM screening during the planning or PD&E phases 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. The context classification, needs of anticipated users, and target speed recommendations should be identified during the planning phase of a project to offer an opportunity to incorporate a Context-Based Solutions approach for the life of the project.

Qualifying projects in all phases for existing and new roadways will be evaluated using the future conditions of the measures.

### Non-qualifying Projects

There are many projects that do not qualify for an 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.

Non-qualifying projects in all phases for existing roadways can be evaluated using existing or future conditions of the measures.

## When to Use Existing and Future Context Classifications

The measures in the Context Classification Matrix in **TABLE 1** can be evaluated based on existing or future conditions. The following provides guidance on when to use existing and future context classification based on the project origins and traffic forecast.

**Existing context classifications should be used when a roadway project is evaluating short-term improvements without projecting future traffic needs.** Existing context classifications are meant to be a snapshot in time of an existing roadway's densities, surrounding land uses, and fronting uses. These existing conditions should include funded roadways in the roadway connectivity measures and permitted development in the land use, building, and density measures. Non-qualifying projects, or projects that do not go through ETDM screening, can be evaluated based on existing conditions if the project does not use future traffic projections. However, Districts may choose to use future context classification based on a longer project timeline.

**Future context classification should be used for all qualifying projects and any projects evaluating future traffic or development.** Future context classification is meant to align the roadway with the needs of planned development, other changes based on community-supported and implementation-focused plans, or local, regional, and State policies. For example, if a new project roadway provides access to future neighborhoods, commercial centers, or other concentrations of expected development, the project roadway should use the future context classification to inform key design characteristics of the project roadway, including design speeds and lane widths. See page 41 for more discussion on evaluating context classification for new roadways.

Non-qualifying projects should also use future context classification when forecasting traffic for a future or interim year. Districts may choose to use future context classification for any project 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.

**In general, the horizon year for the context classification should match the horizon year for the traffic analysis being conducted on projects.**

Examples of non-qualifying projects that may use existing context classifications **when future traffic projections are not being considered:**

- Resurfacing, restoration, and rehabilitation projects;
- Spot safety improvements;
- Traffic operation projects.

Examples of qualifying projects that should use future context classifications include but are not limited to:

- Additional through lanes which add capacity to an existing roadway;
- Highway that 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 that provides access to an area/ bridge replacements.

# 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 1** 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 1** 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:



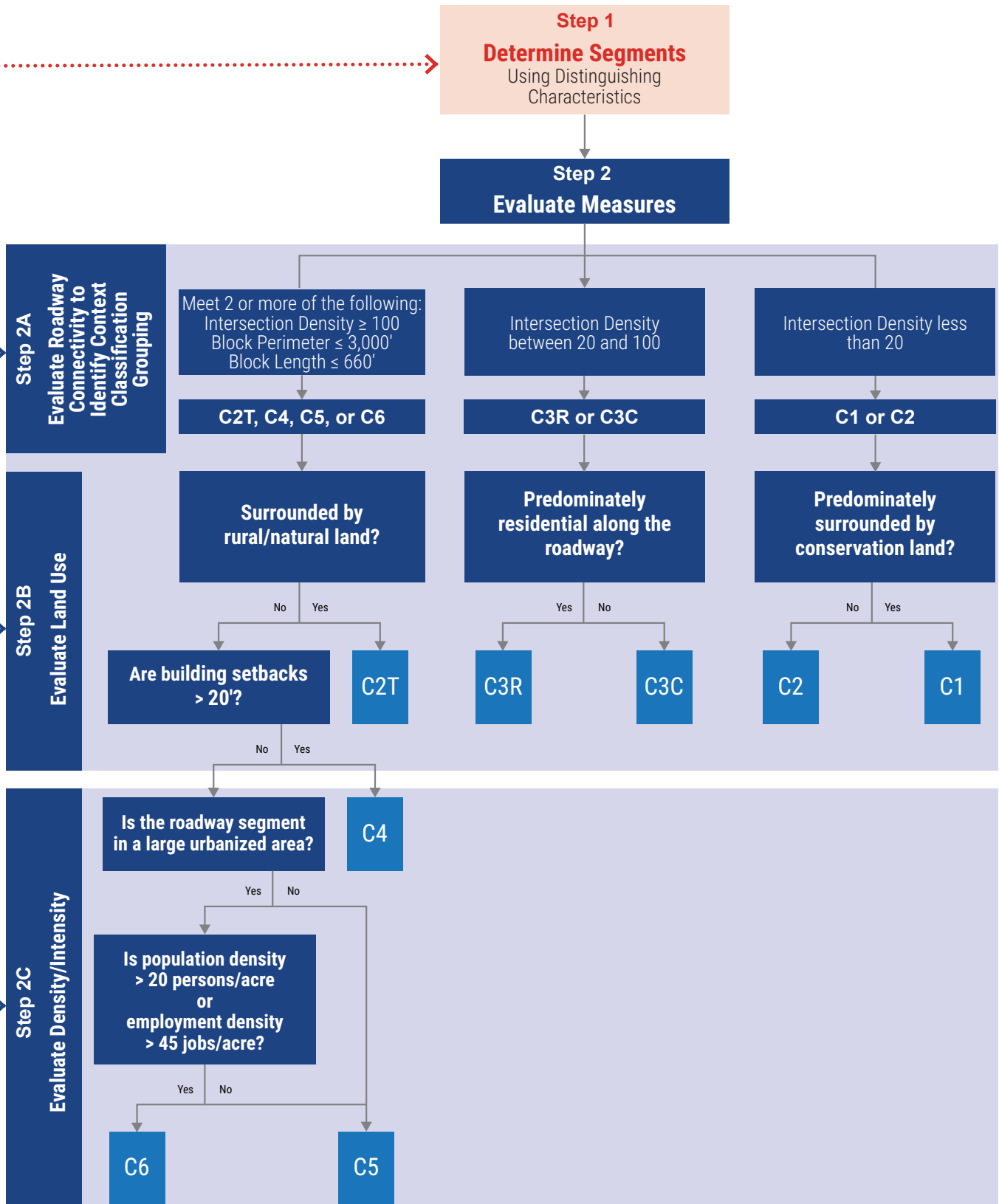
● **Step 2B** Use the land use measures to further refine the evaluation.

C2T, C4, C5, or C6	C3R or C3C	C1 or C2
<p>Determine if the land uses along the roadway segment are surrounded by rural or natural land.</p> <ul style="list-style-type: none"> <li>• <b>Yes:</b> this can be classified as C2T context classification.</li> <li>• <b>No:</b> then further evaluate using building setback measure.</li> </ul> <p>Determine if non-C2T segments have less than 20’ setbacks.</p> <ul style="list-style-type: none"> <li>• <b>Yes:</b> further evaluate in Step 2C.</li> <li>• <b>No:</b> this segment can be classified as C4 context classification.</li> </ul>	<p>Review the land uses along the roadway. Are they predominantly residential?</p> <ul style="list-style-type: none"> <li>• <b>Yes:</b> 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.</li> <li>• <b>No</b> (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.</li> </ul>	<p>Determine if the roadway segment is surrounded by conservation land, such as a park or wildlife refuge.</p> <ul style="list-style-type: none"> <li>• <b>Yes:</b> this can be classified as C1 context classification.</li> <li>• <b>No:</b> this can be classified as C2 context classification.</li> </ul>

● **Step 2C** Use the land use measures to further refine the evaluation.

C5 or C6
<p>Evaluate if within a Large Urbanized Area.</p> <ul style="list-style-type: none"> <li>• <b>Yes:</b> further evaluate using population and employment density.</li> <li>• <b>No:</b> this segment can be classified as C5 context classification.</li> </ul> <p>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?</p> <ul style="list-style-type: none"> <li>• <b>Yes:</b> this segment can be classified as C6 context classification.</li> <li>• <b>No:</b> this segment can be classified as C5 context classification.</li> </ul>

**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 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 network 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 one 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 to be assigned that context classification.

**TABLE 2** and **TABLE 3** 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 13** and **14**. **FIGURES 15** through **19** 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.

See [page 41](#) 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 2** Primary Measures to Define Context Classification

Measure	Description	Methodology	Measurement Area*	Data Source**	
Roadway Connectivity	<b>Intersection Density</b>	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 <b>FIGURE 15</b> ).	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	Street centerline GIS files or physical map, internet-based maps, plans showing programmed roadway projects, and permitted development plans
	<b>Block Perimeter</b>	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 <b>FIGURE 16</b> ).	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	
	<b>Block Length</b>	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 <b>FIGURE 16</b> ).	Roadway	
<b>Land Use</b>	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.	
<b>Building Height</b>	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	
<b>Building Placement</b>	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 <b>FIGURE 17</b> ).	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	
<b>Fronting Uses</b>	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 <b>FIGURE 18</b> ).	Fronting parcels on either side of the roadway	Field review or internet-based aerial and street view imagery, or land development regulations	
<b>Location of Off-Street Parking</b>	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 <b>FIGURE 19</b> ).	Fronting parcels on either side of the roadway	Field review or internet-based aerial and street view imagery, or land development regulations	

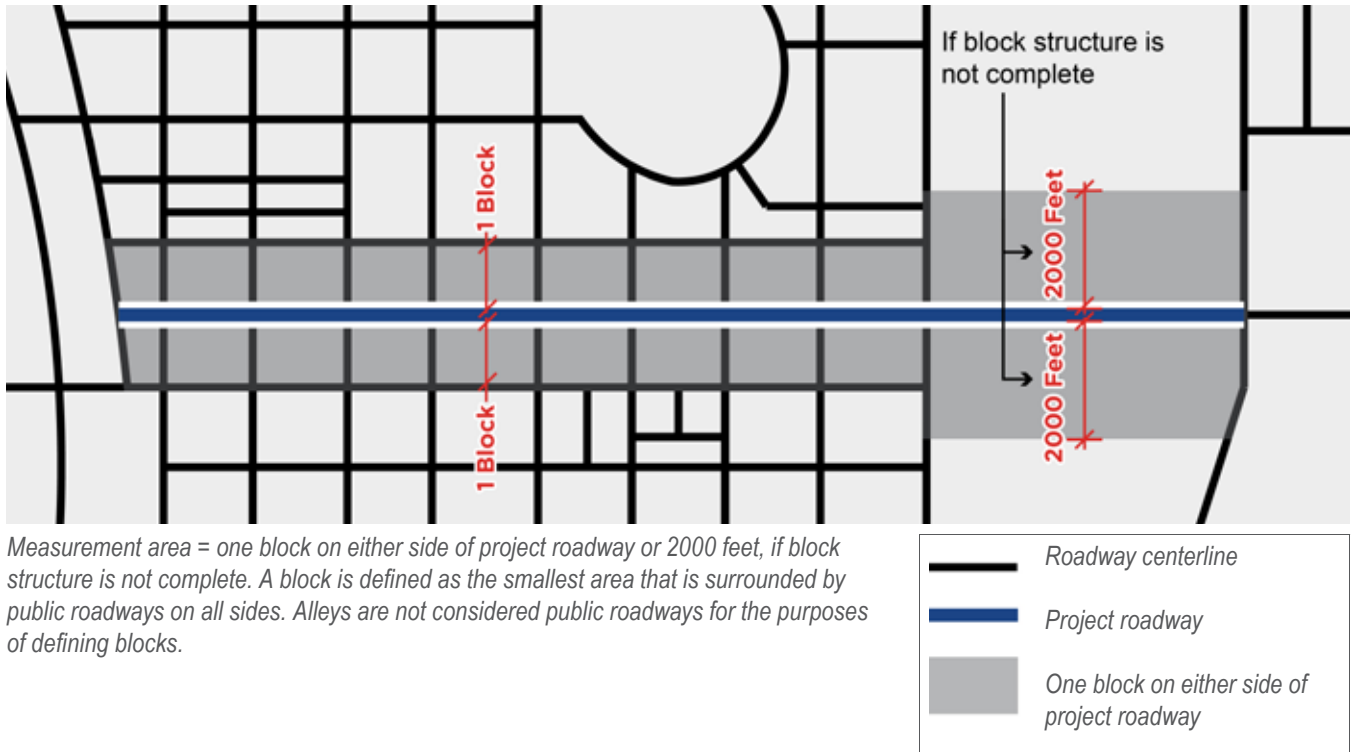
\* The measurement area applies to each context classification segment. Evaluate each measure for each context classification segment. Where characteristics differ for each side of the street, use the characteristics for the side that would yield the higher context classification.

\*\* 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.

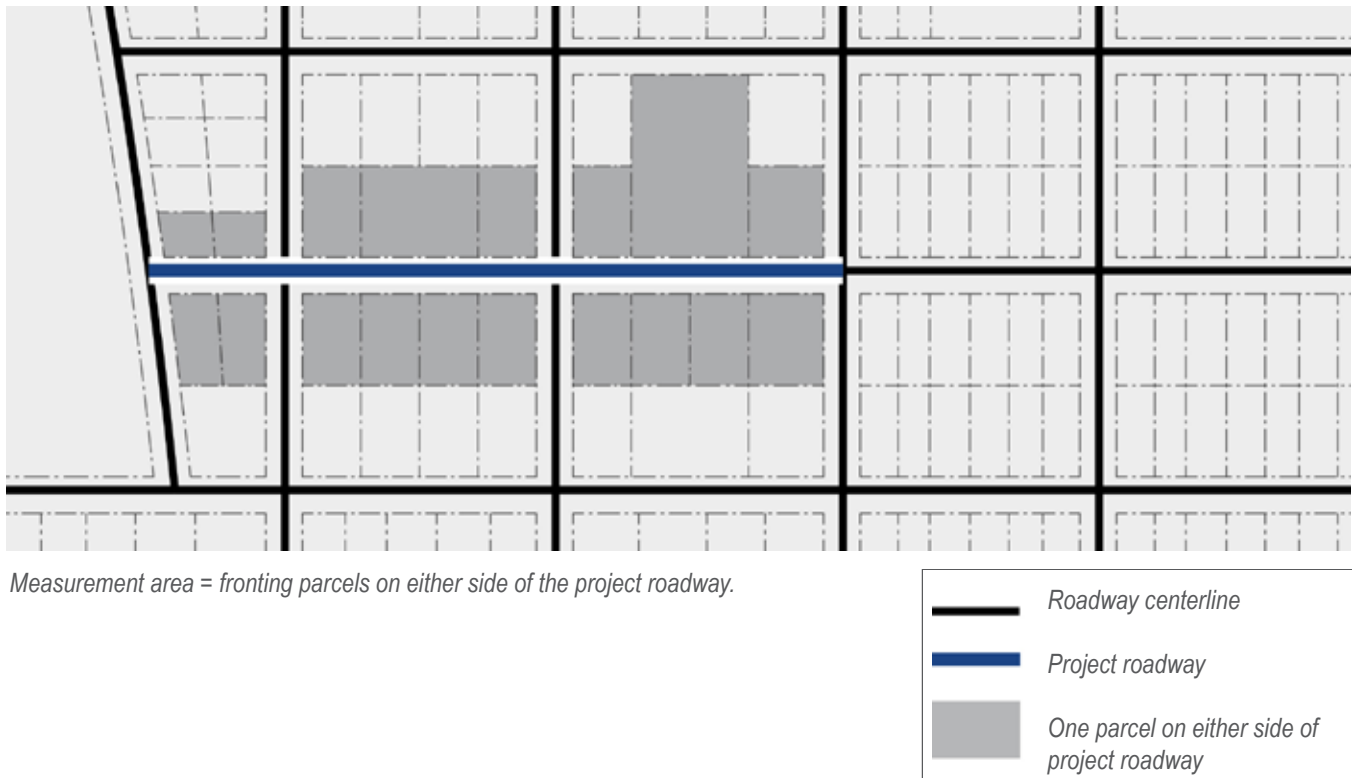
**TABLE 3** Secondary Measures to Define Context Classification

Measure	Description	Methodology	Measurement Area	Data Source
<b>Allowed Residential Density</b>	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
<b>Allowed Office/Retail Density</b>	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
<b>Population Density (existing)</b>	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.
<b>Population Density (future)</b>	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
<b>Employment Density (existing)</b>	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
<b>Employment Density (future)</b>	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

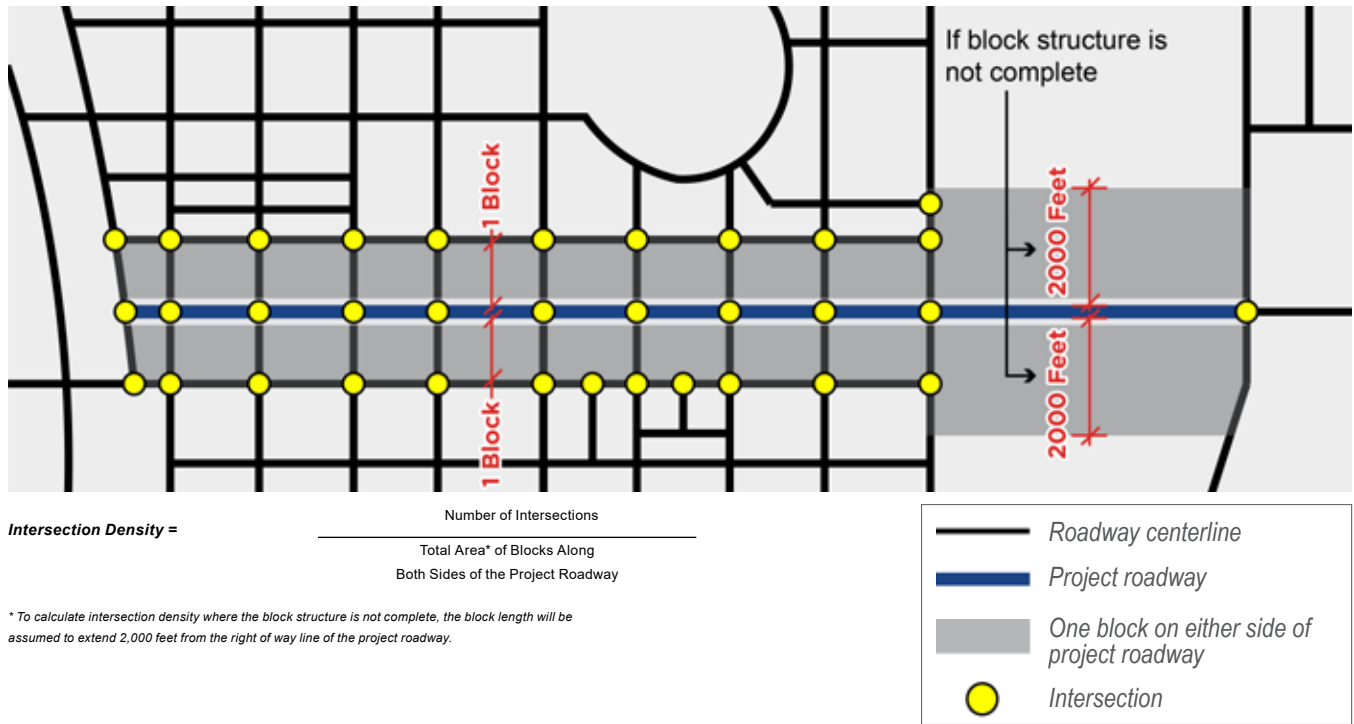
**FIGURE 12** Measurement Area: The Block on Either Side of the Roadway



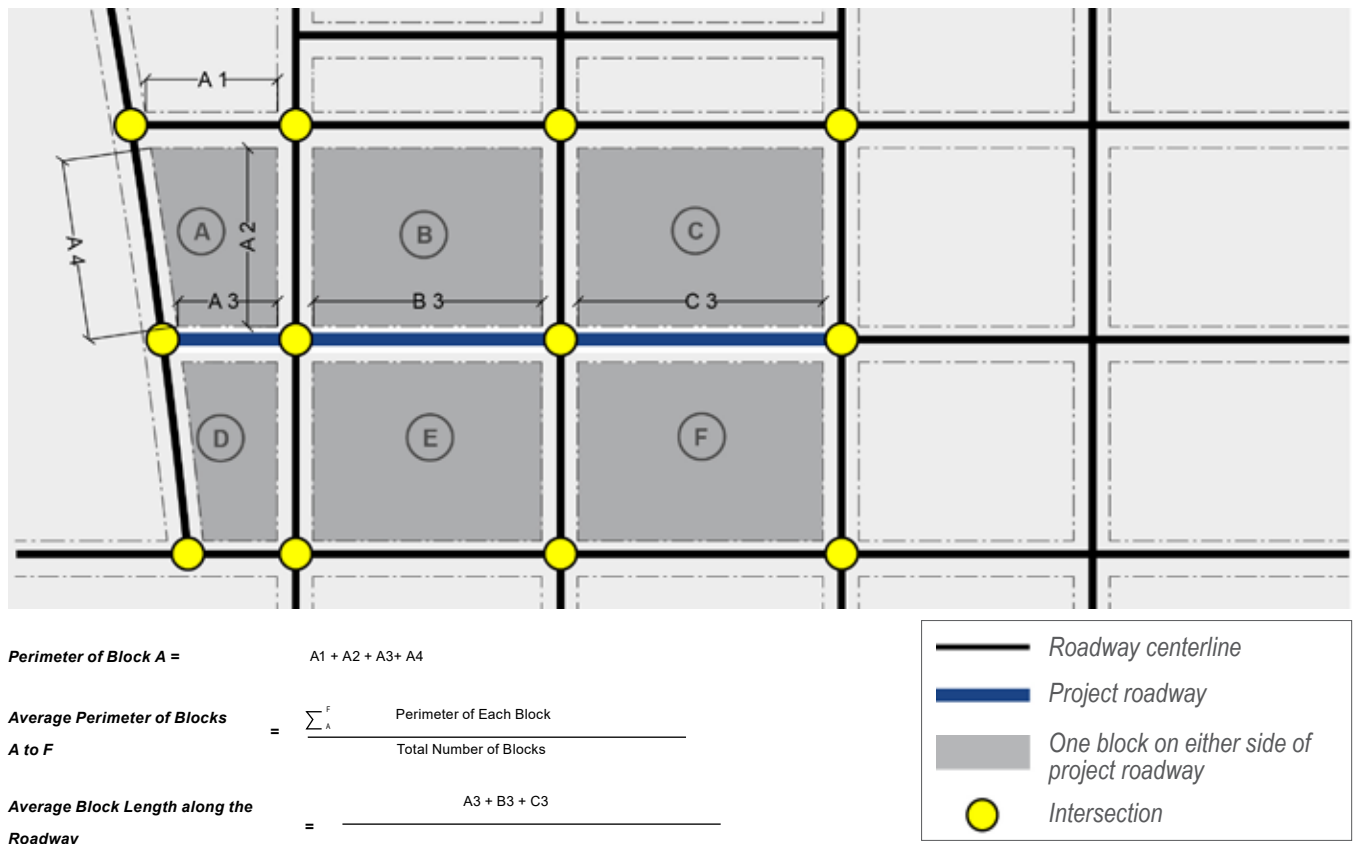
**FIGURE 13** Measurement Area: Fronting Parcels on Either Side of the Roadway



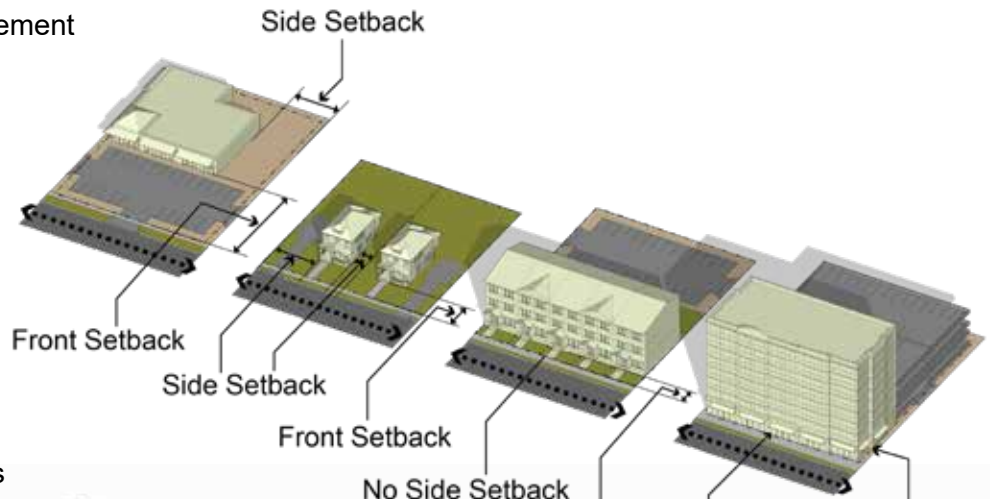
**FIGURE 14** Intersection Density



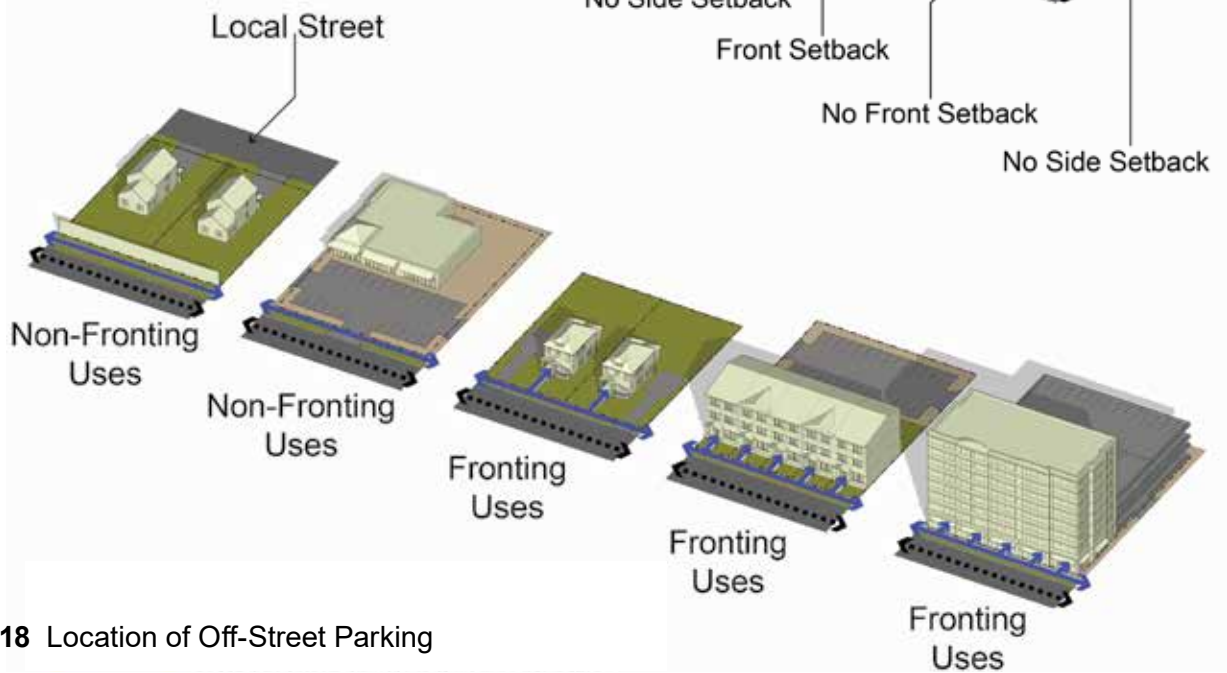
**FIGURE 15** Block Perimeter and Block Length



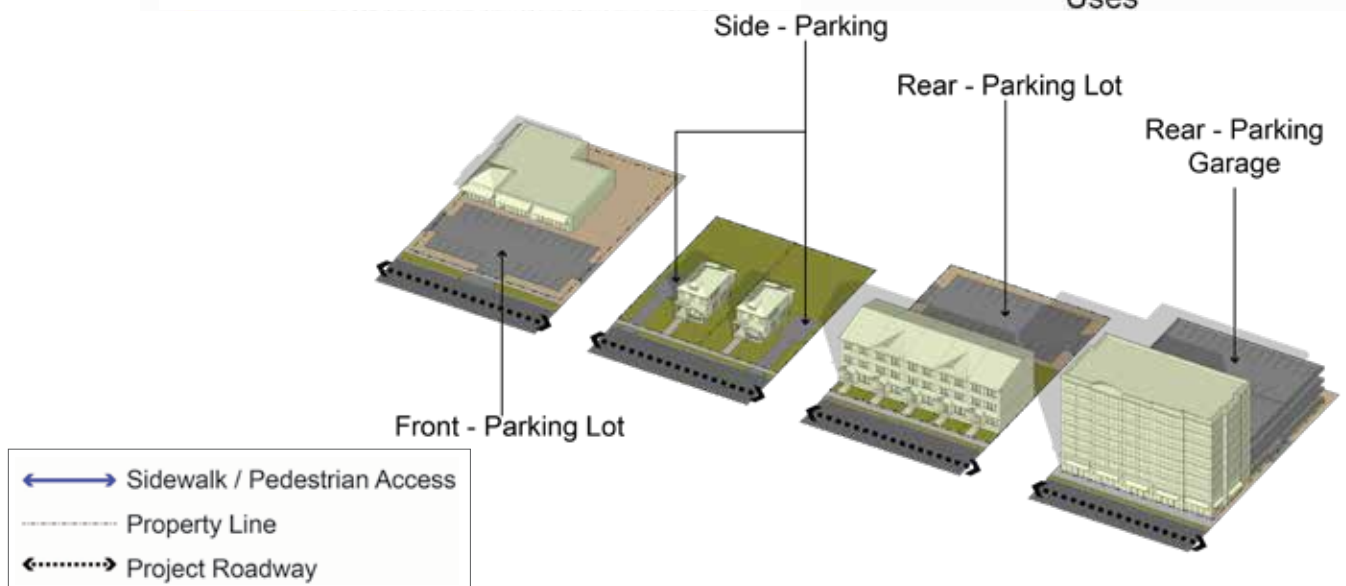
**FIGURE 16** Building Placement



**FIGURE 17** Fronting Uses



**FIGURE 18** Location of Off-Street Parking



# DISTINGUISHING BETWEEN CONTEXT CLASSIFICATIONS

The context classification of a roadway project may not precisely meet all the measures and thresholds of a specific context. For instance, a roadway segment may have population and job densities that meet the thresholds of one context classification, but its block lengths may meet thresholds of a higher or lower context classification. Roadway segments may also meet the thresholds for a context classification on one side but not meet the thresholds on the other. The section below provides guidance on distinguishing between context classifications for roadways that do not meet a singular context classification’s measure.

## Distinguishing between C4-Urban General and C3-Suburban Context Classifications

C3R-Suburban Residential and C3C-Suburban Commercial roadway segments have longer block lengths, larger block perimeters, and less intersection density compared to C4-Urban General roadway segments. C4-Urban General roadway segments will also have adjacent land uses that support higher population and job densities. **FIGURE 19** shows an example of a roadway with connectivity and roadway measures that meet both C3-Suburban and C4-Urban General thresholds.

**FIGURE 19** Distinguishing between C4-Urban General and C3-Suburban Context Classifications

The distinguishing characteristics between C3-Suburban and C4-Urban General roadways are most obvious when the roadway connectivity measures change and the roadway segment have:



In most instances in which characteristics differ for each side of the roadway, use the characteristics for the side that would yield the higher context classification or consider the future of surrounding land uses.

## Distinguishing between C3R-Suburban Residential and C3C-Suburban Commercial Context Classifications

After confirming suburban context classification, the distinction between C3R-Suburban Residential and C3C-Suburban Commercial is an important one because the different land uses result in different roadway users and use patterns.

C3R-Suburban Residential 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-Residential development tends to be static and less likely to change over time. Where a roadway is more consistent with a C3C-Suburban Commercial on one side and a C3R-Residential on the other, default to the higher context classification which is C3C-Suburban Commercial.

In C3C-Suburban Commercial 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-Suburban Commercial environments generally attract trips to and from retail and commercial establishments and have more transit ridership and transit service than C3R-Suburban Residential. As a result, C3C-Suburban Commercial corridors also experience higher bicycle and pedestrian activity compared to C3R-Suburban Residential environments. Some C3C-Suburban Commercial corridors also have intermittent multifamily apartments generating trips to and from the commercial uses. C3C-Suburban Commercial 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-Suburban Commercial context classifications, crashes between motorists and bicyclists/pedestrians are more prevalent than in C3R-Suburban Residential areas. In these corridors, the combination of higher levels of pedestrian and bicycle activity, 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 midblock 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.*

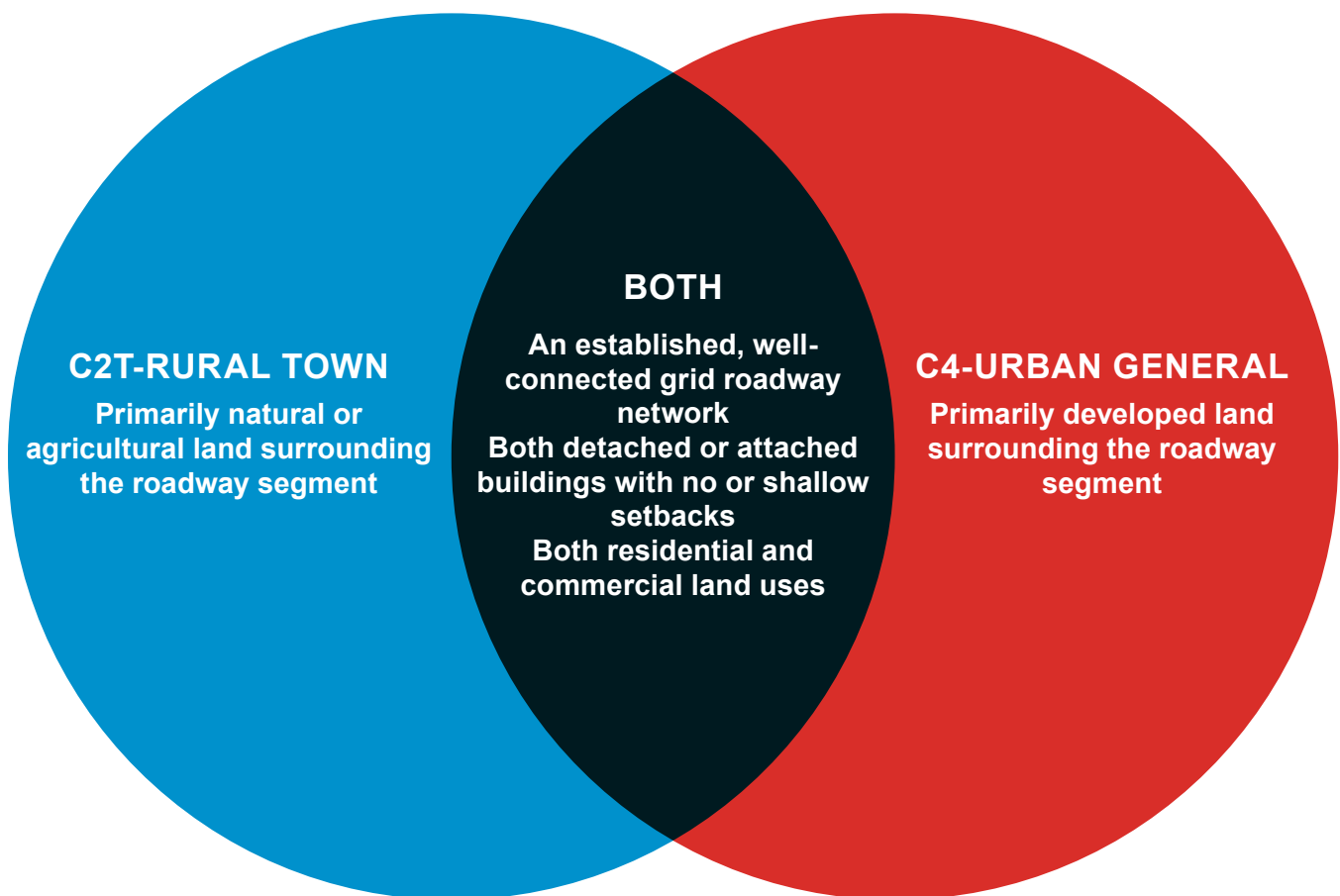


*C3C corridors generally experience more bicycle and pedestrian activity compared to C3R environments.*

## Identifying C2T-Rural Town

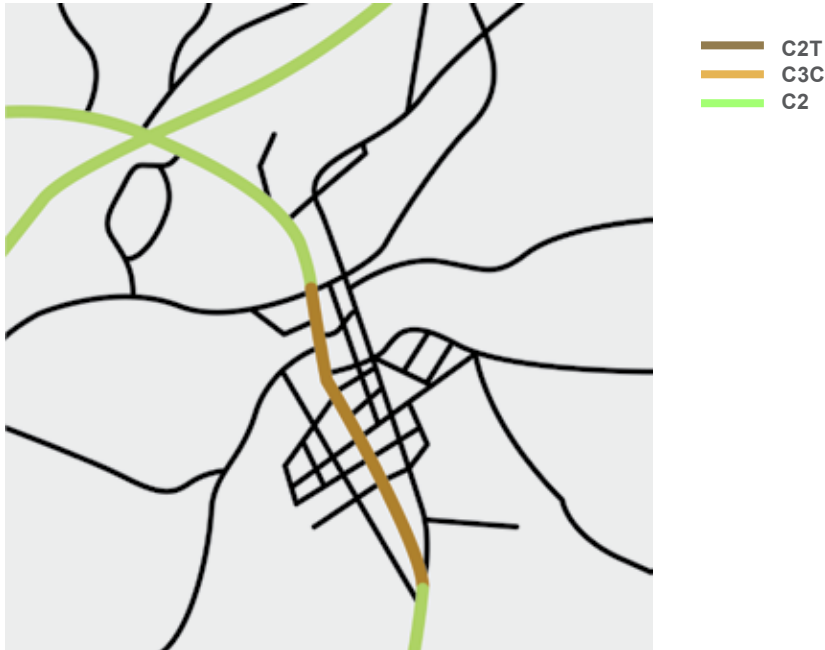
Rural Towns, a term defined by the *AASHTO Green Book*, are characterized by small concentrations of developed areas immediately surrounded by rural areas, undeveloped areas, or natural areas. They include historic towns and typically have low density (one- or two-story buildings) with land uses mainly of residential and local commercial uses serving the immediate area. Building setbacks are small and significantly less than surrounding areas. In most cases, a roadway segment can be classified as C2T-Rural Town when a concentration of development is surrounded by rural and natural areas. These can be easy to locate when a roadway transitions directly from C2-Rural to C2T-Rural Town, but there may be short segments of C3-Suburban in the transition area.

C2T-Rural Town and C4-Urban General context classifications share many of the same characteristics, and determining a clear separation between the two can be challenging. The Step-By-Step Guide on [page 26](#) can be used to help determine this difference. The distinguishing characteristics between C4-Urban General and C2T-Rural Town are:



When developed areas with a well-connected grid network stretch for more than 10-20 blocks or have longer segments of surrounding C3-Suburban areas, they may be more in line with a C4-Urban General context classification. **FIGURE 20** and **FIGURE 21** show conceptual examples of a C2T-Rural Town roadway and a C4-Urban General roadway, respectively. When a roadway shares characteristics of both a C2T-Rural Town and C4-Urban General context classification, practitioners may default to the higher, C4-Urban General, context classification. Refer to ***Applying Context Classification on Local Roadways*** for guidance on applying the C2T-Rural Town designation on local streets.

**FIGURE 20** C2T-Rural Town



**FIGURE 21** C4-Urban General



# 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-Rural Town, C4-Urban General, C5-Urban Center, or C6-Urban Core 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-Natural and C2-Rural context classifications as it is anticipated there will be a lower volume of non-motorists than there are in other contexts, and in C3-Suburban 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 FDOT Central Office Roadway Design Office. 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 1**.

### 3 Evaluate the Secondary Measures

**TABLE 2** 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.

# APPLYING CONTEXT CLASSIFICATION ON LOCAL ROADWAYS

Recent updates to the *2023 Florida Greenbook*, *2018 AASHTO Green Book*, and the *2023 FDOT Multimodal Quality/Level of Service Handbook* have incorporated guidance for local streets related to context classification (see Chapter 4). With these updates, there has been an increased interest among local agencies in identifying context classification for local streets. Some local agencies have already adopted their own context classification systems. For agencies wanting to get started, this section describes data available to support local context classification evaluations and guidance on how to apply it to local streets.

## Adapting Context Classification to Local Streets

This Guide presents an approach to evaluate context classification for the state road system. The terminology, measures used, and thresholds may not all apply to local streets. Agencies may encounter development patterns different from the measures and thresholds for the state road system context classifications. Furthermore, agencies may lack the datasets required to calculate measures. Local agencies can adjust the context classification methodology to fit their needs while maintaining consistency with FDOT and the *Florida Greenbook*. Here are a few examples where local agencies may want to tailor the methodology in this Guide to match their local conditions:

- FDOT limits the use of C6-Urban Core to large urban areas.** FDOT's definition of C6-Urban Core is limited to urbanized areas with a population over one million. While FDOT may not use C6-Urban Core for a state road passing through a city, the local agency may want to differentiate their city center from surrounding urban areas. Local agencies wanting to classify an Urban Core can document the relationship between the local agency's Urban Core and the C5-Urban Center on state roadways.
- Context classification terminology has specific, local meaning.** FDOT's context classification terminology is closely aligned with the terminology used in the *AASHTO Greenbook*. Local codes, plans, and policies may have adopted different definitions for terms used by FDOT. For example, the zoning code may identify specific urban centers that do not always align with FDOT's C5-Urban Center. Similarly, agencies may refer to their Urban Core as their Downtown Core. In these cases, agencies can document the relationship between the preferred local terminology and the context classifications used by FDOT and the *Florida Greenbook*.
- Additional context classifications are needed.** FDOT's context classifications were meant to cover the most common conditions along state roadways. Additional classifications may be beneficial to support local planning and design. One example is a desire to design urban general streets in a residential neighborhood differently from urban general streets on a commercial corridor. Cities commonly distinguish between "C4 Residential" and "C4 Commercial," for instance, in local form-based codes. Directly relating any new or modified context classifications to the *Florida Greenbook*, similar to the example in **TABLE 4**, may be helpful for determining design criteria for specific contexts.
- Thresholds for primary and secondary measures do not yield the appropriate context classification on local streets.** Local agencies can use the thresholds in **TABLE 1** as a starting point, but may need to refine them based on local conditions. For example, urban neighborhoods with small lots and a mix of duplexes and townhomes may have a relatively high population density, despite not meeting the distinguishing characteristics of an C5-Urban Center. In this case, a local agency could adjust the threshold and classify the streets as C4-Urban General to match the character of the area.

- **Different measures can help differentiate context classification.** On local streets, there may be different measures that can more easily differentiate context classification or local datasets not available at a state level. For example, *NCHRP 1022 Context Classification Application: A Guide* includes building density, calculated as the number of buildings per square mile or square foot of building footprint per square mile, using the Microsoft Maps U.S. Building Footprint database. This data can help identify C2T-Rural Towns and C5-Urban Center/C6-Urban Core context classifications.
- **C2T-Rural Towns may not sufficiently describe an actual rural town.** FDOT is primarily concerned with the context classification of only the state roads running through a town, and a single classification of “Rural Town” is usually sufficient for that purpose. However, the other streets in that town will likely require a more complete set of context classifications. In this case, C2T-Rural Town is only a starting point for the complete context classification of all the town streets.

Potential changes should be properly documented to support collaboration between local and state planning and design manuals. An example relating local and state context classification is shown in **TABLE 4**. Agencies should apply their methodology consistently and avoid modifying thresholds on a case-by-case basis at the risk of adopting a context classification inconsistent with observed development patterns. Use of future context classification (see page 25) can help agencies plan for a future vision while understanding the existing challenges and opportunities of users.

**TABLE 4** Statewide and Sarasota Context Classifications

SARASOTA CONTEXT CLASSIFICATION	STATEWIDE CONTEXT CLASSIFICATION*
<b>Downtown Core</b> —The most intensely developed areas of the city. These streets are adjacent to the tallest buildings and in areas with mixed and commercial land use.	<b>C5—Urban Center</b>
<b>Urban Village</b> —Small, urban centers outside of the downtown core area that serve commercial and mixed-use developments.	<b>C5—Urban Center</b>
<b>Urban General Commercial/Mixed Use</b> —Part of the urban grid network that serves a variety of businesses and residential uses.	<b>C4—Urban General</b>
<b>Urban General Residential</b> —Part of the grid network with mostly single-family residential uses.	<b>C4—Urban General</b>
<b>Suburban Commercial or Industrial</b> —Low-density commercial or industrial areas that have large lots and that are separated from residential areas.	<b>C3C—Suburban Commercial</b>
<b>Suburban Residential</b> —Residential areas with homes on either side of the street and that have a disconnected road network and large blocks.	<b>C3R—Suburban Residential</b>
<b>Special District</b> —Areas with unique characteristics and functions that do not fit with other standard contexts. Examples include university campuses and waterfront streets with sensitive environmental constraints, frequent public beach access, or limited right-of-way.	<b>Special District</b>

\*Statewide classifications C1—Natural, C2—Rural, C2T—Rural Town, and C6—Urban Core are not present in Sarasota city limits.  
Source: Draft Sarasota Engineering Design Criteria Manual

## Examples of Locals Using Context Classification

Several local agencies have been early adopters of context classification for local streets.

### City of Tampa

**Purpose:** The City of Tampa Vision Zero Action Plan called for the development of street design guidelines and countermeasures that help achieve desired speeds and desired safety results systemwide based on context classification. Context-based targets were then included as part of the City’s mobility plan, Tampa MOVES (see **FIGURE 22**).

**Adaptations:** The City of Tampa used the FDOT context classification as a starting point. FDOT’s C4-Urban General context classification was split in two: C4R-Urban General Residential and C4M-Urban General Mixed Use. This will help the City meet the different needs of their neighborhood residential streets and commercial corridors.

**FIGURE 22** City Tampa Context-Based Desired Vehicle Speeds



Source: City of Tampa, Tampa MOVES

### City of Sarasota

**Purpose:** As part of the update to their Engineering Design Criteria Manual, the City is exploring context classification to create context-based design criteria. The updated Engineering Design Criteria Manual will guide design and implementation of transportation projects within city limits. The City’s goals for the manual update include improving community design quality, creating safe streets for all ages and abilities, and creating designs that expand transportation choices.

**Adaptations:** As an urbanized area with less than one million people, C6-Urban Core does not apply to the state road network in the city. However, the City identified a need to have criteria for their downtown streets that differed from other urban centers throughout the city. The City split FDOT’s C5-Urban Center into two categories: Urban Village and Downtown Core. The terminology also differs from FDOT’s terminology to better match terminology in existing city plans and policies (see **TABLE 4**). The City’s context classifications are specifically for local streets, while the statewide classifications will still be used for state roads.

## Space Coast Transportation Planning Organization

**Purpose:** As part of its 2045 Long Range Transportation Planning process, the Space Coast Transportation Planning Organization (SCTPO) began developing local context classifications to better link transportation and land use planning, an emphasis area for the SCTPO Board. This year, the SCTPO leveraged its context classification database and further engaged local municipalities to refine the local context classification designations as part of its Congestion Management/State of the System reporting. Context classifications on local roadways allow the SCTPO and member municipalities to continue using the **FDOT Multimodal Quality/Level of Service (MQ/LOS) Handbook** to determine planning-level roadway capacities for their planning activities since FDOT has adopted context classification to determine planning-level roadway capacities in the 2023 **MQ/LOS Handbook**.

**Adaptations:** None.

## Preliminary Local Context Classification

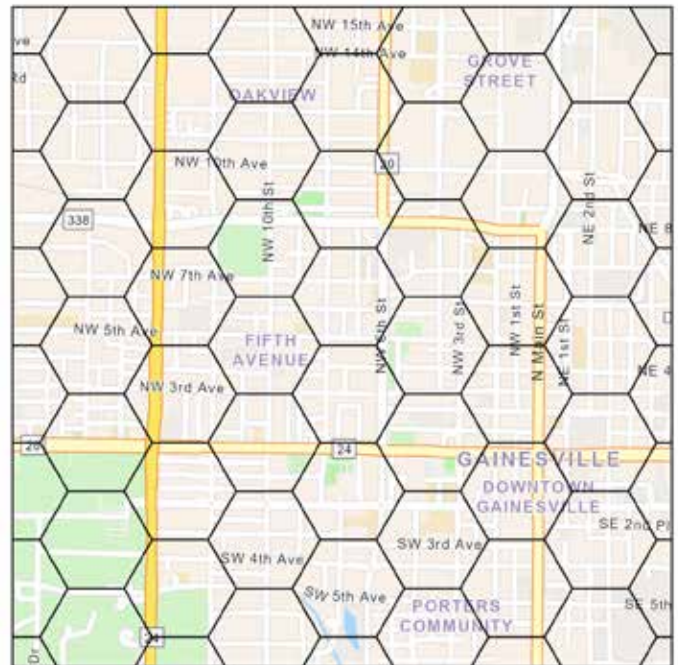
For agencies interested in local context classification, FDOT completed a preliminary context classification evaluation for local streets, following a method aligned with the FDOT process for the State Highway System. The preliminary local context classification may be used as a starting point for local agencies during planning and project development. No agency is required to use the information provided, and agencies that have already assigned context classification for local streets may continue to use their existing process.

## Analysis Areas

Preliminary local context classification was evaluated for areas, rather than specific street segments. Each area is one quarter mile wide; **FIGURE 23** provides an example of these analysis areas. Analyzing areas rather than specific roadway segments provides a level of accuracy that allows local agencies to see how the context classification changes along a corridor while providing flexibility to refine specific transition points.

**The preliminary local context classification evaluation is based on existing data. Local agencies may choose to integrate future measures to evaluate future context classification. The section When to Use Existing and Future Context Classifications provides additional guidance on applying future context classification.**

**FIGURE 23** Preliminary Local Context Classification Analysis Areas



## Measures

The measures used to assess the preliminary local context classification align with the methods used for determining the context classification for FDOT roadways and use existing statewide data. These measures, shown in **TABLE 5**, are a subset of the measures used to determine context classification for state roadways (**TABLE 1**). As local agencies refine the preliminary analysis, they may choose to use additional data and measures that are available in their jurisdiction.

**TABLE 5** Preliminary Local Context Classification Measures

CATEGORY	MEASURE	DATA SOURCE
<b>Roadway Connectivity</b>	Intersection Density (intersections per square mile)	U.S. Census Bureau TIGER/Line Files and Shapefiles
	Block Length (feet)	
	Block Perimeter (feet)	
<b>Population &amp; Employment Density</b>	Population Density (persons/acre)	2020 U.S. Census
	Job Density (jobs/acre)	Longitudinal Employment and Housing Dynamic (LEHD)
<b>Existing Land Use</b>	Land Use Description	Florida Department of Revenue

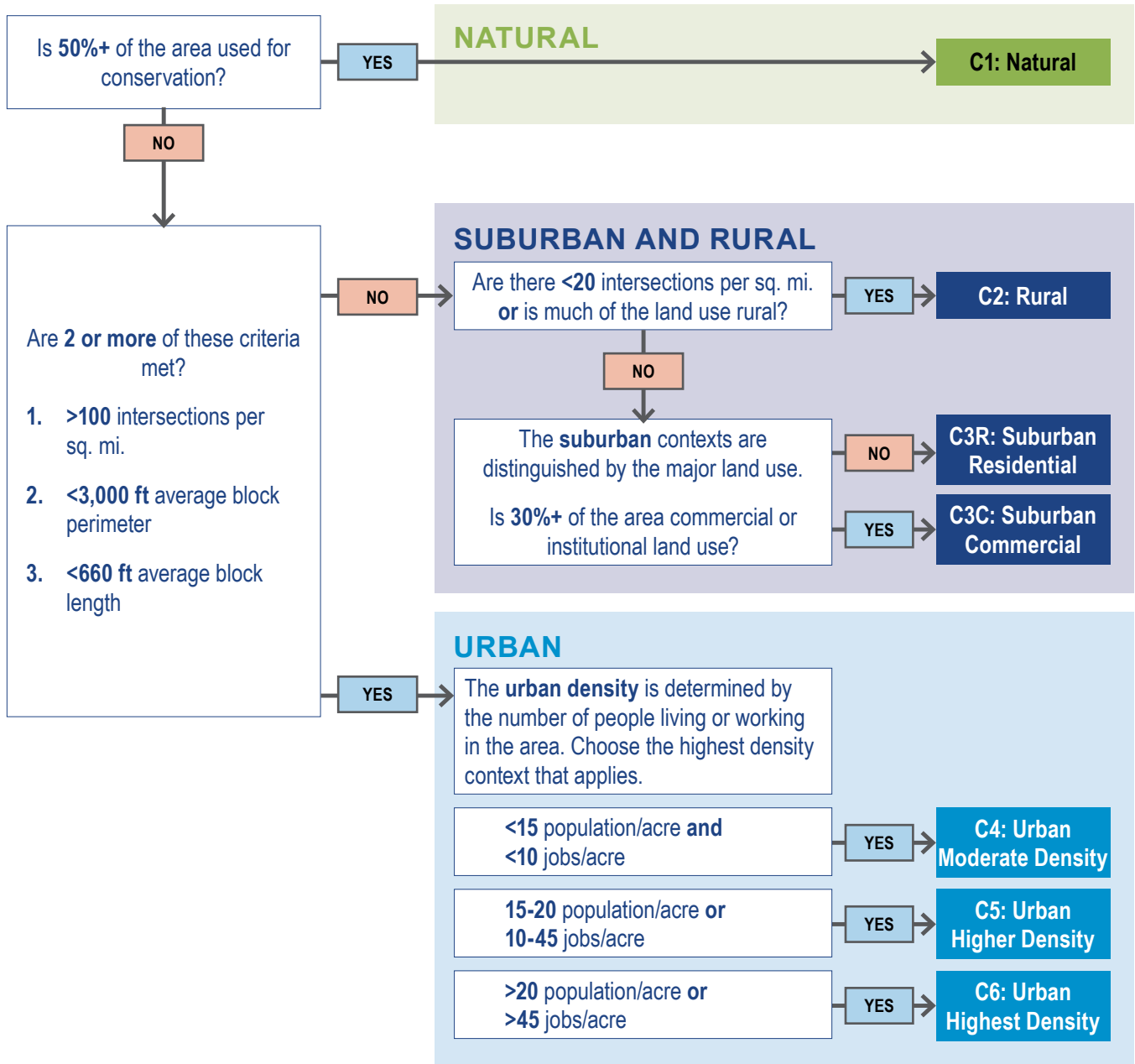
## Preliminary Context Classification Assignment

Measures were calculated for each area. Measures for a particular area are used to determine the context classification assigned according to the process shown in **FIGURE 24**. The terms used to describe each context classification are similar to the terms used in the FDOT context classification applied to the State Highway System, with a few modifications:

- Airports, universities, and military bases were assigned a Special District designation due to the unique nature of the land use and transportation needs.
- Based on input received from a focus group of municipalities, the term “Rural Town” is not being applied consistently to local streets. Therefore, C2T-Rural Town is not included in the preliminary evaluation. Instead of trying to distinguish between cities and towns, the evaluation focuses on the relative density of places to support local planning.
- Similarly, rather than limiting C6-Urban Core to major metropolitan areas, C6-Urban Core is used to identify the areas with the greatest urban density, even in smaller towns and cities.

The preliminary local context classification is available at FDOT’s ConnectPed.

**FIGURE 24** Preliminary Local Context Classification Process



## Relationship to CNU/SmartCode™ Transect System

Some agencies have implemented a transect system or form-based code that can be used when applying context-based guidance and criteria. 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 6**. For the local street system (non-state roads) the CNU/SmartCode system may provide a closer fit. This will need to be determined individually by each town.

**TABLE 6** Relationship between FDOT Context Classifications and the SmartCode™ Transect System

FDOT Context Classification	SmartCode™ Transect Zone	Description of SmartCode™ Transect Zone
<b>C1 – Natural</b>	T1 - Natural Zone	Lands approximating wilderness conditions
<b>C2 – Rural</b>	T2 - Rural Zone	Sparsely settled lands in open or cultivated states
<b>C2T – Rural Town</b>		No corresponding transect zone; may sometimes be coded as a small T5 or T4 hamlet or village
<b>C3R – Suburban Residential</b>	Coded as Conventional Suburban Development (CSD)	The SmartCode™ does not provide for this type of development pattern
<b>C3C – Suburban Commercial</b>		
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
<b>C4 – Urban General</b>	T4 - General Urban Zone	Mixed use but primarily residential urban fabric in a variety of housing types and densities
<b>C5 – Urban Center</b>	T5 - Urban Center Zone	Higher density mixed use buildings that accommodate retail, offices, row houses, and apartments
<b>C6 – Urban Core</b>	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
<b>SD – Special District</b>	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 7**).<sup>1</sup>

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.

**TABLE 7** 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.

<sup>1</sup> Federal Highway Administration, "Highway Functional Classification Concepts, Criteria and Procedures."

# SOCIOECONOMIC CHARACTERISTICS

When considering vulnerable road users, it is important to consider social vulnerability. When considered together, socioeconomic characteristics can be an indicator for crash risk as low-income communities<sup>1</sup>, minority groups, and persons with limited access to education (those without a high school diploma) are disproportionately more likely to be injured or killed in a traffic crash.<sup>2</sup>

Research conducted by FDOT found:

- Pedestrian crashes are **two times** more likely to occur in low-income communities.
- Pedestrians in lower-income communities are **two to three times** more likely to be killed or severely injured when struck by a vehicle.
- Crashes involving bicyclists are **two times** more likely to occur in low-income communities.
- Regardless of socioeconomic characteristics, **young people (19 years and younger) are more at risk of traffic crashes** as a share of the total population.

Suburban contexts also show a high percentage of traffic crashes, especially those involving vulnerable road users<sup>3</sup>. Although suburban roadway designs such as greater number of travel lanes, wider medians, and longer crossing distances played a factor in higher crash frequencies, land use was a stronger indicator.

Land uses that were considered “high-risk” for crashes included grocery stores, gas stations, convenience stores, pharmacies, commercial shopping centers, and fast-food restaurants.

These land uses in suburban contexts and low-income communities saw more people walking and bicycling to their destinations. Higher crash frequencies were linked to walking and bicycling behaviors within these high-risk land uses along **C3-Suburban roadways. Consequently, C3R-Suburban Residential or C3C-Suburban Commercial roadway segments with adjacent high-risk land uses may benefit from additional strategies to provide safer pedestrian and bicyclist facilities.**

The U.S. Department of Transportation and Joint Office of Energy and Transportation have developed tools to inform the planning and design of roadways that consider transportation-disadvantaged populations through the Equitable Transportation Community Explorer and the Climate & Economic Justice Screen Tool. Both come from the Justice40 Initiative, which intends to identify and prioritize projects that benefit communities facing barriers to affordable, reliable, and safe transportation.

These highlighted areas can provide additional context when aligning the design of a roadway with the needs of the community, supported by land uses, target speeds, and multimodal considerations. Prioritizing the needs of vulnerable users, particularly those in low-income communities, minority groups, and people with limited access to education can help reduce fatal and serious injury crashes.

<sup>1</sup> A low-income community is defined by the Department of Housing and Urban Development’s “very low-income,” and uses poverty rates of 15% or greater, or when the median household income of a census block group is less than 50% of the area median income (AMI).

<sup>2</sup> Dumbaugh, E., Mitsova, D., & Saha, D. (2020). An Examination of At-Risk Population Segments and Environmental Risk Factors (Technical Report). Florida Department of Transportation.

<sup>3</sup> Dumbaugh, E. & Stiles, J. (2023). Refining C3 Context-Classification Criteria for Low-Income and Minority Populations (Technical Report). Florida Department of Transportation.

# 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 8** provides a menu of useful data sources for identifying different needs for different users. Not all the data presented in **TABLE 8** 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 8** Examples of Potential Data to Determine User Needs by Mode

Mode	Data
 <b>Pedestrian</b>	<ul style="list-style-type: none"> <li>• Location of signalized pedestrian crossings</li> <li>• Location of marked or signed pedestrian crossings</li> <li>• Posted, design, and operating speeds</li> <li>• Vehicular traffic volumes</li> <li>• Existing sidewalk characteristics (location, width, condition, obstacles or pinch points, gaps, separation from vehicles)</li> <li>• Intersection ramps and alignment/Americans with Disabilities Act (ADA) compliance</li> <li>• Utilities location</li> <li>• Existing landscape buffer and shade trees</li> <li>• Pedestrian counts</li> <li>• Crash data</li> <li>• Lighting levels</li> <li>• Existing and future land use, building form and site layout, development scale and pattern</li> <li>• Existing and future pedestrian generators (e.g. schools, parks, transit stops)</li> <li>• Problems/needs identified on the Safety Needs List Dashboard</li> <li>• Activity levels (StreetLight, Strava, etc)</li> <li>• Transit ridership (stop level)</li> </ul>
 <b>Bicyclist</b>	<ul style="list-style-type: none"> <li>• Local and regional bicycle network</li> <li>• Posted, design, and operating speeds</li> <li>• Vehicular traffic volumes</li> <li>• Number of vehicular travel lanes</li> <li>• Location and availability of bicycle parking</li> <li>• Bicycle user type</li> <li>• Existing bicycle facility characteristics (location, width, obstacles or pinch points, separation from vehicles)</li> <li>• Bicyclist counts</li> <li>• Crash data</li> <li>• Location of destinations</li> <li>• Lighting levels</li> <li>• Pavement condition</li> <li>• Existing and future land use, building form and site layout, development scale and pattern</li> <li>• Problems/needs identified on the Safety Needs List Dashboard</li> <li>• Activity levels (StreetLight, Strava, etc)"</li> <li>• Transit ridership (stop level)</li> </ul>
 <b>Automobile</b>	<ul style="list-style-type: none"> <li>• Design Traffic [existing and projected Average Annual Daily Traffic (AADT), K-factor (K), directional distribution (D), and traffic growth projections]</li> <li>• Trip lengths and origin/destination patterns</li> <li>• Turning movement counts</li> <li>• Posted, design, and operating speeds</li> <li>• Signal timing</li> <li>• Location and availability of parking</li> <li>• Crash data</li> <li>• Lighting levels</li> <li>• Pavement condition</li> <li>• Existing and future land use, building form and site layout, development scale and pattern</li> <li>• Problems/needs identified on the Safety Needs List Dashboard</li> </ul>
 <b>Transit</b>	<ul style="list-style-type: none"> <li>• Existing and future transit routes and stops</li> <li>• Transit service headways</li> <li>• Location and infrastructure at transit stops</li> <li>• Sidewalk and bicycle facility connection to transit stops</li> <li>• ADA compliant transit stops</li> <li>• Existing and projected ridership (route or stop level)</li> <li>• Existing and future transit generators and attractors</li> <li>• Type of transit technology</li> <li>• Trip lengths, origin/destination patterns</li> </ul>
 <b>Freight</b>	<ul style="list-style-type: none"> <li>• Designated truck routes</li> <li>• Truck volumes</li> <li>• Vehicle classification counts</li> <li>• Existing and future location of industrial land uses or other generators of freight trips</li> <li>• Freight loading areas/truck parking</li> </ul>

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.<sup>1</sup>



**Operating speed**—the speed at which drivers are observed traveling during free flow conditions.<sup>2</sup>



**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.<sup>3</sup>

The FDM provides three categories of design speed that regulate the selection of many of the project standards and criteria used for design.

**High-Speed Roadways** are those with design speeds 50 MPH and greater.

**Low-Speed Roadways** are those with design speeds 40 MPH to 45 MPH.

**Very-Low Speed Roadways** are those with design speeds 35 MPH and less.

The concept of target speed is to identify a desired operating speed and develop design strategies and elements that reinforce operating speed. Target speeds should be within the design speed range provided in the *FDM* for each context classification, as shown in **TABLE 9**. The target speed should reflect the needs of safety, quality of life, and economic development of the corridor, and be established by a team that includes, but is not limited to Design, Traffic Operations, Safety, Planning, and Program Management offices.

Design speed should be selected early in the design process and should be influenced by target speed. Where the recommended target speed is not feasible to attain in a single project, the design speed should be as close to the target speed as can be achieved within the constraints of the project. When these speeds are different, it can result in inconsistent driver expectation about the intended 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.

<sup>1</sup> American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011

<sup>2</sup> American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011

<sup>3</sup> FDOT Design Manual, 2024

**TABLE 9** FDOT Context-Based Design Speeds for Arterials and Collectors

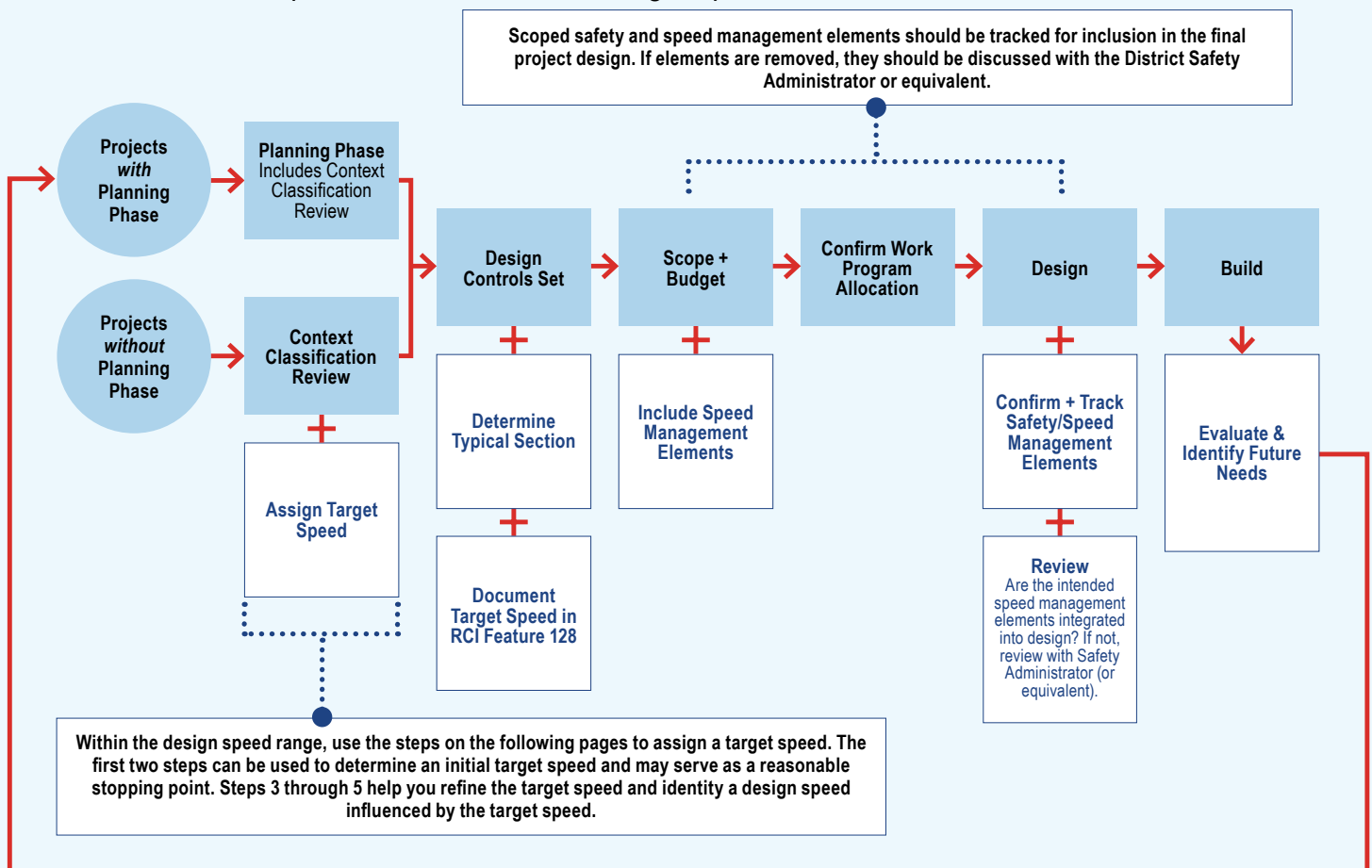
CONTEXT CLASSIFICATION	ALLOWABLE DESIGN SPEED RANGE (MPH)	SIS MINIMUM (MPH)
C1 Natural	55-70	65
C2 Rural	55-70	65
C2T Rural Town	25-45	40
C3 Suburban	35-55	50
C4 Urban General	25-45	45
C5 Urban Center	25-35	45
C6 Urban Core	25-30	45

Refer to **FDM 201** for additional guidance related to design speed selection, including conditions for allowable reductions to SIS minimum design speeds.

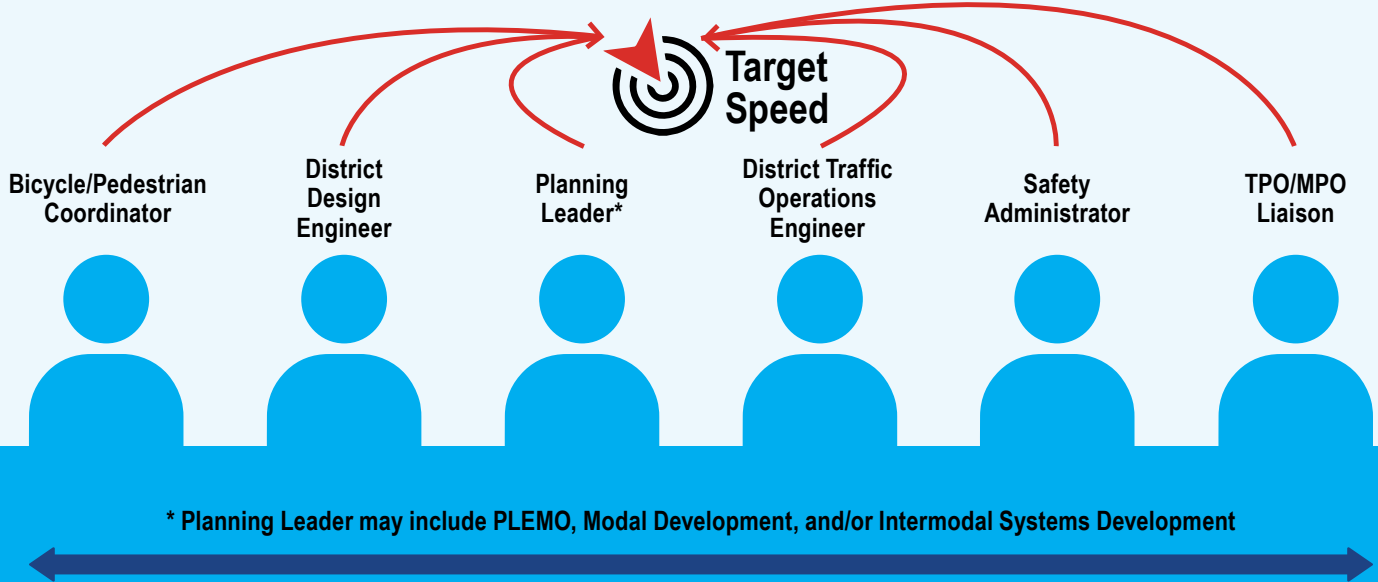
## DETERMINING THE TARGET SPEED

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 25** shows an example process that identifies target speeds during the planning phase of the project and while 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 25** Example Process to Determine Target Speed

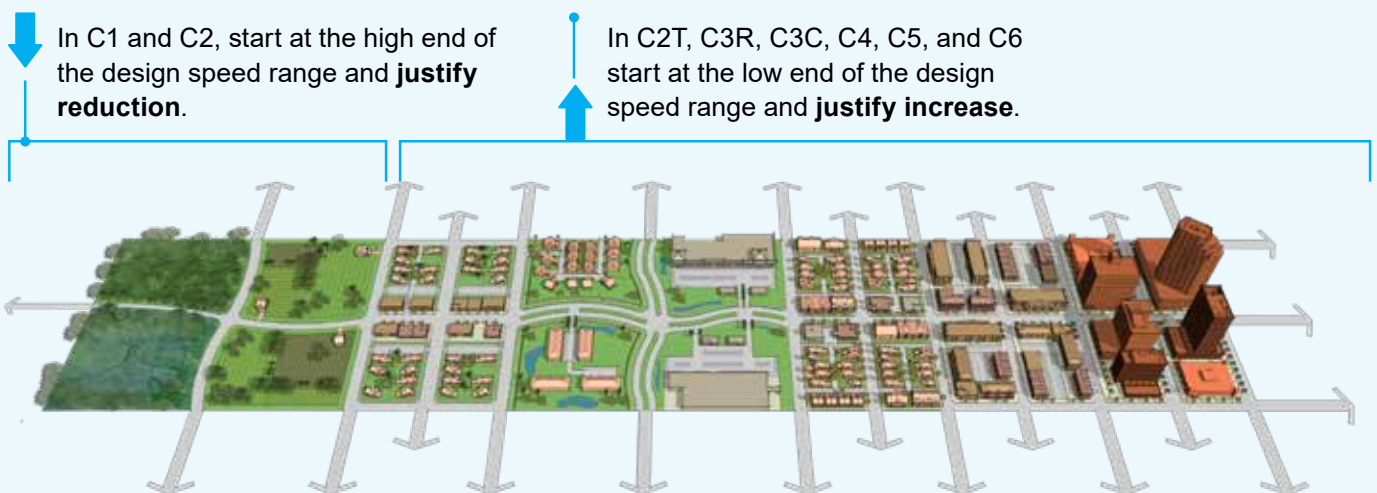


The target speed should be identified by a multidisciplinary group of engineers and planners. This group can work together to set the target speed and make sure the elements identified to achieve the target speed are carried through scoping, design, and implementation.



### STEPS TO DETERMINING TARGET SPEED

1. **DETERMINE *FD*M CONSISTENCY:** Identify context classification, current design and posted speed, SIS designation, and *FD*M context classification design speed range. Check RCI Feature 128 to determine if a Target Speed was previously assigned to the roadway. If so, determine if this is still an appropriate Target Speed.
2. **IDENTIFY STARTING POINT FOR TARGET SPEED:**



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, or 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. **DOCUMENT TARGET SPEED:** Document the identified target speed within the RCI Feature 128. Documenting the target speed in RCI preserves the work that has been done to determine the target speed and allows future projects on the same corridor to pick up where the last project left off, in terms of eventually achieving a target speed..
5. **REVIEW POTENTIAL COUNTERMEASURES AND DESIGN SPEED:** Identify speed management strategies that are feasible within the scope of the project. If the recommended target speed value is not feasible to attain in a single project, the design speed should be as close to the target speed as can be achieved within the constraints of the project. It is often easier to achieve speeds within the **FDM** design speed categories (high, low, very low), for example, from 45 MPH to 40 MPH in a single project. Achieving speeds between the **FDM** design speed categories may be difficult within projects that do not include full reconstruction. For example, if the design speed of an existing roadway is 45 MPH, an **FDM Low Speed Roadway**, it may not be feasible to reduce the design speeds to 35 MPH to achieve a **Very Low Speed Roadway** without full reconstruction. A separation of modes may be another strategy to provide a safe and comfortable travel space for all users when design speeds are higher than the target speed.

## PEDESTRIAN AND BICYCLIST SAFETY ON HIGH-SPEED ROADWAYS

If the posted speed is 40 mph or above or there are six or more travel lanes, achieving the low end of the target speed range may require a full reconstruction. Where maintaining vehicle speeds of 40 mph or above is a priority, additional separation between vehicles and non-motorized users is essential to create a safe and comfortable experience. Frequent crossing opportunities are also needed, especially where transit is present. Examples of bicycle facilities can be found in **FDM** section 223.2. When applicable, shared use paths may be used to provide a separated facility for pedestrians and bicyclists. Design guidelines for shared use paths can be found in **FDM** section 224.1.

## TARGET SPEEDS FOR SHORT C1-NATURAL SEGMENTS

Conservation areas can extend over a state road for a short segment, with development on either side. An example is where Silver Spring State Park intersects SR 35 in Marion County. There is an approximately one-mile segment of state park, adjacent to C3C-Suburban Commercial segments. It may not make sense to transition to 55 mph for a short C1-Natural segment. In these cases, districts may request a design variation to lower the design speed. Where conservation or rural areas extend for very short segments, less than half a-mile, consider assigning the context classification of the higher side to avoid short speed transitions. Additionally, where a trail crossing is located along a C1-Natural segment, districts may request a design variation to reduce the speed along with high visibility crossing treatments to bring more awareness to the walking and biking activity.

# 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 then 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 Context-Based Solutions Website provides examples of speed management tools for each context classification. For example, as shown in **FIGURE 26** 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 27**. Refer to **FDM 202** for additional speed management tools by context classification and design speed.

**FIGURE 26** C2T-Rural Town Speed Management



- 1 Terminated vista
- 2 Raised crosswalk
- 3 Shared lanes with sharrows
- 4 Street trees

**FIGURE 27** 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 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 10** 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)

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, 9*). 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.<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup> Age plays an important role in how pedestrians use a facility, as older adults are the most vulnerable pedestrians.<sup>4</sup>

<sup>1</sup> American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011, 2–43.

<sup>2</sup> Smart Growth America, *Dangerous by Design 2019*

<sup>3</sup> United States Census Bureau, "Americans With Disabilities: 2014," November 2018 <https://www.census.gov/content/dam/Census/library/publications/2018/demo/p70-152.pdf>.

<sup>4</sup> "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.<sup>5</sup>

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.

<sup>5</sup> American Association of State Highway and Transportation Officials, *Guide for the Development of Bicycle Facilities* Fourth Edition, 2012, 15.

## DESIGN VEHICLE

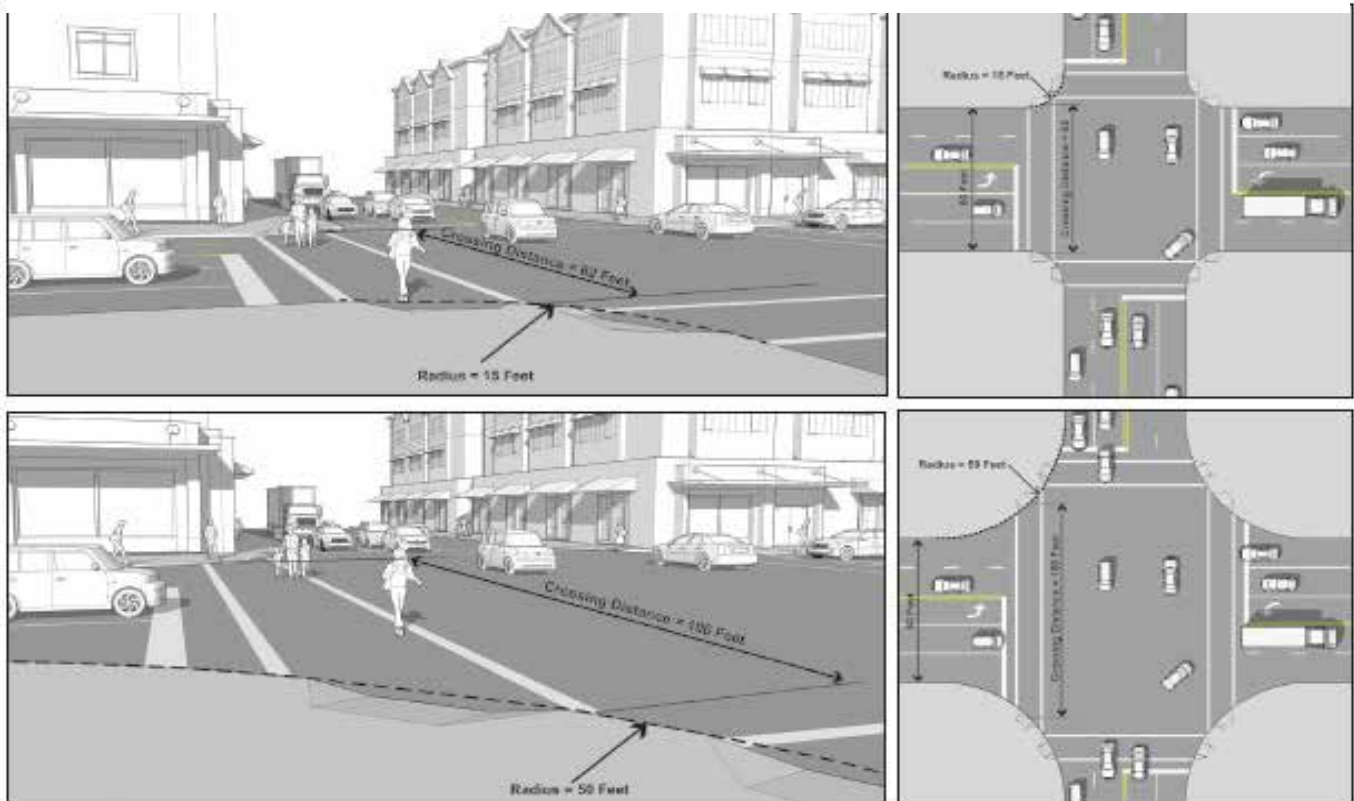
The type of design vehicle is influenced by the functional and context classification of a roadway (Section 201.6, 13). This Guide builds on existing guidance from the *FDM* and the *FDOT District 7 Draft Freight Roadway Design Considerations* in determining the design vehicle based on context and users. 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 28** Relationship between Curb Radii and Pedestrian Crossing Distance

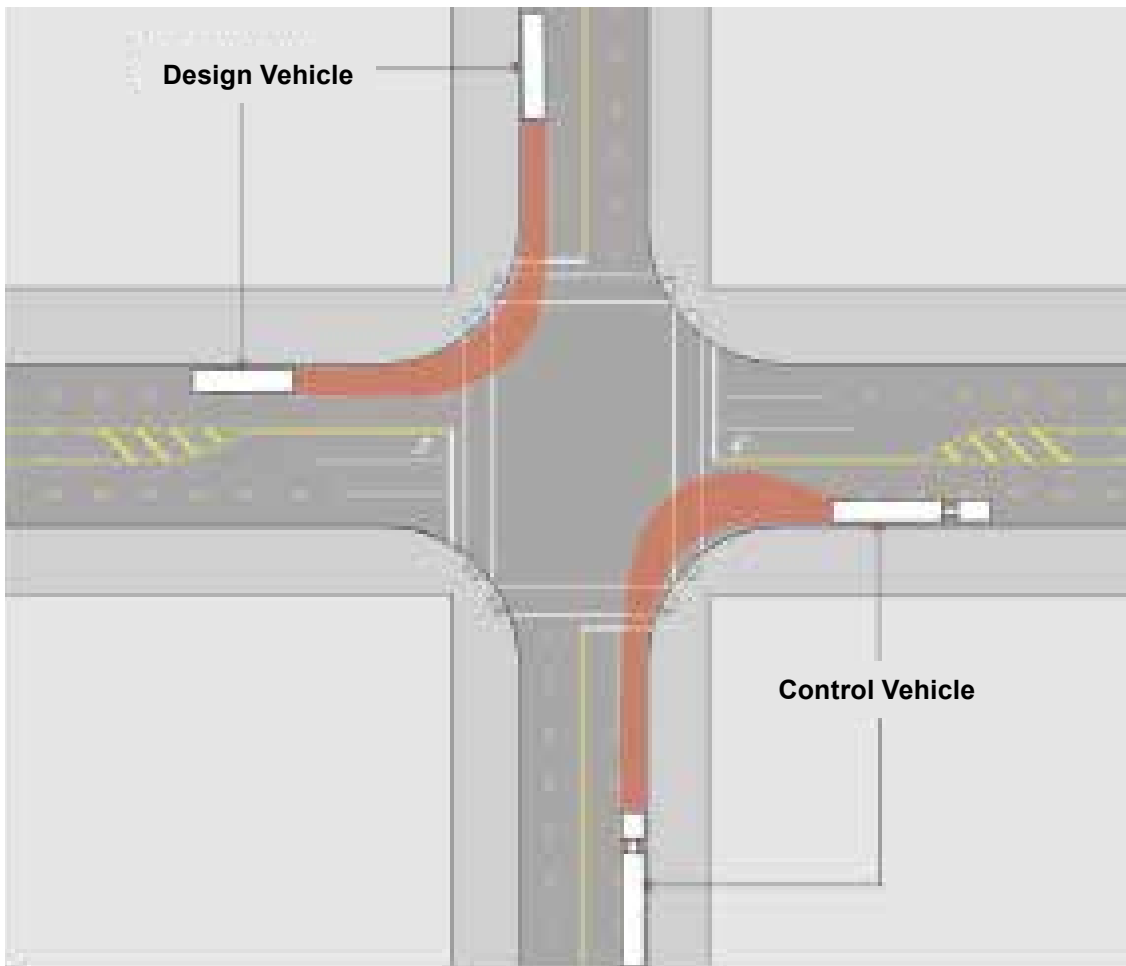


*Curb radii has significant influence on the pedestrian crossing distance at intersections. Top and bottom illustrations compare the crossing distances between an intersection with 50 feet and 15 feet curb radius.*

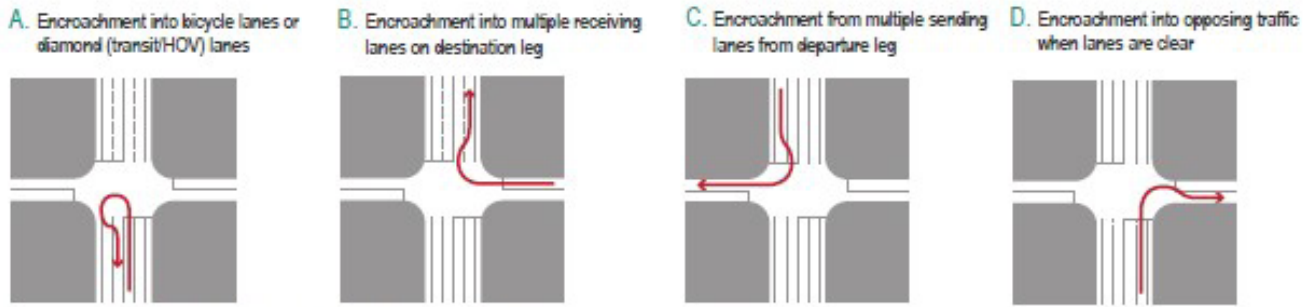
The control vehicle is the largest vehicle that can be expected to make use of the roadway. In this approach, the current FDOT design vehicle could be used as the control vehicle for curbed roadways within C4-Urban General, C5-Urban Center, and C6-Urban Core context classifications (*Section 201.6.1, 15*). 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 29**):

- 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 30**).
  - Minor encroachment into the street side area if no critical infrastructure (traffic signal, poles, etc.) is present.

**FIGURE 29** Intersection Design Should Consider Both Design Vehicle and Control Vehicle



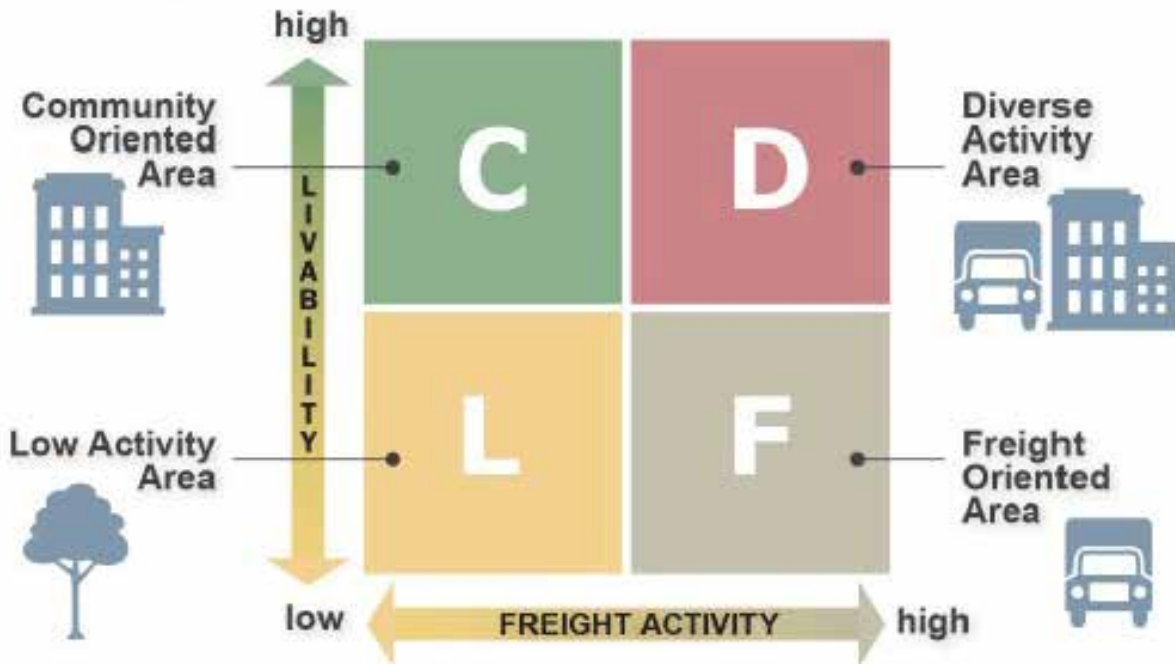
**FIGURE 30** An Infrequent Control Vehicle Encroachment into Opposing and Adjacent Lanes  
**FDOT District 7 Draft Freight Roadway Design Considerations** outlines a context-sensitive design approach



Source: FDOT District 7 Draft Freight Roadway Design Considerations.

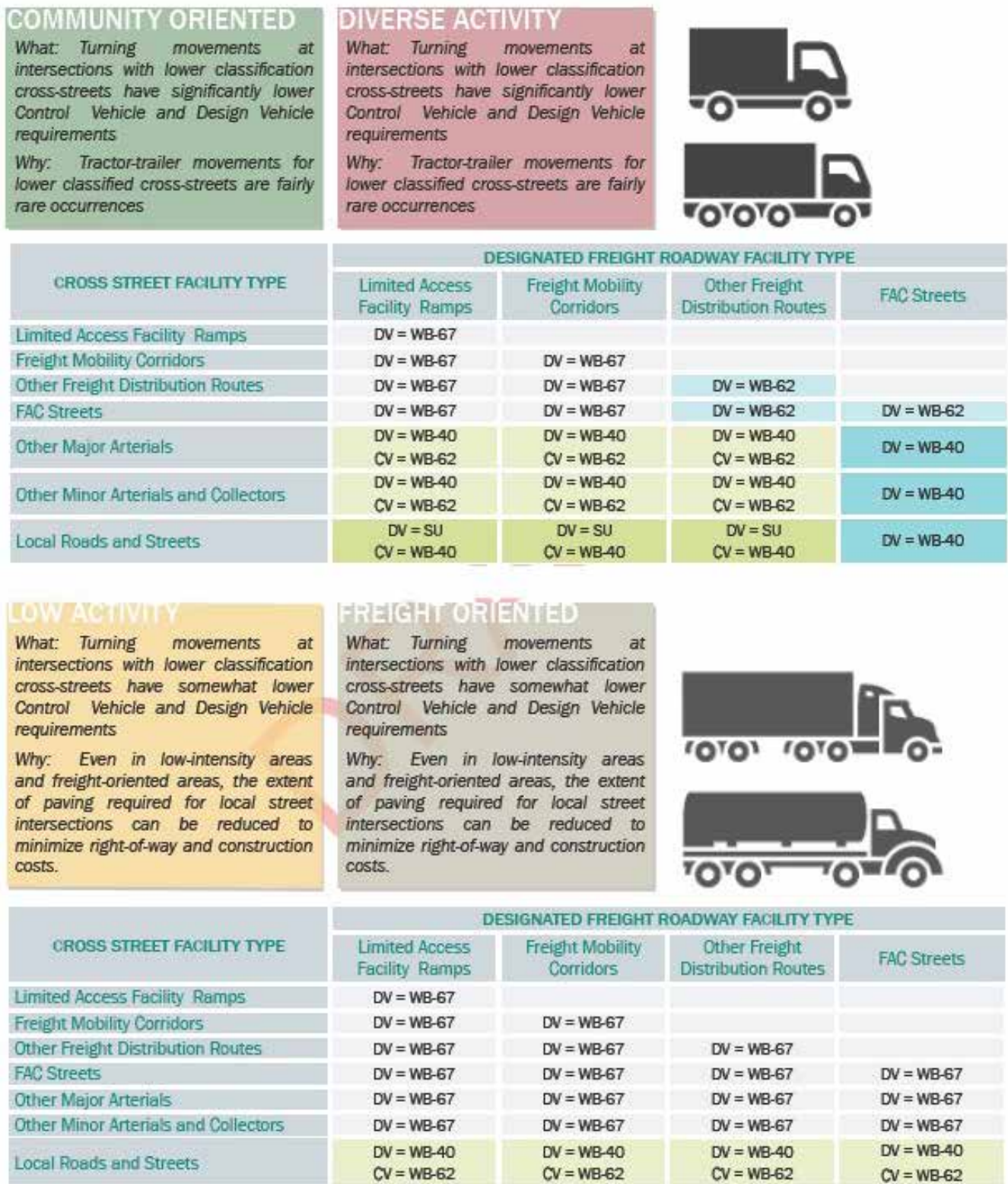
and strategies for freight accommodations. The report identifies four general area types characterized by the land uses and activities that exist or are anticipated in areas throughout the Tampa Bay region (see **FIGURE 31**). The report defines four freight roadway facility types and seven cross-street facility types. **FIGURE 32** 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 31** FDOT District 7 Draft Freight Roadway Design Considerations: General Area Types



Source: FDOT District 7 Draft Freight Roadway Design Considerations.

**FIGURE 32** 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-Natural, C2-Rural, and C3R-Suburban Residential 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 bicycle lane versus providing a paved shoulder (*Section 223.2.1, 2*)
- Substitution of a shared use path for a bicycle lane in C1-Natural, C2-Rural, or C3-Suburban context classifications or substitution of an urban side path for a bicycle lane in C2T-Rural Town, C4-Urban General, C5-Urban Center, or C6-Urban Core context classification (*Section 223.2.3, 7*)

**Other Design Criteria** influenced by context classification in the **FDM** include:

- Objectives for resurfacing, restoration, and rehabilitation projects based on context classification (*Section 114.2, 3*)
- Lane repurposing projects (*Section 124.2, 2*)
- 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-Urban General, C5-Urban Center, and C6-Urban Core but also may be found in C2T-Rural Town. Where on-street parking is not present in C4-Urban General, C5-Urban Center, or C6-Urban Core, it should be considered if in alignment with local plans, speed management needs, or parking needs. In C6-Urban Core and C5-Urban Center contexts it may sometimes be located within the median of a divided low speed urban street. (*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, 56*)
- Minimum clearance from the bottom of the roadway base course to the Base Clearance Water Elevation (*Section 210.10.3 (2), 59*)
- Placement of trees and other vegetation at intersections in C2T-Rural Town, C3C-Suburban Commercial, C4-Urban General, C5-Urban Center, and C6-Urban Core context classifications (*Section 212.11.6, 27*)
- Corner radii (*Section 212.12.1, 42*) and design of channelized right-turn lanes (*Section 212.12.2, 44*)
- Driveway location (*Section 214.1, 2*), design (*Section 214.1.1, 3*), and type (*Section 214.2, 7*)
- Requirements for external lighting of overhead signs (*Section 230.2.4, 3*)
- Requirements for vehicle detection systems (*Section 233.9, 21*) and considerations for microwave vehicle detection systems (*Section 233.9.3, 22*)

# 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-Rural Town, C4-Urban General, C5-Urban Center, and C6-Urban Core 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-Natural, C2-Rural, C3C-Suburban Commercial, C3R-Suburban Residential, and in some cases, C2T-Rural Town. 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 1.4, Table 7*). Other parameters, such as median width are set in consideration of the context classification (*Section 3.1.1, Table 13*).

Additionally, the guidebook assigns modal priorities for the design of medians and driveways (*Section 1.4, Table 8*). The modal priorities are complementary to the expected user types in different context classifications presented previously in **FIGURE 6**.

Other decisions that are affected by context classification include:

- The radial return at driveways (*Section 4.2.1, 75*)
- The types of delivery areas that are available to freight traffic (*Section 7.6.1, 143*)
- Appropriateness of higher speed driveways in C1-Natural, C2-Rural, and C3C-Suburban Commercial (*Section 4.2.3, 80*)
- Recommendations for offset left-turn lanes in C4-Urban General, C5-Urban Center, and C6-Urban Core (*Section 5.4.2, 107*)
- Consideration for right turn lanes (*Section 6.2.1, 111*)

# 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 2023 **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-Rural Town, C3C-Suburban Commercial, C4-Urban General, C5-Urban Center, and C6-Urban Core (*Section 5.2.5.1 (2c)*).

The **TEM** allows the District Traffic Operations Engineer to implement leading pedestrian intervals (LPIs) at their discretion in any context. The 2023 **TEM** removed the requirement for additional analysis in context classifications C1-Natural, C2-Rural, C3R-Suburban Residential, and C3C-Suburban Commercial (*Section 3.11.5*).

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-Urban General, C5-Urban Center, and C6-Urban Core (*Section 5.2.5.2 (3)*)
- Context classification should be considered when reviewing requests for bicycle signs (*Section 2.11.2 (4a)*)
- Figure 5.2-13 integrates context classification into midblock crosswalk and unsignalized intersection treatment selection

# FDOT QUALITY/LEVEL OF SERVICE HANDBOOK

The **FDOT Multimodal Quality/Level of Service Handbook (MQ/LOS Handbook)** and the Generalized Service Volume Tables (GSVT) 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 **MQ/LOS Handbook** recognizes that motorists have different thresholds for acceptable delay in rural versus urban areas. The 2023 **MQ/LOS Handbook** introduced GSVT based on context classification. This more stratified set of tables better represents varied conditions across the state. When analyzing future-year traffic characteristics, the Handbook suggests using future context classification.

Since MQ/LOS can be evaluated on both state and local roadways, local agencies may wish to evaluate context classification for their local streets to apply the GSVTs. Local agencies can refer to Applying Context Classification on Local Roadways for additional information on evaluating context classification for local streets.

There are several key traffic characteristics used in the GSVTs, some of which are directly influenced by context classification, including Standard K and peak hour factor (PHF). The **MQ/LOS Handbook** provides a range of Standard K factors for each context classification. The K factor is the ratio of traffic volume in the study hour to annual average daily traffic (AADT) and is used to convert peak hour two-way volume to AADT and vice versa.

The K factor generally decreases as an area becomes more urbanized and high traffic volumes are spread over longer time periods. The **MQ/LOS Handbook** also provides PHF for each context classification. The PHF compares the traffic volume during the busiest 15-minutes of the peak hour with the total volume during the peak hour. The PHF increases as context classification increases, indicating there is less variability in traffic over the peak hour period.

Additionally, bicycle and pedestrian level of traffic stress (LTS) methodologies are included for arterial roadways. As applied in the **MQ/LOS Handbook**, LTS methodologies only address comfort traveling along a facility as it relates to facility type, width, and continuity; vehicular posted speeds; vehicular volumes; and separation from traffic. It does not address the impacts of intersection design or delay, crossing frequency, or number of driveways. The scale is defined by the type of user who finds the facility comfortable.

# 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 *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 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-Rural Town, C4-Urban General, C5-Urban Center, and C6-Urban Core 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 governments' 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 Context-Based Solutions. In general, a proposal in a more urban context classification would necessitate a larger study area with more analysis components. Chapter 4 of the handbook provides suggested level of study based on whether a particular development is projected to have a low, medium, or high volume of peak hour, nonmotorized trips for a particular context classification.

# 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 Context-Based Solutions 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.

### 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:

<b>C1-Natural</b>	Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.
<b>C2-Rural</b>	Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.
<b>C2T-Rural Town</b>	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes many historic towns.
<b>C3R-Suburban Residential</b>	Mostly residential uses within large blocks and a disconnected/ sparse roadway network.
<b>C3C-Suburban Commercial</b>	Mostly non-residential uses with large building footprints and large parking lots. Buildings are within large blocks and a disconnected/ sparse roadway network.
<b>C4-Urban General</b>	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.
<b>C5-Urban Center</b>	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.
<b>C6-Urban Core</b>	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

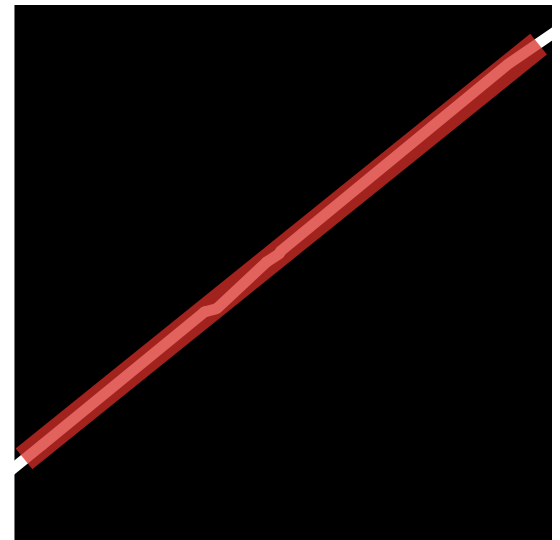
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
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
DUI/Acre	Floor-Area Ratio (FAR)	Persons/Acre	Jobs/Acre
Development not allowed	Development not allowed	0	0



Streets and Blocks Network



Street View

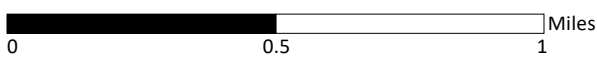


Bird's Eye View

Open Space



Existing Land Use



# C2-RURAL: S.R. 52, WEST OF DADE CITY, PASCO COUNTY

## Primary Measures

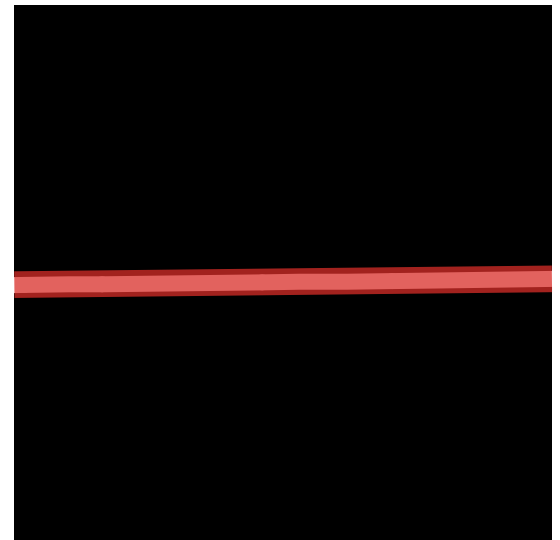
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
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

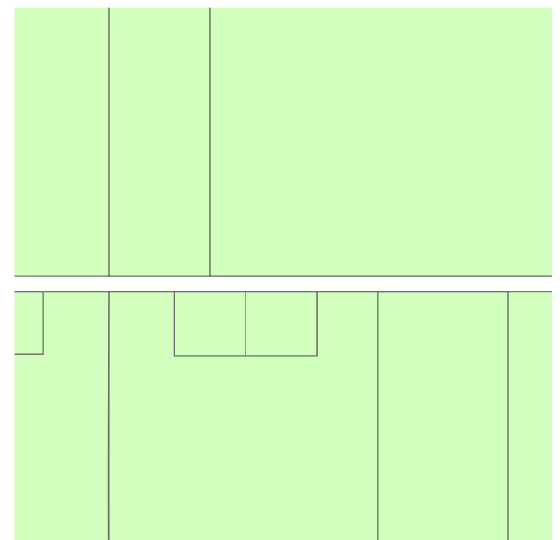


Street View

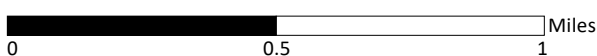


Bird's Eye View

Agriculture



Existing Land Use



## C2T-RURAL TOWN: MAIN ST, HAVANA, GADSDEN COUNTY

### Primary Measures

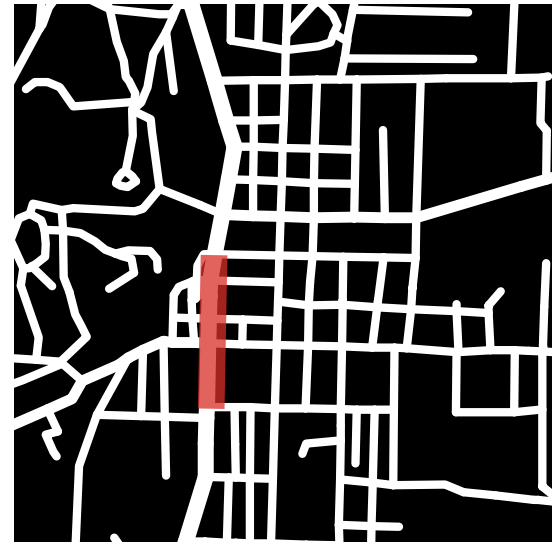
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
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

### 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



Aerial Satellite Image



Streets and Blocks Network

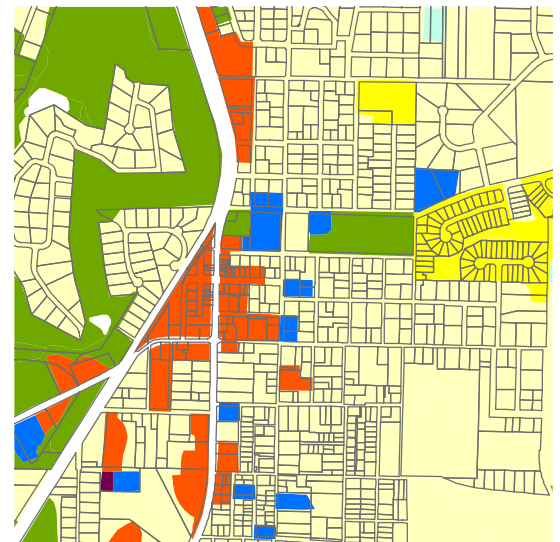


Street View

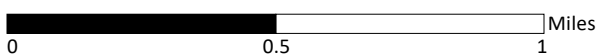


Bird's Eye View

- Single-Family Residential
- Multi-Family Residential
- Commercial
- Retail
- Agriculture
- Institutional/Government
- Industrial
- Open Space
- Vacant



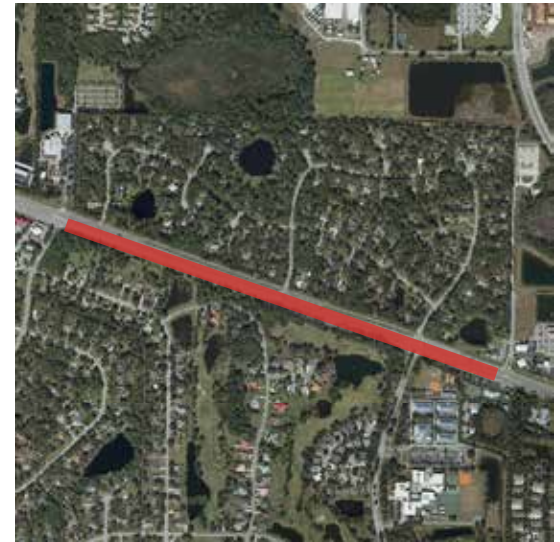
Future Land Use



# 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		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/ Sq Mile	Feet	Feet
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



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
1	0.23	0.4	0



Streets and Blocks Network



Street View

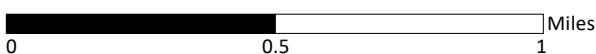


Bird's Eye View

- Single-Family Residential
- Multi-Family Residential
- Commercial
- Retail
- Institutional/Government
- Open Space
- Vacant



Existing Land Use



# 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

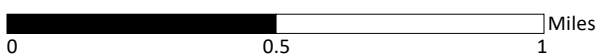


Bird's Eye View

- Single-Family Residential
- Commercial
- Institutional/Government
- Industrial
- Open Space
- Vacant



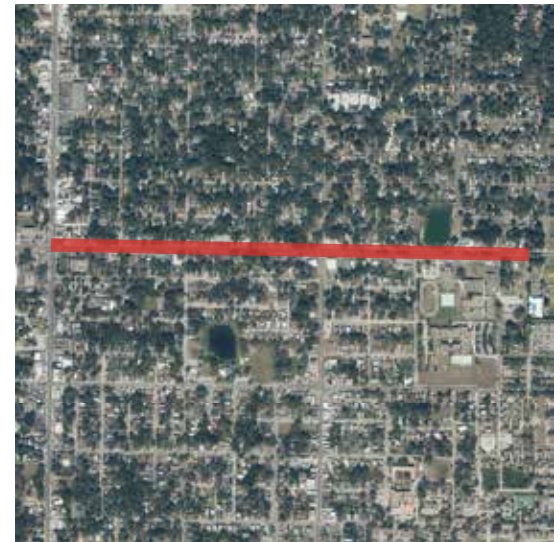
Existing Land Use



# C4-URBAN GENERAL: DR. MLK JR. BLVD, EAST TAMPA, TAMPA, HILLSBOROUGH COUNTY

## Primary Measures

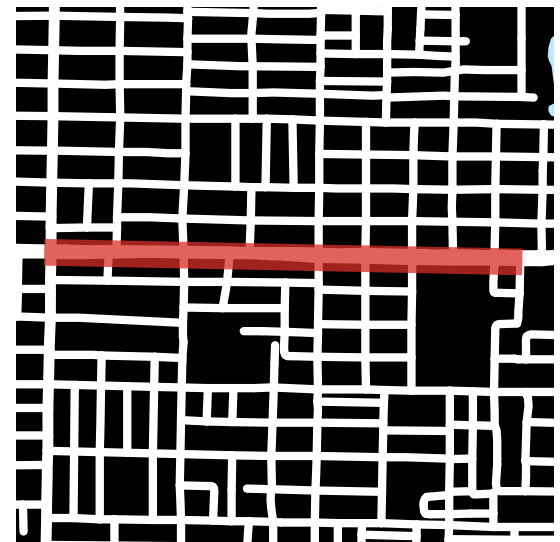
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/ Sq Mile	Feet	Feet
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 setbacks (10' to 20') front and side	Yes	Mostly in side, occasionally in rear or front	230	1,760	490



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
12	1.5	8.5	3



Streets and Blocks Network



Street View

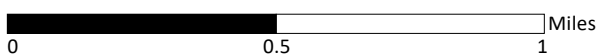


Bird's Eye View

- Single-Family Residential
- Multi-Family Residential
- Commercial
- Retail
- Institutional/Government
- Open Space
- Vacant



Existing Land Use



# C5-URBAN CENTER: MONROE ST, DOWNTOWN TALLHASSEE, LEON COUNTY

## Primary Measures

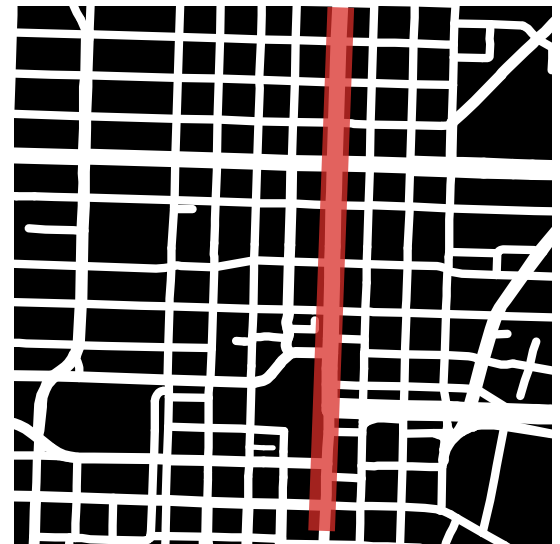
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
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

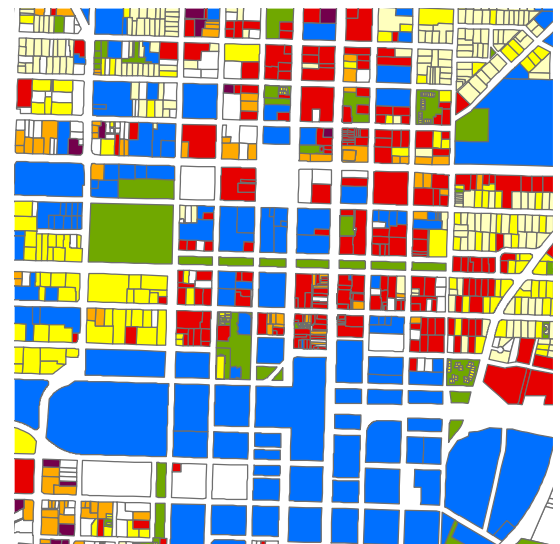


Street View

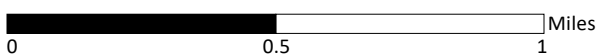


Bird's Eye View

- Single-Family Residential
- 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

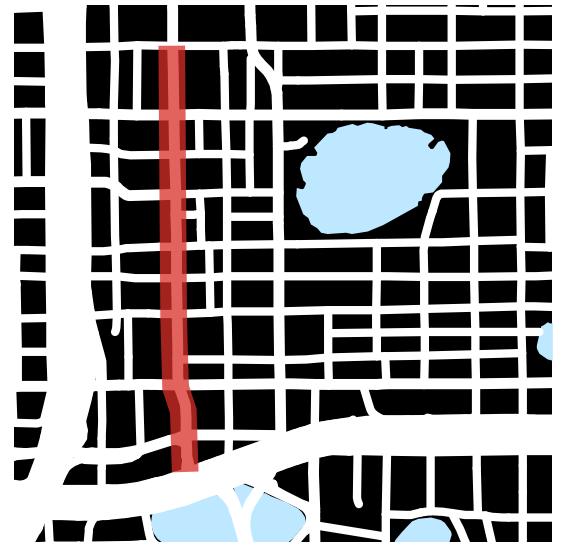
Distinguishing Characteristics	Land Use	Building Height	Building Placement	Fronting Uses	Location of Off-street Parking	Roadway Connectivity		
						Intersection Density	Block Perimeter	Block Length
Description	Description	Floor Levels	Description	Yes / No	Description	Intersections/Sq Mile	Feet	Feet
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



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
200	3	8.5	170



Streets and Blocks Network

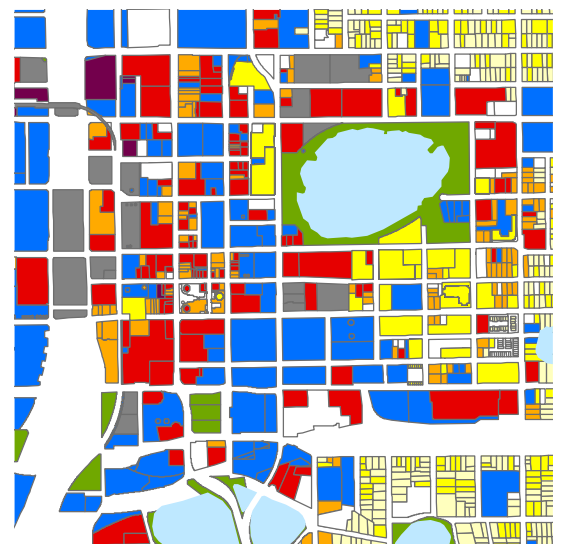


Street View

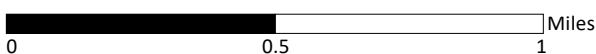


Bird's Eye View

- 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.



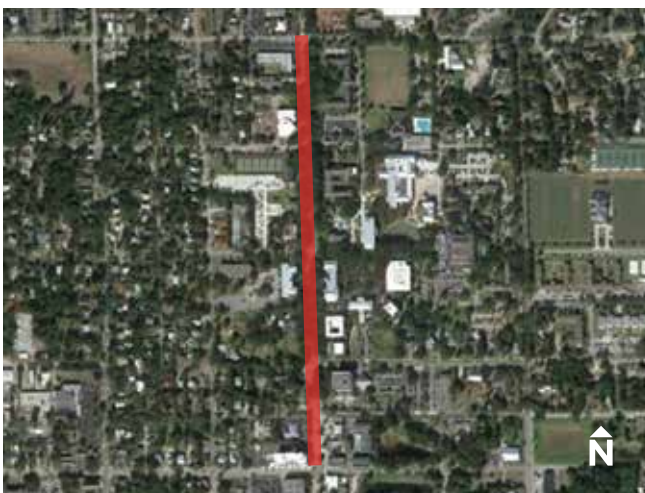
*Aerial Satellite Image*



*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 33** Potential Target Speeds for Case Studies

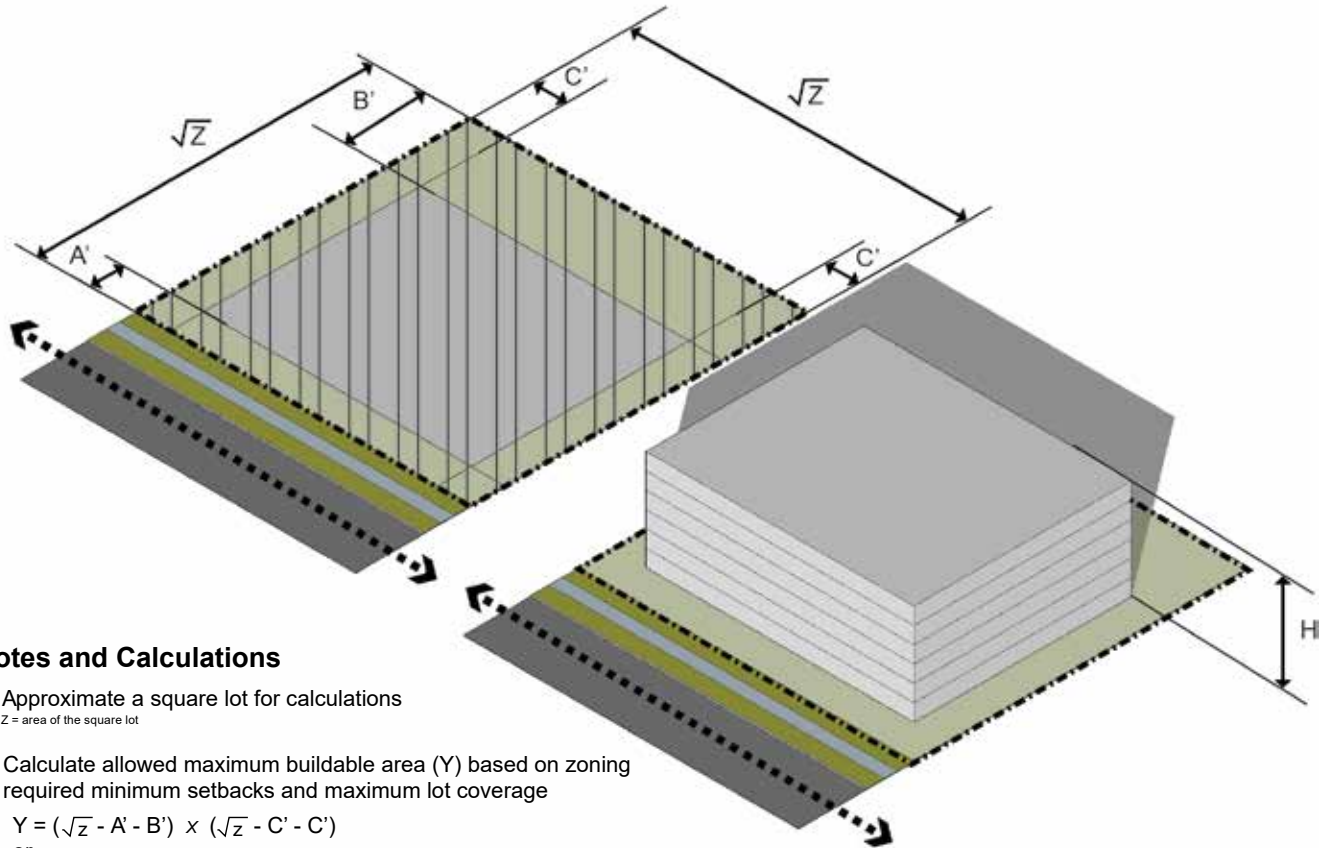
Context Classification	Location	Fronting Uses	Population Density	Vulnerable Users	Cross Section Elements	Access Classification	Transit Service	Pedestrian and Bicycle Generators	Existing Posted Speed	Target Speed
<b>C1-NATURAL</b>	FL 24, CEDAR KEY SCRUB STATE RESERVE, LEVY COUNTY	N/A	Low	<b>Low</b> N/A	Paved shoulder	4	None	None	60	<b>60</b>
<b>C2-RURAL</b>	S.R. 52, WEST OF DADE CITY, PASCO COUNTY	No	Low	<b>Low</b> N/A	Paved shoulder	3	None	None	55	<b>55</b>
<b>C2T-RURAL TOWN</b>	MAIN ST, HAVANA, GADSDEN COUNTY	Most parcels fronting street	Low	<b>Medium</b> Low median income	No dedicated bicycle facility (cyclists share lanes)	6	None	Downtown Havana, Havana Community Park, public library, private K-12 school	30	<b>30</b>
<b>C3R-SUBURBAN RESIDENTIAL</b>	S.R. 70, LAKEWOOD RANCH, MANATEE COUNTY	No	Low	<b>Medium</b> Presence of elementary and middle school students	Paved shoulder	3	None	Elementary & middle school	50	<b>50</b>
<b>C3C-SUBURBAN COMMERCIAL</b>	ORANGE BLOSSOM TRAIL, ORLANDO, ORANGE COUNTY	No	Low	<b>Medium</b> 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	<b>35</b>
<b>C4-URBAN GENERAL</b>	DR. MLK JR. BLVD, EAST TAMPA, TAMPA, HILLSBOROUGH COUNTY	Most parcels fronting street	High	<b>High</b> 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	<b>30</b>
<b>C5-URBAN CENTER</b>	MONROE ST, DOWNTOWN TALLAHASSEE, LEON COUNTY	Most parcels fronting street	Medium	<b>Low</b>	On-street parking, no dedicated bicycle facility (cyclists share lanes)	7	High frequency local service (3 local routes, 5 buses per hour)	Downtown Tallahassee, LeMoyné chain of parks, high school, Florida State Capitol, university basketball arena	25	<b>25</b>
<b>C6-URBAN CORE</b>	ORANGE AVE, DOWNTOWN ORLANDO, ORANGE COUNTY	Most parcels fronting street	High	<b>Medium</b> 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	<b>25</b>

# 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)

$$\text{Floor Area Ratio (FAR)} = \frac{Y \times J}{Z}$$

- 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 a 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 <https://www.fdot.gov/roadway/context-based-solutions/default.shtm>.

## 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?

The table below clarifies the 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				
<b>C1-Natural</b>	No development along roadway		Sparse roadway network			No development along roadway			
<b>C2-Rural</b>		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	
<b>C2T-Rural Town</b>								Population will vary based on mix of single- and multi-family residential	
<b>C3R-Suburban Residential</b>			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	
<b>C3C-Suburban Commercial</b>						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	
<b>C4-Urban General</b>						No consistent pattern of allowed office/retail density			

