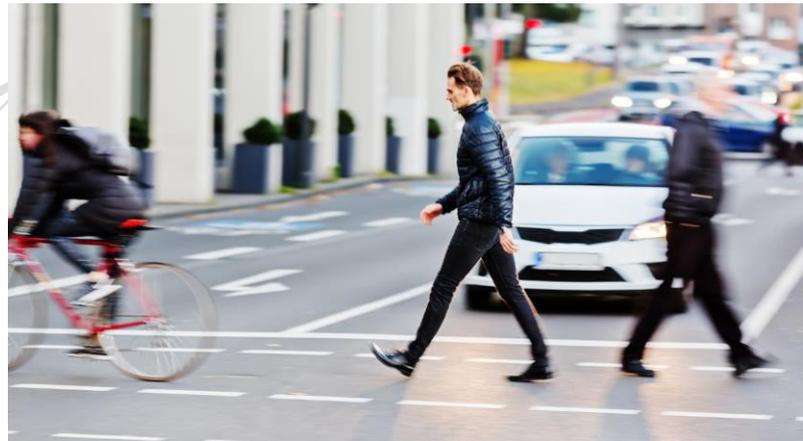


# EXHIBIT A



# Transportation Design Manual

January 2021

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## CHAPTER 1 – INTRODUCTION

This Manual has been created for use by engineering professionals for the analysis, development, design, and implementation of improvements to County owned and maintained transportation facilities and infrastructure. All standards and practices set forth in this publication must meet or exceed FDOT Standard Specifications for Road and Bridge Construction, (latest edition).

This publication is subject to revisions and updates as material specifications, design criteria, and technologies advance or improve. These revisions will take place as technical bulletins and periodic annual edition updates.

## CHAPTER 2 - REFERENCES

- 2.1 FDOT Design Manual
- 2.2 FDOT Standard Plans for Road Construction
- 2.3 FDOT Standard Plans for Bridge Construction
- 2.4 FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook)
- 2.5 FDOT Manual on Uniform Traffic Studies (MUTS)
- 2.6 FDOT Traffic Analysis Handbook
- 2.7 Highway Capacity Manual (HCM)
- 2.8 FDOT Site Impact Applications Guide
- 2.9 FDOT Transportation Site Impact Handbook
- 2.10 FDOT Project Traffic Forecasting Handbook
- 2.11 FDOT Flexible Pavement Design Manual
- 2.12 FDOT Rigid Pavement Design Manual
- 2.13 FDOT Traffic Engineering Manual
- 2.14 FDOT Standard Specifications for Road and Bridge Construction
- 2.15 ITE Trip Generation Manual
- 2.16 FDOT Quality/Level of Service Handbook
- 2.17 FHWA Manual on Uniform Traffic Control Devices (MUTCD)
- 2.18 AASHTO Highway Safety Manual (HSM)
- 2.19 FDOT Structures Manual
- 2.20 FDOT Florida Highway Landscape Guide
- 2.21 FDOT Manual on Intersection Control Evaluation
- 2.22 FDOT Speed Zoning for Highways, Roads and Streets in Florida
- 2.23 FDOT Complete Streets Implementation Plan
- 2.24 Pinellas County Standard Technical Specifications for Roadway and General Construction
- 2.25 Pinellas County Standard Details
- 2.26 Pinellas County Stormwater Manual
- 2.27 NCHRP Report 672, Roundabouts: An Informational Guide
- 2.28 Pinellas County Land Development Code
- 2.29 FDOT Rule Chapter 14-40 – Landscape Beautification and Conservation

It is noted that the latest edition of a given reference is applicable for the purposes of this manual. Any deviation must be approved by Pinellas County.

## CHAPTER 3 – TRAFFIC STUDY GUIDELINES

Prior to the preparation of a traffic study, the project's Traffic Engineer and the County's Transportation Division must prepare and execute a methodology letter to determine study area, scope of work and methodology. For projects impacting City roads or within one-quarter mile of an incorporated area, the County will consult with the city's Public Works Department concerning the required methodology. For projects impacting State Roads, the County will coordinate with FDOT.

The methodology letter will outline key components of the traffic study (roadway segments and intersections to be studied, and unusual and/or unique conditions the study must address, etc.). A key component of the methodology letter will be a statement addressing the type and duration of field data (machine traffic counts, manual traffic counts, directional distribution counts, etc.) the project's traffic engineer must obtain. This includes stating the time of year and days of the week that are appropriate for obtaining the traffic data. The methodology will also detail the various studies and analyses appropriate to the project which may involve one or more of the specific analyses identified in the sections below.

The project's Traffic Engineer and representatives from the County's Transportation Division must sign the methodology letter prior to commencement of the traffic study.

### 3.1 TRAFFIC ANALYSIS

A traffic analysis evaluates the effect of traffic demand and supply on the performance of a transportation facility in relation to meeting goals and objectives of the facility.

Guideline References include:

- 3.1.1 FDOT Traffic Analysis Handbook
- 3.1.2 Highway Capacity Manual
- 3.1.3 AASHTO Highway Safety Manual

### 3.2 TRAFFIC IMPACT STUDY

A traffic impact study evaluates the estimated site-generated traffic volumes and assesses the impact of a proposed development on the public roadway system. Guideline References include:

- 3.2.1 FDOT Site Impact Applications Guide
- 3.2.2 FDOT Transportation Site Impact Handbook
- 3.2.3 FDOT Project Traffic Forecasting Handbook
- 3.2.4 ITE Trip Generation Manual
- 3.2.5 FDOT Quality/Level of Service Handbook
- 3.2.6 Highway Capacity Manual

### 3.3 SIGNAL WARRANT ANALYSIS

A signal warrant analysis evaluates the traffic volumes and safety of an existing unsignalized intersection to determine if the intersection meets the criteria for signalization and would perform more efficiently and safely under signal control.

Guideline References include:

- 3.3.1 FHWA MUTCD
- 3.3.2 FDOT MUTS

### 3.4 INTERSECTION CONTROL EVALUATION (ICE)

An ICE investigates and screens several alternatives for intersection control to identify which option is optimal for a location. This process incorporates safety performance metrics, using the Highway Safety Manual methodologies, into the intersection project development process. This is a requirement for all projects when looking at alternative intersection improvements. Screened alternative configurations may include:

- Two-Way Stop-Control
- All-Way Stop-Control
- Signalized Control
- Roundabout
- Median U-Turn (MUT)
- Signalized Restricted Crossing U-Turn (RCUT) or Superstreet
- Unsignalized Restricted Crossing U-Turn (RCUT) or J-Turn
- Jug handle
- Displaced Left-Turn
- Continuous Green Tee
- Quadrant Roadway

Guideline References include:

- 3.4.1 FDOT Manual on Intersection Control Evaluation

### 3.5 GAP STUDY

A gap study is used to determine the size and the number of gaps in the vehicular traffic stream for unsignalized intersections and access points, pedestrian studies, and school crossing studies.

Guideline References include:

- 3.5.1 FDOT MUTS

### 3.6 INTERSECTION DELAY STUDY

A delay study evaluates the performance of intersections in allowing traffic to enter and pass through, or to enter and turn onto another route.

Guidelines include:

- 3.6.1 FDOT MUTS

### 3.7 TRAVEL TIME AND DELAY STUDY

A travel time and delay study is used to evaluate the quality of traffic movement along a route and determine the locations, types, and extent of traffic delays.

Guideline References include:

- 3.7.1 FDOT MUTS

### 3.8 NO-PASSING ZONE STUDY

A no-passing zone study identifies segments of 2-lane roadways where passing operations should be restricted due to site conditions.

Guideline References include:

3.8.1 FDOT MUTS

### **3.9 ADVISORY SPEED STUDY**

An advisory speed study is performed at locations where the site parameters create a condition where it is advisable for drivers to use a slower speed than the regulated posted speed. Such locations may be at curves or intersections.

Guideline References include:

3.9.1 FHWA MUTCD

3.9.2 FDOT MUTS

3.9.3 FDOT Speed Zoning for Highways, Roads and Streets in Florida

### **3.10 SPOT SPEED STUDY**

A spot speed study is the measurement of average speed passing a point on a roadway.

Guideline References include:

3.10.1 FDOT MUTS

3.10.2 FDOT Speed Zoning for Highways, Roads and Streets in Florida

### **3.11 TRANSPORTATION SAFETY STUDY**

The purpose of a safety study is to identify unsafe conditions along a facility and recommend operational or design solutions to improve the safety for all roadway users.

Guideline References include:

3.11.1 FDOT MUTS

Additionally, a safety benefit-cost analysis should be conducted utilizing methodologies contained in Section 122 of the FDOT Design Manual. This Manual presents two methodologies including the AASHTO Highway Safety Manual (HSM) method.

## CHAPTER 4 – COMPLETE STREETS

### 4.1 GENERAL

This section outlines the methodology for identifying and prioritizing corridors within Pinellas County for implementation of Complete Streets solutions. Complete Streets design considerations aim to (1) be context-sensitive solutions, (2) serve the needs of all users, including pedestrians, bicyclists, transit riders, motorists, and freight handlers, and (3) promote safety, quality of life, and economic development.

### 4.2 IMPLEMENTING COMPLETE STREETS

Pinellas County has developed a Complete Streets Corridor Evaluation Report (the report), which identifies corridors for potential complete street improvements as outlined below. The purpose of this list is to identify and prioritize corridors for potential local funding.

- 4.2.1 Major arterials with higher posted speed limits (exceeding 45 MPH) and higher volumes (exceeding 25,000 AADT) are not considered as viable corridors for safety reasons.
- 4.2.2 Roadways that function as a minor arterial, collector, and local facility should be evaluated for Complete Streets improvements.
- 4.2.3 All of the arterial and collector roadways have been evaluated and categorized into 4 Tiers. Any roadways with resurfacing projects were added to Tier 1. Corridors in each Tier were included in Report. Future resurfacing projects can be assigned a Tier using the criteria below, which was also used for the corridors in the report.
  - 4.2.3.1 Tier 1: Corridors overlapping in the Forward Pinellas Active Transportation Plan and County Paving Plan.
  - 4.2.3.2 Tier 2: Corridors overlapping in the local Vision Workshop and having connectivity within the County's overall transportation system. Reviewed plans include: Pinellas Trail Loop, Forward Pinellas Active Transportation Plan, Long Range Transportation Plan and Capital Improvement Plan. These corridors were scored and categorized through a scoring system with consideration for V/C, AADT, transit and probability for Complete Street improvements considering the typical section.
  - 4.2.3.3 Tier 3: Corridors adjacent to Tier 1 corridors that fill in the gaps between Tier 1 and Tier 2 corridors. The Tier 2 scoring system was used to categorize these corridors.
  - 4.2.3.4 Tier 4: Corridors that are not within the County's jurisdiction but are key components for connectivity in the overall Complete Streets plan.
- 4.2.4 State owned facilities are not included on the prioritized list due to potential state funding options
- 4.2.5 Facilities with existing bike lanes or paved shoulders were not included so that funding could be made available for the corridors that lacked multimodal facilities.

Improvements along these corridors should include multi modal facilities primarily focusing on completing connections to and between existing trails, bike lanes and facilities. Design of sidewalks and bike facilities are included in Chapters 6, 7, and 8 of this Manual.

## CHAPTER 5 – ACCESS MANAGEMENT SYSTEM FOR ARTERIAL AND COLLECTOR ROADS

### 5.1 GENERAL ACCESS STANDARDS

Consideration should be made for access control during the design of a new collector or arterial facility to ensure safety and improve facility operations. The reduction of the frequency of access points and the restriction of turning and crossing maneuvers is accomplished more effectively by the design of the roadway geometry than by the use of traffic control devices.

Pinellas County has adopted access management standards as part of its Land Development Code (LDC) located at:

[https://library.municode.com/fl/pinellas\\_county/codes/code\\_of\\_ordinances?nodeId=PTIILADECO\\_CH154SIDERI-WIMSUPL\\_ARTIVACMA](https://library.municode.com/fl/pinellas_county/codes/code_of_ordinances?nodeId=PTIILADECO_CH154SIDERI-WIMSUPL_ARTIVACMA).

All new development, re-development, or changes in use, on or adjacent to County maintained right-of-way, shall be required to bring the right-of-way, including all access connections, into compliance with Pinellas County's Land Development Code. This requirement applies regardless of whether a site is within a municipality or unincorporated County.

These access standards include an inventory and classification of county roads, depicted in Tables 5-1 and 5-2 of this Manual. Access spacing and design standards should be followed when designing or re-designing county facilities.

- 5.1.1 Direct egress from property adjacent to arterial and collector streets may be restricted when egress to a road of lesser designation is available. Additional access points may be permitted to an arterial and/or collector when the project generates over 555 daily trips subject to the findings and recommendations from a traffic report approved by the County's Transportation Division.
- 5.1.2 If a property is located such that access can be provided to either an arterial or collector facility, access to the arterial facility may be prohibited.
- 5.1.3 New direct driveway access to individual Single-family, Attached, Detached, Two-family, and Three-Family dwellings may be prohibited on arterial and collector streets, except those for which no other access can be reasonably provided.
- 5.1.4 Common access facilities on arterial and collector streets are encouraged when two or more contiguous sites are planned for commercial, office or industrial facilities (two access facilities maximum on property less than 200 feet frontage).
- 5.1.5 Off-street parking may be designed to ensure that all vehicles leaving or entering the public street right-of-way may be traveling in a forward motion, except driveways serving Single-family, Attached, Detached, Two-family, and Three-Family dwellings.
- 5.1.6 In addition to the above criteria, an inventory has been compiled which classifies the various segments of the county numbered road system, according to existing and proposed safe access point spacing intervals. See Table 5-1 for driveways and Table 5-2 for medians.
  - 5.1.6.1 These intervals will be utilized as a guideline to standardize the minimum spacing criteria for the issuance of new driveway permits and median openings without the necessity of obtaining an administrative adjustment.

- 5.1.6.2 If a particular county road is not included in the inventory, the spacing criteria are not applicable, and issuance of permits is dependent on the other design criteria.
- 5.1.6.3 Driveway Connection Spacing may be based on the roadway class pursuant to Table 5-1. The roadway class may establish the minimum driveway spacing guidelines along a particular arterial or collector roadway. Other engineering and safety factors must also be considered. The spacing standards are as follows:
  - 5.1.6.3.1 Class 1 Controlled Access Facility
  - 5.1.6.3.2 Class 2 Driveway spacing must be greater than 680 feet
  - 5.1.6.3.3 Class 3 Driveway spacing must be greater than 460 feet
  - 5.1.6.3.4 Class 4 Driveway spacing must be greater than 240 feet
  - 5.1.6.3.5 Class 5 Driveway spacing must be greater than 120 feet
  - 5.1.6.3.6 Class 6 Driveway spacing must be greater than 0 feet
- 5.1.6.4 Median Opening Spacing may be based on the roadway class pursuant to Table 5-2. Other engineering and safety factors must also be considered. The spacing standards are as follows:
  - 5.1.6.4.1 Class 1 spacing of medians must be greater than 1,320 feet
  - 5.1.6.4.2 Class 2 spacing of medians must be greater than 990 feet
  - 5.1.6.4.3 Class 3 spacing of medians must be greater than 660 feet
  - 5.1.6.4.4 Class 4 spacing of medians must be greater than 330 feet
- 5.1.6.5 Florida Department of Transportation (FDOT) requirements may exceed and supersede these standards for state roads/facilities.
- 5.1.6.6 All criteria are to be applied, together with sound engineering judgment, to promote safety.

**5.2 DESIGN AND CONSTRUCTION CRITERIA FOR ACCESS CONNECTIONS TO COUNTY ROADS**

- 5.2.1 In addition to controlling access locations, the following design criteria should be considered when evaluating access points: All access locations should have adequate sight distance available for the safe execution of entrance, exit, and crossing maneuvers.
  - 5.2.1.1 Locations of access points near structures, decision points, or the termination of street or highway lighting should be avoided.
  - 5.2.1.2 Driveways should not be placed near intersections or other points that would tend to produce traffic conflict.
  - 5.2.1.3 The spacing of access points should be adequate to prevent conflict or mutual interference of traffic flow.
  - 5.2.1.4 Adequate spacing between access and decision points is necessary to avoid burdening the driver with the need for rapid decisions or maneuvers.
  - 5.2.1.5 Frequent median openings should be avoided.
  - 5.2.1.6 The use of a frontage road or other auxiliary roadways is recommended on major collectors and arterials where the need for direct or minor road access is frequent.

Design and construction criteria for access connections to county roads are as follows. All new or reconstructed driveways and median openings shall be designed to conform with the following criteria:

- 5.2.2 Private driveways (Single-family, Attached, Detached, Three-family, and Two-Family dwellings):
  - 5.2.2.1 Minimum width, ten (10) feet for Single-Family Detached and 20 feet for Single-Family-Attached, Two-Family, and Three-Family dwelling.
  - 5.2.2.2 Maximum width, 24 feet on collector and arterial roads; 30 feet on local subdivision roads.
  - 5.2.2.3 Fifteen feet minimum radii required for rural section.
  - 5.2.2.4 Standard flares as shown in FDOT Standard Plans required for a road that has urban curb and gutter section. (No curbs for driveway permitted within right-of-way; wheelchair access to be provided).
  - 5.2.2.5 Where a driveway crosses a ditch, a six-foot minimum stabilized shoulder, with three-fourths inch per foot (6%) slope, each side of driveway pavement will be required.
  - 5.2.2.6 On a driveway where a culvert is to be installed, the end of the culvert shall not extend beyond the side of property line prolonged. If the end of the culvert creates a hazardous condition in relation to the end of an existing culvert, the proposed culvert should be extended and connected to the existing culvert with a ditch bottom inlet or junction box.
  - 5.2.2.7 Culverts shall be a minimum of 15 inches R.C.P. or hydraulic equivalent.
  - 5.2.2.8 Culvert length (L) to be determined by site conditions; in general, it will be pavement width plus 20 feet (10 feet each side of driveway).
  - 5.2.2.9 Mitered end sections are required on all culvert installations, as per FDOT Standard Plans.
  - 5.2.2.10 Justifications for size of culvert must be submitted, along with flow line elevations (inverts).
  - 5.2.2.11 A minimum flow of 2.5 feet per second must be maintained as a cleansing velocity in all culverts.
  - 5.2.2.12 Driveway construction from edge of pavement to the property line shall consist of the following:
    - 5.2.2.12.1. One-inch of Type SP-9.5 Fine, Traffic Level C asphalt surface, six-inch lime rock base compacted to 98 percent density.
    - 5.2.2.12.2. Six-inch thick 3,000 psi concrete, with six-inch by six-inch no. 10 welded wire mesh. (Existing sidewalk to be replaced where it does not meet these criteria.)
    - 5.2.2.12.3. Gravel, crushed concrete or shell driveways will be allowed subject to compliance with all applicable standards listed above and the following stipulations:
      - 5.2.2.12.3.1. The land development/permitting section shall reserve the right to refuse use of a non-suitable material.
      - 5.2.2.12.3.2. A pad for the protection of existing pavement shall be constructed.
    - 5.2.2.12.4. Paver driveways shall comply with Pinellas County Standard Details Index 1345.

- 5.2.2.13 Driveway construction which requires removal of a vertical curb (raised curb) shall have pavement saw cut at curb line prior to removing existing curb and replaced with a header curb or valley in accordance with existing type.
- 5.2.2.14 Driveway construction where Miami type curb (mountable) exists must tie to the back of the curb.
- 5.2.2.15 Frontage of 50 feet or less shall be limited to one driveway. Not more than two driveways shall be permitted for any one property fronting on the same road (exceptions may be approved if good cause is shown).
- 5.2.3 Multi-Family, Commercial, and other non-residential driveways.
  - 5.2.3.1 Minimum width 24 feet (16 feet if driveway is signed and marked as one-way).
  - 5.2.3.2 Maximum width 40 feet (plus radii and/or flares).
  - 5.2.3.3 Entrance radii (rural and/or curb-less section):
    - 5.2.3.3.1. Thirty-five feet minimum entrance radius required.
    - 5.2.3.3.2. Twenty-five feet minimum exit radius required.
  - 5.2.3.4 Addition of pavement for acceleration/deceleration lanes and additional pavement for Class 3 through Class 6 (referred to in section 5.1.6.3 in Chapter 5) to arterial, collector and commercial roads must comply with County standards.
  - 5.2.3.5 Class 2 and 3 entrances are to be overlaid with 1½ inches of SP-9.5 asphalt to the center of the road, including the addition (feather edge at center of road).
  - 5.2.3.6 Class 4, 5, and 6 entrances and modifications thereof, are to be overlaid the entire width of the road with 1½ inches of SP-9.5 asphalt.
  - 5.2.3.7 FDOT Standard flares as shown in FDOT Standard Plans are required for curb and gutter sections unless radii are otherwise approved by the County Engineer.
  - 5.2.3.8 A six-foot shoulder, each side of pavement, will be required.
  - 5.2.3.9 On driveways where a culvert is to be installed, the end of the culvert shall be no closer than six feet to side property lines. If the end of the proposed culvert creates a hazardous condition in relation to the end of an existing culvert, the proposed culvert shall be extended and connected to the existing culvert with a D.B.I. (except common driveway).
  - 5.2.3.10 On driveways where culvert is not to be installed, a six-foot setback from the side property line extended, measured from where the radius, or flare, meets the existing pavement, is required.
  - 5.2.3.11 Culverts shall be a minimum of 15 inches RCP (corrugated metal pipe will not be allowed for commercial driveways).
  - 5.2.3.12 Culvert length (L) to be determined by the site conditions; in general, it will be pavement width plus 20 feet (10 feet each side of driveway).
  - 5.2.3.13 Mitered end sections are required on all culvert installations (miter to begin at edge of six-foot shoulder).
  - 5.2.3.14 Justification for size of culvert must be submitted, along with flow line elevations (inverts).
  - 5.2.3.15 A minimum flow of 2.5 feet per second must be maintained as a cleansing velocity.
  - 5.2.3.16 Driveway and turn lane construction shall conform to pavement specifications for arterial, collector, industrial and residential streets as set forth in this manual.
  - 5.2.3.17 Frontages of 50 feet or less shall be limited to one driveway. Not more than two driveways shall be permitted for any one property fronting on the same road

(variance may be granted subject to proper conformance to all local, state and federal regulations).

5.2.3.18 Access from public streets to parking facilities shall be in accordance with the following:

5.2.3.18.1 On county collector roads there shall be a minimum of 50 feet from the edge of the through travel lane to the first internal intersection or drive.

5.2.3.18.2 On county arterial roads there shall be a minimum of 75 feet from the edge of the through travel lane to the first internal intersection or drive.

**Table 5-1 – Pinellas County Driveway Connection Spacing Inventory**

Class*	Range	Road Name	From	To
6	0 ft.	100th Way/CR 361	Bay Pines Blvd./SR 595	54th Ave. N./CR 200
5	≥120 ft.	102nd Ave. N./CR 296	113th St./CR 321	US Alt. 19/SR 595
3	≥460 ft.	102nd Ave./CR 296	US Alt. 19/SR 595	Starkey Rd./CR 1
4	≥240 ft.	102nd Ave. N./CR 296	Hamlin Blvd./CR 213	113 St./CR 321
4	≥240 ft.	113th St. N./CR 321	Park Blvd./CR 694	Ulmerton Rd./SR 688
2	≥680 ft.	118th Ave. N./CR 296	US Hwy. 19/SR 55	28th St./CR 683
5	≥120 ft.	125th St. N./CR 283	74th Ave. N./CR 240	102nd Ave. N./CR 296
4	≥240 ft.	130th Ave./Wilcox/CR 352	Indian Rocks Rd./CR 233	Ulmerton Rd./SR 688
5	≥120 ft.	131st St./Vonn Rd./CR 263	74th Ave. N./CR 240	Wilcox Rd./CR 352
4	≥240 ft.	142nd Ave. N./CR 376	Belcher Rd./CR 501	US Hwy. 19/SR 55
5	≥120 ft.	22nd Ave. S-Gulf/CR 138	Pasadena Ave./SR 693	34 St. S./SR 55
5	≥120 ft.	28th St. N./CR 683	38th Ave. N./CR 184	62nd Ave. N./CR 216
3	≥460 ft.	28th St. N./CR 683	Gandy Blvd./SR 694	Roosevelt Blvd./SR 686

<b>Table 5-1 – Pinellas County Driveway Connection Spacing Inventory</b>				
Class*	Range	Road Name	From	To
4	≥240 ft.	34th St. N./CR 663	118th Ave. N./CR 296	Ulmerton Rd./SR 688
6	0 ft.	35th St./37th St. N./CR 651	38th Ave. N./CR 184	54th Ave. N./CR 202
5	≥120 ft.	38th Ave. N./CR 184	Tyrone Blvd./SR 595	4th St./SR 92
6	0 ft.	46th Ave. N./CR 188	Park St./CR 1	37th St./CR 651
1	CAF	49th St./CR 611	Roosevelt Blvd./SR 686	Gulf to Bay/SR 60
4	≥240 ft.	49th St./CR 611	US 19	Roosevelt Blvd./SR 686
5	≥120 ft.	49th St./CR 611	5th Ave. N./SR 595	US Hwy. 19/SR 55
5	≥120 ft.	54th Ave. N./CR 202	Park St./CR 1	1st St. N.
6	0 ft.	54th Ave. N./CR 200	Duhme Rd./CR 321	100th Way/CR 361
5	≥120 ft.	58th St. N./CR 583	Roosevelt Blvd./SR 686	Whitney Rd./CR 438
6	0 ft.	58th St. N./CR 581	38th Ave. N./CR 184	62nd Ave. N./CR 216
5	≥120 ft.	60th St. N./CR 573	102nd Ave./CR 296	115th Cr. N.
5	≥120 ft.	62nd St. N./CR 565	US Hwy. 19/SR 55	Roosevelt Blvd./SR 686
5	≥120 ft.	62nd St. N./CR 563	118th Ave./CR 303	US Hwy. 19/SR 55
5	≥120 ft.	62nd Ave. N./CR 216	Belcher Rd./CR 501	4th St./SR 92
6	0 ft.	66th Ave.-116th St./CR 224	Oakhurst Rd./CR 233	113th St./CR 321
5	≥120 ft.	74th Ave./Oakhurst/CR 240	137th St. N./CR 233	66th Ave./CR 224
4	≥240 ft.	86th Ave. N./CR 266	98th St./CR 373	Starkey Rd./CR 1

<b>Table 5-1 – Pinellas County Driveway Connection Spacing Inventory</b>				
Class*	Range	Road Name	From	To
6	0 ft.	86th Ave. N./CR 264	Hamlin Rd./CR 213	Seminole Blvd./SR 595
5	≥120 ft.	98th St./CR 373	86th Ave./CR 266	102nd Ave./CR 296
3	≥460 ft.	Alderman Rd./CR 816	US Alt. 19/SR 595	US Hwy. 19/SR 55
6	0 ft.	Alt Keene Rd./CR 395	East Bay Dr./SR 686	McMullen Rd./CR 385
5	≥120 ft.	Alt Keene Rd./CR 395	East Bay Dr./SR 686	McMullen Rd./CR 434
4	≥240 ft.	Anclote Rd./CR 992	US Alt. 19/SR 595	Anclote Blvd./CR 994
4	≥240 ft.	Anclote Blvd./CR 994	Anclote Rd./CR 992	US Alt. 19/SR 595
5	≥120 ft.	Belcher Rd./CR 501	Bryan Dairy Rd./CR 296	Sunset Point Rd./CR 576
5	≥120 ft.	Belcher Rd./CR 501	38th Ave./CR 184	54th Ave./CR 202
4	≥240 ft.	Belcher Rd./CR 501	Park Blvd./CR 694	54th Ave./CR 202
4	≥240 ft.	Belcher Rd./CR 501	Sunset Point Rd./CR 576	Klosterman Rd.
3	≥460 ft.	Belcher Rd./CR 501	Park Blvd./SR 694	Bryan Dairy Rd./CR 296
5	≥120 ft.	Belleair Rd./CR 464	Lake Ave./CR 385	US Hwy. 19/SR 55
4	≥240 ft.	Belleair Cswy. /CR 416	Gulf Blvd./CR 183	Indian Rocks Rd./CR 233
6	0 ft.	Belleair Rd./CR 464	US Alt. 19/SR 595	Lake Ave./CR 385
6	0 ft.	Betty Lane/CR 355	SR 590	Overbrook Ave./CR 560
1	CAF	Bryan Dairy Rd./CR 296	66th St./SR 693	US Hwy. 19/SR 55
3	≥460 ft.	Bryan Dairy Rd./CR 296	Starkey Rd./CR 1	66th St. N./SR 693
4	≥240 ft.	Carlton Rd./CR_78	Klosterman Rd./CR 880	Curlew Pl./CR 80

<b>Table 5-1 – Pinellas County Driveway Connection Spacing Inventory</b>				
Class*	Range	Road Name	From	To
5	≥120 ft.	Central Ave./CR 150	Park St./CR 1	3rd St. N
6	0 ft.	Countryside Blvd./CR 720	Curlew Rd./SR 586	McMullen-Booth/CR 611
4	≥240 ft.	Curlew Ext./CR 95	US Hwy. 19/SR 55	West Lake Dr./CR 537
4	≥240 ft.	Curlew Pl./CR 80	Florida Ave./CR 369	Carlton Rd./CR 78
5	≥120 ft.	Donegan Rd./CR 363	8th Ave. SE/CR 400	Lake Ave./CR 375
5	≥120 ft.	Donegan Rd./CR 376	Donegan Rd./CR 363	Lake Ave./CR 375
5	≥120 ft.	Drew St./CR 528	NE Coachman Rd./SR 590	US Hwy. 19/SR 55
5	≥120 ft.	Duhme Rd./113th/CR 321	Welch Cswy/CR 666	Park Blvd./SR 694
3	≥460 ft.	E.L. Woodlands Pkwy. /CR 627	Tampa Rd./CR 752	E.L. Woodlands Blvd.
2	≥680 ft.	East Lake Rd./CR 611	Tampa Rd./CR 752	Pasco County Line
1	CAF	East-West Parkway	Tampa Rd./SR 586	Hillsborough County Line
5	≥120 ft.	Enterprise Rd./CR 638	McMullen-Booth/CR 611	Phillippe Pkwy/SR 590
5	≥120 ft.	Florida Ave./CR 369	Curlew Pl./CR 80	Sunset Dr./CR 944
5	≥120 ft.	Forest Lakes Blvd./CR 667	SR 580	Tampa Rd./SR 584
6	0 ft.	Greenbriar Blvd./CR 425	Hercules Ave./CR 425	Belcher Rd./CR 501
6	0 ft.	Greenwood Ave./CR 335	Wyatt St./CR 456	Belleair Rd./CR 464
5	≥120 ft.	Gulf Blvd./CR 183	Clearwater Pass Bridge	Walsingham Rd./SR 688

<b>Table 5-1 – Pinellas County Driveway Connection Spacing Inventory</b>				
Class*	Range	Road Name	From	To
5	≥120 ft.	Gulf Rd./CR 928	Florida Ave./CR 369	Whitcomb Blvd./CR 399
6	0 ft.	Haines Rd./CR 691	US Hwy. 19/SR 55	9th St./CR 803
4	≥240 ft.	Haines Bayshore/CR 454	US Hwy. 19/SR 55	Whitney Rd./CR 575
5	≥120 ft.	Hamlin Blvd./CR 213	102nd Ave./CR 296	Walsingham Rd./SR 688
6	0 ft.	Hercules Ave./CR 425	Druid Rd.	Imperial Way
5	≥120 ft.	Hercules Ave./CR 425	Druid Rd.	Virginia St./CR 618
5	≥120 ft.	Hermosa Dr.-19th/CR 39	US Hwy. 19/SR 55	Tampa Rd./CR 752
6	0 ft.	Highland Ave./CR 375	Belleair Rd./CR 464	Union St./CR 600
5	≥120 ft.	Highland Ave./CR 375	East Bay Dr./SR 686	Belleair Rd./CR 464
6	0 ft.	Highland Blvd. N./CR 804	US Hwy. 19/SR 55	Highlands Blvd./CR 547
6	0 ft.	Highlands Blvd./CR 547	Lake St. George Dr./CR 577	Woodridge Pkwy
6	0 ft.	Highlands Blvd./CR 547	US Hwy. 19/SR 55	Lake St. George Dr./CR 577
4	≥240 ft.	Highpoint Dr.	Lansbrook Pkwy. /CR 619	Bryan Lane
5	≥120 ft.	Indian Rocks Rd./CR 233	Walsingham Rd./SR 688	West Bay Dr./SR 686
4	≥240 ft.	Keene Rd.-Omaha/CR 1	Gulf to Bay/SR 60	Tampa Rd./CR 752
5	≥120 ft.	Keene Rd./CR 1	Belleair Rd./CR 464	Gulf to Bay/SR 60
4	≥240 ft.	Keene Rd-Starkey/CR 1	94th Ave./CR 282	Belleair Rd./CR 464
3	≥460 ft.	Keystone Rd./CR 582	US Hwy. 19/SR 55	Hillsborough Co. Line

<b>Table 5-1 – Pinellas County Driveway Connection Spacing Inventory</b>				
Class*	Range	Road Name	From	To
4	≥240 ft.	Klosterman Rd./CR 880	Carlton Rd./CR 78	US Hwy. 19/SR 55
6	0 ft.	Lake St. George Dr./CR 577	Tampa Rd./CR 752	Highlands Blvd./CR 547
6	0 ft.	Lake St. George Dr./CR 577	Countryside Blvd./CR 720	Tampa Rd./CR 752
6	0 ft.	Lake Ave./CR 385	Alt Keene Rd./CR 395	Gulf to Bay/SR 60
5	≥120 ft.	Lake Ave./CR 375	Ulmerton Rd./SR 688	Donegan Rd./CR 376
6	0 ft.	Lakeview Rd./CR 488	Ft. Harrison Ave./SR 595	Hercules Ave./CR 425
5	≥120 ft.	Main St./CR 576	McMullen-Booth/CR 611	10th Ave. (Safety Harbor)
6	0 ft.	McMullen Rd./CR 434	Lake Ave./CR 375	Alt Keene Rd./CR 395
3	≥460 ft.	McMullen-Booth/CR 611	Gulf to Bay/SR 60	SR 580
2	≥680 ft.	McMullen-Booth/CR 611	SR 580	Tampa Rd./CR 752
6	0 ft.	Mehlenbacher Rd./CR 432	Indian Rocks Rd./CR 233	Clearwater-Largo/SR 595
4	≥240 ft.	Meres Blvd./CR 912	Florida Ave./CR 369	US Alt. 19/SR 595
6	0 ft.	Nebraska Ave./CR 776	US Alt. 19/SR 595	US Hwy. 19/SR 55
5	≥120 ft.	Nursery Rd./CR 474	Highland Ave./CR 375	US Hwy. 19/SR 55
5	≥120 ft.	Oakhurst Rd./137th/CR 233	74th Ave. N./CR 240	Walsingham Rd./SR 688
6	0 ft.	Old Ridge Rd./CR 313	74th Ave. N./CR 240	Walsingham Rd./CR 330
5	≥120 ft.	Omaha St./CR 1	Nebraska Ave./CR 776	Alderman Rd./CR 816

<b>Table 5-1 – Pinellas County Driveway Connection Spacing Inventory</b>				
Class*	Range	Road Name	From	To
5	≥120 ft.	Omaha St./CR 1	SR 580	Nebraska Ave./CR 776
6	0 ft.	Orange St./CR 377	US Alt. 19/SR 595	Pennsylvania Ave./CR 760
6	0 ft.	Palmetto St./CR 548	Highland Ave./CR 375	Saturn Ave.
5	≥120 ft.	Palmetto St./CR 550	Hercules Ave./CR 425	Belcher Rd./CR 501
5	≥120 ft.	Park Blvd./SR 694	140th St. N.	113th St. N./CR 321
4	≥240 ft.	Park Blvd./CR 694	113th St. N./CR 321	66th St. N./SR 693
2	≥680 ft.	Park Blvd./CR 694	Gulf Blvd./CR 699	140th St. N.
3	≥460 ft.	Park St./CR 1	Central Ave./CR 150	Park Blvd./CR 694
5	≥120 ft.	Pennsylvania Ave./CR 760	Orange St./CR 377	US Alt. 19/SR 595
6	0 ft.	Ponce de Leon Blvd./CR 456	Missouri Ave./SR 595	Hillcrest Ave.
6	0 ft.	Ponce de Leon Blvd./CR 456	Indian Rocks Rd./CR 233	US Alt. 19/SR 595
5	≥120 ft.	Ridge Rd./Clwtr-Largo/CR 321	Ulmerton Rd./SR 688	West Bay Dr./SR 686
3	≥460 ft.	Ridgemoor Blvd.	East Lake Rd./CR 611	Ridgemoor Dr.
5	≥120 ft.	Riverside Dr./CR 936	Tarpon Dr./Gulf Rd./CR 928	Spring Blvd./CR 936
4	≥240 ft.	San Martin Blvd./CR 823	Macoma Dr.	Gandy Blvd./SR 694
5	≥120 ft.	Starkey Rd./CR 1	Park Blvd./SR 694	94th Ave./CR 282
4	≥240 ft.	Sunset Point Rd./CR 576	Keene Rd./CR 1	McMullen-Booth/CR 611

<b>Table 5-1 – Pinellas County Driveway Connection Spacing Inventory</b>				
Class*	Range	Road Name	From	To
6	0 ft.	Sunset Point Rd./CR 576	US Alt. 19/SR 595	Keene Rd./CR 1
5	≥120 ft.	Sunset Point Rd./CR 576	US Alt. 19/SR 595	Keene Rd./CR 1
4	≥240 ft.	Tampa Rd./CR 752	US Alt. 19/SR 595	Curlew Rd./SR 586
5	≥120 ft.	Tampa Rd./CR 752	Orange St./CR 377	US Alt. 19/SR 595
4	≥240 ft.	Tarpon Lake Blvd./CR 619	East Lake Rd./CR 611	Lansbrook Pkwy/CR 619
6	≥0 ft.	Tarpon Woods Blvd./CR 814	East Lake Rd./CR 611	Ridgemoor Blvd.
6	0 ft.	Taylor-8th Ave./CR 400	Indian Rocks Rd./CR 233	Donegan Rd./CR 363
4	≥240 ft.	Treasure Island Cswy/CR 150	Gulf Blvd./CR 699	Park St./CR 1
2	≥680 ft.	Trinity Blvd./CR 996	East Lake Rd./CR 611	Pasco County Line
6	0 ft.	Union St./CR 600	Edgewater Dr./SR 595	Hercules Ave./CR 425
3	≥460 ft.	Village Center Dr./CR 838	Tarpon Lake Blvd./CR 619	East Lake Rd./CR 611
6	0 ft.	Virginia St./CR 632	Main St./SR 580	Keene Rd./CR 1
6	0 ft.	Virginia St./CR 618	Keene Rd./CR 1	Hercules Ave./CR 425
5	≥120 ft.	Walsingham Rd./CR 330	Ulmerton Rd./SR 688	US Alt. 19/SR 595
4	≥240 ft.	West Lake Rd./CR 537	Tampa Rd./CR 752	US Hwy. 19/SR 55
5	≥120 ft.	West Lake Rd./CR 537	Curlew Ext./CR 95	Tampa Rd./CR 752
5	≥120 ft.	West Bay Dr./CR 416	Indian Rocks Rd./CR 233	Clearwater-Largo/SR 595

**Table 5-1 – Pinellas County Driveway Connection Spacing Inventory**

Class*	Range	Road Name	From	To
5	≥120 ft.	Westlake Blvd./CR 439	Nebraska Ave./CR 776	Alderman Rd./CR 816
6	0 ft.	Whitcomb Blvd./CR 399	Meres Blvd./CR 912	Gulf Rd./CR 928
5	≥120 ft.	Whitney Rd./CR 575	Whitney Rd./CR 438	Haines Bayshore/CR 454
5	≥120 ft.	Whitney Rd./CR 438	US Hwy. 19/SR 55	58th St. N./CR 583
3	≥460 ft.	Woodfield Blvd.	Forelock Dr.	Keystone Rd./CR 582

To be used by Pinellas County as a guideline only. Other engineering and safety factors must be considered.

\*Class 1 Controlled Access Facility

\*Class 2 Driveway spacing must be greater than 680 feet

\*Class 3 Driveway spacing must be greater than 460 feet

\*Class 4 Driveway spacing must be greater than 240 feet

\*Class 5 Driveway spacing must be greater than 120 feet

\*Class 6 Driveway spacing must be greater than 0 feet

Class**	Range	Road Name	From	To
3	≥660 ft.	102nd Ave. N./CR 296	Hamlin Blvd./CR 213	US Alt. 19/SR 595
3	≥660 ft.	113th St. N-Ridge/CR 321	Welch Causeway/CR 666	8th Ave. SW/CR 400
3	≥660 ft.	118th Ave. N./CR 296	US Hwy. 19/SR 55	28th St. N./CR 683
3	≥660 ft.	28th St. N./CR 683	118th Ave. N./CR 296	Roosevelt Blvd./SR 686
1	>1320 ft.	49th St./CR 611	Roosevelt Blvd./SR 686	Gulf to Bay/SR 60
3	≥660 ft.	49th St./CR 611	38th Ave. N./CR 184	Roosevelt Blvd./SR 686
3	≥660 ft.	54th Ave. N./CR 202	Park St./CR 1	4th St. N./SR 687
3	≥660 ft.	Alderman Rd./CR 816	US Alt. 19/SR 595	US Hwy. 19/SR 55
3	≥660 ft.	Belcher Rd./CR 501	54th Ave. N./CR 202	Park Blvd./SR 694
3	≥660 ft.	Belcher Rd./CR 501	Palmetto St./CR 550	Klosterman Rd.
3	≥660 ft.	Belcher Rd./CR 501	Ulmerton Rd./SR 688	East Bay Dr./SR 686
2	≥990 ft.	Belcher Rd./CR 501	Park Blvd./SR 694	Ulmerton Rd./SR 688
3	≥660 ft.	Bryan Dairy Rd./CR 296	98th St./CR 373	66th St. N./SR 693

<b>Table 5-2 – Median Opening Spacing Roadway Inventory</b>				
Class**	Range	Road Name	From	To
1	>1320 ft.	Bryan Dairy Rd./CR 296	66th St./SR 693	US Hwy. 19/SR 55
4	≥330 ft.	Drew St./CR 528	NE Coachman Rd./SR 590	US Hwy. 19/SR 55
2	≥990 ft.	East Lake Rd./CR 611	Tampa Rd./CR 752	Pasco County Line
1	>1320 ft.	East-West Pkwy/NA	Tampa Rd./CR 752	Hillsborough County Line
3	≥660 ft.	Keene Rd./CR 1	Virginia St./CR 618	Curlew Rd./SR 586
3	≥660 ft.	Keystone Rd./CR 582	US Hwy. 19/SR 55	East Lake Rd./CR 611
3	≥660 ft.	Klosterman Rd./CR 880	US Alt. 19/SR 595	US Hwy. 19/SR 55
2	≥990 ft.	McMullen-Booth/CR 611	Gulf to Bay/SR 60	SR 580
2	≥990 ft.	McMullen-Booth/CR 611	SR 580	Tampa Rd./CR 752
3	≥660 ft.	Omaha St./CR 1	Nebraska Ave./CR 776	Alderman Rd./CR 816
3	≥660 ft.	Park Blvd./CR 694	Gulf Blvd./SR 699	66th St. N./SR 693
3	≥660 ft.	Park St./CR 1	Central Ave./CR 150	Park Blvd./CR 694
3	≥660 ft.	Ridgemoor Blvd./NA	East Lake Rd./CR 611	Ridgemoor Dr.

<b>Table 5-2 – Median Opening Spacing Roadway Inventory</b>				
Class**	Range	Road Name	From	To
3	≥660 ft.	Starkey Rd./CR 1	Park Blvd./SR 694	East Bay Dr./SR 686
4	≥330 ft.	Sunset Point Rd./CR 576	Keene Rd./CR 1	10th Ave./Safety Harbor
3	≥660 ft.	Tampa Rd./CR 752	US Alt. 19/SR 595	Curlew Rd./SR 586
3	≥660 ft.	Treasure Island Cswy/CR 150	Gulf Blvd./SR 699	Park St./CR 1
2	≥990 ft.	Trinity Blvd./CR 996	East Lake Rd./CR 611	Pasco County Line
<p>To be used by Pinellas County as a guideline only. Other engineering and safety factors must be considered.</p> <p>**Class 4 spacing of medians must be greater than 330 feet</p> <p>**Class 3 spacing of medians must be greater than 660 feet</p> <p>**Class 2 spacing of medians must be greater than 990 feet</p> <p>**Class 1 spacing of medians must be greater than 1,320 feet</p>				

## **CHAPTER 6 – SIDEWALK DESIGN**

### **6.1 GENERAL**

Sidewalks shall be constructed to meet the requirements set forth in:

- 6.1.1 Pinellas County Standard Details
- 6.1.2 Pinellas County Standard Technical Specifications for Roadway and General Construction
- 6.1.3 FDOT Design Manual
- 6.1.4 FDOT Standard Plans for Road Construction

All sidewalks must meet ADA requirements.

### **6.2 GEOMETRY**

- 6.2.1 All sidewalks are to be constructed at a thickness of 6 inches with 3,000 psi concrete.

### **6.3 CURB RAMPS**

Curb ramps shall be constructed per the following references:

- Arterial and Collector Roads – FDOT Standard Plans for Road Construction
- Residential Roads – Pinellas County Standard Details

### **6.4 DETECTABLE WARNING PADS**

The County's color preference for detectable warning pads is yellow.

## **CHAPTER 7 – BIKE FACILITY DESIGN**

### **7.1 GENERAL**

A bicycle facility shall be provided on all County collector and arterial roadways, except where contrary to public safety. A design variation is required when a bicycle facility cannot be provided or when criteria cannot be met.

Bicycle facilities shall follow criteria set forth in Chapter 223 of the FDOT Design Manual.

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## **CHAPTER 8 – TRAIL AND SHARED-USE PATH DESIGN**

### **8.1 GENERAL**

County trails and shared use paths shall conform to the standards set forth in Chapter 224 of the FDOT Design Manual.

### **8.2 TRAIL INTERSECTION CROSSING**

Refer to the standards set forth in Index 1365 of the Pinellas County Standard Details for signing and pavement marking details when intersecting a trail with a roadway.

## CHAPTER 9 – ROADWAY DESIGN

### 9.1 GENERAL

It is the County’s intent of this chapter to establish minimum construction standards for roadways and other transportation facilities to ensure the health, safety, and welfare for the people of Pinellas County. It is also intended to establish standards to ensure that facilities are constructed and maintained to ensure long-term durability. The County intends to follow industry construction standards while also recognizing new and comparable technologies for roadways construction.

### 9.2 DESIGN SPEEDS

Design speed shall be in accordance with the guidelines specified in the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook) and/or the FDOT Design Manual.

Refer to FDOT Speed Zoning for Highways, Roads and Streets in Florida for further considerations on setting the target speed based on classification and context.

Table 9-1 below lists typical design speeds for the corresponding functional classification of the facility. The design speed for any County roadway will be jointly approved by the County Engineer and the Public Works Transportation Division Director.

Road Classification	Allowable Design Speed Range
Residential Light Traffic	25 - 35 MPH
Residential Medium Traffic	30 - 40 MPH
Collector/ Minor Collector	45 - 50 MPH
Minor/ Principal Arterial	50 - 55 MPH

### 9.3 CROSS-SLOPE

Cross-slope shall be designed as specified in the Florida Greenbook unless otherwise specified.

Minimum pavement cross-slope for residential, collector, or arterial roadways shall be 2 feet per 100 feet (2.00%). Maximum cross-slope for all functional classifications shall be no greater than 4 feet per 100 feet (4.00%).

### 9.4 LANE WIDTHS

Lane widths shall be designed as specified in the Florida Greenbook and/or the FDOT Design Manual. Upon review, the County will decide which reference will be utilized.

Table 9-2 below lists minimum lane widths for the corresponding functional classification. The lane widths for any County roadway should not be less than set forth in the table unless approved by the County Engineer.

<b>Table 9-2: Minimum Lane Widths</b>	
Roadway Type	Minimum Lane Width
Residential Light Traffic	10'
Residential Medium Traffic	10'
Collector/ Minor Collector	11'
Minor/ Principal Arterial	12'

**9.5 TURN LANES**

General criteria for design of turn lanes are in Chapter 3, Section C.7, Table 3 – 10 of the Florida Greenbook and Chapter 212.6, Exhibit 212-1 of the latest edition of the FDOT Design Manual. Upon review, the County will decide which reference will be utilized.

**9.6 LANE TRANSITIONS**

Lane transitions shall be designed as specified in Chapter 3 of the Florida Greenbook and/or Chapter 212 of the FDOT Design Manual. Upon review, the County will decide which reference will be utilized.

**9.8 VERTICAL ALIGNMENT**

Vertical alignment shall be designed as specified in Chapter 3 of the Florida Greenbook and/or Chapter 210 of the FDOT Design Manual. Upon review, the County will decide which reference will be utilized.

Criteria for the vertical alignment of County roadway profile is in Chapter 3, Section C.5 of the Florida Greenbook. The profile must be designed such that the minimum roadway base clearance to the seasonal high groundwater table (SHGWT) at the low edge of pavement is 1.0 foot. The minimum edge of pavement elevation shall also be five feet above mean sea level, or the lowest edge of pavement shall be above the 25-year storm event as indicated in Section 3.5.4.4 of the Pinellas County Stormwater Manual, whichever is the more stringent.

**9.9 UNDERDRAINS**

Underdrains shall be considered on both sides of curbed and uncurbed roads wherever groundwater may potentially and deleteriously intrude into the roadway base. If minimum base clearance is unattainable non-granular bases and underdrain systems are to be evaluated on a project by project basis using geotechnical and SHWT data to determine an adequate solution to be approved by the County Engineer. Underdrains outfalling to inlets are to have inverts at or above the treatment volume elevation of receiving retention/detention ponds and/or lakes, or, alternatively, a separate, positive and adequate outfall is to be provided.

If the bottom of roadside swale ditches is less than 24 inches below the edge of the road surface, install underdrains, unless it can be demonstrated that groundwater and surface waters will not adversely impact the roadway base and will drain quickly. As an example, shallow collection and treatment swales may be adequate in areas where the predominate soils are well draining Type-A Hydrologic Soil Group (HSG) soils or have been confirmed to drain well through geotechnical testing.

Underdrain installation shall be per Pinellas County Standard Details for underdrain installation. Underdrain inspection boxes are required at the end of all runs that do not terminate in structures or maximum of 300-foot intervals. If the storm sewer system is less than 30 inches below the edge of pavement, a separate underdrain system with cleanout/inspection boxes shall be installed to an outfall greater than 30 inches in depth.

## 9.10 RETURN RADII

Minimum return radii are largely dependent upon the design vehicle. Confirm the turning movement of the design vehicle (i.e. large trucks or buses) in consideration for the intersection that is being designed. Return radii for residential County roadways must not be less than 15' regardless of the design vehicle. Return radii for collector and arterial County roadways must not be less than 25'.

## 9.11 ROADSIDE DESIGN

### 9.11.1 Clear Zone

Follow clear zone criteria set forth in Chapter 3, Section C.7.f of the Florida Greenbook.

### 9.11.2 Shoulders

Design all shoulders in accordance with Chapter 3, Section C.7.c of the Florida Greenbook.

### 9.11.3 Curbing

For County residential streets that require concrete curbing, design curbing in accordance with Pinellas County Standard Details, Index 1305 and 1315. Design curbing for County collectors and arterials in accordance with FDOT Standard Plans for Road Construction, Index 520-001. Conform to the FDOT Standard Specifications for Road and Bridge Construction for materials and installation on all curbing.

### 9.11.4 Medians

Design all medians in accordance with Chapter 3, Section C.7.e of the Florida Greenbook. Medians must be grassed and mulched and may contain trees or other vegetation in accordance with the landscaping standards of this manual as approved by the County.

## 9.12 INTERSECTIONS

General criteria for design of intersections is in Chapter 212 of the latest edition of the FDOT Design Manual and Chapter 3 C.9 of the Florida Greenbook.

### **9.13 ROUNDABOUTS**

Design County roundabouts in accordance with Section 213 of the FDOT Design Manual and NCHRP Report 672.

### **9.14 DRIVEWAYS AND TURNOUTS**

Design County residential driveways in accordance with Pinellas County Standard Details, Index 1340, 1345, and 1353. Design commercial driveways and residential driveways along County collector and arterial roadways in accordance with FDOT Standard Plans for Road Construction, Index 330-001 and Index 522-003.

## CHAPTER 10 – PAVEMENT DESIGN

### 10.1 GENERAL

The standards set forth in this section represent the minimum requirements that must be met for flexible and rigid pavement design for vehicular roadways in Pinellas County.

### 10.2 FUNCTIONAL CLASSIFICATION

The County separates minimum pavement structures for four functional classifications: Residential Light Traffic, Residential Medium Traffic, Collector/Minor Collector, and Minor/Principal Arterial.

10.2.1 Residential Light Traffic is characterized as low-volume suburban and rural residential neighborhoods.

10.2.2 Residential Medium Traffic is characterized as medium-volume, densely populated and urban residential neighborhoods. Both residential functional classifications typically have speed limits of 25 – 35 mph.

10.2.3 Collector/Minor Collector routes are characterized as high-volume roadways that connect residential and arterial roadways, as well as mobility and access to local establishments. Collector/Minor Collector routes typically have speed limits of 35 – 45 mph.

10.2.4 Minor/Principal Arterial roadways are characterized as high-volume, high-speed routes that connect cities and have longer distances. They can also provide direct access to abutting land uses. Minor/Principal Arterial roadways typically have posted speeds between 45 – 55 mph.

The Pinellas County Comprehensive Plan identifies the functional classifications of current and future roadways throughout Pinellas County. Links to the maps are provided at:

[http://www.pinellascounty.org/Plan/comp\\_plan/03trans/app-b/fig3-2.pdf](http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2.pdf)  
[http://www.pinellascounty.org/Plan/comp\\_plan/03trans/app-b/fig3-2a.pdf](http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2a.pdf)  
[http://www.pinellascounty.org/Plan/comp\\_plan/03trans/app-b/fig3-2b.pdf](http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2b.pdf)  
[http://www.pinellascounty.org/Plan/comp\\_plan/03trans/app-b/fig3-2c.pdf](http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2c.pdf)  
[http://www.pinellascounty.org/Plan/comp\\_plan/03trans/app-b/fig3-2d.pdf](http://www.pinellascounty.org/Plan/comp_plan/03trans/app-b/fig3-2d.pdf)

### 10.3 STRUCTURAL COEFFICIENT

Minimal composite structural coefficients for County roadways are as follows:

Residential Light Traffic – 2.46  
Residential Medium Traffic – 3.06  
Collector/Minor Collector – 3.28  
Minor/Principal Arterial – 4.17

More information on structural coefficients for different pavement layers can be found in the FDOT Flexible Pavement Design Manual, Table 5.4. Waivers and variances will be considered in accordance with FDOT's established process.

## 10.4 PAVEMENT STRUCTURE

### 10.4.1 Sub-Base

Specifications for Stabilized Sub-Base for all County roadways must meet the requirements of the current Pinellas County Standard Technical Specifications for Roadway and General Construction, and Section 160 of the latest edition of the FDOT Standard Specifications for Road and Bridge Construction. Sub-Base stabilization on all functional classifications, with exception to Residential Light Traffic, shall be minimum 12" Type B Stabilization with minimum LBR 40. This will provide a sub-base structural coefficient of 0.96 total. Residential Light Traffic shall have minimum 9" of Type B Stabilization with minimum LBR 40, which provides a sub-base structural coefficient of 0.72.

### 10.4.2. Base

Limerock is the standard base material for County roadways. Other base material will be considered by the County on a case-by-case basis. Meet the requirements of Section 200 of the latest edition of the FDOT Standard Specifications for Road and Bridge Construction. Minimum limerock base thickness for County roadways are as follows:

Residential Light Traffic – 6" (Min. LBR 100) (1.08 total structural coefficient)  
Residential Medium Traffic – 8" (Min. LBR 100) (1.44 total structural coefficient)  
Collector/Minor Collector – 8" (Min. LBR 100) (1.44 total structural coefficient)  
Minor/Principal Arterial – 10 ½" (Min. LBR 100) (1.89 total structural coefficient)

If the SHWT is one foot or less below the bottom of the base, crushed concrete or Type B-12.5 asphaltic base in the same optional base group as the limerock base thickness may be used. For information on optional base groups, refer to the FDOT Flexible Pavement Design Manual, Table 5.6.

### 10.4.3. Asphalt

All structural and friction asphalt courses must meet the requirements of Section 337 of the latest edition of the FDOT Standard Specifications for Road and Bridge Construction. Minimum requirements for asphalt surface courses are as follows:

Residential Light Traffic – Type SP-9.5, Traffic Level C (1 ½")  
Residential Medium Traffic – Type SP-9.5, Traffic Level C (1 ½")  
Collector/Minor Collector – Type SP-12.5, Traffic Level C (2")  
Minor/Principal Arterial – Type SP-12.5, Traffic Level C (3")

On high speed roadways, friction course may be added as approved and directed by the County Engineer.

#### 10.4.4. Concrete Pavement

All County roadways with proposed concrete pavement must meet the required criteria in the latest editions of the FDOT Rigid Pavement Design Manual, Section 350 of the FDOT Standard Specifications for Road and Bridge Construction, and FDOT Standard Plans for Road Construction, Index 350-001 and Index 446-001.

## **CHAPTER 11 – TRAFFIC CONTROL**

### **11.1 GENERAL**

A traffic control plan is required for all projects affecting County roadways and shall be included in the construction plans for County review.

All right-of-way use permits require a maintenance of traffic (MOT) plan. All plans shall be prepared by someone with an Advanced MOT certification and shall be approved by the County Traffic Engineer prior to implementation, unless in an emergency. The Advanced MOT certification shall be provided with the submittal to the County.

### **11.2 DESIGN**

Design the traffic control plan in accordance with Chapters 240, 241, 242, and 243 of the FDOT Design Manual and the Pinellas County Standard Technical Specifications for Roadway and General Construction.

### **11.3 LANE CLOSURES**

All lane closures must be approved by the County Traffic Engineer and a two-week advance notification is preferred for any work involving lane closures.

Coordinate with the County for acceptable lane closure times. When this information for collector and arterial lane closures cannot be provided by the County, calculate lane closure times in accordance with the FDOT Design Manual.

### **11.4 PEDESTRIAN AND BICYCLE FACILITY CLOSURES**

Temporary Traffic Control (TTC) plans must provide safe, continuous, and Americans with Disability Act (ADA) compliant routes for pedestrians, bicyclists, and transit users. Except on Limited Access facilities, all roadways are considered bikeways regardless of whether a bicycle-specific facility is present.

When existing bicycle/pedestrian facilities are closed or relocated in a TTC zone, the temporary facility or route must be detectable and include accessibility features consistent with the features present in the existing facility. Additional guidance can be found in Chapter 6D of the MUTCD.

## CHAPTER 12 – TRAFFIC SIGNS

### 12.1 GENERAL

Submit signing and pavement marking plans for the design of any County roadway or public facility that warrants proposed signage conforming to the criteria herein and the following publications:

- 12.1.1 FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook)
- 12.1.2 FDOT Design Manual
- 12.1.3 FDOT Standard Plans for Road Construction
- 12.1.4 FHWA Manual on Uniform Traffic Control Devices (MUTCD)
- 12.1.5 Pinellas County Standard Technical Specifications for Roadway and General Construction
- 12.1.6 Pinellas County Standard Details

### 12.2 ROADSIDE MEMORIAL POLICY

#### 12.2.1 Purpose

The purpose of this policy is to establish the guidelines for the placement of standardized roadside memorials for people that have died as a result of a motor vehicle, pedestrian or bicycle crash within County maintained right-of-way on segments of roadway in unincorporated Pinellas County.

#### 12.2.2 Authority

The County Transportation Division is responsible for the implementation of the Roadside Memorial Marker Program.

#### 12.2.3 Scope

The installation of a roadside memorial marker will be processed in accordance with the following:

##### 12.2.3.1 Request

Requests for a memorial marker shall be submitted in writing by filling out a Memorial Marker Request Form. The form is available by calling the County. Requests may be made by immediate family members or friends.

Requests from friends require written approval from the deceased's immediate family.

##### 12.2.3.2 Installation

Memorial markers will be designed, constructed and installed by the Pinellas County Public Works Department. The exact location will be at the discretion of Pinellas County.

Memorial markers will not be allowed within the limits of active construction work zones.

There shall be no activities while the memorial marker is in place that pose a safety hazard to the public or that violates any provision of Chapter 316 of the Florida Statutes concerning stopping, standing, parking, or obstruction of traffic on public roads.

The requesting citizen will be notified once the installation is complete.

#### 12.2.3.3 Time Period

Memorial markers will be allowed to remain in place for two years after installation unless earlier removal is necessitated by construction activities. After two years, the sign will be removed by County forces.

#### 12.2.3.4 Sign Design

The memorial marker shall be a 15" diameter aluminum sign with a white background and black letters.

The sign message will state 'Drive Safely – In memory', and the family will have the option of adding the deceased's name to the sign.

As an option, the County can offer an alternate safety message to the 'Drive Safely' legend if desired by the family that would be specific to the type of crash, and as long as it will fit on the sign. Examples could be 'Don't Drink and Drive', 'Buckle Up', 'Slow Down', 'Watch for Pedestrians', 'Watch for Bicycles', etc.

The sign will be mounted at a height of 3.5' (42") from the ground to the top of the sign.

#### 12.2.3.5 Cost

Pinellas County will incur the cost of design, construction, installation, maintenance, and removal of the memorial marker.

## **CHAPTER 13 – PAVEMENT MARKINGS**

### **13.1 GENERAL**

Pavement markings and materials shall meet all criteria listed herein, including applicable specifications contained in the latest edition of the following publications:

- 13.1.1 FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook)
- 13.1.2 Pinellas County Standard Technical Specifications for Roadway and General Construction
- 13.1.3 FDOT Standard Plans for Road Construction
- 13.1.4 Pinellas County Standard Details
  - 13.1.4.1 Index 1365: PCED Trail Intersection Crossing Detail

### **13.2 DESIGN**

All crosswalks are to be special emphasis. Alternative designs, based on context for high volume/activity area, will be considered as appropriate.

### **13.3 SUPPLEMENTAL CRITERIA**

- 13.3.1 All pavement striping and markings shall be alkaline base thermoplastic compound.
- 13.3.2 All bike facility symbols shall be pre-formed thermoplastic.
- 13.3.3 Raised pavement markers (RPMs) shall be included with all markings and shall use a bituminous adhesive material.

## CHAPTER 14 – TRAFFIC SIGNALS

### 14.1 GENERAL

Traffic signals provide regulatory traffic control for safe travel at conflict points and other locations along the road network. A design documentation package shall be included with any signal work. Signals should be designed to meet all criteria listed herein, including applicable specifications contained in the latest edition of the following publications:

- 14.1.1 FDOT Standard Specifications for Road and Bridge Construction
- 14.1.2 Pinellas County Standard Technical Specifications for Roadway and General Construction
- 14.1.3 Pinellas County Standard Details
- 14.1.4 FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook)
- 14.1.5 FDOT Design Manual
- 14.1.6 FDOT Standard Plans for Road Construction
- 14.1.7 FDOT Structures Manual
- 14.1.8 FDOT Traffic Engineering Manual
- 14.1.9 FHWA Manual on Uniform Traffic Control Devices (MUTCD)

### 14.2 SUPPLEMENTAL CRITERIA

Coordination with the County Transportation Division is required to determine the following signalization features on a case by case basis. All components shall be designed consistent with the Pinellas County Standard Details.

- 14.2.1 Vehicle Detection
- 14.2.2 Uninterrupted Power Supply (UPS)
- 14.2.3 Designing for future signal head and sign structure load
- 14.2.4 Pre-emption
- 14.2.5 Intersection Lighting
  - 14.2.5.1 County signalized intersections with existing lighting need to meet FDOT's current lighting criteria for horizontal and vertical foot-candle.
  - 14.2.5.2 Lighting cannot be wired to the signal cabinet for power. Lighting is required to use a separate disconnect or meter.

## **CHAPTER 15 – TRAFFIC SIGNAL RETIMING**

### **15.1 GENERAL REQUIREMENTS**

Contact the County's Traffic Control Center for existing timing information.

All timings shall be provided in Synchro. Electronic files of any timing analysis shall be provided to the County.

All clearance intervals shall be calculated in accordance with FDOT criteria.

## CHAPTER 16 – TRAFFIC CALMING

### 16.1 GENERAL

The intent of this chapter is to provide guidance on County-preferred traffic calming methods on all County roads. Traffic calming uses physical design and other traffic control measures to ensure lower speeds for motorists, and provide a more safe, compatible environment for pedestrians and cyclists. These features should be considered for facilities with higher volumes of bicyclists and pedestrians.

The County's Traffic Calming methods are contained in the ***Residential Traffic Management Program*** document. A copy can be obtained by contacting Public Works Traffic Engineering.

## **CHAPTER 17 – ROADWAY STREET LIGHTING**

### **17.1 GENERAL**

Roadway lighting offers significant safety benefits for drivers, and pedestrians alike and it may also assist in reducing crime. Street lighting shall meet all criteria listed herein, including applicable specifications contained in the latest edition of the following publications:

- 17.1.1 FDOT Design Manual
- 17.1.2 FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook)
- 17.1.3 FDOT Standard Plans for Road Construction
- 17.1.4 Pinellas County Standard Technical Specifications for Roadway and General Construction

### **17.2 ARTERIALS AND COLLECTORS**

- 17.2.1 Arterial and Collector roads shall follow the lighting criteria set forth in Chapter 231 of the FDOT Design Manual.
- 17.2.2 The County's streetlights on arterial and collector roads are maintained by either Public Works or Duke Energy.
- 17.2.3 All lighting needs will be determined by the County.

### **17.3 DESIGN**

Design work shall be coordinated with the local power company for the design and luminaire requirements. The local power company is responsible for the lighting maintenance.

### **17.4 RESIDENTIAL STREET LIGHTING**

Residential lighting should be requested through the County and follow the Pinellas County Street Lighting Districts Policy and Procedures for obtaining petitions from residents in favor of the addition of street lighting. Lighting request forms can be obtained at:

[http://www.pinellascounty.org/forms/street\\_light.htm](http://www.pinellascounty.org/forms/street_light.htm)

## **CHAPTER 18 – BRIDGE DESIGN**

### **18.1 DEFINITION**

A bridge is defined as a structure with a span greater than or equal to 20 feet between abutments, spring lines of arches, or inside faces of outboard stems for multiple cells. For spans within the range of 20 to 24 feet, a cost comparison will be made to determine if a bridge or culvert is cost effective. Structures with spans greater than 24 feet are designated as bridges.

The following items are not considered a bridge:

18.1.1 An individual pipe or series of pipes crossing a road.

18.1.2 Culverts with spans between inside faces of outboard stems of less than 20 feet.

### **18.2 STANDARDS AND SPECIFICATIONS**

Bridge design shall be in accordance with this manual and the following standards and specifications:

18.2.1 FDOT Design Manual, Chapter 121 and Chapter 260

18.2.2 No vehicular timber bridges are allowed.

### **18.3 TESTING**

Required testing reports shall be submitted to Public Works Construction Services and the Roadway and Bridge Maintenance Sections.

### **18.4 LICENSURE**

Bridge design calculations and plans shall be signed, sealed, and dated by a professional engineer licensed in the state of Florida who practices as a structural engineer.

### **18.5 BICYCLE AND PEDESTRIAN BRIDGES**

Bicycle and pedestrian bridges shall be designed in accordance with Chapter 266 of the FDOT Design Manual

All pedestrian overpasses over traffic shall be fenced with a minimum railing height for pedestrian walkways:

18.5.1 Pedestrians only: 3.5 feet

18.5.2 Pedestrians and bikes: 4.0 feet

Walkway grades and cross slopes shall not exceed 2%.

## CHAPTER 19 – LANDSCAPING

### 19.1 GENERAL

Landscape design, vegetation planting, and tree preservation shall comply with the rules and standards in accordance with the following reference manuals:

- 19.1.1 Pinellas County Land Development Code
- 19.1.2 Pinellas County Standard Technical Specifications for Roadway and General Construction
- 19.1.3 Pinellas County Standard Details Index 1111: Tree Protection
- 19.1.4 Pinellas County Stormwater Manual
- 19.1.5 FDOT Standard Plans for Road Construction
- 19.1.6 FDOT Design Manual Chapter 228
- 19.1.7 FDOT Florida Highway Landscape Guide
- 19.1.8 FDOT Rule Chapter 14-40 - Landscape Beautification and Conservation

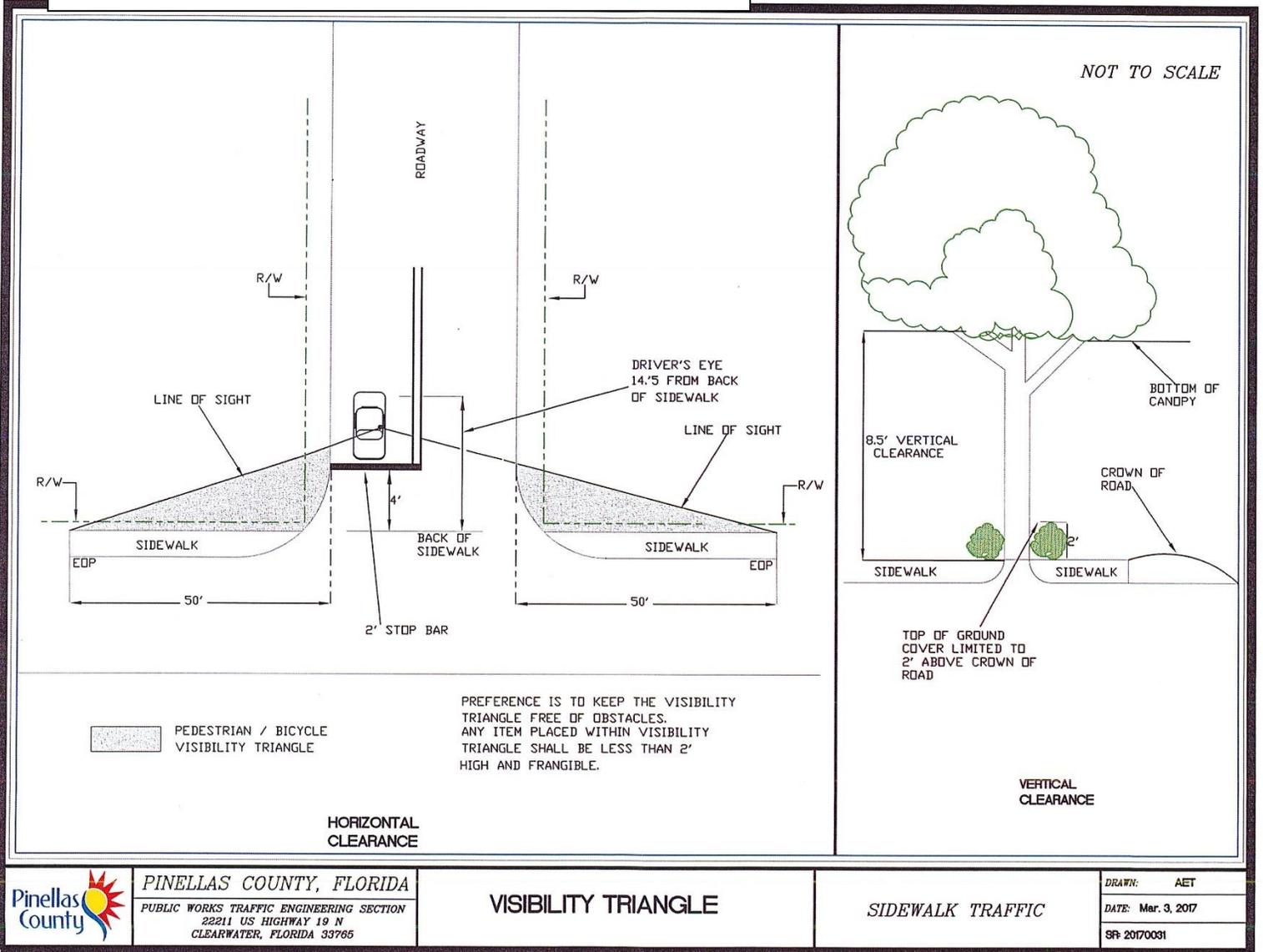
The most stringent design standard shall be used.

The preparation of landscape plans in Pinellas County shall be signed and sealed by a Florida registered Landscape Architect in conformance with Chapter 481 of the Florida Statutes.

Trees shall be preserved when not in conflict with the standards set forth in this manual.

All plantings within the clear zone must meet the County's sight line requirements as depicted in Figure 19-1 and have a trunk diameter at maturity of four inches or less when measured six inches above the ground.

**Figure 19-1 – Clear Zone for Roadway Landscaping**



PINELLAS COUNTY, FLORIDA  
PUBLIC WORKS TRAFFIC ENGINEERING SECTION  
22211 US HIGHWAY 19 N  
CLEARWATER, FLORIDA 33765

**VISIBILITY TRIANGLE**

**SIDEWALK TRAFFIC**

***Page Not Used***