

RURAL ROAD IMPROVEMENT STANDARDS
UPDATED FEBRUARY 2025

I. Table of Contents

I. PURPOSE AND APPLICABILITY 3

II. RELATIONSHIP TO OTHER TOWN-ADOPTED PLANS AND POLICIES 4

 COMPREHENSIVE PLAN 4

 UNIFIED LAND DEVELOPMENT CODE (ULDC) 4

 TOWN WIDE IMPROVEMENT STANDARDS 4

 TRAILS MASTER PLAN 4

III. DEFINITIONS 5

IV. GENERAL PROCESS 6

 Implementation of Rural Road Improvement Standards 6

 Capital Improvement Project Process 6

V. ROADWAY DESIGN 7

 STREET SECTIONS 7

 EQUESTRIAN TRAILS OR PATHS 7

 BIKEWAYS 7

 CENTER TURN LANES 7

 MEDIANS 8

 LANDSCAPE 8

 GUARDRAIL 8

 DRAINAGE 8

 TRAFFIC CALMING 8

 EXISTING CONDITIONS 9

VI. ROADWAY CLASSIFICATIONS The roadway classifications levels are identified as follows: 10

VII. INTERSECTION DESIGN 12

 INTERSECTION IMPROVEMENTS 12

 DRIVEWAY SEPARATION (NEW DRIVEWAYS ONLY) 12

 SIGHT TRIANGLES 12

 Cameras 13

VIII. INTERSECTION LIGHTING STANDARDS AND DESIGN 14

 LIGHTING SOURCES 14

 DARK SKY 14

 POLE HEIGHTS 14

 SHIELDS 14

IX. SPECIAL SIGNAGE 15

 AGRICULTURAL VEHICLE, LIVESTOCK, HORSE CROSSING, AND PEDESTRIAN 15

 SPECIAL SPEED LIMIT SIGNS 15

X. ROADWAY CONSTRUCTION SPECIFICATIONS 16

I. PURPOSE AND APPLICABILITY

The purpose of the Rural Road Improvement Standards is to establish unique road improvement design standards that are rural (rather than urban) in character for future road improvements in the designated Rural Residential area of the Town. The intent of the Rural Road Improvement Standards is to preserve and enhance the existing rural character of the Rural Residential Area consistent with the policy direction in the Comprehensive Plan. It is not the intent of these new design standards to change the planned roadway improvements outlined in the adopted Comprehensive Plan, but rather to affect the design and potentially construction timing of those future improvements to be more rural in character.

Once adopted by the Town Council, the Rural Road Improvement Standards shall apply to all future road improvements within the Town, including all new road widening and intersection improvements, as well as roadway paving and new road construction. These design standards shall also apply to previously approved road improvement projects within the Town that are not yet constructed or otherwise vested. For example, design specifications for intersection light standards outlined herein will be utilized on all public roadways where other intersection light fixtures have not already been purchased and/or placed.

The Rural Road Improvement Standards is a value-based approach for incremental (rather than ultimate) road improvements that solve specific traffic issues identified through periodic evaluations of traffic conditions. The Rural Road Improvement Standards document is based on principles of Context Sensitive Design. Under this policy, roads are not simply built to the projected ultimate improvement unless the actual demand exists. By phasing road improvements, the character of the rural residential area can be maintained.

II. RELATIONSHIP TO OTHER TOWN-ADOPTED PLANS AND POLICIES

COMPREHENSIVE PLAN

The Rural Road Improvement Standards implement the Comprehensive Plan goals, policies, and actions. These standards implement the provisions of the Future Land Use and Transportation Elements regarding the maintenance of features that create the rural character, including small local roadways and their functional characteristics and multiple use. Pursuant to State law, implementing documents must be consistent with the Town's adopted Comprehensive Plan.

UNIFIED LAND DEVELOPMENT CODE (ULDC)

The Rural Road Improvement Standards supplement the allowed use and development standards in the Town's adopted ULDC. Both documents are planning tools used by the Town to guide the physical form and function of the community consistent with the Comprehensive Plan. While most of the Town's ULDC regulations apply to land outside the public right-of-way, the rural roads Improvement standards focus on improvements within the public right-of-way. The ULDC does include special development standards for improvements within and adjacent to the right-of-way, including but not limited to access, fencing, special signage, and clear visibility requirements at the intersections of streets and driveways.

TOWN WIDE IMPROVEMENT STANDARDS

The Rural Road Improvement Standard document replaces the Districtwide Paving Analysis Report for design details associated with the Town's local roads, as defined in the Transportation Element of the Comprehensive Plan (Refer to Appendix A).

TRAILS MASTER PLAN

The Trails Master Plan is an expression of the Town's desire to have an exemplary off-street equestrian trail system that provides connectivity throughout the Town in order to offer recreational opportunities and an alternative method for transportation for Loxahatchee Groves residents. The Trails Master Plan discusses the use of off-street trails throughout the Town and is not part of this Rural Roads project since the Rural Road Improvement Standards focus on improvements in the right of way.

III. DEFINITIONS

Arterial streets - The arterial system carries the major portion of trips entering and leaving the urban area, as well as the majority of through movements. In addition, significant intra-area travel, such as between residential areas and commercial or business should be served by this system.

Average Daily Traffic (ADT) - The average of 24-hour traffic flows on a roadway segment (both directions) measured over multiple days, typically over a week or longer, measured under typical operating conditions excluding holidays, non-recurrent conditions (i.e., accidents), and times when schools are not in session.

Collector Streets - Provide both land access service and traffic circulation within residential neighborhoods, commercial and industrial areas. Collectors penetrate residential neighborhoods, distributing trips from the arterials through the area to the ultimate destination. Conversely, the collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system.

Context Sensitive Design – Tailoring roadway design to adjacent land use with sensitivity to community values and considers cultural, historic, environmental and economic as well as traffic issues. Community members and Town staff are involved in a collaborative process that includes people/stakeholders with diverse expertise in order to reach solutions.

Endangered or Threatened Plant Species – Landscaping that is endangered or threatened shall not be removed without permission of the landowner. The list of endangered or threatened species is found in the Florida Administrative Code Chapter 5B-40.0055 – Regulated Plant Index

Invasive Species – Landscaping that is found on the Noxious Weed List in the Florida Administrative Code 5B-57.007. These plants shall be removed from any property and properly disposed of when a project under the scope of these standards is constructed.

Local streets - Primary function is to provide direct access to abutting land and access to collector streets. It offers the lowest level of mobility.

Median - Generally raised and curbed area separating opposing lanes of traffic.

Native Landscaping - Landscaping that is native and does not contain ornamental plantings. A list of native landscaping can be found on the UF/IFAS Extension website at <https://gardeningolutions.ifas.ufl.edu/plants/ornamentals/native-plants/>

Off Street – Improvements that are not located in the public right of way

On-Street – Improvements that are located in the public right of way

Right of Way – A strip of land occupied or intended to be occupied by certain transportation and public use facilities such as roadways and utilities.

Roundabout – A roundabout is larger than a traffic circle and used to allocate right-of-way for competing movements.

Rural Road – A roadway that is located within the Rural Residential Area of the Town.

Traffic Circle – A traffic circle is used as a traffic calming device at intersections that typically fit within the existing curb line.

Traffic Control Device – Traffic control devices shall be defined as all signs, signals, markings, and other devices used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, pedestrian facility, or bikeway by authority of a public agency having jurisdiction.

IV. GENERAL PROCESS

Implementation of Rural Road Improvement Standards

The process for implementation of these Rural Road Improvement Standards is outlined in this document. Once the need for an improvement is identified, the Town will work with affected property owners and rural residents to discuss impacts and alternatives. Town Council will provide direction on the alternatives and the Capital Improvement Project Process outlined below will commence.

Capital Improvement Project Process

Roadway and intersection improvements are carried out by the Town Public Works Department and are listed as Capital Improvement Projects (CIP). Listed below are the steps of a CIP project.

1. Preliminary roadway evaluation to identify options, opportunities and constraints,
2. Employ the services of a surveyor to establish right-of-way, easement, or property lines so residents can visualize the improvement,
3. Community outreach meetings with affected property owners,
4. Preliminary project design, scope, and environmental evaluation,
5. Refine project design, scope, and environmental evaluation as needed to remain within budgetary constraints and proceed with certification,
6. Certification of the final preferred project,
7. Right-of-way engineering and negotiations-primarily with individual property owners,
8. Final design with more details in the defined right-of-way (e.g., landscape, lighting design, driveways) for review, comment, and approval by the Town Council after recommendations from the affected property owners,
9. Request bids for construction, award contract, and commence construction.

V. ROADWAY DESIGN

This section includes basic street typologies describing the range of public roads within the Rural Residential Area. The Rural Road Standards, identified as Table 1 Roadway Classifications, identifies the roadway design specifics for each of those road typologies. As stated in the Rural Roads Improvement Policy document, roadway widening shall occur when certain thresholds are met. The street sections shall be refined on a case-by-case basis for the preservation of trees. All roads will have minimal lane width with open drainage and native landscape. Roads within the Rural Residential Area will typically not include curb, gutter, or sidewalk. Except for demonstrated safety needs or for necessary tree preservation, there shall be no medians in the Rural Residential Area.

STREET SECTIONS

Roadways in the Rural Residential Area shall have a rural character that will include minimal lane widths. Roadway section standards are shown in the Rural Roads Standards table on page 9 of this document and include provisions for center turn lanes for improved access and safety.

EQUESTRIAN TRAILS OR PATHS

Horses and riders have the right-of-way on all local streets where equestrian trails are not presently available or accessible.

There may be places within the Rural Residential Area where equestrian trails or paths are necessary or desired (e.g., designated pedestrian access to schools and community facilities or commercial uses, connection to Townwide trail system). If included within the Rural Residential Area, paths shall be constructed with a surface such as compacted soil, shell rock, decomposed granite or other similar surface, that is appropriate for the intended use.

BIKEWAYS

Bike lanes and bike routes can be included as part of the roadways within the Rural Residential area as needed and as space permits. Bicycle circulation through the rural area will be provided with the use of bike routes and bike lanes for connectivity to Townwide trail system. Bike routes and bike lanes have been accounted for in the Rural Road Standards table in this document in the paved shoulder column.

CENTER TURN LANES

For the Rural Residential Area, use of center turn lanes will have a negligible effect on roadway capacity in the Town since the volume of turning traffic into and out of adjacent properties is low. However, the benefit of a center turn lane may be substantial for local residents that may have difficulty accessing their property. Consequently, center turn

lanes may be considered for implementation at any time to improve safety and convenience independent of intersection improvements. The need for center turn lanes will be determined on a case-by case basis.

MEDIANS

Except for demonstrated safety needs or for necessary tree preservation, there shall be no medians in the Rural Residential area. If needed for tree preservation, the inside travel lane (closest to the median) will be 12 feet and include a curb between the travel lane and median and will include curb cuts in order to facilitate drainage from around the tree.

LANDSCAPE

Rural roadways shall have native landscaping within the public right-of-way. Ornamental plantings will not be part of the project unless they are pre-existing. The landscaping will not be irrigated except as necessary for establishment. Healthy, viable trees shall be saved wherever possible. Exotic and Noxious plants shall be removed from the project area.

GUARDRAIL

Guardrails should be used along all roadways to protect drivers and vehicles from roadside hazards. Guardrails, when used, should be designed in accordance with FDOT Section 536 following the plans located in the FDOT Standard Plans Index 536.

DRAINAGE

Rural roadways shall include open swales for drainage. Native vegetation will be allowed to grow within the open swale as long as the vegetation does not reduce the efficiency of the swale or create a fire hazard. Swale width shall be the minimum necessary to accommodate the drainage requirements of the particular roadway and adjacent properties.

Roadside swales shall be designed and constructed as necessary to accommodate the drainage requirements of the particular roadway and adjacent properties. Roadway drainage improvements shall incorporate sound engineering practices to maintain the integrity of the roadway and the conveyance of storm water runoff.

TRAFFIC CALMING

There are many methods for traffic calming that can be employed by the Town. The Town standard is the Seminole style speed hump. The details for the traffic calming can be found in Appendix B. The design of this hump is as follows.

1. The total length of the speed hump is 22 foot in length;
2. The total elevation at the "table" section is 3.5";
3. The ramp length is 6 foot in length;

4. The flat section is 10 foot in length;
5. "Speed Hump" signs shall be placed immediately prior to start of the speed hump.
6. Within 150' foot of the base of the speed hump a "Bump Ahead" sign shall be placed.

EXISTING CONDITIONS

All current roads that are in service at the time of adoption of these standards are non-conforming roads that are considered in compliance with the standards at the time of the road's installation. As these roads are milled and overlaid or significantly improved, they will be required to be brought up to the current accepted standards.

VI. ROADWAY CLASSIFICATIONS The roadway classifications levels are identified as follows:

1. County and State Roads – Okeechobee Blvd and Southern Blvd - Okeechobee Blvd is classified as a County Road and the road surface is maintained by Palm Beach County. The signs and striping are maintained by the Town. Southern Blvd is a State Road, and the Town has no maintenance obligation for this road. The weight limit on County and State Roads is determined by the agency responsible per Florida Department of Transportation Guidance.
2. Service Level 1 – Throughfare Roads – B Rd, D Rd, and F Rd – These arterial roads are defined as “Principal public access from Town properties to both Okeechobee Blvd and Southern Blvd.” All service level 1 roads are a paved surface and stripped in accordance with the road paving guidance at the time of paving and striping. These roads should have a maintained drive width of at least 20 feet with a preferred width of 24 feet. The weight limit on service level 1 roads is 22,000 lbs.
3. Service Level 2 – Primary Roads – A Rd, C Rd, and E Rd – These arterial roads are defined as “Public access from Town properties to Okeechobee Blvd or Southern Blvd.” This includes the following lettered roadways A Rd, C Rd, and E Rd. The primary roads are usually at least a half mile in length and should have a maintained drive width of at least 18 feet with a preferred width of 24 feet. These roads are currently a combination of paved and unpaved surfaces. The weight limit on these roads is 22,000 lbs.
4. Service Level 3 – Subdivision Neighborhood Roads – Upper and Lower North Rd, Collecting Canal Rd, Compton Rd, Bryan Rd, Casey Rd, Marcella Rd, Tangerine Dr, E Citrus Rd, Gruber Ln, and 6th Ct N – These collector streets are defined as “Connector public access between two or more Service Level 1 or Service Level 2 roads.” These roads have a typical straight away length of at least one half a mile, servicing at least 12 lots. These roads should have a maintained drive width of at least 18 feet with a preferred width of 24 feet. These roads are a combination of paved and unpaved surfaces. The weight limit on these roads is 22,000 lbs.
5. Service Level 4 – Subdivision Non-Through Roads – These roads are defined as “Non-through public direct access to Town properties.” These roads are connected to service level 3 roads and are typically considered dead end roads. These roads should have a maintained drive width of at least 16 feet with a preferred width of 20 feet. These roads are a combination of paved and unpaved surfaces. The weight limit on these roads is 22,000 lbs.
6. Service Level 5 – Private Roads – These roads are defined as “Non-through

private direct access to Town properties.” The roads are considered and labeled as privately maintained subdivision roads. These roads are not built, paved, or maintained by the Town. Zoning code states the road surface for a private road shall be a minimum of 15 feet and will make the recommendation on the most efficient surface and manner to maintain the road. The weight limit on these roads are restricted to rating provided by the engineer of record who designed them.

Table 1 Roadway Classifications

Rural Road Classification	Lane Width (Minimum)	Paved Shoulder	Unpaved shoulder/transition	Roadside Ditch	Total Pavement Width	Turn Lane Width
Level 1 (>400 ADT)	10-ft	1 to 3-ft	1-ft	Open, varies	20 to 24-ft	11
Level 2 (<400 ADT)	10-ft	1 to 3-ft	1-ft	Open, varies	20 to 24-ft	0
Level 3	10-ft	1 to 3-ft	1-ft	Open, Varies	18 to 24-ft	0
Level 4	10-ft	1 to 3-ft	1-ft	Open, Varies	16 to 20-ft	0
Level 5	8	1 to 3-ft	1-ft	Open, Varies	15 to 20-ft	0
2-lane	11-ft	3 to 5-ft	3-ft	Open, Varies	28 to 32-ft	0
2-lane + center turn lane	11-ft	3 to 5-ft	3-ft	Open, Varies	40 to 44-ft	12-ft

VII. INTERSECTION DESIGN

Intersection improvements shall be phased and constructed as needed based on traffic counts. Intersections will be designed in keeping with the rural character of the area and shall not include curb, gutter, and sidewalks and will have only minimal safety lighting.

Phased Intersection improvements are based on traffic volumes. The intersection improvements are the maximum that would be made at an intersection. Once the threshold is met, the intersection will be evaluated to see if all the improvements listed are warranted.

INTERSECTION IMPROVEMENTS

Intersections shall not adversely affect nor alter or detract from the existing rural residential appearance, appeal, or quality of life. Improvements will include designs and scale that minimizes pavement and use of turn lanes whenever possible.

Luminaires may not be required on all four corners of an intersection. Lighting analysis software shall be used to determine the minimum number of luminaires required at an intersection to meet standard illumination requirements. Lighting requirements at specific intersections will be evaluated on a case-by-case basis.

The installation of curb, gutter, and sidewalk is not required and shall not be a part of the signalization of an intersection. Other options that may be considered when an intersection is signalized are placing signal poles farther from the edge of travel way, placing berms around signal poles or signal cabinets, and providing small pedestrian refuge areas at the edge of the road where a crosswalk is proposed.

DRIVEWAY SEPARATION (NEW DRIVEWAYS ONLY)

When existing driveways are near an intersection and their access is impacted by intersection improvements then a special evaluation is required. The Town will work with affected property owners to determine appropriate action to maintain property access. For new driveways, compliance with Section 100 of the Unified Land Development Code is required.

SIGHT TRIANGLES

The Town of Loxahatchee Groves has established Article 105-005 in regard to sight triangles at various intersection types.

1. *Intersection of driveway and street.* Where a driveway intersects a street, the triangular area of property on both sides of a driveway, measured 10 feet from the intersection, and on the street line, measured 10 feet from the intersection, shall form two legs of the sight distance triangle, and the third side being a line connecting the ends of the two other sides.
2. *Intersection of trail and street.* Where a trail intersects a street, the triangular area of property on both sides of a trail, measured 10 feet from the intersection, and on the street line, measured 10 feet from the intersection, shall form two legs of the sight distance triangle, and the third side being a line connecting the ends of the two other sides.
3. *Intersection of two streets.* Where two streets intersect, the triangular area of

property on all sides of the intersection measured 25 feet from the intersection, and on the street line, measured 25 feet from the intersection, shall form two legs of the sight distance triangle, and the third side being a line connecting the ends of the two other sides.

In addition to these requirements, properly located and designed driveways and intersections allow drivers to visualize oncoming traffic at the point where the driveway meets the road. Vegetation such as tree limbs, shrubbery, and bushes should be maintained at a level to promote adequate visibility. For all Town roads a proper sight distance of 335 feet should be maintained if you look to the left and 290 feet if looking to the right.

Cameras

The Town of Loxahatchee Groves has contracted the services of an automated speed detection system to detect and cite those driving in excess of the posted speed limit. These devices will be deployed in school zones to enforce school zone speed for the safety of our children and the pedestrian traffic who may be traversing these areas. Locations and associated fines are outlined by the ordinances passed by the Town Council. In addition to the speed detection cameras, the Town is deploying license plate reading cameras at critical intersections in cooperation with the Palm Beach County Sheriff's Office to assist law enforcement, providing safety and protection for our residents. The location of these cameras will be determined by Town Management through discussions with the Palm Beach County Sheriff's Office and the vendor. These cameras will be used exclusively by the aforementioned parties. Future locations will be considered as needed. Installations will be located at a minimum of 6 feet from the road edge if not protected by a curb or guardrail. The distance will be 2 feet if the camera is protected by a raised Type "D" or Type "F" curb or a guard rail.

VIII. INTERSECTION LIGHTING STANDARDS AND DESIGN

The least intrusive intersection lighting is to be considered when improvements are made at an intersection, where lighting is needed for safety reasons, or when a new intersection is constructed. Continuous roadway lighting is not to be installed. Computer software shall be used to calculate the optimum location, height, and spacing for alternative lighting solutions at each intersection. All lighting shall comply with Section 50-030 of the current edition of the Unified Land Development Code.

LIGHTING SOURCES

Energy efficient LED lighting is preferred due to the more natural color rendition and pure white light. LED fixtures are energy efficient and have a long service life. High pressure sodium or metal halide lamps are not permitted.

DARK SKY

To minimize trespass lighting to the skies, full cutoff luminaires are required. Full cutoff luminaires are designed so that they do not emit any light above 90 degrees, thereby reducing sky glow. Ensure the design results in good uniformity to improve visibility and minimize reflected light into the sky.

POLE HEIGHTS

The height of any outdoor lighting pole shall not exceed 25 feet per Section 50-030 of the current approved edition of the Unified Land Development Code.

SHIELDS

Use internal or external shields when necessary to minimize light trespass onto neighboring properties. Use of shields should be evaluated to ensure they do not impact the required intersection lighting levels.

IX. SPECIAL SIGNAGE

Signage can be used for many purposes in the Rural Residential Area. Signs can identify that a motorist is entering a Rural Residential Area as well as posting a speed limit for the area.

AGRICULTURAL VEHICLE, LIVESTOCK, HORSE CROSSING, AND PEDESTRIAN CROSSING SIGNS

Signs that indicate to motorists they are in a Rural Residential Area are encouraged. These signs may be used at appropriate locations in the Rural Residential area.

SPECIAL SPEED LIMIT SIGNS

Speed limit signs that utilize radar for detecting speed shall be used whenever possible in key locations along 2- and 4-lane arterials with Town approval.



W11-7



W11-5

X. ROADWAY CONSTRUCTION SPECIFICATIONS

1. Roadway Design Requirements

1.1 General Design Standards

- Follow AASHTO Green Book for geometric design principles.
- Adhere to FDOT SP-12.5 asphalt specifications for surfacing where applicable.

1.2 Geometric Design

Design Parameter	Specification
Design Speed	30 mph (based on road classification).
Design Weight	80,000 pounds
Roadway Width	Arterial and Collector Roads: 20' Min., 24' Preferred; Local Roads: 18' Min., 20' Preferred.
Shoulder Width	2 feet, Shell Rock preferred.
Stopping Sight Distance	As per AASHTO for selected design speed.
Cross Slope	2–4% to facilitate proper drainage.
Pavement Thickness	SP-12.5 asphalt, 2.5 inches thick on compacted base rock.
Base Layer	Minimum 10 inches of compacted limerock or shell rock base (LBR 100).
Subgrade Layer	12" Compacted Subgrade
Shoulder Cross Slope	4–6% to prevent water accumulation.

1.3 Road Surfacing

1. Asphalt Pavement:

- Material: SP-12.5 asphalt mix, as per FDOT Specifications.
- Thickness: Minimum 2.5 inches compacted thickness.
- Base: Minimum 10 inches of limerock or shell rock base (LBR 100) compacted to 98% maximum density per AASHTO T-180.
- Subgrade: Minimum 12 inches of compacted to 98% maximum density pre AASHTO T-180.

2. Shell Rock Roads:

- **Surface thickness: Minimum 8 inches of limerock or shell rock base (LBR 100) compacted to 98% maximum density per AASHTO T-180.**
- **Subgrade: Minimum 12 inches of compacted to 98% maximum density pre AASHTO T-180.**
- **Gradation: base to 1-12 shell to ensure load-bearing and minimal dust.**

2. Roadway Drainage Specifications

2.1 Roadway Drainage Principles

- **Effective drainage is essential for rural road longevity and safety.**
- **Get water off the road quickly and avoid water running lengthwise along the road.**

2.2 Cross Slope and Road Crown

- **Cross Slope:**
 - **Asphalt Roads: 2–4% slope.**
 - **Shell Rock Roads: 4–6% slope to allow for water runoff.**
- **Crown: Maintain a consistent crown to ensure water dispersal to shoulders and ditches.**

2.3 Shoulders and Ditches

1. Shoulders:

- **Width: 2–4 feet, surfaced with Shell Rock or compacted soil.**
- **Cross Slope: 4–6% for proper drainage.**

2. Ditches:

- **Slope:**
 - **2:1 for stable soils.**
 - **3:1 for erodible soils or where safety concerns exist.**
- **Depth: Minimum 18–24 inches below the road surface.**
- **Lining:**
 - **Grass-lined for non-erosive flows (less than 2 ft/sec).**
 - **Stone or riprap-lined for erosive or high-velocity flows.**

3. Ditch Maintenance:

- **Regular cleaning to remove obstructing sediment and vegetation.**

- **Avoid direct discharge into canals—use vegetated buffers or turnouts.**

2.4 Culverts and Stream Crossings

1. Culverts:

- **Material: Corrugated Aluminum pipe (CAP) reinforced concrete pipe (RCP), or Advanced Drainage Systems ADS-HP pipe.**
- **Minimum Diameter: 18 inches.**
- **Design Capacity: Accommodate 100-year storm flows with debris allowance.**
- **Placement: Ensure proper bedding and alignment to prevent erosion.**
- **Reinforced concrete pipe must include a headwall at any otherwise unsupported ends**

2. Low-Water Crossings:

- **For low-flow swales with minimal environmental impact.**
- **Surface: Reinforced concrete or riprap for erosion resistance.**

3. Headwalls:

- **Install concrete or riprap headwalls to stabilize culverts where pipes penetrate the sloped ground surface**

2.5 Roadside Drainage Structures

- **Swales: Grass-lined or stone-lined swales for low-velocity runoff.**
- **Turnouts: Divert water away from ditches into vegetated areas to reduce erosion.**
- **Energy Dissipation: Use riprap aprons or plunge pools at culvert outlets.**
- **Catch basin: collect runoff where necessary and install culvert connection to receiving canal**

3. Safety Features

- **Signage and Markings: Comply with MUTCD standards for rural roads.**
- **Clear Zones: Maintain a 10-foot recovery area where feasible.**
- **Pavement Markings:**
 - **Centerlines: Required for roads >20' and with traffic >400 vehicles/day.**
 - **Edge lines: Recommended for all paved roads >20'.**

4. Maintenance and Rehabilitation

1. Paved Roads (SP-12.5 Asphalt):

- **Crack Sealing:** Annually for cracks >1/4 inch wide.
- **Patching:** Use hot mix asphalt for potholes and localized failures.
- **Overlays:** Apply 1–2 inches of new asphalt every 8–12 years based on traffic load.

2. Shell Rock Roads:

- **Grading:** Grade monthly to maintain cross slope and crown.
- **Re-Shell Rocking:** Add new aggregate every 2–3 years or as needed.

3. Drainage Systems:

- **Clean ditches and culverts annually to ensure unobstructed flow.**
- **Stabilize eroded areas with vegetation or stone as needed.**
- **Take advantage of natural slopes and well-drained subgrade when possible to promote safe and efficient collection and removal of water from roadways and reduce saturation of roadway and base materials**

5. Environmental and Cost Considerations

- **Design roads to minimize environmental impact, avoiding wetlands and flood-prone areas.**
- **Use erosion control measures such as grassed swales, riprap, and sediment basins.**
- **Balance cost and performance using locally sourced materials for subbase and surfacing.**

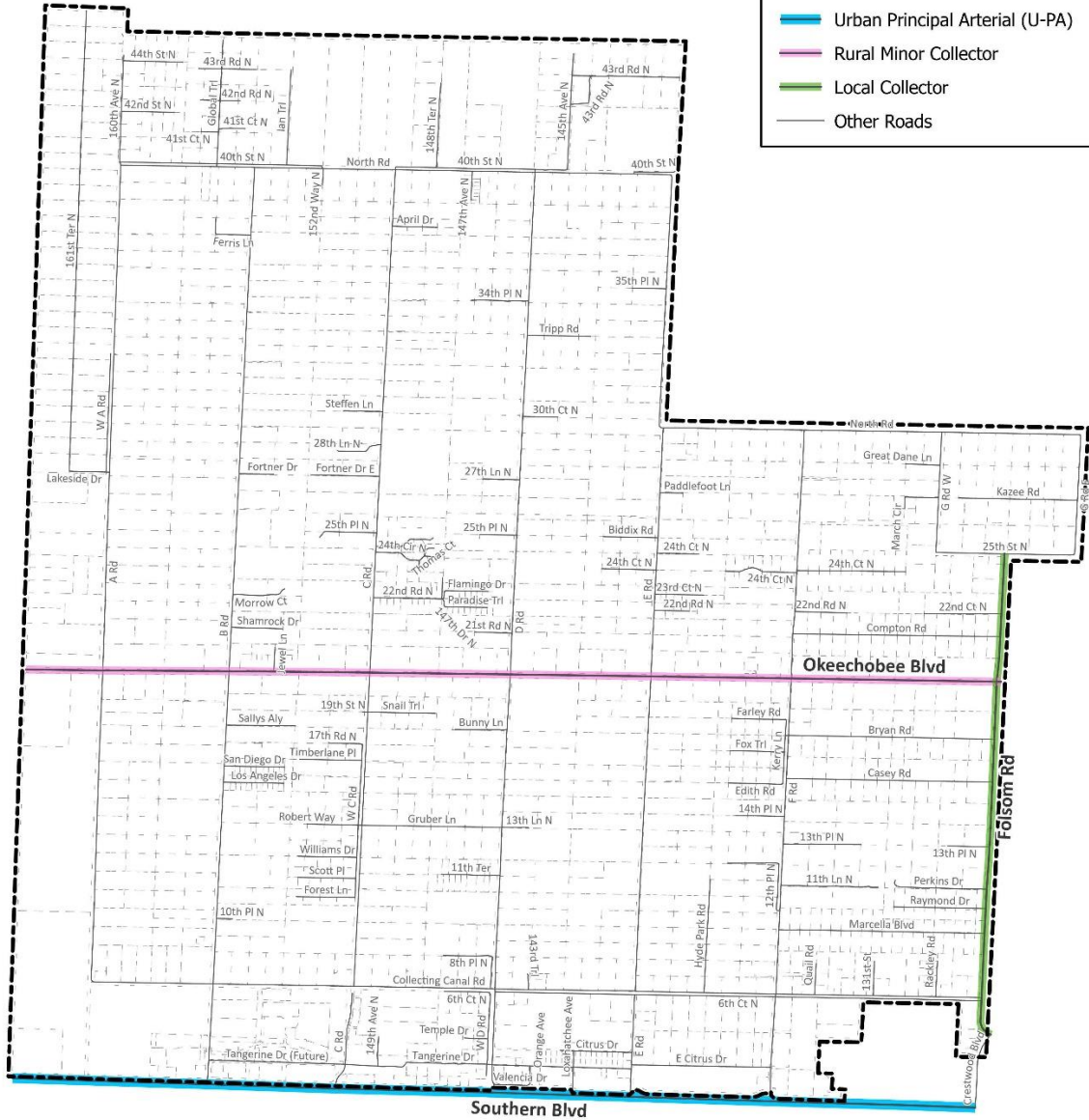
APPENDIX A



**LOXAHATCHEE
GROVES
FLORIDA**

MAP TRN-1 - Major Roads Functional Classification Map

- Municipal Boundaries
- Parcels
- Functional Classification**
- Urban Principal Arterial (U-PA)
- Rural Minor Collector
- Local Collector
- Other Roads



Source: 2023 Town of Loxahatchee
Municipal Boundaries and Roads;
County Property Appraiser Parcels

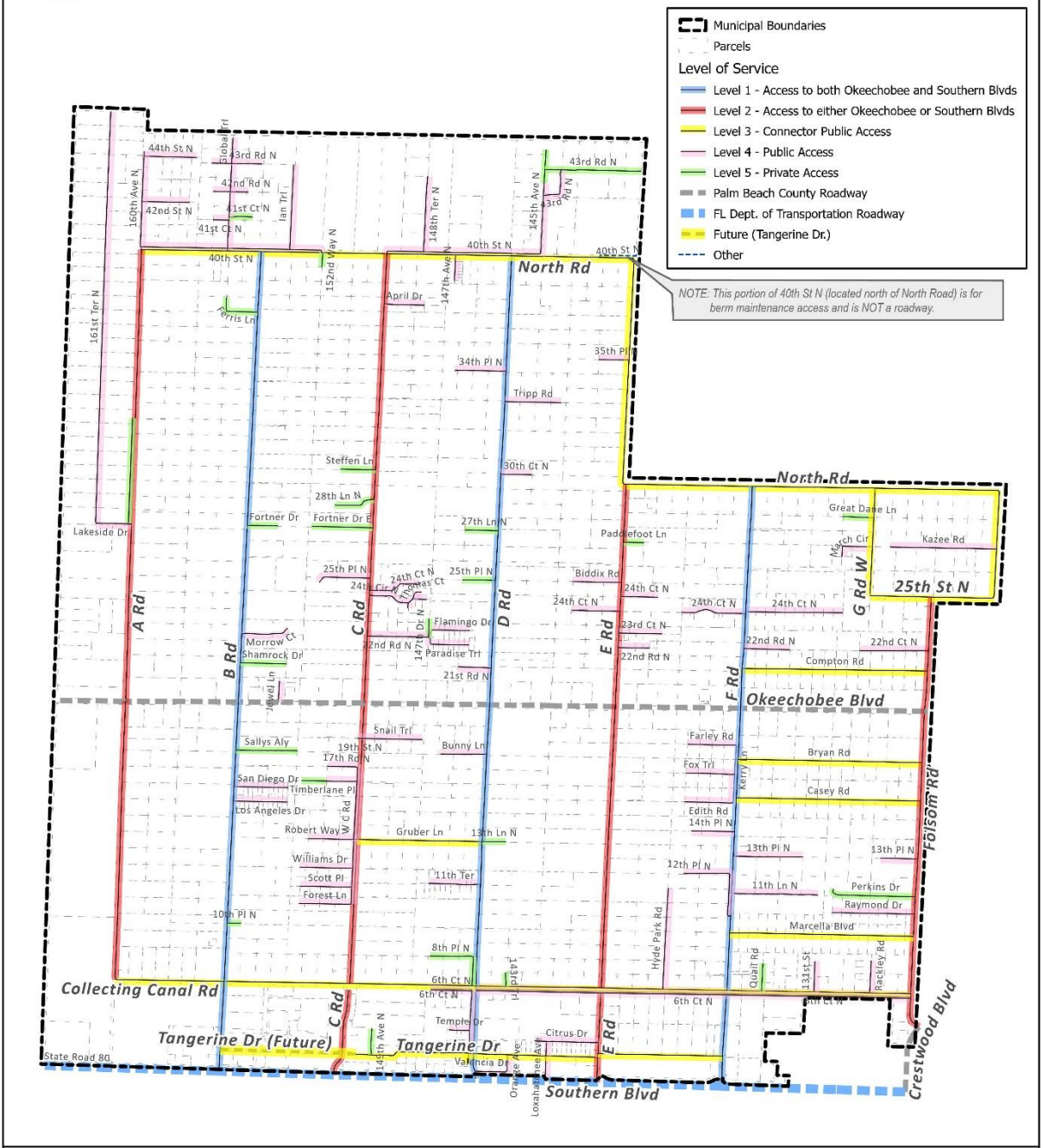


0 0.5 1 Miles





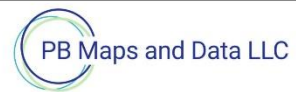
MAP TRN-2 - Local Roads Classification Map



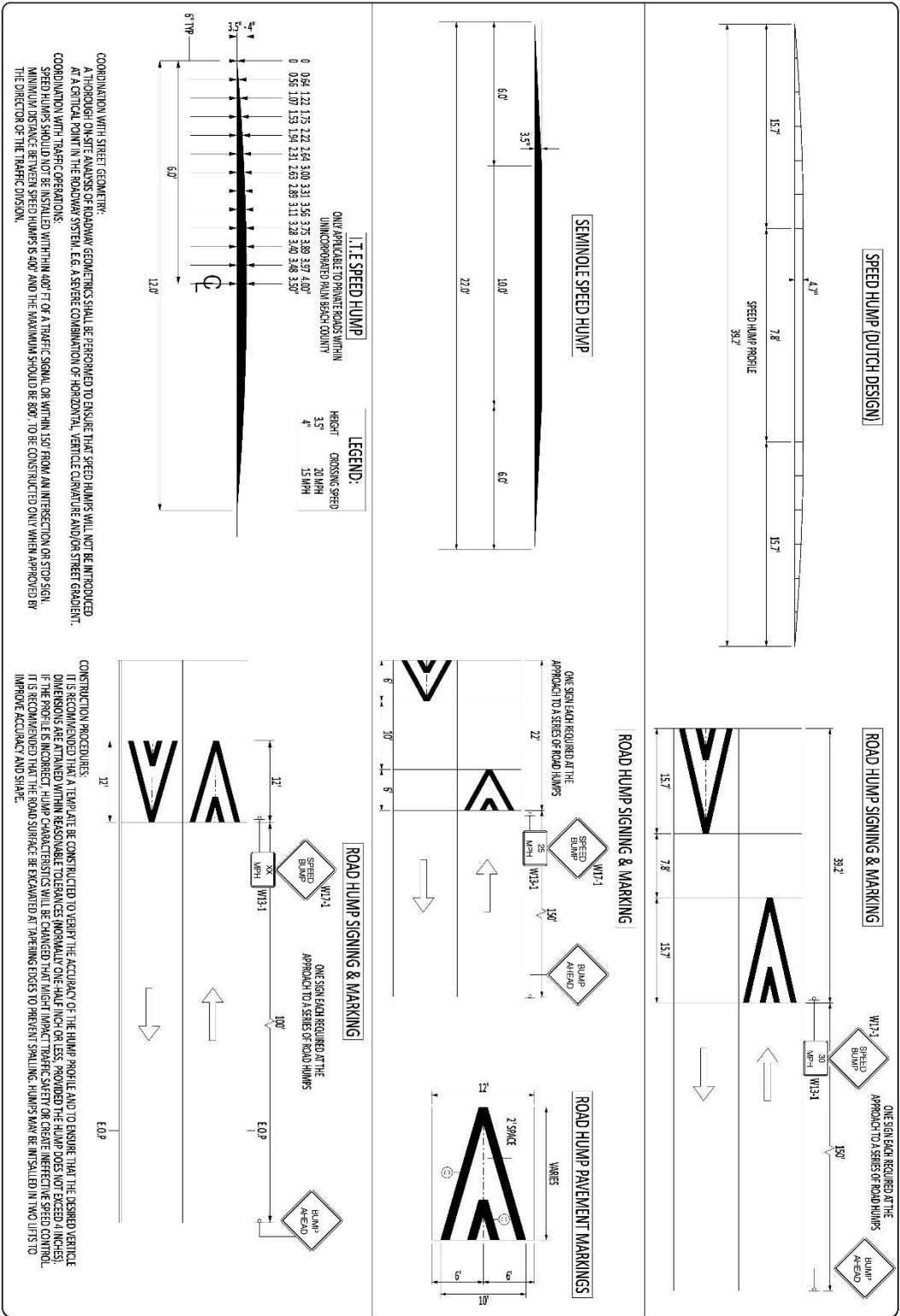
Source: 2023 Town of Loxahatchee Municipal Boundaries and Roads; County Property Appraiser Parcels



0 0.5 1 Miles



APPENDIX B



	PROJECT:	ROAD SPEED HUMP DETAILS
	SCALE:	NTS
APPROVED:	DATE:	7/15/24
DRAWN:	DATE:	7/15/24
CHECKED:	DATE:	7/15/24
NO.	REVISION	BY
DATE		
SHEET: 7 OF: 12 T-P-24		