



FLORIDA'S TURNPIKE ENTERPRISE LANDSCAPE PROGRAM MASTER PLAN



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EXECUTIVE SUMMARY

In order to achieve a successful, predictable and efficient Landscape Program, Florida's Turnpike Enterprise (FTE) has developed this Landscape Master Plan (Plan). The plan coalesces many of the policies and procedures already being utilized into a comprehensive approach to managing the FTE Landscape Program. The plan is comprised of several sections which outline the vision, design philosophy, work program, technical criteria and performance monitoring metrics, all necessary for the implementation of a successful Landscape Program.

Consistent with the Departmental Mission, the FTE Landscape Vision is, **"To Promote Safe, Cost Efficient, Environmentally Responsible Landscapes Which Attract and Grow Business"**. Components of this Master Plan serve to provide specific guidance beyond statewide standards for the development of landscape projects within the FTE highway systems. The goal is to establish a comprehensive management system, design approach and guidelines which will assist with the implementation of landscape projects to provide long-term value for FTE and its customers.



LANDSCAPE PROGRAM ORGANIZATION

The FTE Landscape Program is managed by the District Landscape Architect under the Transportation Development Section. The District Landscape Architect is supported by in-house staff who develop concepts, and a General Design Consultant who is primarily responsible for the development of the landscape working drawings.

Landscape working drawings can be prepared in several distinct ways. Stand-alone independent landscape plans are projects which do not necessarily follow or are 'tied to' roadway construction projects. Stand alone dependent landscape plans are produced as part of new roadway projects however, these are separate projects and are usually let independently or as a goes-with project. Landscape projects which are included as part of the roadway construction project are considered incidental and cannot exceed the lesser of \$100,000 or 10% of the preliminary cost estimate.

Each have specific, unique preparation and contractual obligations which are defined in Section Three of the Master Plan. Stand alone landscape projects are let for bidding and are maintained by the Operations and Maintenance Section. Coordination between these sections occurs at mean levels and is essential to a successful landscape program and projects.



MASTER PLAN ORGANIZATION

The Master Plan is organized into six main sections with an Executive Summary. The Executive Summary explains the purpose of the Plan; the first section, **Controlling Criteria**, provides an overview of the Federal, State, Departmental and FTE governing policies and procedures to which the program must adhere; the second section, **Design Philosophy**, identifies components of project planning and guides the development of our landscapes; the third section, **Context**, describes the overall system and specific system features which are unique to FTE; the fourth section, **Project Planning and Design**, identifies the design processes which are critical for maintaining consistency and delivering successful landscape projects; The fifth section, **Landscape Work Program**, contains an explanation of the methodology by which projects are selected and the current five year work program; The final section, **Resources**, contains procedures, templates, examples, checklists, and links to outside resources that serve as references to consultants as they perform work for FTE’s Landscape Program.



CONTROLLING CRITERIA

The FTE Landscape Program has been developed in accordance with and must comply with numerous Federal, State and Departmental criteria which are shown below.

GOVERNING POLICIES

ARTICLE II, SECTION 7(A), FLORIDA CONSTITUTION

"It shall be the policy of the state to conserve and protect its natural resources and scenic beauty."

SECTION 334.044 (26) FLORIDA STATUTES

"The department shall have the powers and duties to...conserve the natural roadside growth and scenery; and to provide for the implementation and maintenance of roadside conservation, enhancement, and stabilization programs. No less than 1.5 percent of the amount contracted for construction projects shall be allocated by the department for the purchase of plant materials...."

FDOT MISSION STATEMENT

"The department will provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of our environment and communities."



FDOT POLICY TOPIC NO. : 000-650-011-D

"It is the policy of the Florida Department of Transportation to conserve, protect, restore and enhance Florida's natural resources and scenic beauty when constructing and maintaining the State Highway System."

UNDER THIS POLICY, FLORIDA CAN HAVE:

- » The nation's most beautiful highways that attract and grow business.
- » Safe roadsides that are durable as well as ecologically and economically sustainable.
- » Measurable returns on investments that grow in value over time.

IN CARRYING OUT THIS POLICY, THE DEPARTMENT WILL:

- » Make highway beautification everyone's business.
- » Accommodate existing and proposed trees and other long-lived plants by consistently integrating landscape conservation and highway beautification into the processes that are used to plan, design, construct, and maintain roadways.
- » Utilize design strategies that enhance Florida's distinctive sense of place, create lasting curb appeal, minimize cost, conserve, and maintain high quality landscapes.
- » Accept responsibility for maintenance of the state's highest priority landscapes, as established by the Department, when necessary to implement this policy.
- » Develop and implement a system to track costs and accomplishments of progress contributing to highway beautification.



DESIGN PHILOSOPHY

FTE's landscape design philosophy incorporates landscape beautification and conservation values. Our focus as a program has shifted away from the "bold vision" design approach characterized by designing beautification projects using many large signature palms and few, if any, shrubs and returned to its historical roots of developing sustainable native landscapes. The FTE landscape program limits high intensity landscapes to landmark destinations and focuses on healing native landscapes and developing opportunities to incorporate ecosystem services enhancing and conserving Florida's natural environment.

While important, aesthetics is only part of the complex equation for producing responsible landscapes within the FTE highway system. Turnpike landscapes must also be called upon to modulate traffic behavior, stabilize steep erodible embankments, screen or emphasize views, provide environmental services, mitigate the effects of pavement and other man-made structures on the environment and minimize maintenance needs. Therefore, in keeping with the mandate issued by Department Policy Topic No. 000-650-011c, "Highway Beautification" future landscapes will provide a balance of high intensity landscapes and native or naturalistic plantings.



LANDSCAPE INTENSITY

Each project must develop a landscape hierarchy based on the level of aesthetic impact and corresponding maintenance requirements. Intensity areas are to be designated as High Intensity, Moderate Intensity, and Low Intensity. High Intensity landscape areas are limited to no more than 25% of the project area. Moderate Intensity areas are limited to no more than 50% of the project area and Low Intensity areas must comprise a minimum of 50% of the project area.



LOW INTENSITY

Low intensity areas are intended to be native or naturalistic plantings utilized for screening a view, ecosystem restoration, or as a backdrop to specimen landscapes. These low intensity areas will accordingly require less long-term maintenance.



Low Intensity areas (buffers, sustainable landscape areas, or reforestation) and non-landscaped areas (storm water management, limits of horizontal clearance, etc.) make up 50% minimum of the project area.

LOW INTENSITY STRATEGIES:

- » Landscape Buffers
- » Sustainable Landscape Areas
- » Reforestation
- » Slope Stabilization



MODERATE INTENSITY

Moderate level landscapes require a balanced level of maintenance, to include reduced mowing, pruning, pest control, and fertilization.

Moderate intensity landscape areas shall consist of plantings complementing High Intensity landscapes, providing a variety of color and texture, slope stabilization and other functional or aesthetic aspects.



HIGH INTENSITY

High Intensity landscape areas are designed for maximum aesthetic appeal and will generally require the most intensive maintenance. Although typically designed to include flowering plants and exotic palms, High Intensity areas can also be designed utilizing very large native species to achieve maximum aesthetics.

High Intensity landscape areas are located in the most visible focal points usually at overpass embankments, infield gore areas, and gantry sites for maximum aesthetic impact



It is intended that the high intensity landscape areas comprise no more than 25% of the total landscape for each project.

KEY HIGH INTENSITY USES

- » **Focal Points**
- » **Gateways**
- » **Gore Areas**



PLANT DIVERSITY GOALS

Species Diversification is a prudent goal for the establishment of man-made and managed ecosystems. Species diversification is a natural, low impact means to mitigate the potential negative effects of blight, insect infestation, and fire threat and other potentially harmful threats. It is also a means to broaden the overall aesthetic of any particular landscape providing for a range of color, texture and bloom time.

Create landscapes that have an uneven aged mix of no more than 10 percent of the same species, 20 percent of the same genus, and 30 percent of the same family.

» Landscape Design:

FDM 228: <https://www.fdot.gov/roadway/fdm/default.shtm>

Mitigating the potential negative effects of monoculture (lack of species diversification) is also a prudent method of protecting the investment in green infrastructure FDOT makes. A modern example of the negative effects of monoculture is the near entire loss of the urban forest canopy of most towns and cities throughout the northeast and midwest due the Dutch Elm Disease. This scenario has also played out here in Florida with the recent discovery of the Texas Phoenix Palm Disease which has affected several roadway landscape projects with devastating results.



THE IMPORTANCE OF USING INDIGENOUS SPECIES

Native vs. Indigenous – While we generally refer to the use of Native plants in our landscape projects, it is important to match the species to the ecosystem in which they are being planted. This insures that the landscape project will have a greater chance of success. It also means that the species selection will support the ecosystem in which it is planted. The use of Native plants is to be commended however, they should also be endemic to the surrounding ecosystem to ensure the best results.

In biogeography, a species is defined as native (or indigenous) to a given region or ecosystem if its presence in that region is the result of only natural processes, with no human intervention. Every natural organism (as opposed to a domesticated organism) has its own natural range of distribution in which it is regarded as native. Outside this native range, a species may be introduced by human activity; it is then referred to as an introduced species within the regions where it was anthropogenically introduced.

An indigenous species is not necessarily endemic. In biology and ecology, endemic means exclusively native to the biota of a specific place. An indigenous species may occur in areas other than the one under consideration.



ECOSYSTEM SERVICES

INTRODUCTION

This document outlines a policy, process and means for tracking Ecosystem Services in accordance with current Federal, State and Department policies.

- » Florida Statutes 334.044 (26) states “It is the policy of the Florida Department of Transportation to conserve, protect, restore and enhance Florida’s natural resources and scenic beauty when constructing and maintaining the State Highway System. FDOT policy requires FTE to develop a landscape program that: Provides safe roadsides that are durable, and ecologically and economically sustainable.
- » Develops measurable returns on investments that grow in value over time.
- » Accommodate existing and proposed trees and other long-lived plants by consistently integrating landscape conservation and highway beautification into the processes that are used to plan, design, construct, and maintain roadways.
- » Develop and implement a system to track costs and accomplishments of programs contributing to highway beautification.”



Ecosystem services are defined as the many and varied benefits to humans gifted by the natural environment and from healthy ecosystems. Ecosystems functioning in healthy relationship, offer such things like natural pollination of crops, clean air, clean water, resilience and productivity of food crops, extreme weather mitigation, human mental and physical well-being.

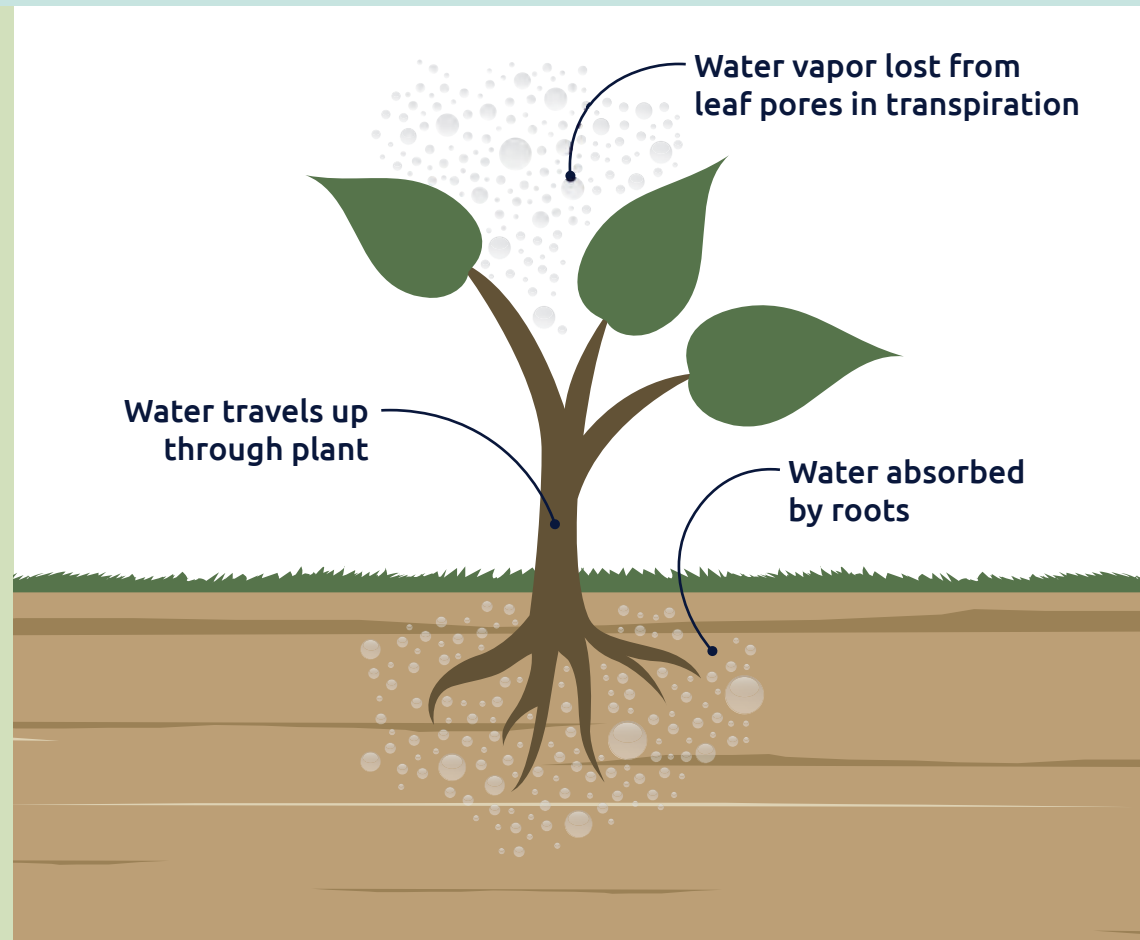
In order to support the Department’s Policy the FTE Landscape Program adheres to the following nature based design solutions and post-project monitoring strategies:

- » Inventory and analyze the current state of ecosystem services along the FTE roadway system.
- » Identify existing healthy ecosystems throughout the FTE system for the purpose of ecosystem conservation and preservation.
- » Utilize nature-based design solutions to establish sustainable landscape areas utilizing techniques such as reforestation; implementation of natural systems stormwater management infrastructure; and diversification of native plant species. These solutions should result in measurable benefits such soil conservation, decreased mowable areas and frequencies, increased pollinator and avian forage areas, heat island mitigation, and carbon sequestration.
- » Program landscape projects with a focus on increasing and improving ecosystem services throughout the system.
- » Implement a scoring system that tracks measurable goals such as restoring and increasing the acreage of natural ecosystems along the FTE system which will result in maintenance cost savings due to their implementation.
- » Maintain an ecosystem services inventory updated post construction and monitored during the maintenance phase of the project.



Not all ecosystem benefits accrue to FTE landscapes. Accordingly, we will focus on the following benefits:

- » **Regulating Services** such as climate, water, and disease regulation (plant diseases) as well as pollination;
- » **Supporting Services** such as soil formation and nutrient cycling; and
- » **Cultural Services** such as educational, aesthetic, and cultural heritage values as well as recreation and tourism.



ECOSYSTEM SERVICES MONITORING METHODOLOGY

Based on Departmental policy, both Quantitative and Qualitative data will be recorded and analyzed to establish current Ecosystem Services and the impact of improvements over time. The core elements of measurement include environmental quality, social factors, and economic impact.

The FTE Landscape Program only applies analysis and monitoring of the roadside areas within its domain and relevant categories.

Figure. FTE Landscape Program – Ecosystems Monitoring

CRITERIA	CATEGORY	GOAL
Economic	Maintenance Cost Containment	Decrease maintenance cost per acre
	Monetary Contributions	Increase return on investment
Environmental	Conservation/Preservation	Preserve existing vegetation and ecology
	Stormwater Management	Reduce gray stormwater infrastructure systems
	Sustainable Landscape Areas	Introduce Sustainable Landscape Areas to system
	Reforestation	Increase reforested acreage
	Carbon Sequestration	Increase tons of sequestered carbon
	Species Diversity	Increase diversity of species
	Heat Island Mitigation	Remove heat islands from FTE system



COMPONENTS OF FTE ECOSYSTEM SERVICES DESIGN AND MONITORING

MAINTENANCE COST CONTAINMENT

Departmental policy focuses on containing maintenance costs for landscape. The intent of each new landscape project will be to develop a system with lower maintenance costs per square yard. The summation of the different nature-based design strategies outlined in this document will result in a more valuable roadside environment that is easier and less costly to maintain.

Maintenance Cost Containment will be measured by establishing a baseline maintenance cost for the currently installed and maintained landscape projects and adjusted over time as new landscape projects that adopt a regenerative approach to the ecology and new less invasive maintenance practices are put into effect throughout the system.



MONETARY CONTRIBUTIONS

Landscape projects provide considerable, measurable monetary contributions to Florida’s economy along with providing the less tangible benefit of enhanced aesthetics. Enhanced aesthetics support one of the top three contributors to Florida’s Gross Domestic Product, Tourism.

A Department commissioned study in 2014 determined that FDOT **landscape projects contributed \$3.10 per \$1 invested**. Accordingly, each new landscape project will be required to calculate this monetary contribution. These costs are summarized on an annual basis.



CONSERVATION/PRESERVATION

Ecosystem conservation considers entire communities of species and their interactions with the physical environment and aims to develop integrated plans involving wildlife, physical resources, and sustainable use. Conservation and preservation of natural ecosystems are a cost-effective means of reducing maintenance costs of the FTE roadway system. Careful roadway alignment and placement of supporting utilities and infrastructure in previously disturbed areas prevents the spending of capital and long-term maintenance responsibilities. Additionally, it preserves the monetary value of the ecosystem services that are being provided by the preserved area and reduces landscape construction costs.



STORMWATER MANAGEMENT

The U.S. EPA defines stormwater management as the effort to reduce runoff of rainwater or melted snow into streets, lawns and other sites. The goal of managing stormwater is to control flooding and treat water pollution at the source, allowing water to infiltrate back into the ground and keeping pollutants in managed basins where they can be collected rather than flowing downstream and polluting water bodies.

The FTE roadway system utilizes a combination of closed and open system to manage stormwater. By planting the slopes and bottoms of the basins with appropriate plant material, the efficiency of the stormwater management facility can be increased by rainfall interception, evapotranspiration, and enhanced infiltration; larger quantities of carbon and nutrients could be fixed in the soil at the source of pollution.

The benefits include additional water quantity infiltrated on site, better water quality downstream, reduced maintenance costs, and higher value of ecosystem services being provided by stormwater facilities.



SUSTAINABLE LANDSCAPE AREAS

The FTE Landscape program has adopted the strategy of creating Sustainable Landscape Areas (SLAs) throughout the FTE Roadway system. SLAs are composed of predominantly native plants endemic to the region of the state where projects are located. By simply changing management practices for these areas, long term maintenance costs will be reduced.

In addition to providing economic benefits, they are also expected to provide ecosystem services such as increasing species diversity, improving air and water quality, mitigating heat island effect, increasing pollinator forage areas, soil conservation, and enhanced aesthetics.



REFORESTATION

Reforestation is the natural or intentional restocking of existing forests and woodlands that have been depleted by right of way clearing. An integrated strategy; each FTE landscape project will explore the potential for including reforestation of areas which are not critical to the function of the roadway.

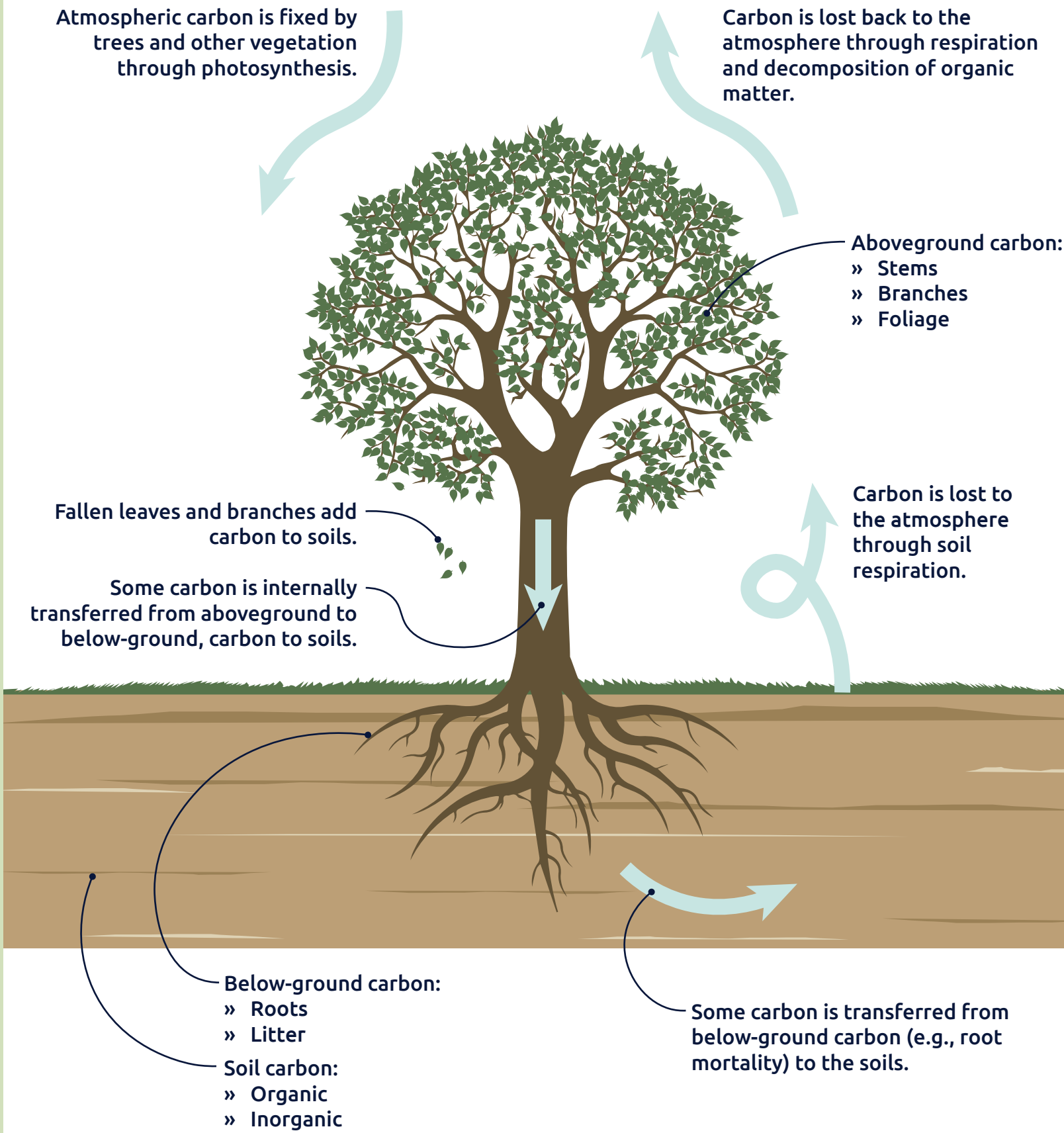
This integrated reforestation strategy helps to reduce overall capital improvements and maintenance costs because smaller native trees are used in greater quantities. The trees would be maintained for an establishment period and left to their own devices with minimal maintenance to take place in these areas. As the trees grow, they provide the benefits of shade, habitat, improvement of air and water quality, and carbon sequestration providing more valuable ecosystem services as they mature.



CARBON SEQUESTRATION

Carbon sequestration or carbon dioxide removal is the long-term removal, capture or sequestration of carbon dioxide from the atmosphere to slow or reverse atmospheric CO2 pollution and to mitigate heat island effect and global warming. Plants sequester carbon through photosynthesis. They respire carbon dioxide and anchor carbon through their root systems into the soil. The road-side landscape area of the FTE system provides an opportunity to sequester more carbon through the replacement of sodded road-side areas outside of the recovery zone with trees.

The benefits of carbon sequestration include heat island mitigation; reduction in air temperature; improved air and water quality; increased ecosystem services.

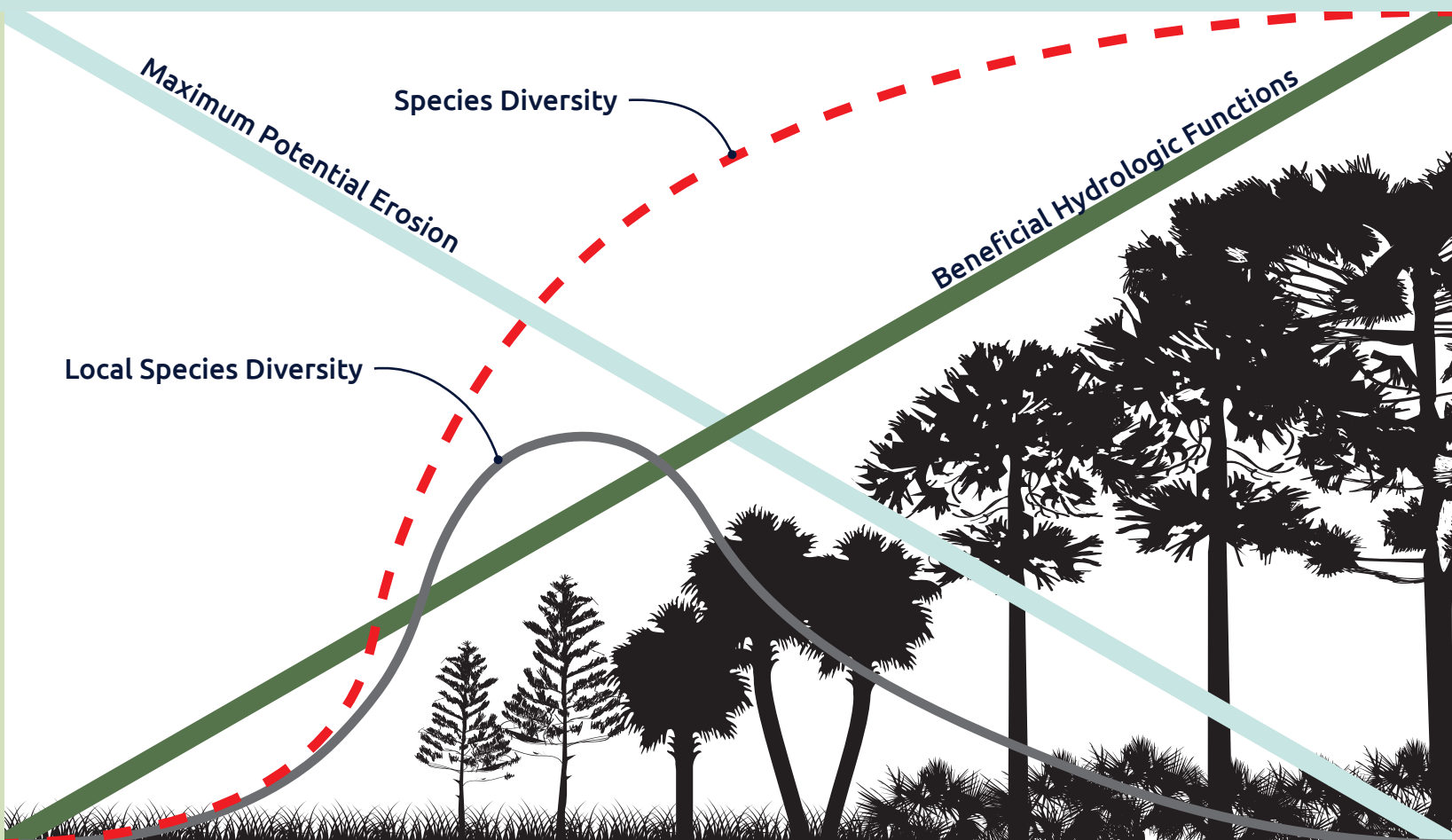


Source: U.S. Environmental Protection Agency

SPECIES DIVERSITY

Species diversity refers to the number of different species represented in an ecological community. A goal of the landscape program is to increase the use of native plant species to enhance naturally occurring ecosystems.

The benefits of species diversity include creating greater resilience to ecosystem collapse, better air and water quality, increased forage area for pollinators and wildlife, increased ecosystem services and lower maintenance costs for introduced landscape materials.

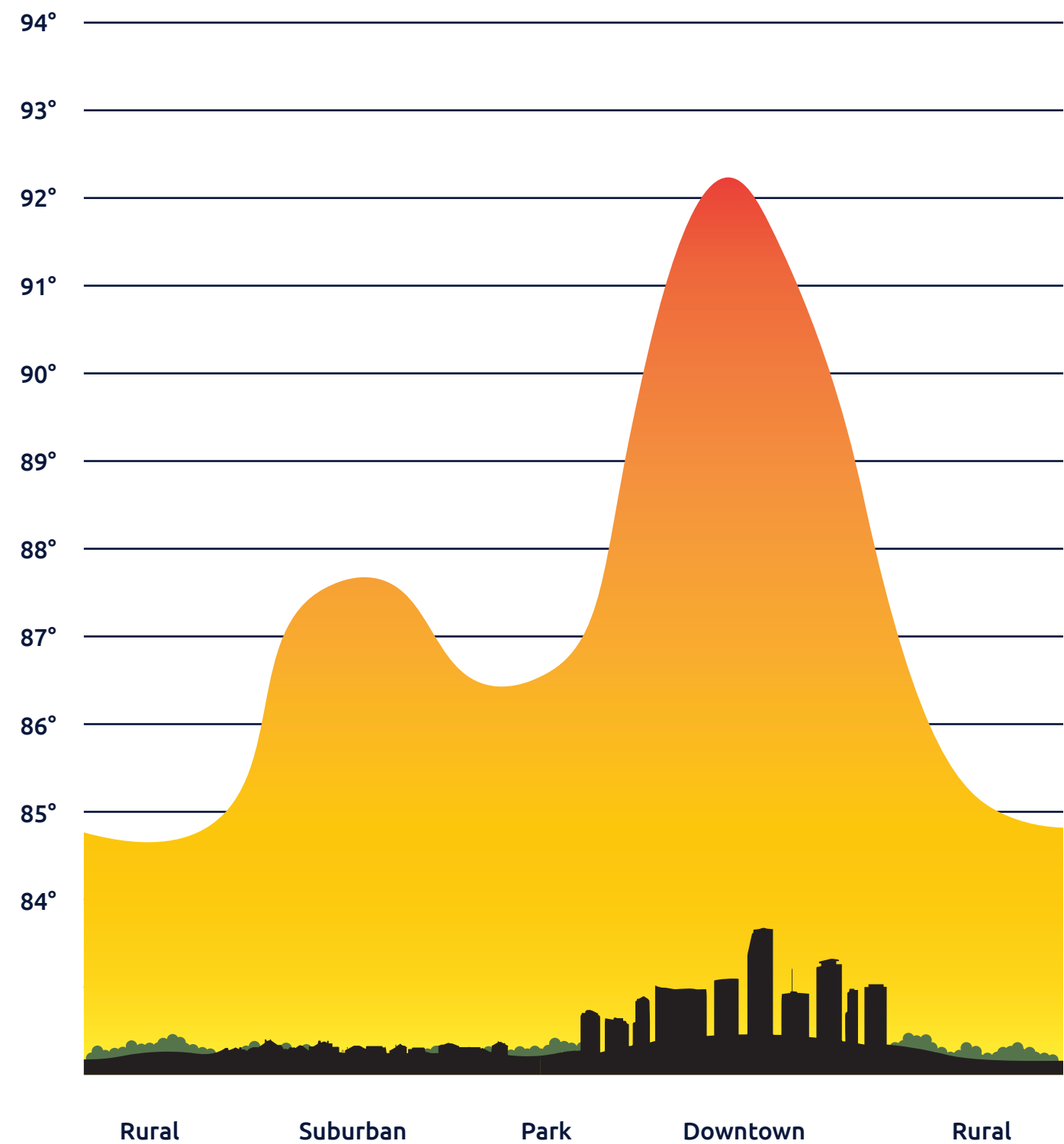


HEAT ISLAND MITIGATION

Heat Island Effect describes built up areas that are hotter than nearby rural areas. Roadway surfaces invariably create heat islands since they are paved surfaces that capture heat and maintain higher temperatures affecting surrounding areas. The roadside landscapes of the FTE system can assist in the mitigation of heat islands by introducing more trees to capture carbon, moderate air temperature by evapotranspiration, and cast more shade over the system as opposed to sod or paved surfaces.

The benefits of addressing Heat Island Effect include the introduction of more beneficial ecosystem services in the form of sustainable landscape areas or reforestation projects. These interventions capture more carbon; improve air and water quality; and provide a friendlier user experience along the FTE roadway system.

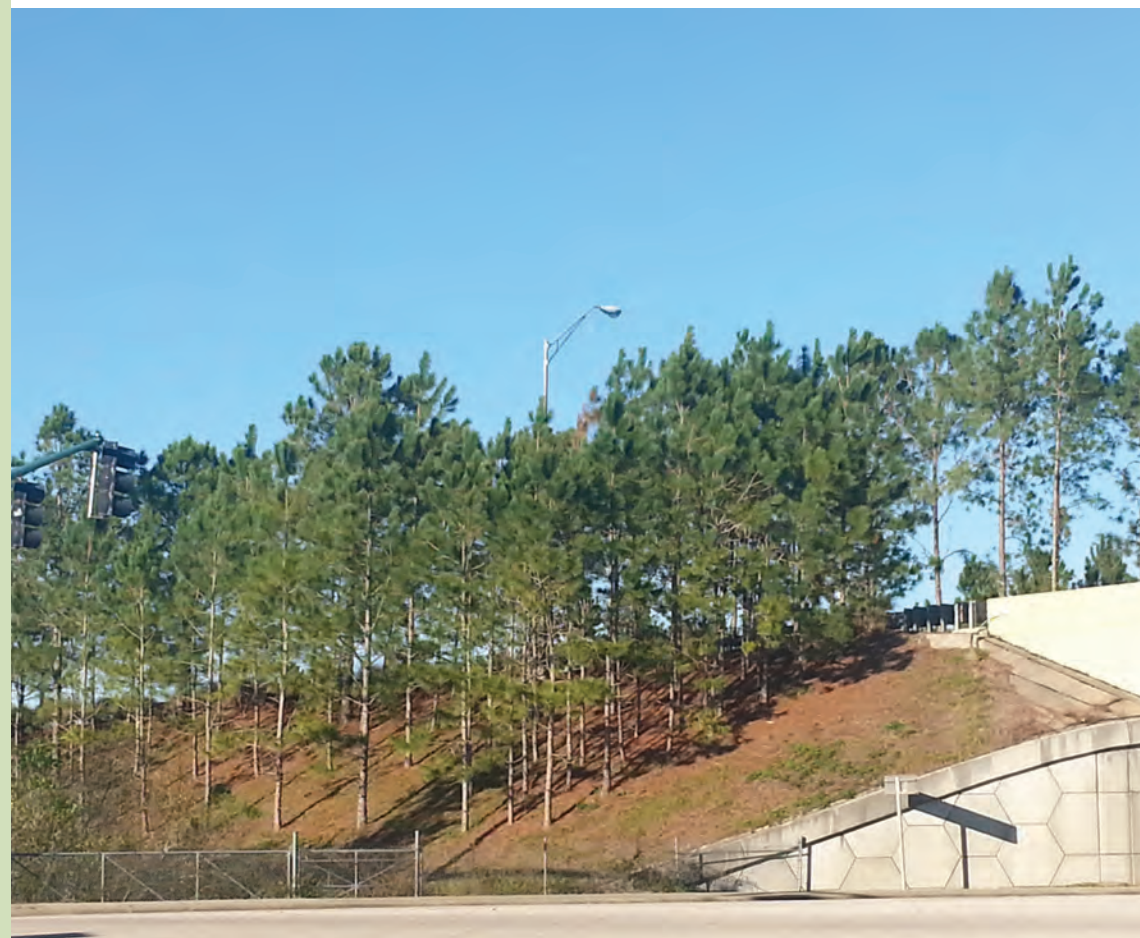
URBAN HEAT ISLAND PROFILE



REFORESTATION

Reforestation is intended to be proposed for areas which have been previously cleared and have no other roadway function. Reforestation serves to reestablish the indigenous forest canopy and may be utilized to screen undesirable views or stabilize slopes.

Benefits of reforestation include oxygen production, carbon sequestration, and reduction of stormwater. The establishment of reforestation requires little to no maintenance.



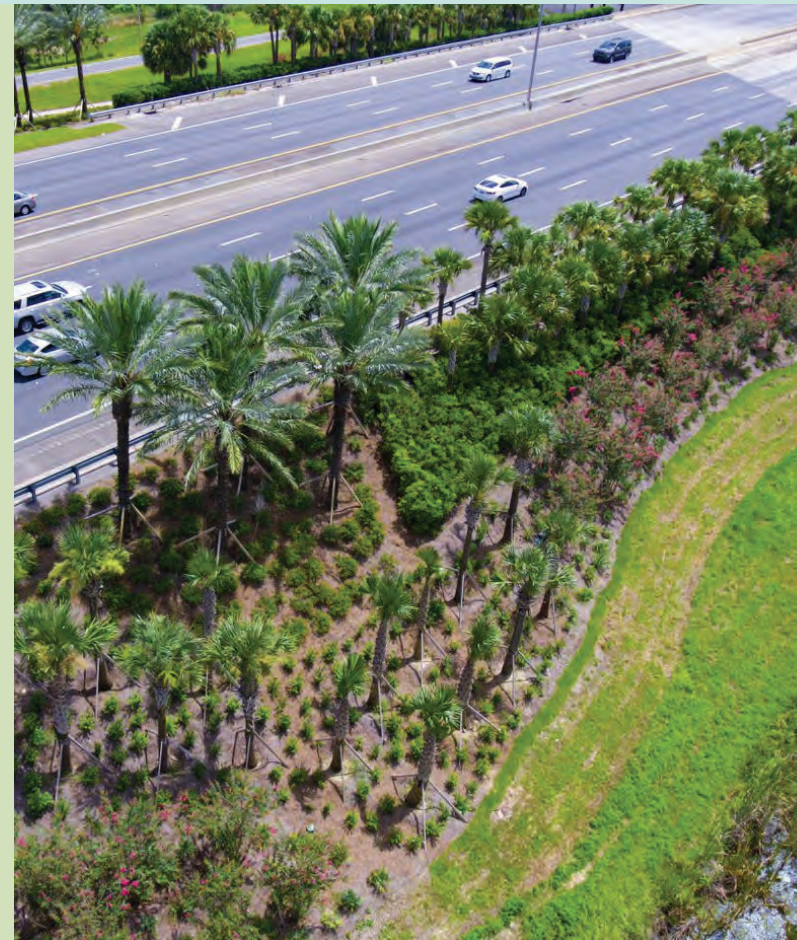
SLOPE STABILIZATION

FDOT Embankment specifications provide for a wide variety of soil types which are primarily intended for structural support of the roadway system. This, combined with excessive runoff of rainwater and southwestern exposures makes them particularly inhospitable for plant life and aesthetically unappealing.

Mowing operations on steep slopes is expensive and dangerous and consequently, slopes are not mowed with the same frequency as flat areas. The result is poor turf grass establishment and excessive erosion.

FTE landscapes must address these issues by providing plant cover which will survive these conditions, eliminate the need for mowing, stabilize the embankment and provide enhanced aesthetics.

Designers are encouraged to explore alternative methods for mitigating steep embankment such as terracing or Concrete Masonry Unit (CMU) revetment.



HARDSCAPE

Due to the increasing widening of FTE facilities, right of way is becoming more constrained. This limits the use of landscape plantings to achieve enhanced aesthetics. Accordingly, the use of hardscape, paint applications and graphics are often times the only way to beautify the corridor.

Roadway structural elements such as bridge columns and support elements, retaining walls, noise abatement walls and stand alone hardscape structures should be considered as an opportunity to provide required roadway aesthetics.

For more information:

- » Noise walls and Perimeter walls:
https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/fdm/2020/2020fdm264noiseperimwalls.pdf?sfvrsn=3962e82a_2
- » Retaining walls:
https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/fdm/2020/2020fdm262retwalls.pdf?sfvrsn=6e1e0804_2
- » Form Liners:
<https://www.concretenetwork.com/architectural-form-liners>



ADDITIONAL DESIGN CONSIDERATIONS

- » Emphasize naturalistic design, staggered heights, and groupings rather than straight lines.
- » Emphasize large groupings to provide a high intensity and immediate visual impact.
- » Minimize use of shrubs except in specific applications.
- » Utilize indigenous and hardy non-native plant species suitable to the project site's environmental conditions.
- » Reinforce native canopy when possible.
- » Respect adjacent land uses and their rural, urban or suburban characteristics.
- » Utilize Xeriscape (Florida-friendly) planting principles.
- » Use low maintenance and sustainable plant materials.
- » Provide a lasting and memorable visual statement with the use of seasonal flower or foliage color and unique and contrasting plant types that reflecting Florida's climate.
- » Promote large displays of wildflowers or meadow in large dry retention areas as an alternative to sod.
- » Remove Category 1 Invasive exotic plant material threatening our native plant communities. Refer to www.fleppc.org for current listings.
- » No category I invasive exotic plants shall be proposed on a FTE system. Category II invasive exotics are considered on a case by case basis subject to FTE approval.



SHRUB UTILIZATION

Shrub utilization may be utilized under the following circumstances:

- A.** Screen gantry equipment from travel ways.
- B.** Shrub beds beneath trees and palms to protect from mower damage.
- C.** Placement on steep slope conditions to minimize mowing maintenance efforts (i.e. interchanges, overpasses or cross road embankments).
- D.** Reduce maintenance efforts in isolated areas where it is difficult or dangerous to access.



SHRUB UTILIZATION

- E.** To provide color and visual interest.
- F.** Screening undesirable views, such as industrial areas, where no noise walls are present.
- G.** Soften or accent noise walls.
- H.** Addressing Community commitments agreed to during the public involvement process or other jurisdictional requests.



DRY STORMWATER MANAGEMENT AREAS

Rains can wash exposed soil, landscape debris, fertilizers, and pesticides off the landscape becoming part of the stormwater runoff. Stormwater runoff makes its way to rivers, lakes and canals and, ultimately connects to Florida's groundwater supplies. Groundwater comes from the aquifer, which is the source of almost all of the water we use in our daily lives.

Sustainable stormwater areas describe areas and ecosystems that function to collect, temporary hold and filter stormwater. These areas can provide many ecological benefits in filtering stormwater and also require very little to no maintenance when planted with the appropriate native material. It should be noted that exotic, non-native plant material generally require large amounts of fertilizer to maintain their health. Inevitably, this fertilizer finds its way into our surface and ground water supplies.



DRY STORMWATER MANAGEMENT AREAS

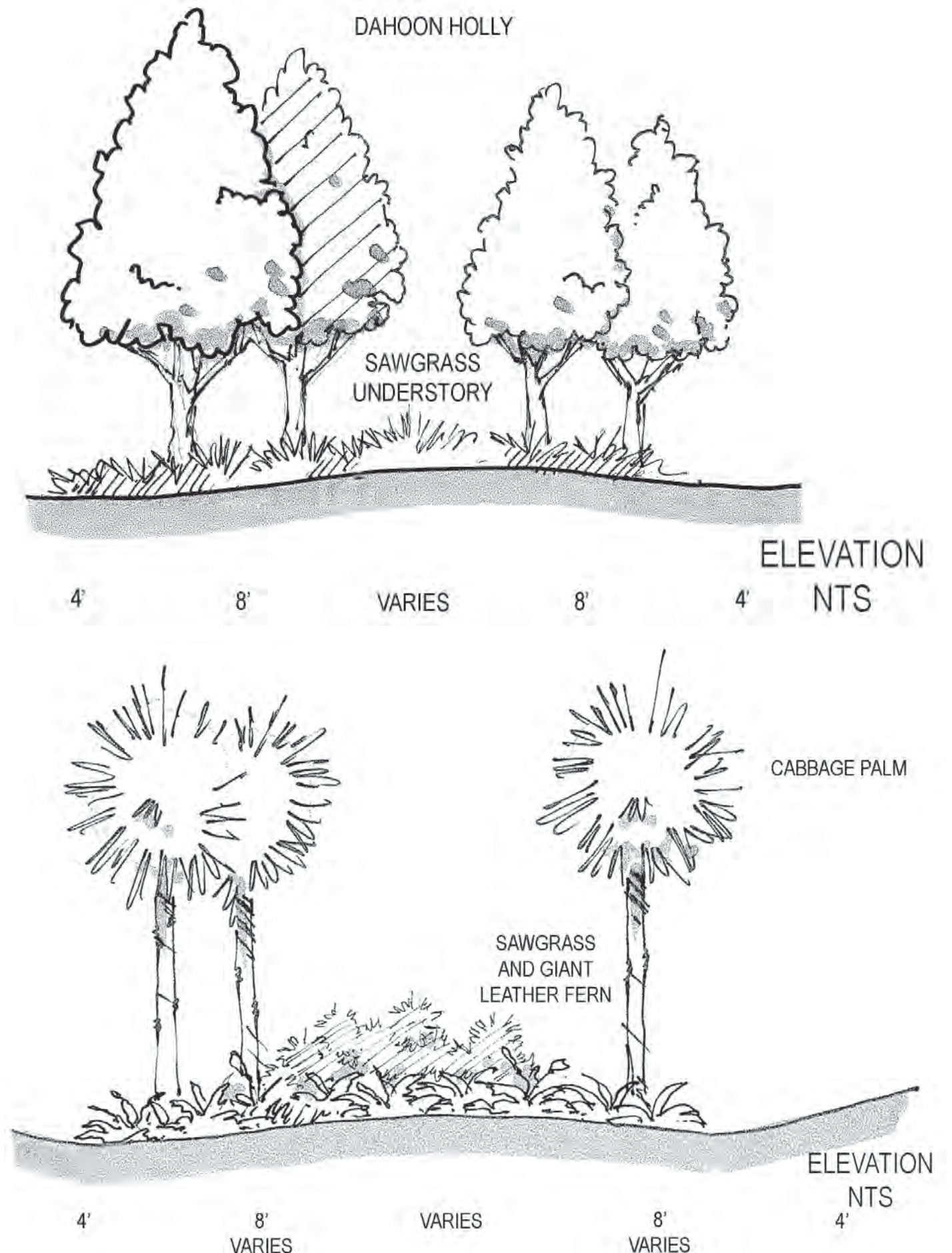
Detention areas and other low-lying areas can be opportunities for plantings that reduce and filter stormwater runoff. Planting these areas with Florida native plant material means that constant trimming (producing debris), fertilizing, and pesticide treatment is unnecessary. Shallow areas can be planted with grasses and other plants to filter water before letting it flow naturally into the ground. Water kept within a landscape this way return to the aquifer, helping to replenish Florida's water supplies with cleaner water.

For more information on planting within Transitional Areas, visit:

- » https://ffl.ifas.ufl.edu/handbook/Protect_the_Waterfront_vSept09.pdf
- » https://ffl.ifas.ufl.edu/handbook/Reduce_Stormwater_Runoff_vSept09.pdf.

For more information on native plant choices for Transitional Areas, visit:

- » <http://publicserver2.sjrwmd.com/waterwise/search.jsp>
- » <http://www.floridayards.org/fyplants/index.php>



SUSTAINABLE LANDSCAPE AREA

The Sustainable Landscape Management Area designation is intended for areas within the Limited Access Right of Way which are typically comprised of under-performing turf and areas that do not have any direct functional characteristic for the roadway excepting dry stormwater management facilities.

The intent is to manage these areas as sustainable fields comprised of desirable herbaceous plant materials in an effort to promote aesthetics, sustainability, and reduce maintenance costs. These areas will be comprised of a variety of grasses and other non-woody plants which aid in storm water runoff management and promote biodiversity such as forage for desirable pollinators.

Sustainable Landscape Management Areas can be achieved with little or no effort beyond controlling the maintenance activities associated with the desired effect. Specific areas will be designated in the Landscape Design plans and the Post Establishment Maintenance Plan which will document quantified maintenance activities and cycles.

Each landscape project will be required to include a percentage of these areas in the design and estimate the amounts and maintenance costs. These items will be tracked cumulatively each fiscal year.



WILDFLOWERS

Wildflower areas are intensively managed areas designed for maximum aesthetic value.

Wildflowers along Florida's Turnpike roadway are an important element that are enjoyed by millions of residents and visitors every day. To comply with Florida's Wildflower Program, FTE continues to plan for and fund wildflower plantings within each project.

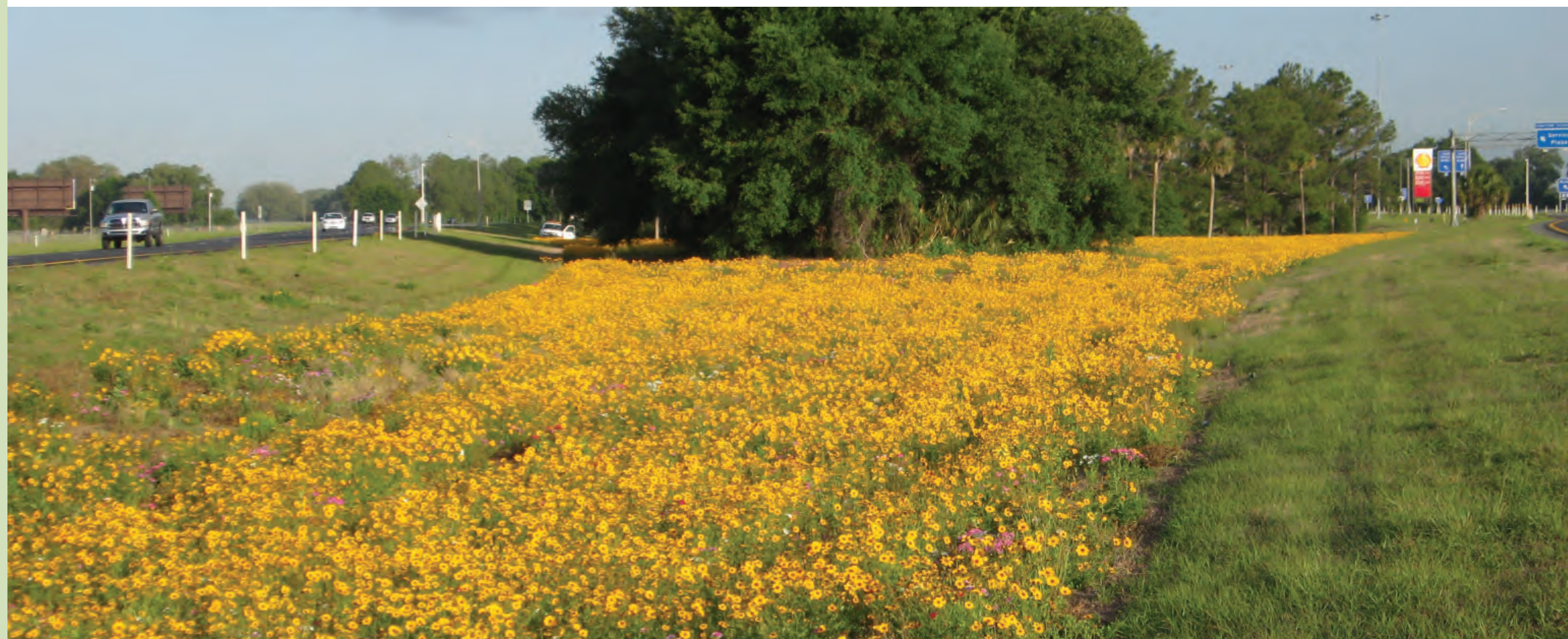


WILDFLOWERS

Using the guiding principles of protection, establishment and management, FTE identified the following wildflower planting designations:

- » Natural Stands – Extensions or remnants of neighboring areas that contain wildflowers.
- » Roadside Meadows – Long blooming areas with a species mix that is best suited for a site.
- » High Impact – Presenting an intense visual statement for high profile locations.

The Landscape Architect of Record (LAOR) shall consider potential and future wildflower sites within their projects. Contact the FTE Roadway Maintenance Department to coordinate appropriate wildflower seed species, locations and installation/establishment techniques.



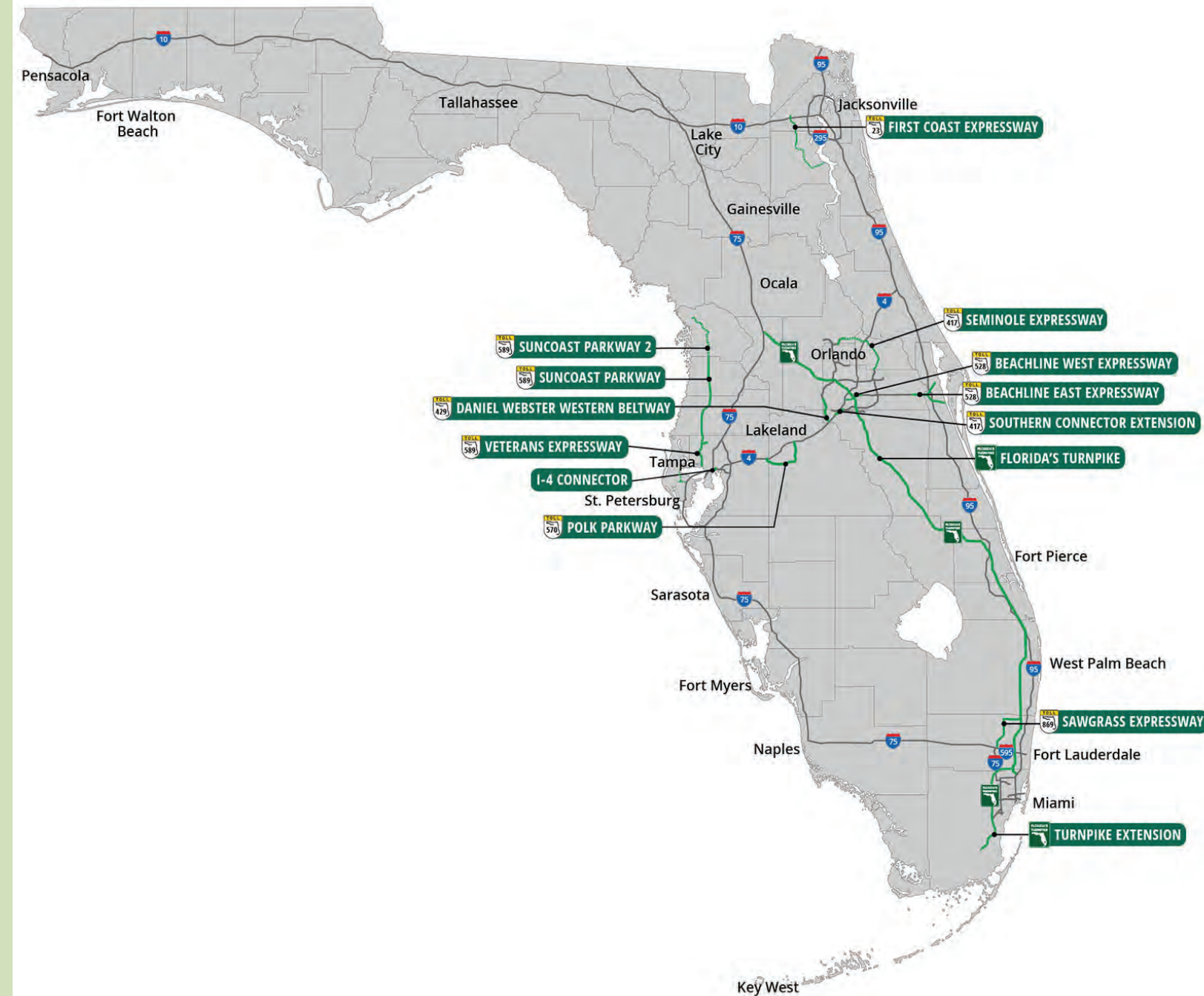
CONTEXT

DISTRICT DESCRIPTION

The Turnpike system consists of over 480 miles of limited access toll highways and eight (8) service plazas across many regions of the State of Florida. An average of five million motorists utilize these highways daily. For the purposes of this Master Plan the Turnpike System has been identified by four regions: South Florida, Turnpike mainline from Miami to North Central Florida (SR 91), as well as the Homestead Extension (HEFT-SR 821), Sawgrass Expressway (SR 869); Central Florida, Seminole Expressway (SR 417), Beachline Expressway (SR 528), Southern Connector Extension of the Central Florida GreeneWay (SR 417), Western Beltway (SR 429); and West Florida, the Veterans Expressway (SR 589), Suncoast Parkway (SR 589) and Polk Parkway (SR 570) and the North, First Coast Expressway.

To view more maps of the Turnpike's facilities, please visit:

» <https://floridasturnpike.com/system-maps/>



DISTRICT FEATURES

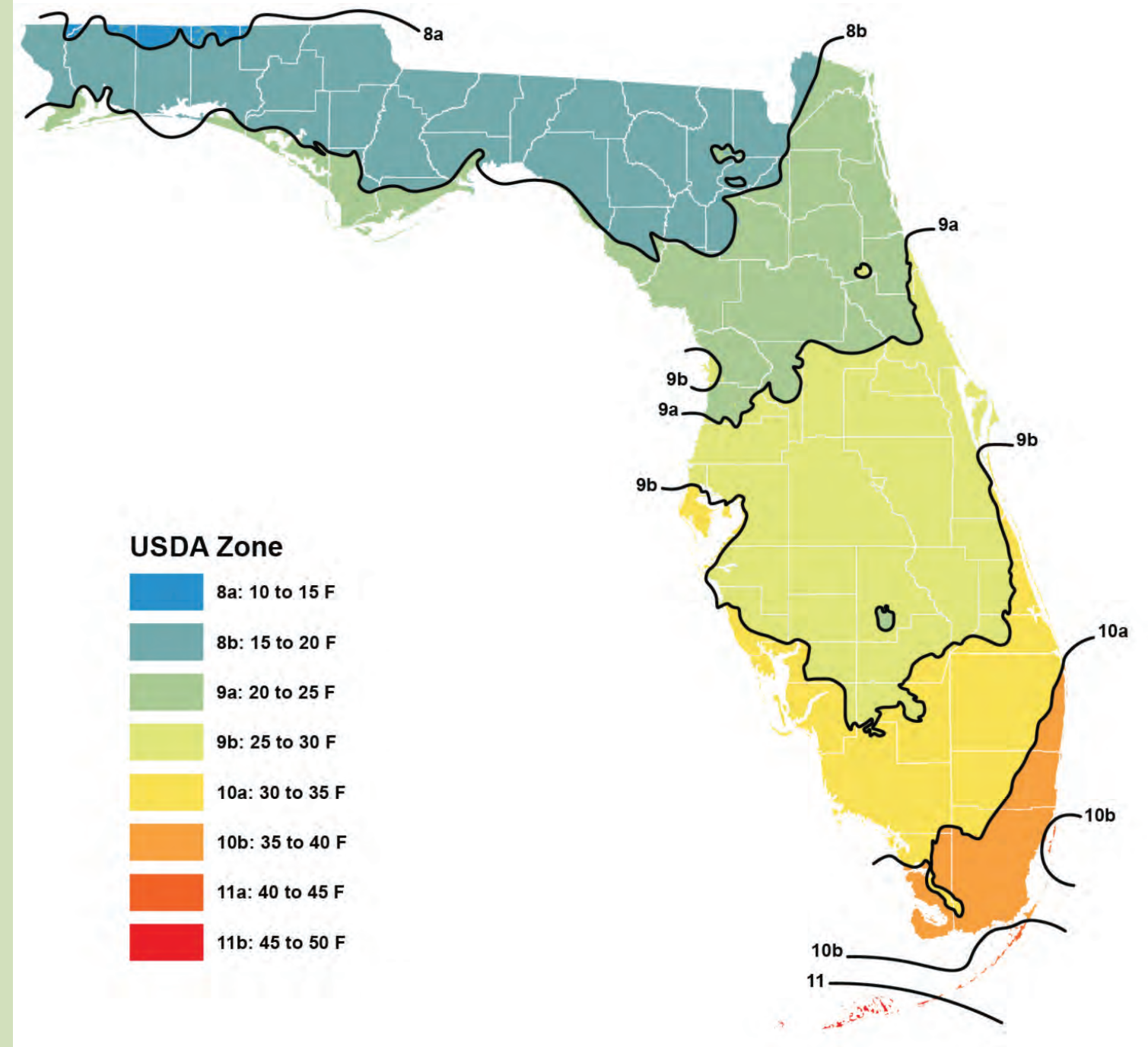
This geographic diversity necessitates maximum flexibility of our designers to respond to regional context and variable climatic conditions. FTE must also balance the landscape program to allow for equitable distribution of the overall landscape budget amongst the South, North and Western Regions.

The Turnpike system extends from Miami-Dade County to Jacksonville and across the state from the Atlantic Ocean to the Gulf of Mexico. It crosses four plant hardiness zones as established by the US Department of Agriculture. Based on the variation of hardiness zones, the FTE system has been divided into two distinct plant palettes: North and West Region (Zones 9A & 9B) and South Region (Zones 10A & 10B).

Although the plants within this document are categorized into two palettes, the cultural identity of the Turnpike System varies greatly based on the communities through which it passes, and designers must consider context when making selections.

The Florida Association of Native Nurseries has published a useful tool linking native plant communities to their USDA hardiness zones. Link to FANN website here:

» <https://www.floridanativenurseries.org/plant-communities/>



COMMUNITY AESTHETIC FEATURES

Community Aesthetic Features (CAF) are an opportunity for a local governmental entity to convey the culture, identity and values of the community through a stand-alone structure or an element affixed to an existing structure in the LA R/W. These features are categorized as Public Art or Local ID Marker. The Local government must enter into a CAF agreement by adopting a resolution to design, construct and maintain the feature. In addition, the CAF agreement requires a bond for the removal of the feature, if this becomes necessary.

The process also involves a review by the Roadway Aesthetics Community of Practice, with representatives from FDOT Central Office, FTE and other Districts who will offer verbal comments. Once the design is approved; and the CAF agreement is executed the CAF can be constructed. Stand alone features could be a statue, monument or sign-wall. Affixed features can be medallions, plaques or other art elements.

For more information:

- » Community Aesthetic Features:
FDM 127: <https://www.fdot.gov/roadway/fdm/default.shtm>
- » Manual of Uniform Traffic Control Devices:
https://mutcd.fhwa.dot.gov/htm/2009r1r2/html_index.htm



PROJECT PLANNING AND DESIGN

Landscape plan development within FTE requires processes and procedures unique to FTE. Designers must be fully knowledgeable of the Turnpike Design Handbook, FDOT Design Manual in addition to their scope document in order to meet these requirements.

» **Turnpike Design Handbook (TDH):**

<https://floridasturnpike.com/business-opportunities/design/turnpike-design-handbook/>

» **FDOT Design Manual:**

<https://www.fdot.gov/roadway/fdm/default.shtm>

The process begins with Existing Roadway Conditions Assessment Report (ERCAR). In most instances this document will be supplied to the design consultant. This is followed by the development of a Concept Plan Long Range Estimate of Construction Cost (also known as a budget). In most instances these will also be provided to the consultant by the district.

The concept plan is followed by the Vegetation Assessment/Disposition Plans and Landscape Construction Plans. The consultant will be required to refine the cost estimate through all submittal phases of plan development.

If the consultant is developing Landscape Opportunity Plans for a roadway project with no landscape component they will be expected to do a thorough analysis of the project (to be shown on the LOP or as a stand alone document). Refer to TDH chapter 301 and FDM chapter 228.



SITE ANALYSIS PLANS (SAP)

Site Analysis Plans must be developed in order to portray issues with the existing site and serve as a basis for the development of design solutions. The primary purpose of developing site analysis plans is to convey to the DLA a clear understanding of the field conditions. These typically include impact on existing vegetation, areas of erosion, critical views, utility impacts, and other physical or regulatory constraints that will impact design solutions. Refer to the Turnpike Design Handbook for further guidance.

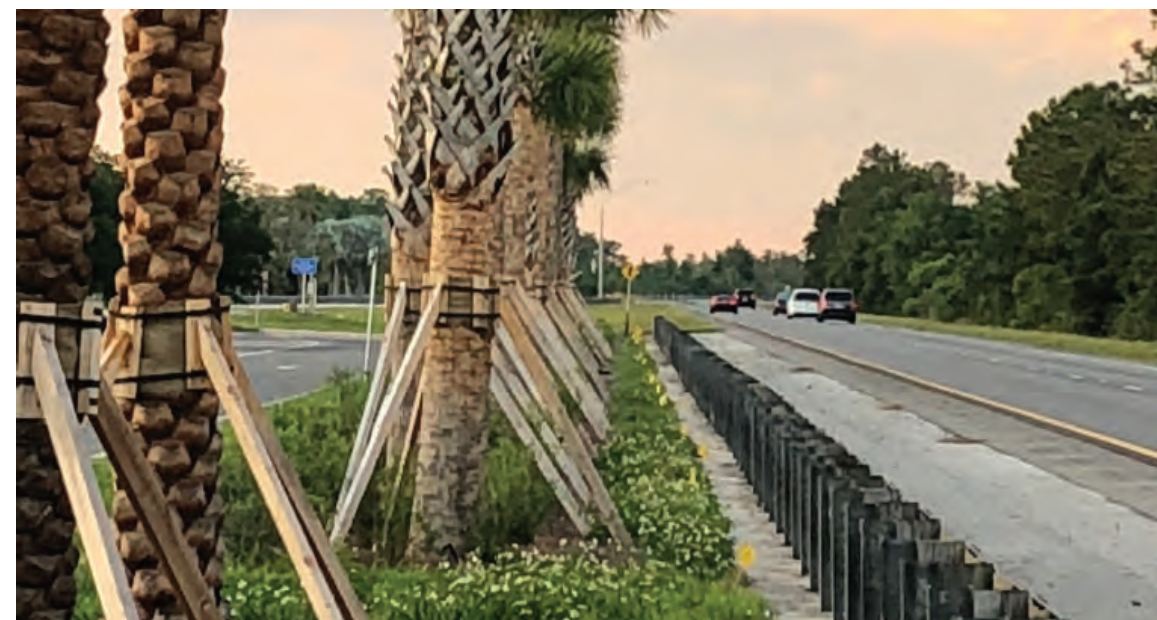
In addition to identifying the existing conditions found in the field, SAP's should also identify areas available for landscape using the following terms: Unrestricted, Moderately Restricted, and Restricted.

Unrestricted areas indicate unimpeded open areas free of regulatory constraints and utilities available for landscape improvements.

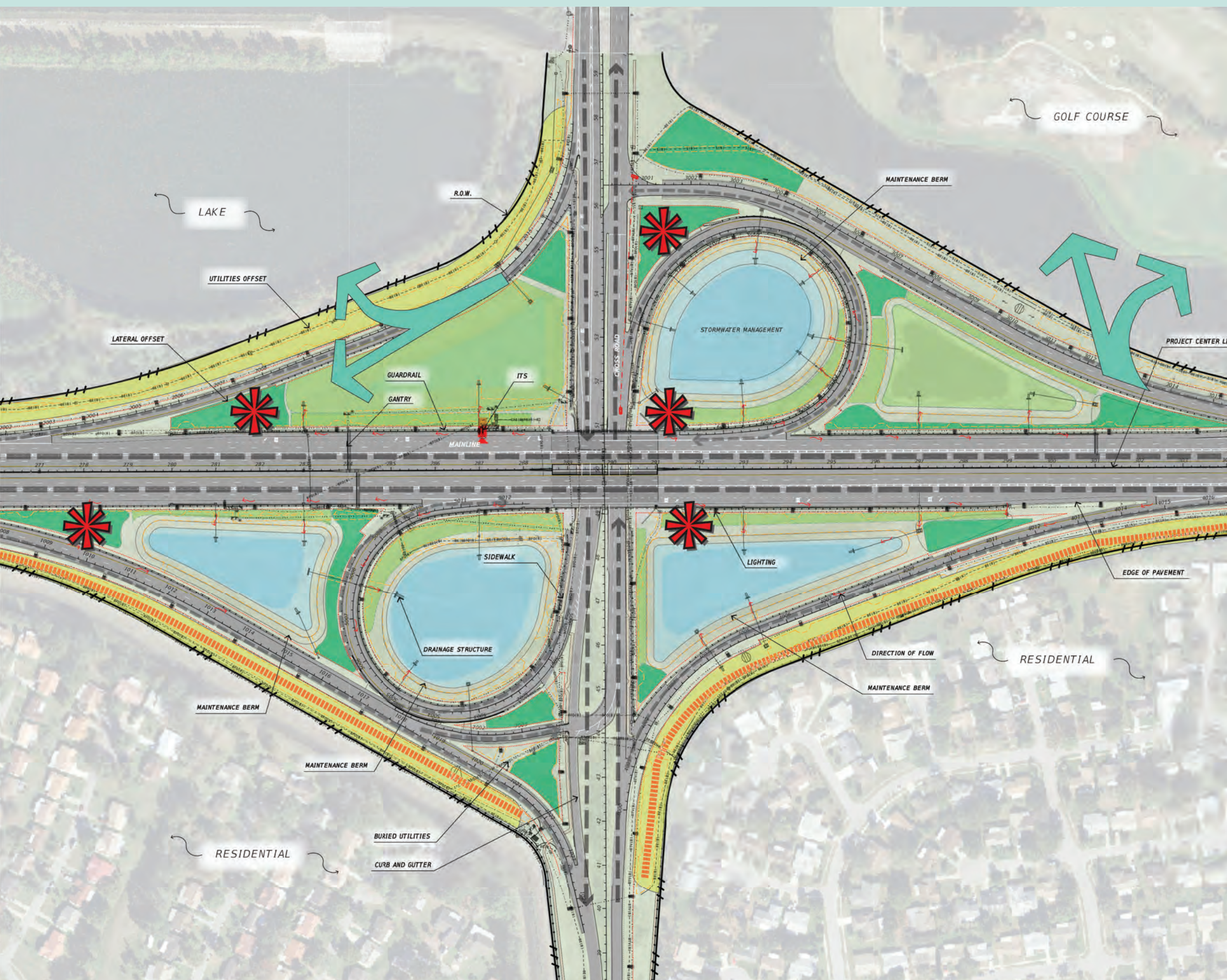
Moderately Restricted areas are open space available for landscape with limited constraints. For example, a utility and its offset dividing the available landscape area into two areas.

Restricted areas are open space impacted by significant regulatory constraints such as lateral offsets, ITS view zones, and/or utilities, storm structures, and other permanent objects preventing the planting of landscape materials other than sod or groundcover. SAP's should also include a discussion of buffers and desirable and undesirable views from and of the roadway.

Buffers are areas on site or off site to be visually screened through the use of landscape material or hardscape, such as a soundwall, to provide visual privacy.



SITE ANALYSIS PLAN (SAP)



--- CONDUIT

--- BE(B)--- BE(B)--- BURIED ELECTRIC POWER

--- BFO(B)--- BFO(B)--- FIBER OPTICS CABLE

--- BT(V)(B)--- BT(V)(B)--- CABLE TV CONDUIT

--- BT(B)--- BT(B)--- TELEPHONE CABLE

..... LATERAL OFFSET

--- UTILITIES OFFSET

--- CLEAR SIGHT

--- R.O.W.

➔ DIRECTION OF FLOW

UNRESTRICTED
AVAILABLE UNIMPEDED LANDSCAPE AREA FREE OF REGULATORY CONSTRAINTS AND UTILITIES.

MODERATELY UNRESTRICTED
OPEN SPACE AVAILABLE FOR LANDSCAPE WITH LIMITED CONSTRAINTS. FOR EXAMPLE, A UTILITY AND ITS OFFSET DIVIDING THE AVAILABLE LANDSCAPE AREA INTO TWO AREAS.

RESTRICTED
OPEN SPACE IMPACTED BY SIGNIFICANT REGULATORY CONSTRAINTS SUCH AS LATERAL OFFSETS, ITS VIEW ZONES, AND/OR UTILITIES, STORM STRUCTURES, AND OTHER PERMANENT OBJECTS PREVENTING THE PLANTING OF LANDSCAPE MATERIALS OTHER THAN SOD.

||||| **BUFFER**
AN AREA ON SITE OR OFF SITE TO BE VISUALLY SCREENED THROUGH THE USE OF LANDSCAPE MATERIAL OR HARDSCAPE SUCH AS A SOUNDWALL TO PROVIDE VISUAL PRIVACY.

➔ **VIEW OPPORTUNITIES**

📹 **ITS CAMERAS**

✳️ **FOCAL POINT**

N

0 250 500 1000

SCALE: 1" = 500'

EXISTING SITE FEATURES

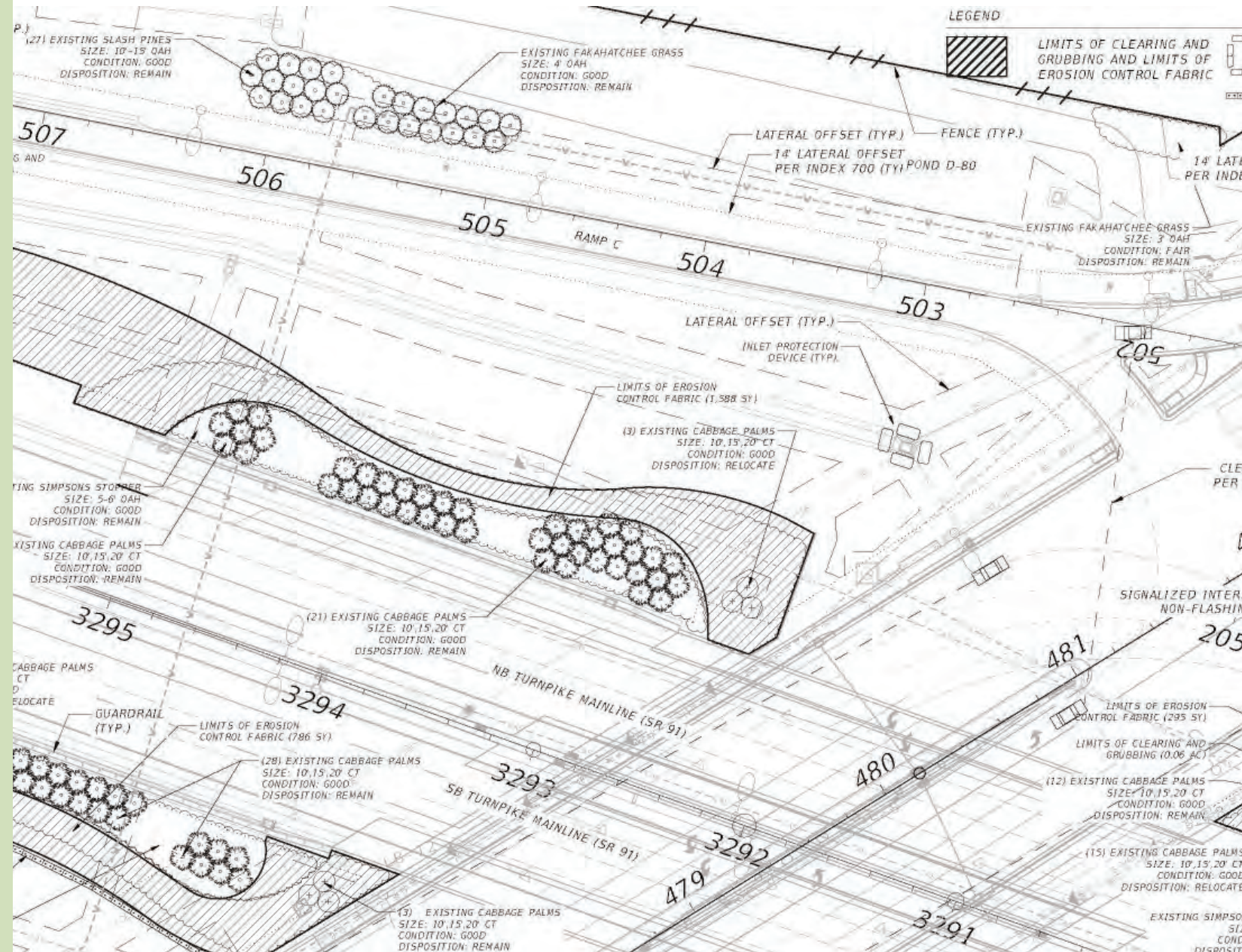
Most sites contain other existing site features critical for further identifying both opportunities and constraints. Examples of these are the following:

EXISTING VEGETATION

Vegetation preservation is the most cost effective way to provide highway beautification. Existing trees that are preserved also contribute more to Ecosystem Services than newly planted trees. State Statute and Departmental Policy require that we conserve existing landscape to the greatest extent possible. Consistent with Departmental Policy, each project must include an evaluation of the existing vegetation and a recommendation for its protection, relocation or removal. Documents included in the Resources section of this manual provide further guidance for vegetation assessment as part of the Existing Roadway Condition Report (ERCAR) process.

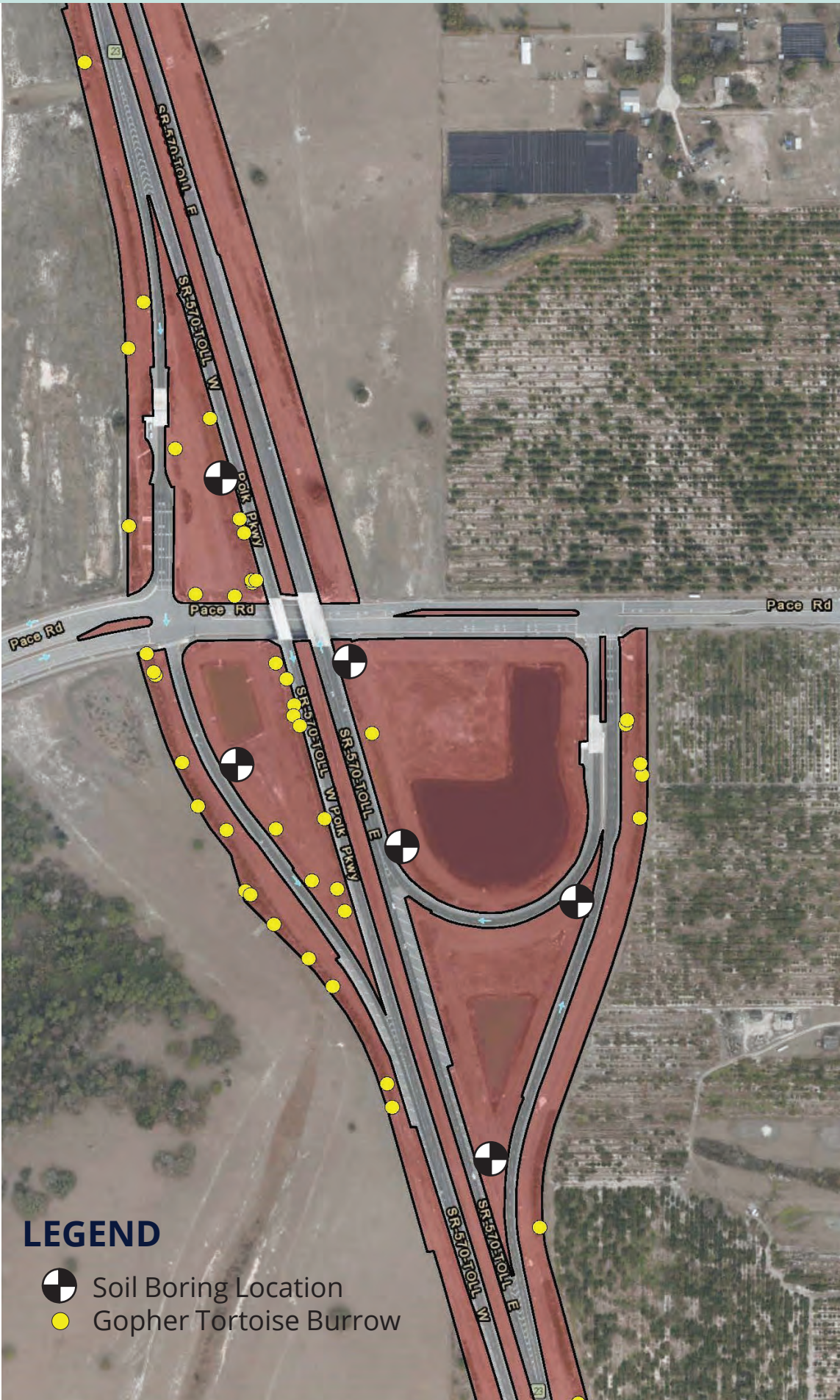
Also, refer to FDM chapter 229. Selective Clearing and Grubbing.

» https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/fdm/2020/2020fdm229selcleargrubdsn.pdf?sfvrsn=3370acb0_2



ENVIRONMENTAL FEATURES

Site analysis must include identification and understanding of the benefits or impacts created by existing environmental conditions. Soils must be analyzed to determine the most suitable plant materials or remediation that may be required for a successful landscape planting. Sites must be analyzed for the presence of threatened or endangered species and the appropriate measures taken if present. Storm water facilities, surface waters and wetlands must be identified and accommodated within the landscape design either as elements to be avoided or enhanced in accordance with current environmental laws.

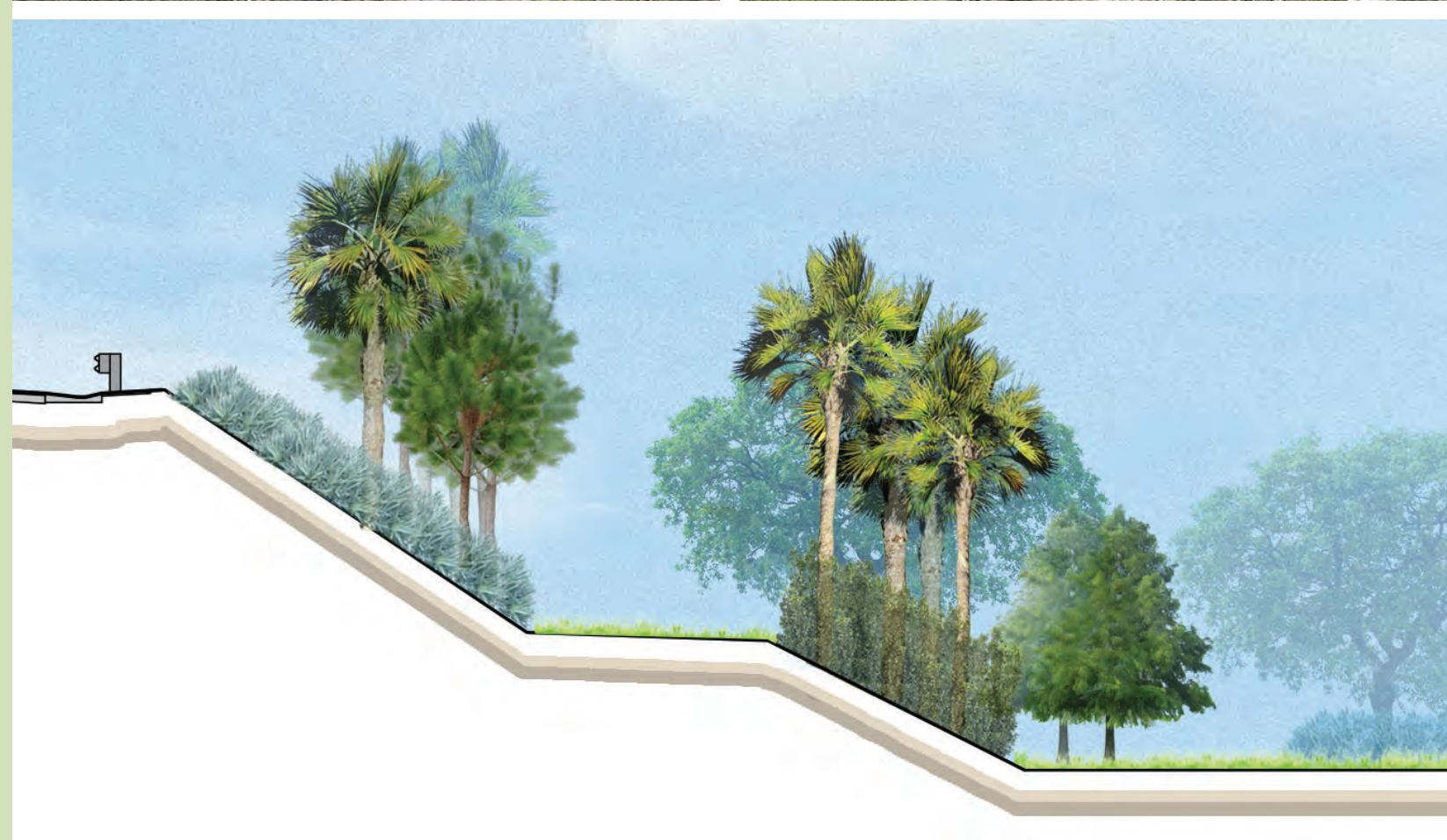


- LEGEND**
- Soil Boring Location
 - Gopher Tortoise Burrow

SLOPE ANALYSIS

A common issue associated with FTE landscape projects is the presence of steep slopes. Steep slopes are dangerous to mow, difficult or impractical to plant on and often suffer severe erosion. Accordingly, designers must assess slopes for these conditions and recommend suitable solutions. Preferred methods include planting tree species that require little if any maintenance, under-planting trees with shrubs to eliminate mowing and help stabilize soils, the use of erosion control fabric or providing terrace walls. Some erosion issues will require more than the installation of plant material to resolve.

- » Slopes 4:1 or less are considered mild to moderate
- » Slopes 3:1 or greater are considered moderate to extreme and are the upper limit of what is considered mowable.
- » Slopes 2:1 or greater are considered extreme and may require the introduction of retaining walls to create areas suitable for planting.



LANDSCAPE OPPORTUNITY PLANS (LOP)

Landscape Opportunity Plans are developed for PD&E design projects and roadway design projects with no landscape component. The intent is for the landscape architect to work closely with the roadway design team to preserve existing vegetation and areas for future landscape plantings. The design approach must be consistent with the philosophy and directives already outlined.

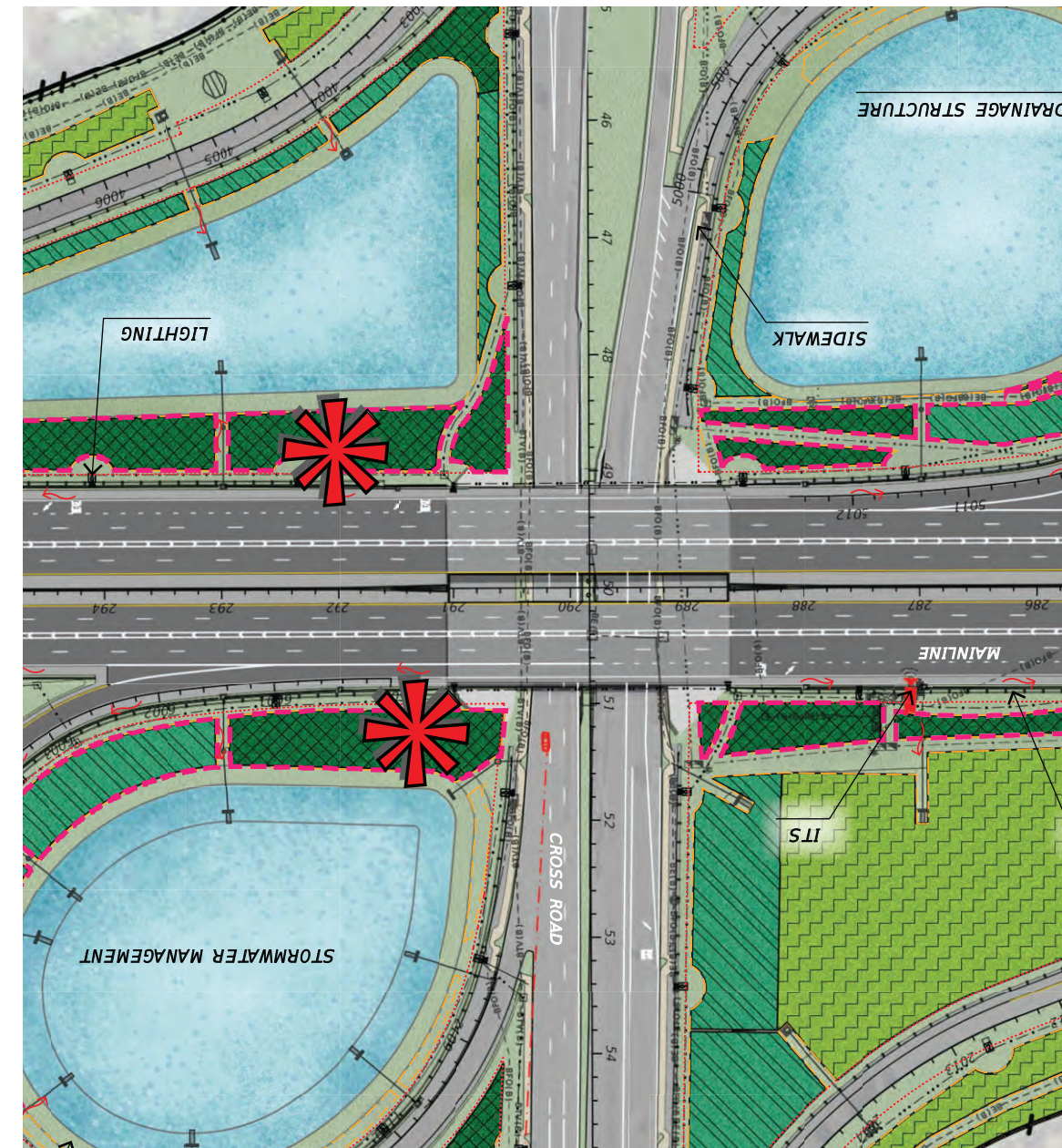
1. GOALS AND EXPECTATIONS

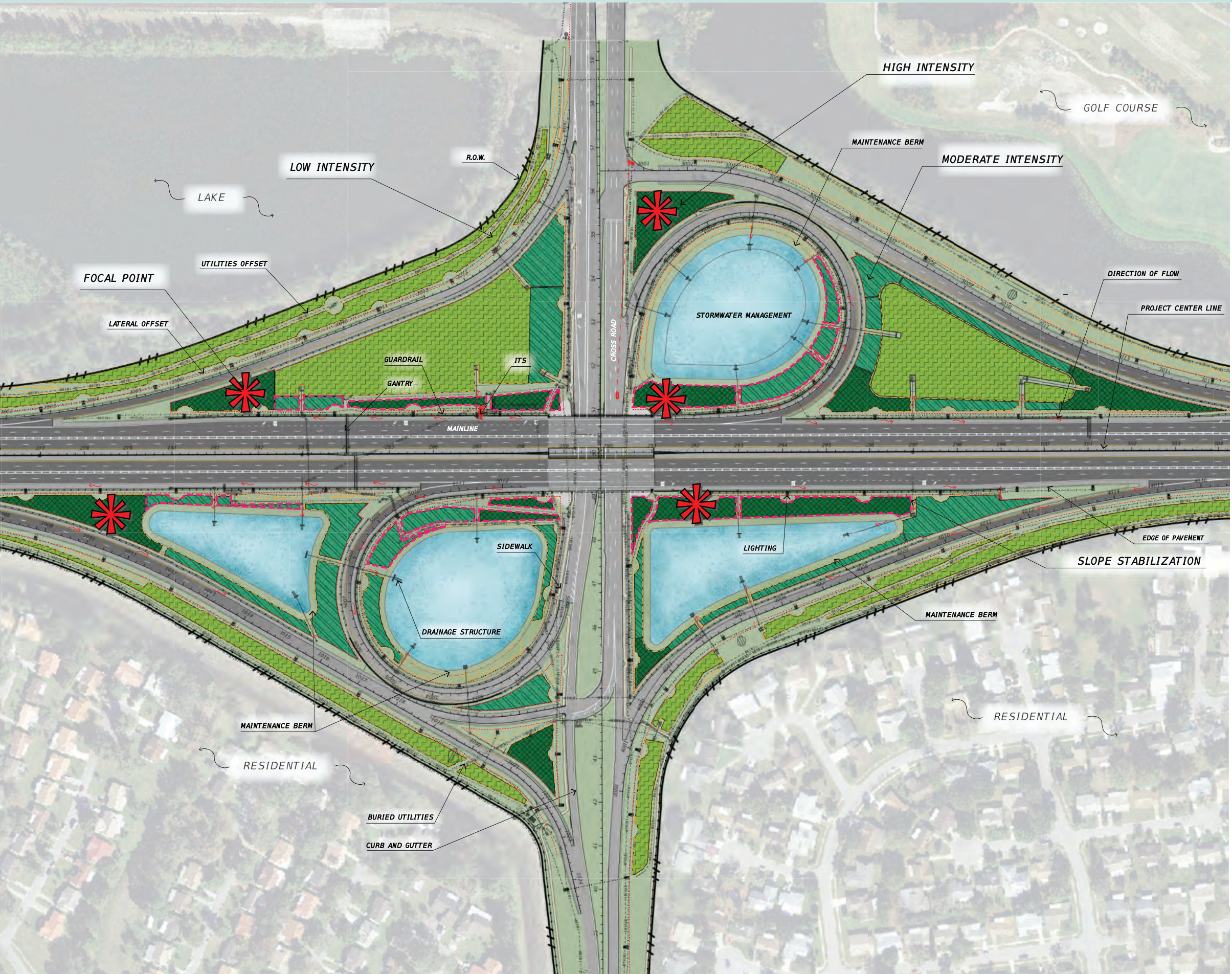
- » The designer should begin by establishing goals for the project through coordination with the FTE Project Manager and determining if there are any commitments that have been made to the impacted community regarding landscape enhancement.
- » Goals should be developed based on specific project conditions. Examples include slope stabilization, the enhancement of favorable views, buffering of roadway impact on residential neighborhoods, mitigation for impacted ecosystems, etc.

2. IDENTIFYING LANDSCAPE

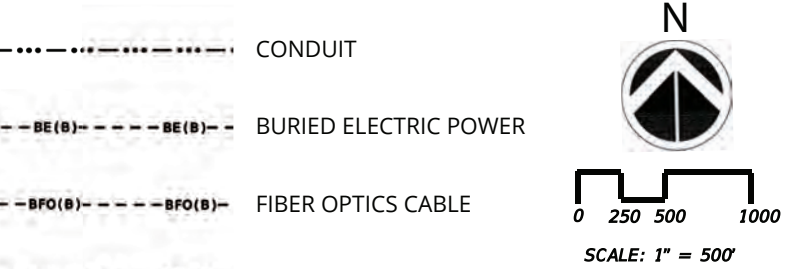
- » Intensity Zones: After identifying site constraints and defining goals for the project, the designer should develop a landscape concept to be depicted on the LOP. In addition to the information required in the [Turnpike Design Handbook in Section 301.2.1](#), designers should identify landscape intensity for the project site based on the definitions found in Chapter 2 Design Philosophy. These include, but are not limited to, Low Intensity, Moderate Intensity, and High Intensity.

“The intent is for the landscape architect to work closely with the roadway design team early in the roadway design process”





LANDSCAPE OPPORTUNITY PLAN (LOP)



- CONDUIT
- BURIED ELECTRIC POWER
- FIBER OPTICS CABLE
- CABLE TV CONDUIT
- TELEPHONE CABLE
- LATERAL OFFSET
- UTILITIES OFFSET
- CLEAR SIGHT
- R.O.W.
- DIRECTION OF FLOW

- LOW INTENSITY**
AREAS DESIGNATED FOR LOW LANDSCAPE MAINTENANCE SUCH AS MEADOW CONDITIONS, TRANSITIONAL NATIVE PLANTINGS, REFORESTATION, AND NATIVE PLANTINGS THAT ARE EASILY ESTABLISHED.
- MODERATE INTENSITY**
AREAS DESIGNATED FOR MODERATE LANDSCAPE MAINTENANCE SUCH AS SECONDARY FOCAL POINTS AND GATEWAYS COMBINING NATIVE PLANTINGS AND NON-NATIVE FLORIDA FRIENDLY PLANTINGS.
- HIGH INTENSITY**
AREAS DESIGNATED FOR HIGH INTENSITY LANDSCAPING REQUIRING A HIGHER LEVEL OF LANDSCAPE MAINTENANCE SUCH AS MAJOR FOCAL POINTS, GATEWAYS AND HIGH VISIBILITY AREAS SUITABLE FOR HIGH IMPACT LANDSCAPING TYPICALLY ALONG THE MAINLINE IN VERY VISIBLE AREAS.
- OPEN LANDSCAPE**
LIMITED TO TURF ONLY, CONSTRAINED BY LATERAL OFFSETS, SIGN VIEW ZONES, ITS EQUIPMENT, UTILITIES, MAINTENANCE BERMS AND UTILITY OFFSETS. TURF SPECIES VARY DEPENDING ON CONDITION.
- SLOPE STABILIZATION**
MEASURES TAKEN TO REDUCE OR ELIMINATE EROSION FOR EMBANKMENTS AND SLOPES WITH 3:1 SLOPE RATIO OR GREATER; CAN INCLUDE PHYSICAL STRUCTURES SUCH AS RETAINING WALLS TO ASSIST IN CREATING PLANTABLE AREAS OR PLANTINGS TO SLOW AND REDUCE STORMWATER RUNOFF.
- STORMWATER MANAGEMENT**
WET RETENTION AREAS; DESIGNATED STORMWATER MANAGEMENT AREAS THAT HOLD AND RETAIN STORMWATER.
- FOCAL POINT**

COMMON CRITICAL ISSUES

ROADSIDE SAFETY AND FDOT DESIGN STANDARDS

Safety is the most spoken word within FTE. Understanding the roadway components and the regulations that control them is paramount. Designers should be familiar with the TDH, FDM and the AASHTO Green Book and apply the requirements found within to their projects. Typical elements that apply to every project include the identification of clear zones, lateral offsets, and sight distances. Additional elements are identified in the TDH. If designers have specific questions, they should work with their FTE Project Manager to connect with the proper staff to get the answers needed.

- » [Turnpike Design Handbook \(TDH\) - Design Criteria - Part 2](#)
- » [FDOT Design Manual](#)
- » [AASHTO Green Book](#)



INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

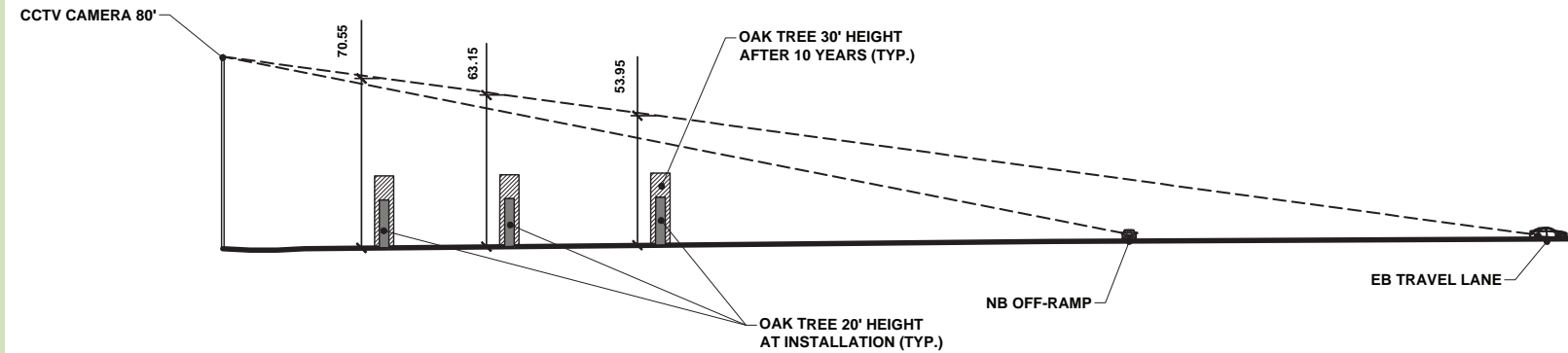
FTE's ITS facilities are managed by Traffic Engineering and Operations and are one of the most critical facilities within the Limited Access Right of Way (LARW) that can affect landscape projects. The main function of the ITS facilities are to provide video feeds through a network of Closed-Circuit Television (CCTV) cameras, and to provide drivers with information through digital message signs.

When planning a landscape project, ITS should be on the top of the designers list of coordination items, for both camera view zones and associated below ground infrastructure. Coordinate with the DLA and ITS Manager to schedule a meeting to review camera locations (including mounting heights) and camera view zones.

Refer to the Turnpike Design Handbook (TDH), Design Criteria - Part 2, Section 221 Intelligent Transportation Systems (ITS) for more information.

» [Turnpike Design Handbook \(TDH\) - Design Criteria - Part 2](#)

ITS SIGHTLINE ANALYSIS

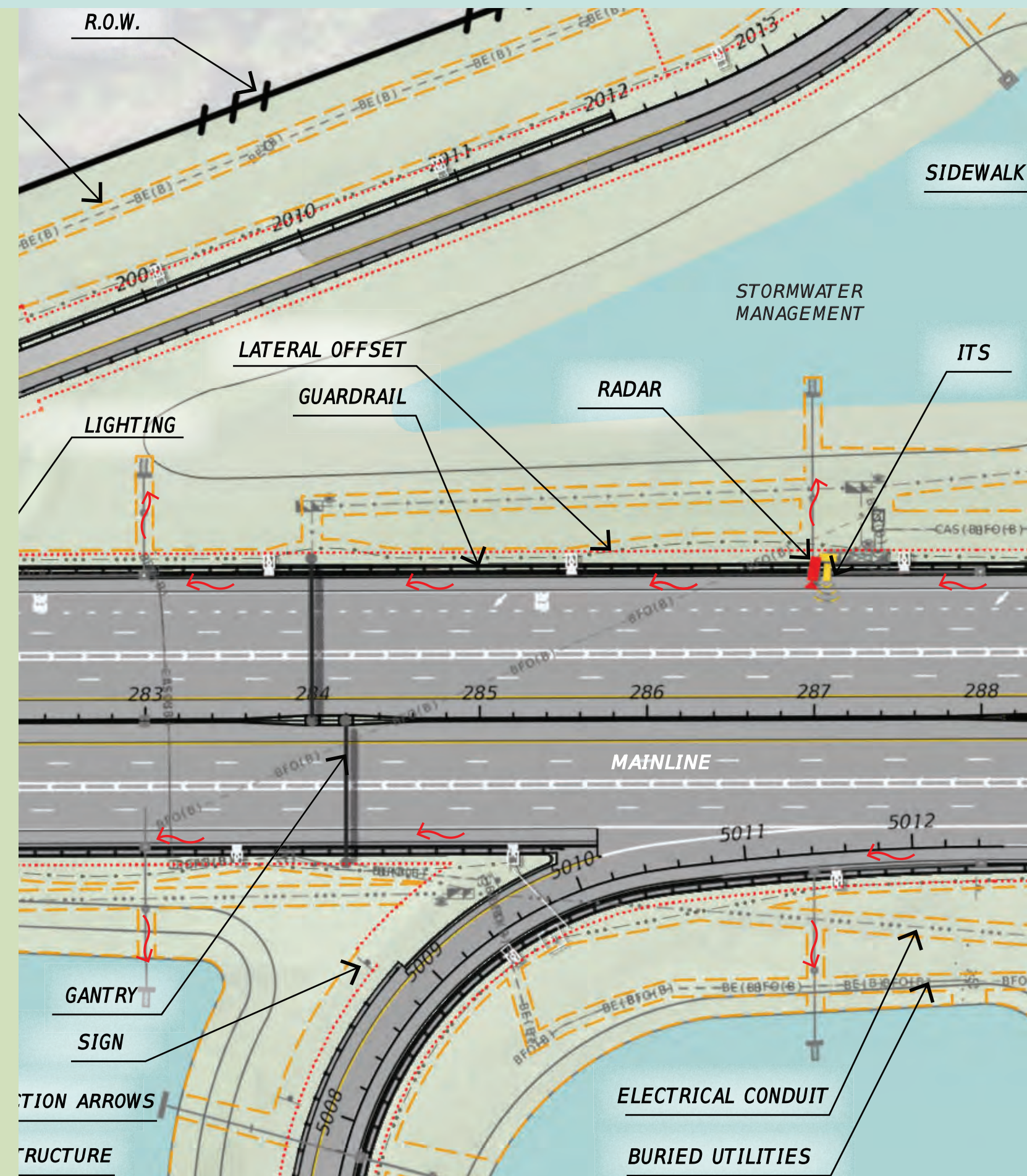


UTILITY COORDINATION

Utility coordination for landscape projects is a critical task. The location of existing utilities plays a significant role in identifying plantable areas within your project limits. FTE maintains a setback chart identifying minimum setbacks requirements for different vegetation types relating to utilities/ facilities. Referring to the Utility Setback Chart, show utilities on the plan with the respected minimum setback requirements set forth by the Turnpike.

Most FTE landscape projects do not provide for utility designation or survey. Utility locations, if shown on the plans, are usually obtained from historical drawings and may not be current or accurate. Accordingly, utility designation and location is delegated to the contractor by means of plan notes.

Utilities will also impact the design of irrigation for your project. Early coordination and documentation with the power service provider when planning for an irrigation system is critical. Designers need to know the location and type of available power for specifying the proper irrigation equipment and establishing service. This will be discussed further under Irrigation Feasibility Report.



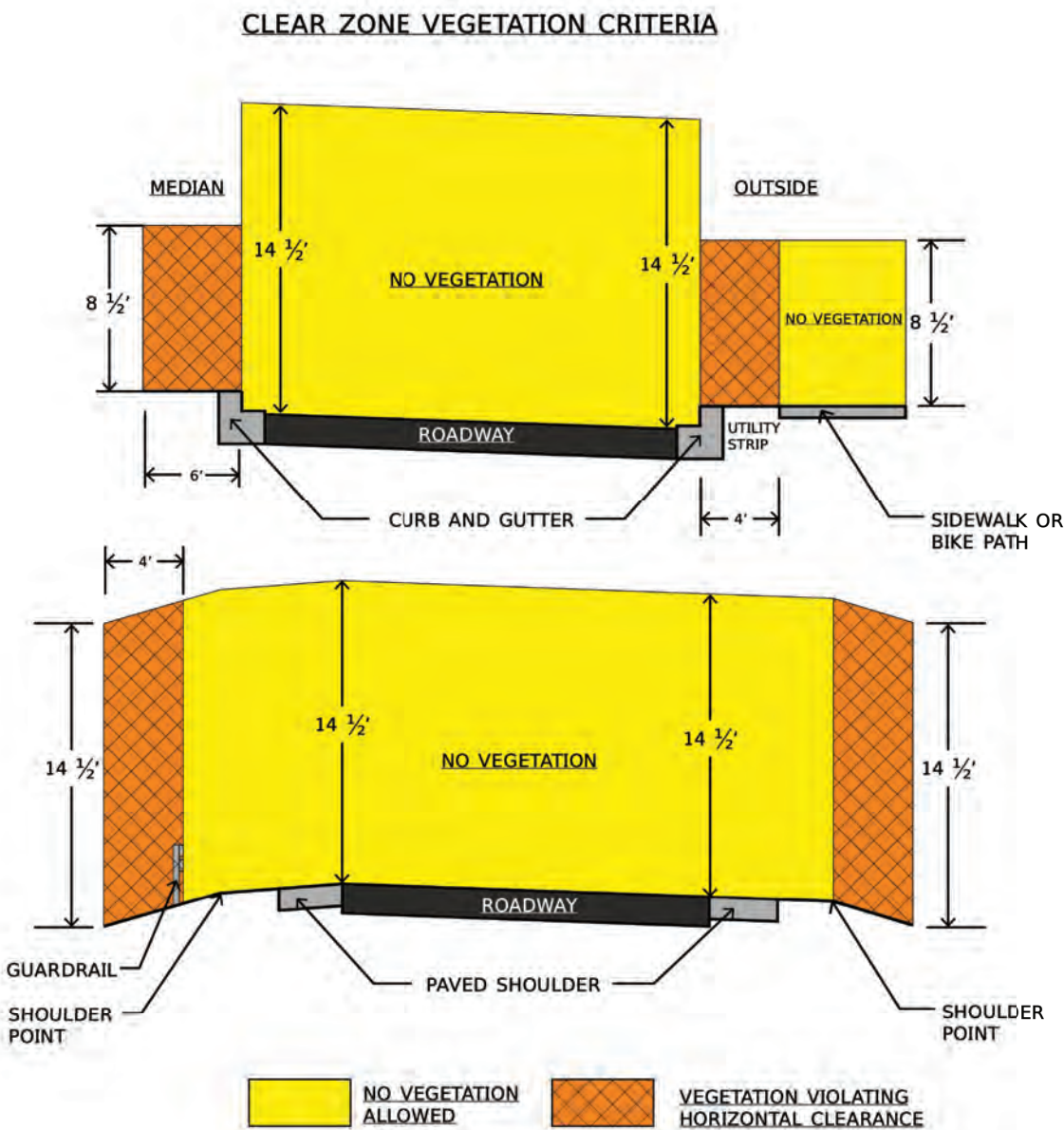
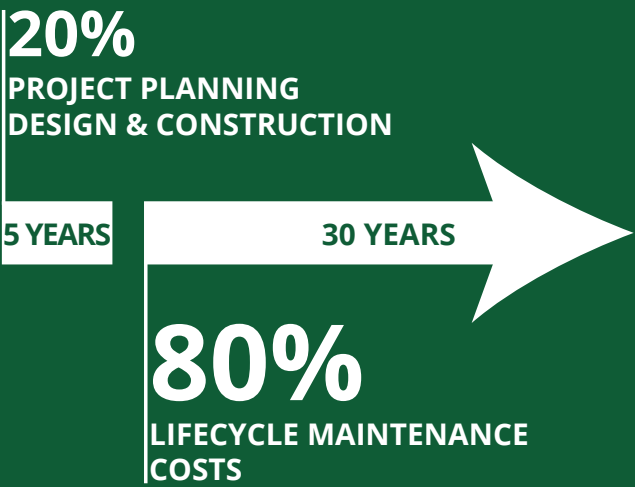
MAINTENANCE

Designs for FTE landscape projects must consider long term maintenance as one of the leading factors. Department policy will require maintenance costs to fall below \$6/SY for new projects. Accordingly, the FTE Landscape Program has developed a strategy for controlling long term maintenance costs for their landscapes and will require designers to develop their designs accordingly and document these efforts.

In order to meet this new policy FTE landscape designs will be required to include up to three intensity areas, High Intensity, Moderate Intensity and Low Intensity, and quantify them on their plans. FTE will supply current maintenance costs for each zone and the designer will adjust their plans accordingly to remain below the target maintenance cost.

High Intensity landscape areas are limited to no more than 25% of the project area. Moderate Intensity areas are limited to no more than 50% of the project area and Low Intensity areas must comprise a minimum of 50% of the project area.

LANDSCAPE LIFECYCLE COSTS



LOW INTENSITY LANDSCAPE DESIGN

Low intensity landscape design areas (buffers, sustainable field conditions, & reforestation) and non-landscaped areas (storm water management, limits of horizontal clearance, etc.) make up 50% of project area.

Low intensity design characteristics:

- » Plantings of pines and cabbage palms with native understory plants to reduce maintenance, mowing operations, and erosion on steep slopes.
- » Naturally occurring pine mulch
- » Annual removal of invasive species
- » Annual removal of dead or dying vegetation
- » Periodic trash removal

LOW INTENSITY LANDSCAPE DESIGNS are native or naturalistic plantings utilized for screening views, ecosystem restoration, or as a backdrop to specimen landscapes. These low intensity areas will accordingly require less long-term maintenance.



- Pine trees - minimal/no pruning necessary
- Mid-level shrubs - minimal/no pruning necessary
- Groundcovers & grasses - once annual/no pruning required

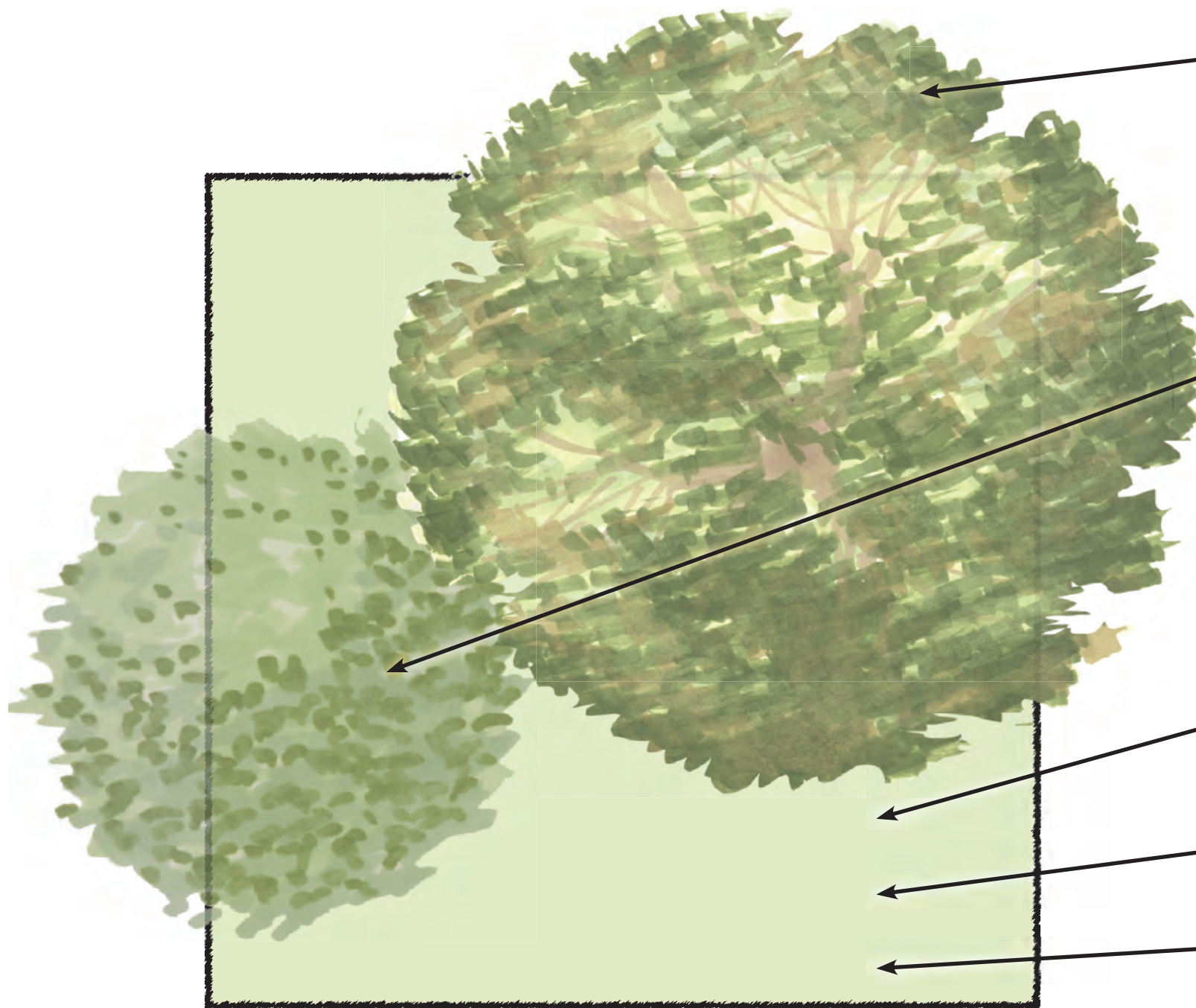


- Native Sabal Palms - only hanging or fallen fronds to be removed
- Groundcovers & grasses - once annual/no pruning required
- Shrubs & Palmetto - no pruning required



- Pine trees - minimal/no pruning required
- Natural pine mulch
- Periodic trash/litter removal and invasive species control required

LOW INTENSITY LANDSCAPE DESIGN PLANTING PATTERN & MAINTENANCE EXAMPLE



NATIVE/NATURAL TREE EXAMPLES:

- » Longleaf Pine (*Pinus palustris*) - Requires little to no pruning. Suggested deadwood removal once annually
- » Sabal Palm (*Sabal palmetto*) - Hanging fronds (dead & hanging) or fallen frond removal only
- » Pond Cypress (*Taxodium* spp.) - No pruning required

LARGE SHRUB EXAMPLES:

- » Seagrape (*Coccoloba uvifera*)
- » Wax Myrtle (*Myrica cerifera*)
- » Firebush (*Amelia patens*)
- » All large, mounding forms when placed in areas that allow for full growth. None or once annual pruning required

Natural pine straw mulch - no maintenance or replenishment required

Invasive species removal once annually


Litter / trash removal required annually

MODERATE INTENSITY LANDSCAPE DESIGN

Moderate intensity design characteristics:


- » Areas of indigenous trees or palms with undersory plantings. May include native and non-native species requiring fertilization and pruning.
- » Recommend understory plantings to to eliminate mowing, or self mulching species.
- » No re-mulching required after establishment.
- » Periodic trash removal.

MODERATE INTENSITY LANDSCAPE DESIGNS are transitional landscapes that complement high intensity landscapes, provide a variety of color and texture.



Royal Palms - dead/hanging frond & fruit removal. Requires fertilization


Wildflower areas - requires mowing after bloom & reseeding



Royal Palms - dead / hanging frond & fruit removal. Requires fertilization

Mowing required between trees planted close together

Florida Thatch palms - no maintenance required

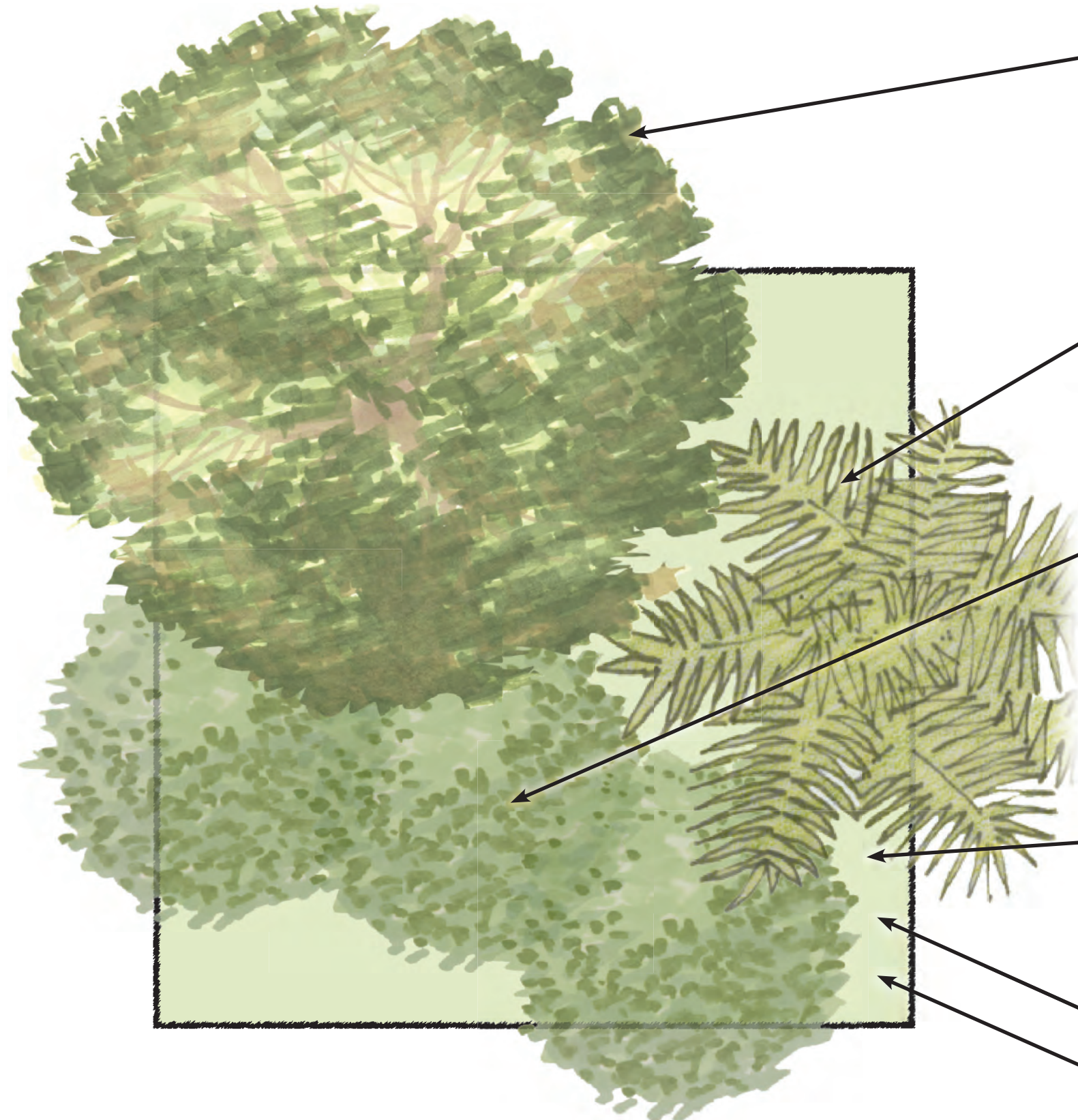


Pine trees - minimal / no pruning necessary. Dead wood removal when necessary

Wax Myrtle - large shrub - no maintenance required

Hedge - requires regular pruning and shaping

MODERATE INTENSITY LANDSCAPE DESIGN PLANTING PATTERN & MAINTENANCE EXAMPLE



TREE EXAMPLES:

- » Live Oak (*Quercus virginiana*) - Required pruning every 2-5 years depending on maturity
- » Buttonwood (*Conocarpus erectus*) - Requires deadwood removal
- » Southern Magnolia (*Magnolia grandiflora*) - No pruning required

PALM EXAMPLES:

- » Sabal Palm (*Sabal palmetto*) - Hanging fronds (dead & hanging) or fallen frond removal only
- » Florida Thatch Palm (*Thrinax radiata*) - No maintenance required

SHRUB EXAMPLES:

- » Stoppers (*Eugenia* spp.)
- » Loropetalum (*Loropetalum chinense*)
- » Cocoplum (*Chrysobalanus icaco*)
- » Can be used as a mounding shape which requires no pruning. Can be shaped or hedged with more maintenance required

GROUNDCOVER EXAMPLES:

- » Grasses - low to no maintenance required
- » Wildflowers - requires once annual mowing and reseeding every 3 years

Trash / litter removal required periodically

Invasive species removal required annually


HIGH INTENSITY LANDSCAPE DESIGN

High intensity landscape design areas should comprise no more than 25% of the total landscape for each project.

High intensity design characteristics:


- » Areas of exotic or indigenous trees and palms.
- » With or without understory plantings.
- » Requires fertilization, pest control, and pruning.

HIGH INTENSITY LANDSCAPE DESIGNS are located in the most visible areas are designed for maximum aesthetic impact and may require a higher level of long-term maintenance.



Greater amount of non-native palms - require more frequent pruning and fertilization

Shrubs close to road or guardrail require frequent maintenance and pruning




Densely planted understory

Clumping palms - require dead frond removal

Date palms - require annual pruning and fertilization

Areas of greater visual interest through variety of plants and planting pattern



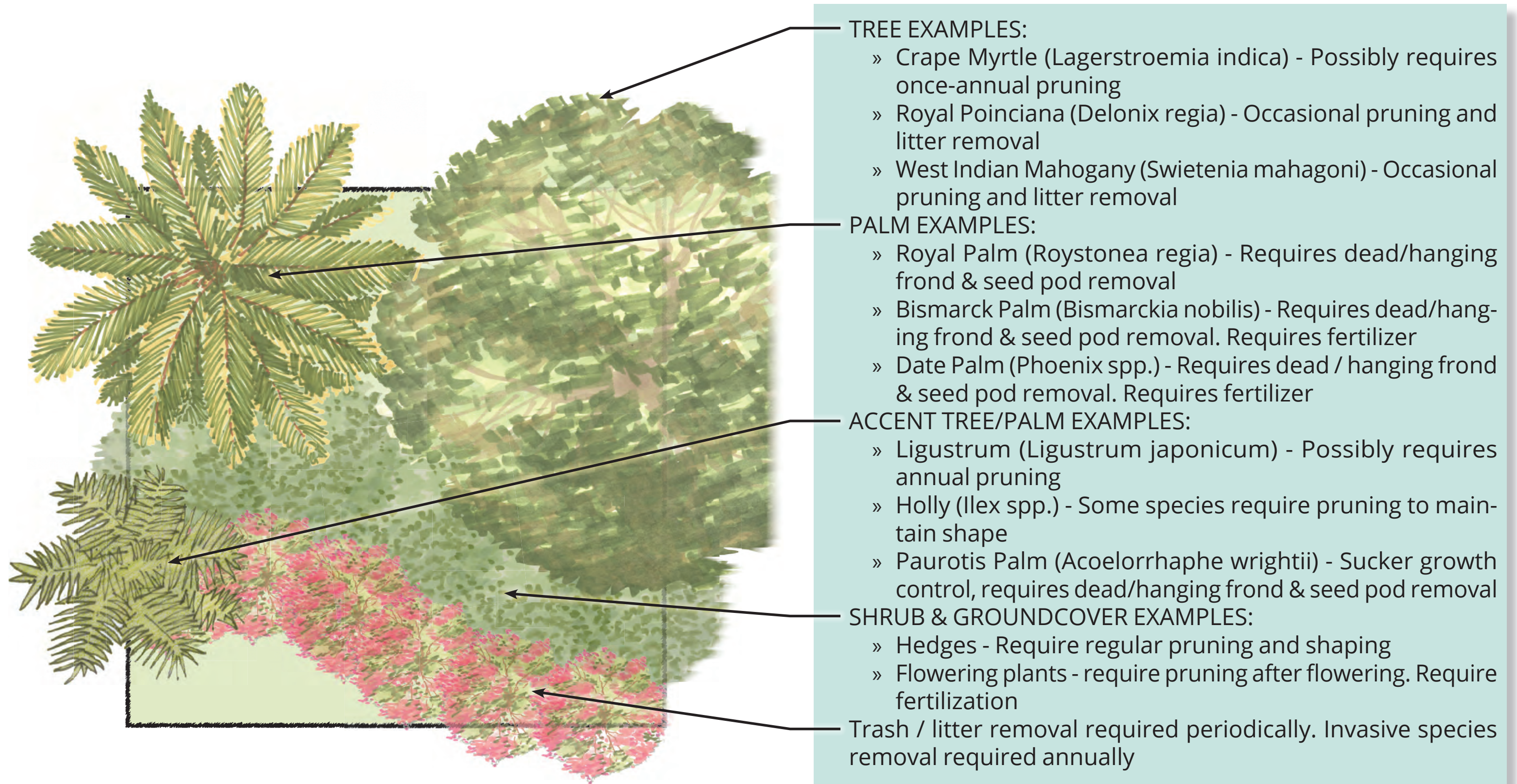
Palms - require annual pruning and fertilization

Flowering trees

Shrubs - require pruning, shaping, and fertilization

Mulched planting beds

HIGH INTENSITY LANDSCAPE DESIGN PLANTING PATTERN & MAINTENANCE EXAMPLE



OUTDOOR ADVERTISING (ODA)

ODA owners have view zone rights. These view zones need to be shown on the plans and cannot be impacted by proposed or existing landscape. When planning the landscape design, give consideration to a plant's future growth and ensure it does not impact the ODA view zone.

"The Outdoor Advertising regulatory program is based on federal law and regulations as well as state statute and rule. Federal law is set forth in the Highway Beautification Act while federal regulations can be found at 23 C.F.R., Section 750. State laws are found in [Chapter 479](#), Florida Statutes. In addition to the state statutes, the Department writes administrative rules to interpret the intent of the statute for the general public. [Chapter 14-10](#), Florida Administrative Code, is the Department's rule chapter which governs outdoor advertising. Copies of the complete rule chapter may be obtained from the Outdoor Advertising Office. Local governments often have their own ordinances which regulate outdoor advertising in their community. The Department cannot issue a permit for an outdoor advertising sign which is not allowed by local ordinances."

The process of working with ODA owners to ensure that their rights are preserved is well documented and described on FDOT's website.

- » <https://www.fdot.gov/rightofway/OutdoorAdvertising.shtm>
- » <https://www.fdot.gov/rightofway/VegetationManagement.shtm>



AVIATION IMPACTS

Federal, state, and local regulations exist to protect the national airspace system and must be considered when a project is within 10 nautical miles (11.5 statute miles) of an airport or spaceport. For additional information refer to FDM 110.5.1:

- » FDM 110: <https://www.fdot.gov/roadway/fdm/default.shtm>

PROJECT AVIATION REQUIREMENTS (FDM 110.5.1)

Step 1: Federal aviation requirements must be met when the project is within 10 nautical miles (11.5 statute miles) of a facility.

- » Contact the District Aviation Coordinator if you are within the 10 nautical miles (11.5 statute miles).

Step 2: Utilize Notice Criteria Tool to input coordinates of any proposed construction or alteration of structures (including natural growth, vegetation, and landscaping) if within the 10 nautical miles.

- » Determine if necessary to file “Notice of Proposed Construction or Alteration.”
- » Document structures requiring notice.

Step 3: If notice is required, use FAA Form 7560-1 to file a “Notice of Proposed Construction or Alteration.”

- » 45 to 60 days advance filing to accommodate the review process and issue the FAA determination letter.
- » “Determination” valid 180 days for construction.
- » FAA will grant only one extension to a determination for 180 days.



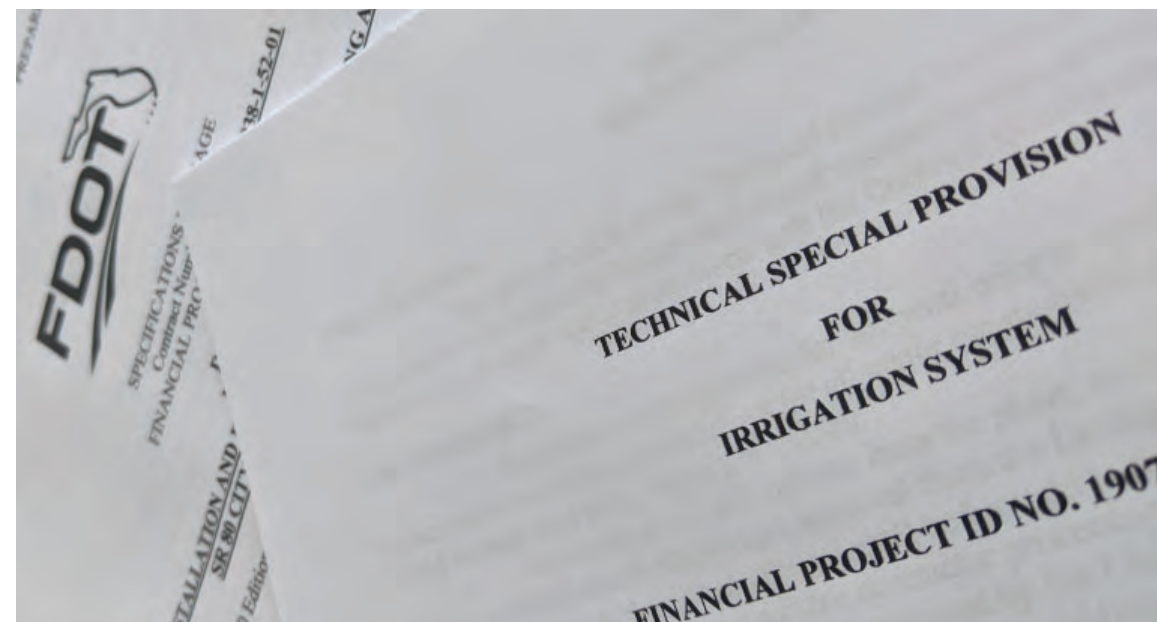
LANDSCAPE IRRIGATION

Roadsides are a hostile environment for plant materials. Less than desirable soils, drainage patterns, heat-island effect and wind make plant survival difficult. Even the most drought-tolerant plants require supplemental watering particularly during the establishment period.

While it is generally not feasible for Florida's Turnpike Enterprise (FTE) to maintain irrigation systems for extended periods, it has been determined that the design and installation of an underground irrigation system can be in the best interest of FTE. Providing a resilient and well-designed underground irrigation system for use during the establishment period provides several advantages, including:

- » **Ensuring FTE's significant investment in plant materials is successful.** Lack of adequate water during the contractor's establishment period may result in deficiencies in expensive plant materials, particularly palms, which will not be manifested until well after the contractor's obligations for establishment have expired. This results in FTE inheriting many substandard plants that will not perform well or die during their anticipated lifetime.
- » **Confirming contractors' bids are comparable.** Experience has demonstrated that if an irrigation system is not included in the bid documents, many contractors will not include sufficient funds in their bids to cover the minimum water requirements for successful plant establishment. They will rely on manual watering or worse, rainfall. These methods have proven unsuccessful on for the majority of projects on which they have been used.
- » **Enhancing roadside safety and protection of the right of way (ROW).** Relying on heavy water tanker trucks entering and leaving the highway at uncontrolled points and traveling over buried utilities and drainage structures or over soft ground creates safety and maintenance concerns.

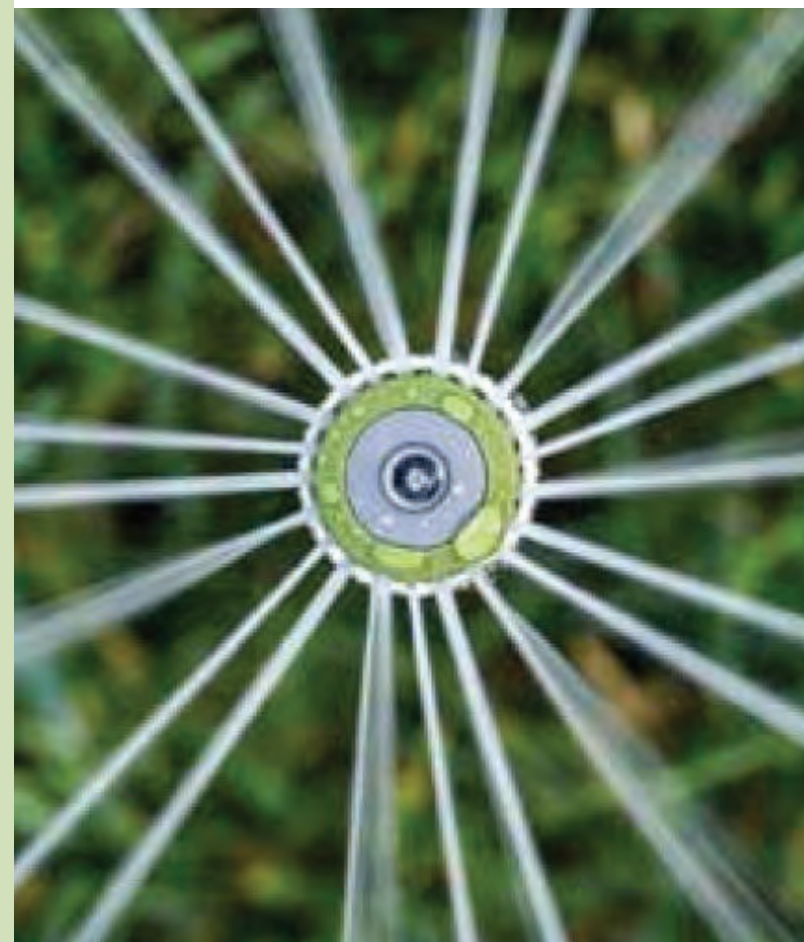
Accordingly, FTE has required, under most circumstances, irrigation systems to be installed with the landscape projects.



IRRIGATION FEASIBILITY STUDY

The purpose of the Feasibility Study will be to document the design process that may be used to complete irrigation system design documents, determine availability of a reliable water and power source, and to determine the financial feasibility of installing the irrigation system. The consultant shall prepare a Feasibility Report including an analysis of the water sources, power sources, permitting requirements, watering methods, materials and operational costs associated with a proposed irrigation system design. The Feasibility Report shall include an overall map of the project limits showing preliminary locations of major system components, including water sources, controllers, electrical connections, and sleeves.

It is imperative that the designer contact the utility providers and verify the availability of both water and power and document this in the report.



WATER SOURCES

The consultant shall determine the appropriate water sources, selected to meet the intent of the project on the basis of durability, cost, water conservation and efficiency, and compatibility with existing Turnpike operations and facilities. FTE encourages the use of a well and manufactured pump system or reclaimed water where available.

WELL WATER

A pump system utilizing a well will provide a very reliable water source for both a permanent and temporary irrigation system installation. There are high initial installation costs for constructing and permitting a well with a pump, however the costs for maintaining an efficient system are low compared to other sources.

The installation of pump system will be dependent on the availability of establishing an electrical service if not already available within the project limits. The well sources may be utilized during construction and during establishment by water trucks as an on-site water source, or utilized by a more permanent installation with an automated irrigation controller.



SURFACE WATER

Pump systems similar to the well source may be used to utilize surface water from retention areas. Retention areas could provide water for a plant establishment period, but may be an unreliable long term solution due to seasonal fluctuations in water levels. In addition, fluctuations in surface water levels caused by withdrawal could have a potential impact to any nearby wetlands.

The installation of a pump system will require an electrical service establishment near the water source. The associated costs of a surface water pump system include the initial installation costs for construction and permitting.

RECLAIMED WATER

Reclaimed water is a reliable water source where available, however pressure conditions may vary with demand. It is an ideal solution where concerns for environmentally sensitive wetlands may be impacted from well or surface water withdrawal.

The water source would not require an electrical connection to operate a pump system or controller. Other benefits of reclaimed water include low installation costs for construction with low impact fees, as well as low ongoing costs for water usage for life of system.



POTABLE WATER

A potable water connection is the most reliable water source with low installation costs for construction. However, potable water has potential high impact fees and high ongoing costs for water usage for life of system.

This water source would not require an electrical connection to operate a pump system or controller.

WATER TRUCK

Another potential irrigation source is manual hand watering with the use of water trucks, hose spraying, and tree water bags. This can be ideal for isolated areas where temporary or permanent irrigation system could not be installed due to location or lack of availability of a reliable power source. In addition, water trucks could utilize any of the above water sources to eliminate the cost for delivering water to the site.

Manual irrigation will require additional costs of labor, safety, and mobilization for the length of plant establishment, however there will be no continuing maintenance costs after plant establishment.



POWER SOURCES

Coordination with the appropriate electrical utility provider on the availability and type of electrical source will be a critical step to establishing the feasibility of installing an irrigation system. The consultant must pull a design ticket to identify utility providers within the project limits. Proposed irrigation system utilizing a power source will require an independent electrical meter account that will be established and owned by the contractor throughout the installation and establishment period.

HARDWIRED (UTILITY)

A hardwired power source utilizing a utility will be required for use with well or surface water source to power a pump system. While this configuration is the most reliable, a new power service will have a moderate installation cost with continuing usage costs for the life of the system, with the potential for an impact fee from the utility service provider.

SOLAR

Solar power could be utilized to operate automated controllers on systems utilizing reclaimed or potable water that do not require a pump system. Solar power can have higher installation costs with little to no ongoing costs for life of system and is ideal for isolated areas where power is not available or accessible.

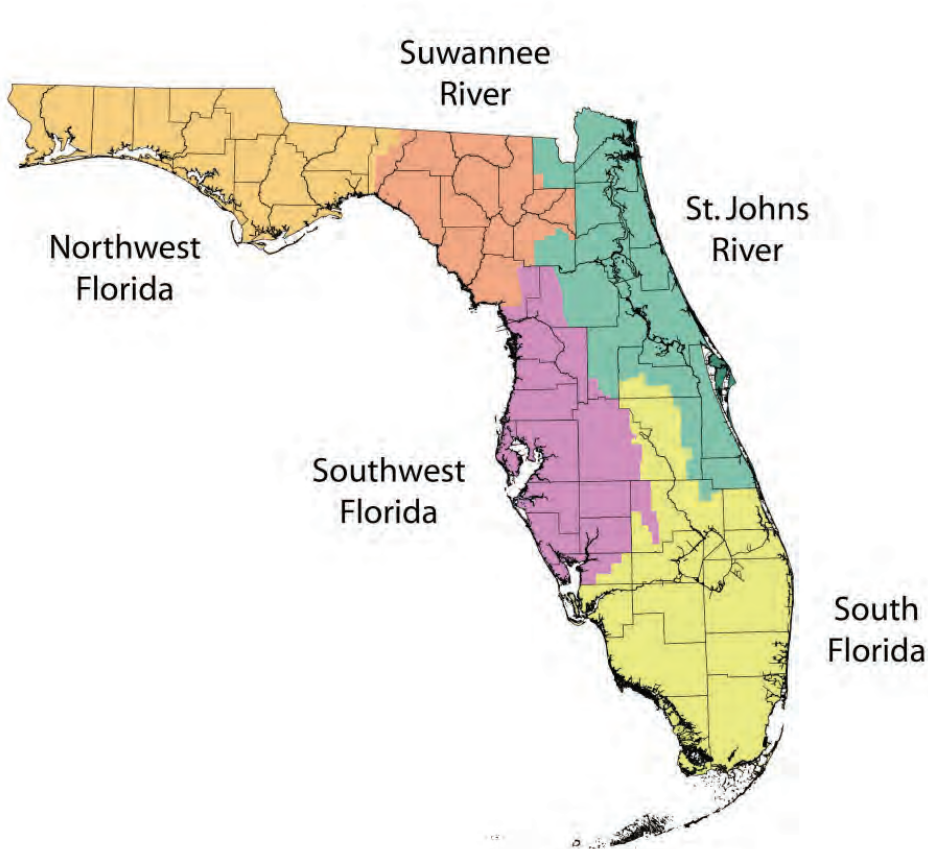
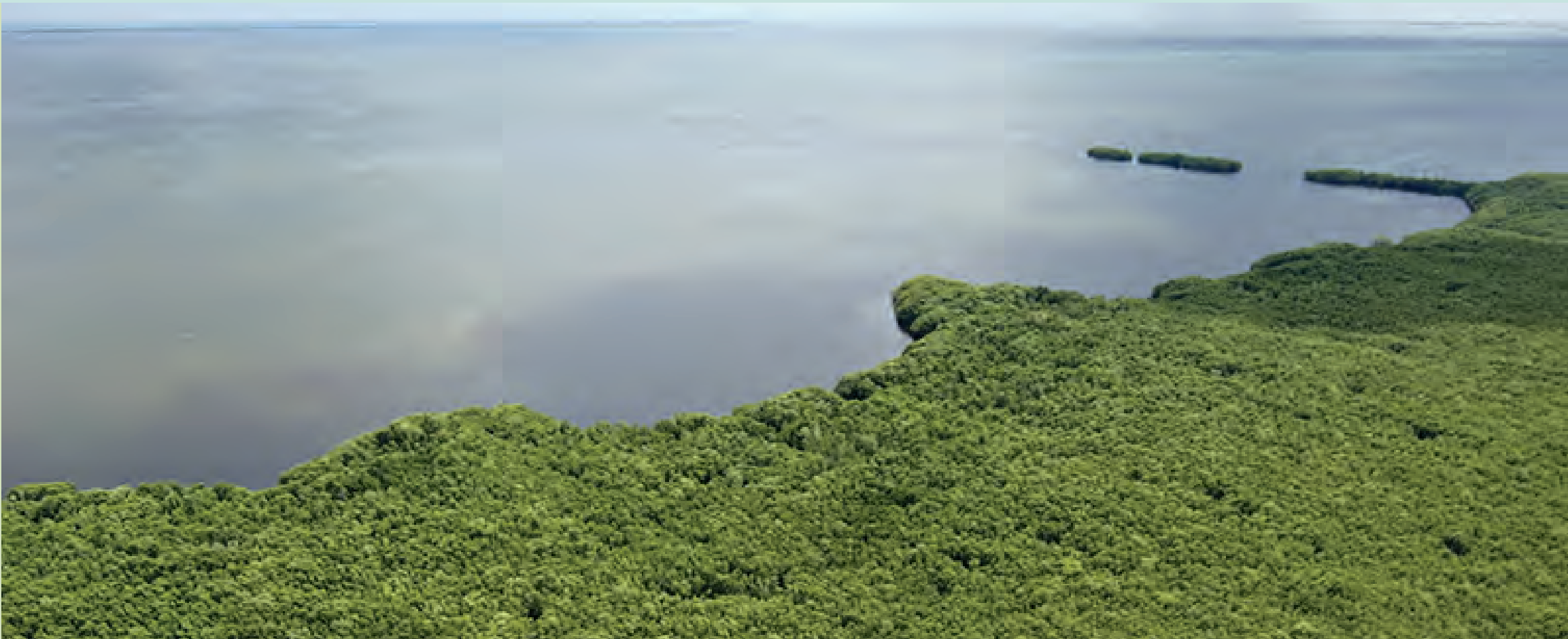
BATTERY

Similar to solar, battery-powered controllers may be utilized to operate automated irrigation controllers on systems utilizing reclaimed or potable water that do not require a pump system. Battery-powered controllers are the most affordable option with low installation costs, however battery-operated controllers will require a maintenance plan for battery replacement. In addition, a typical battery-operated controller lacks features available to traditionally hardwired controllers.



PERMITTING

Water use permits, well construction permits, applications and payment of associated fees should be documented in the Feasibility Report. The consultant shall provide coordination with the appropriate water management district, health department, and local municipalities to determine permit fees and procedures. Permitting, where required, will become the responsibility of the contractor.



STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

PLEASE FILL OUT ALL APPLICABLE FIELDS (*Denotes Required Fields Where Applicable)

The water well contractor is responsible for completing this form and forwarding the permit application to the appropriate delegated authority where applicable.

Permit No. _____
Florida Unique ID _____
Permit Stipulations Required (See Attached) _____
62-524 Quaid No. _____ **Delineation No.** _____
CUP/WUP Application No. _____
ABOVE THIS LINE FOR OFFICIAL USE ONLY

1. *Owner, Legal Name if Corporation _____ ***Address** _____ ***City** _____ ***State** _____ ***ZIP** _____ **Telephone Number** _____

2. *Well Location - Address, Road Name or Number, City _____

3. *Parcel ID No. ☐ (PIN) or ☐ Alternate Key _____ **Lot** _____ **Block** _____ **Unit** _____

4. *Section or Land Grant _____ ***Township** _____ ***Range** _____ ***County** _____ **Subdivision** _____ **Check if 62-524:** ☐ Yes ☐ No

5. *Water Well Contractor _____ ***License Number** _____ ***Telephone Number** _____ **E-mail Address** _____

6. *Water Well Contractor's Address _____ **City** _____ **State** _____ **ZIP** _____

7. *Type of Work: ☐ Construction ☐ Repair ☐ Modification ☐ Abandonment **Reason for Repair, Modification, or Abandonment** _____

8. *Number of Proposed Wells _____

9. *Specify Intended Use(s) of Well(s):

<input type="checkbox"/> Domestic	<input type="checkbox"/> Landscape Irrigation	<input type="checkbox"/> Agricultural Irrigation	<input type="checkbox"/> Site Investigations
<input type="checkbox"/> Bottled Water Supply	<input type="checkbox"/> Recreation Area Irrigation	<input type="checkbox"/> Livestock	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Public Water Supply (Limited Use/DOH)	<input type="checkbox"/> Nursery Irrigation	<input type="checkbox"/> Test	<input type="checkbox"/> Earth-Coupled Geothermal
<input type="checkbox"/> Public Water Supply (Community or Non-Community/DEP)	<input type="checkbox"/> Commercial/Industrial	<input type="checkbox"/> Golf Course Irrigation	<input type="checkbox"/> HVAC Supply
<input type="checkbox"/> Class I Injection	<input type="checkbox"/> Class II Injection	<input type="checkbox"/> HVAC Return	<input type="checkbox"/> HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☐ Drainage

Remediation: ☐ Recovery ☐ Air Sparge ☐ Other _____ (Describe)

10. Distance from Septic System if ≤ 200 ft. _____ **11. Facility Description** _____ **12. Estimated Start Date** _____

13. Estimated Well Depth _____ ft. ***Estimated Casing Depth** _____ ft. **Primary Casing Diameter** _____ in. **Open Hole:** From _____ To _____ ft.

14. Estimated Screen Interval: From _____ To _____ ft.

15. Primary Casing Material: ☐ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other _____

16. Secondary Casing: ☐ Telescope Casing ☐ Liner ☐ Surface Casing **Diameter** _____ in.

17. Secondary Casing Material: ☐ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Other _____

18. Method of Construction, Repair, or Abandonment: ☐ Auger ☐ Cable Tool Jetted ☐ Rotary ☐ Sonic ☐ Combination (Two or More Methods) ☐ Hand Driven (Well Point, Sand Point) ☐ Other _____

☐ Horizontal Drilling ☐ Plugged by Approved Method ☐ Hydraulic Point (Direct Push) _____ (Describe)

19. Proposed Grouting Interval for the Primary, Secondary, and Additional Casing:

From _____ To _____	Seal Material <input type="checkbox"/> Bentonite <input type="checkbox"/> Neat Cement <input type="checkbox"/> Other _____
From _____ To _____	Seal Material <input type="checkbox"/> Bentonite <input type="checkbox"/> Neat Cement <input type="checkbox"/> Other _____
From _____ To _____	Seal Material <input type="checkbox"/> Bentonite <input type="checkbox"/> Neat Cement <input type="checkbox"/> Other _____
From _____ To _____	Seal Material <input type="checkbox"/> Bentonite <input type="checkbox"/> Neat Cement <input type="checkbox"/> Other _____

20. Indicate total number of existing wells on site _____ **List number of existing unused wells on site** _____

21. *Is this well or any existing well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? Yes _____ No _____ If yes, complete the following: CUP/WUP No. _____ District Well ID No. _____

22. Latitude _____ **Longitude** _____ **Datum:** _____ **NAD 27** _____ **NAD 83** _____ **WGS 84** _____

I hereby certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 253, Florida Statutes, to register or properly designate this well. I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of their responsibilities as listed above. Owner consents to allowing personnel of the WMD or Delegated Authority access to the well site during the construction, repair, modification, or abandonment authorized by this permit.

***Signature of Contractor** _____ ***License No.** _____ ***Signature of Owner or Agent** _____ ***Date** _____

BELOW THIS LINE FOR OFFICIAL USE ONLY

Approval Granted By _____ **Receipt No.** _____ **Issue Date** _____ **Expiration Date** _____ **Hydrologist Approval** _____

Fee Received \$ _____ **Check No.** _____

THIS PERMIT IS NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD OR DELEGATED AUTHORITY. THE PERMIT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL CONSTRUCTION, REPAIR, MODIFICATION, OR ABANDONMENT ACTIVITIES.

DEP Form: 62-532.900(1) Incorporated in 62-532.400(1), F.A.C. Effective Date: October 7, 2010 Page 1 of 2

IRRIGATION METHODS

If an irrigation system installation is recommended in the Feasibility Report, the consultant shall determine the following:

- » Types of irrigation strategies to be utilized throughout the project.
- » Preliminary calculations of water use to size the water source.
- » Electrical requirements and potential sources.



OVERHEAD

Overhead application of water is the primary application method for landscape and turf irrigation systems due to water efficiency, automation, and cost effectiveness.

Overhead irrigation offers flexibility with water sources. The products commercially available are designed to utilize a variety of water sources including wells, surface water, reclaimed, or potable water. In addition, equipment designs focus on applying water efficiently by maximizing distribution uniformity for various weather and soil conditions. A well-designed system will take into account equipment performance, head spacing, and distribution uniformity to effectively provide supplemental water to landscapes.

Different types of overhead application nozzles include sprays, rotary, and rotor type irrigation application devices.

Rotary nozzles, a type of multi-trajectory rotating stream nozzle, are the most efficient product for overhead type irrigation with a distribution uniformity of 80%. Rotary nozzles distribute water uniformly onto landscape at a slower application rate to allow the soil to intake water without runoff. The low precipitation application is beneficial on slopes and roadway embankments to establish stabilization plantings. Increased efficiency results in 30% less water use when compared to traditional sprays and significantly reduces wasteful runoff.

Water conservation can be improved when utilizing more traditional rotors and sprays through the use of water saving features such as check valves, matched precipitation, and pressure regulation.



MICRO IRRIGATION

Micro irrigation is considered to be the most efficient form of water application when designed and maintained properly. Micro irrigation utilizes slow and frequent application of water to the soil, delivering water efficiently to the base of each plant through a system of flexible irrigation tubing, drip emitters, bubblers, and micro sprays.

Due to the small diameter of pipe tubing and emitters, micro irrigation is prone to clogging where low-quality water is being utilized. A system with a well or surface water source will be dependent on the use of filtration to remove inorganic particles and control the organic material that may enter the system.

MANUAL WATERING

Supplemental water for establishing landscape plantings can be provided to landscape that are isolated from a viable water

or power source through the use of a combination of water trucks, hose spraying, and tree watering bags.

Manual watering requires additional cost for labor, safety, and mobilization. Ensuring the safety of landscape crews and the accessibility of the site will be especially important to consider when selecting suitable areas to receive this method of watering; specifically along high speed areas, pull off areas, and steep embankments.

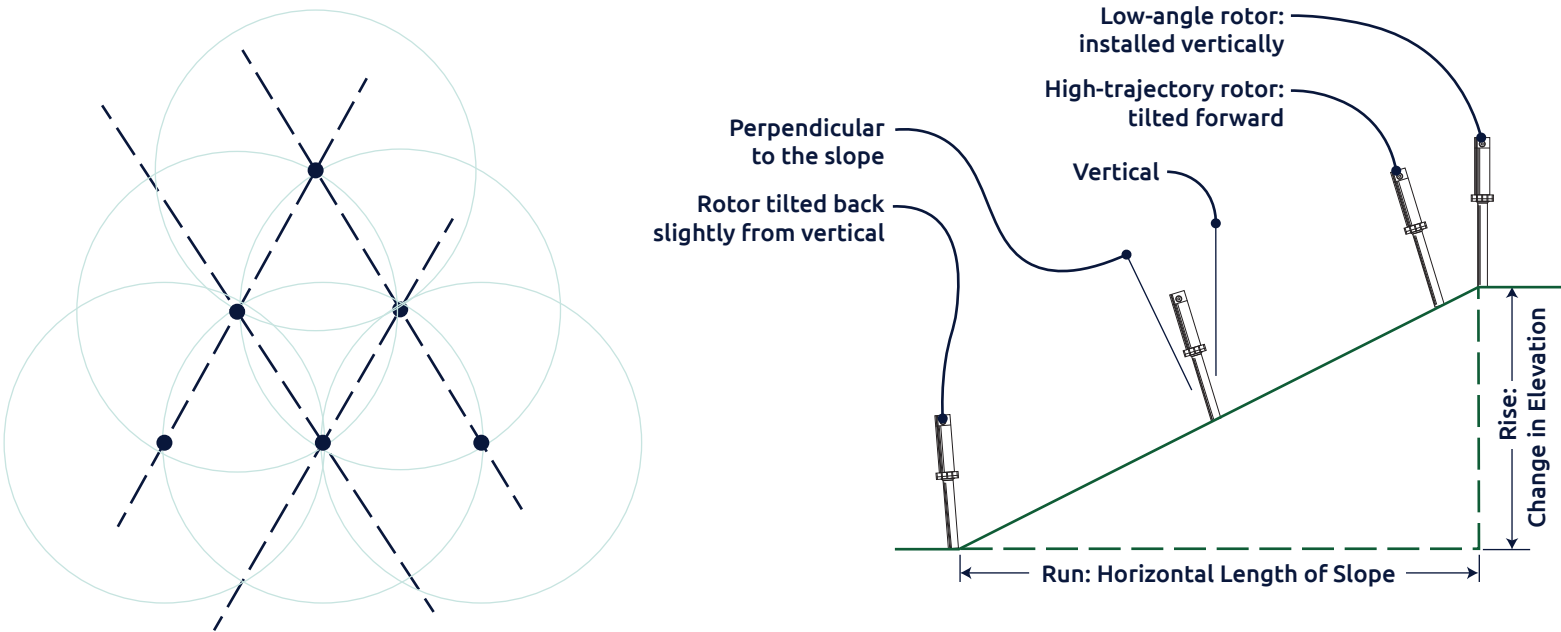
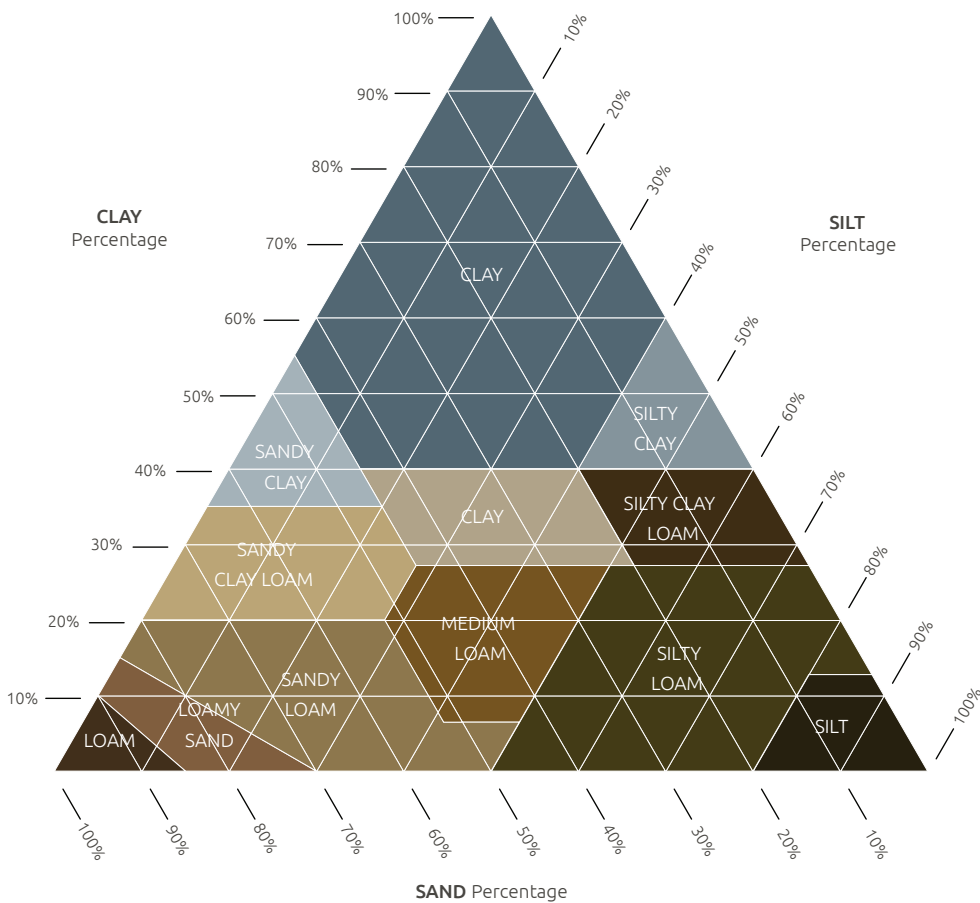
While a sprinkler or drip emitter can be designed to efficiently distribute water automatically, manual watering relies on the expertise of the operator to ensure plant material receives water and can be an inefficient application of water to turf and ornamental landscape. Watering bags for tree establishment provide a slow release of water directly to the root system, but are susceptible to damage.



IRRIGATION DESIGN STRATEGIES

The following irrigation strategies are recommended to encourage consistency between irrigation designs along the FTE system. The strategies have been developed from best practices and lessons learned from previous FTE landscape projects, and are intended to serve as a guide to encourage the design of irrigation systems that help to ensure successful landscape installations, are resilient to harsh conditions, and do not significantly increase project maintenance requirements.

In addition to the design strategies, the irrigation design shall incorporate standards defined in the Florida Building Code, Appendix F. The design shall also incorporate recommendations from the Florida Irrigation Society Standards and Specifications for Turf and Landscape Irrigation Systems, Fourth Edition.



TURF AREAS

Irrigation of turf areas along the FTE is generally discouraged due to the high watering requirement and increased maintenance and mowing of large areas. Turf areas adjacent to heavy pedestrian activity such as parking areas and rest stops may benefit from an irrigation system. High visibility areas, gateways, and areas susceptible to soil erosion where shrubs or groundcovers cannot be utilized may also benefit from irrigation and add to beautification. The use of irrigation for establishing turf areas may be approved on a case-by-case basis.

- » Spray nozzles with matched precipitation installed on a 6" pop-up are recommended for areas 4' wide up to 18'. Factory-installed pressure regulation is recommended to reduce misting and overspray on to roadways and hardscape areas.
- » Low-volume rotary type nozzles installed on a 6" pop-up are recommended for areas 4' wide up to 35', especially where low application rates are desired for embankments and poor soil intake rates.
- » Pop-up rotors may be utilized for irrigating large areas, 25' and greater.



GROUNDCOVERS, SHRUBS, AND ORNAMENTAL GRASSES

Where groundcovers and shrubs are used for screening, embankment stabilization, or beautification, overhead irrigation is encouraged for the duration of the establishment period. The design should consider plant watering requirements, micro-climate factors, and soil intake rates when zoning a system and selecting the appropriate irrigation products.

- » Drip irrigation is only recommended to eliminate overspray onto buildings where hard water or iron deposits are present in the water source. Drip irrigation may also be recommended in areas smaller than 4' wide.
- » Spray nozzles with matched precipitation installed on a fixed shrub riser are recommended for areas 4' wide up to 18'. Factory-installed pressure regulation is recommended to reduce misting and overspray on to roadways and hardscape areas.
- » Low-volume rotary type nozzles installed on a fixed shrub riser are recommended for areas 4' wide up to 35', especially where low application rates are desired for embankments and poor soil intake rates.
- » Rotors installed on a riser may be utilized for irrigating large areas, 25' and greater.



TREES AND PALMS

Trees and palms along the FTE contribute the greatest visual impact in a landscape project. Many of these plantings located in harsh micro-climates and artificially created planting areas are susceptible to stress, making supplemental watering essential to proper establishment. When roadway conditions make these areas inaccessible to maintenance vehicles or water trucks, a well designed irrigation system will ensure proper watering has occurred.

- » Fixed flow rate pressure compensating bubblers on a flex hose riser, installed inside of mulch watering ring. Size flow rate and quantity of bubblers to provide the proper amount of water for each planting. Design to consider planting size, location, elevation, and soil type.
- » Fixed flow rate pressure compensating bubblers installed below grade inside a preferred pipe, ideal for areas with compacted soils or plaza areas with tree planting pits. Size flow rate and quantity of bubblers to provide the proper amount of water for each planting. Design to consider planting size, location, elevation, and soil type.



WILDFLOWERS AND NATIVE PLANTINGS

When necessary for the establishment of native area infill plantings and wildflower areas, manual watering with quick-coupler valves installed on nearby irrigation systems can provide a reliable water source without the need to transport water to the site.

- » Quick-coupler valves installed below grade on a swing-type riser. Valve boxes with SCTE Tier 8 load ratings are recommended in grassed areas for protection from landscape equipment and light trucks.



AUTOMATIC IRRIGATION CONTROLLER

Automated scheduling adjustments based on weather or accumulated rainfall promote water conservation and help to ensure landscape material is not over-watered. Irrigation controllers or pump monitoring systems that feature remote water management will help to ensure the landscape has received irrigation and alerts maintenance of issues in the field.

Decoder controllers allow for future system expansion and can reduce the complexity of an irrigation system on very long or large projects.

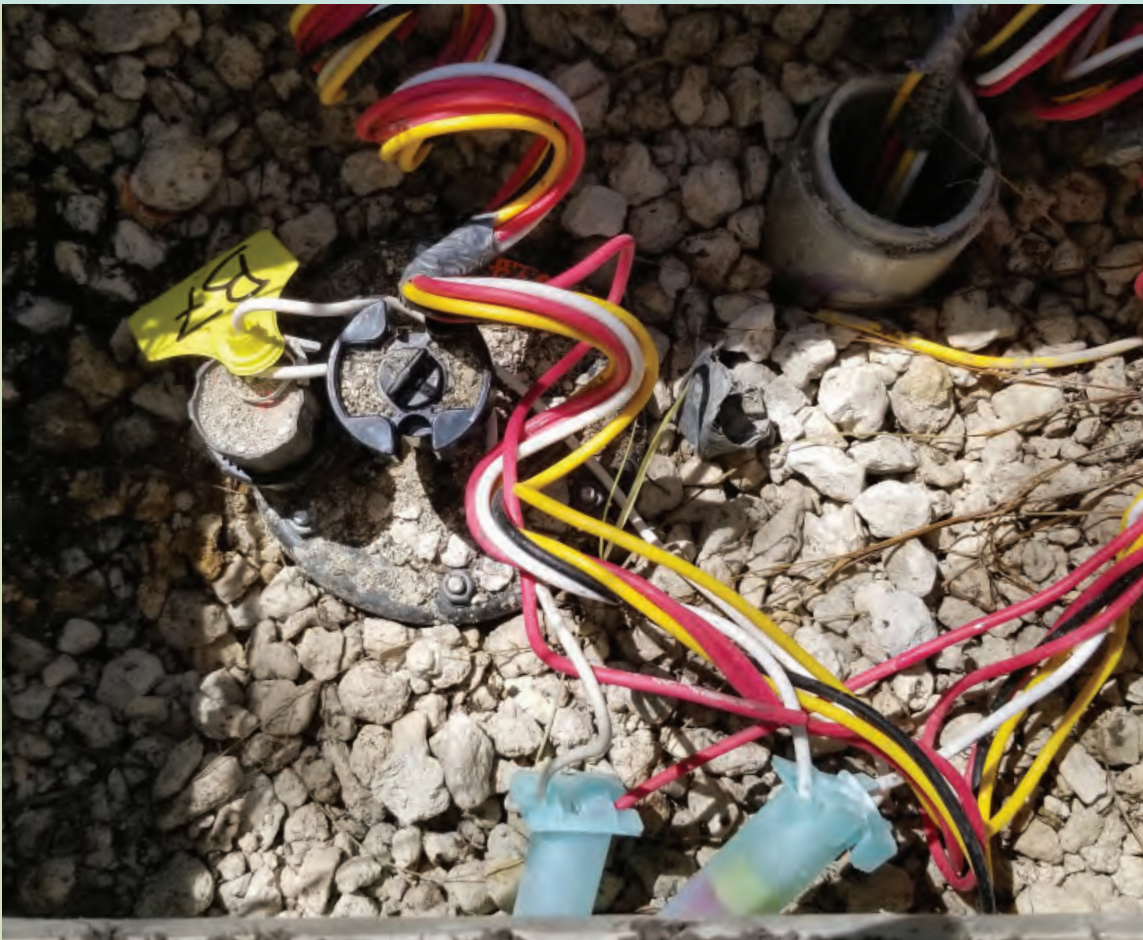
DIRECTIONAL BORING

Limit the number of directional bores. Design ticket and utility coordination is critical during the installation. May be used to extend irrigation water sources, electrical service, and automated irrigation control across interchanges, into medians, and other isolated areas that may not have direct access to water or power.

IRRIGATION EQUIPMENT

Valve boxes for irrigation valves installed within grassed areas are more susceptible to damage from incidental traffic and maintenance activity. Where valve boxes cannot be installed in shrub beds, a valve box with SCTE Tier 8 load ratings are recommended to protect irrigation equipment from landscape maintenance equipment and light trucks.

Waterproof irrigation wiring connections should be specified on all wiring splice locations, including junction boxes and solenoid or decoder connections.

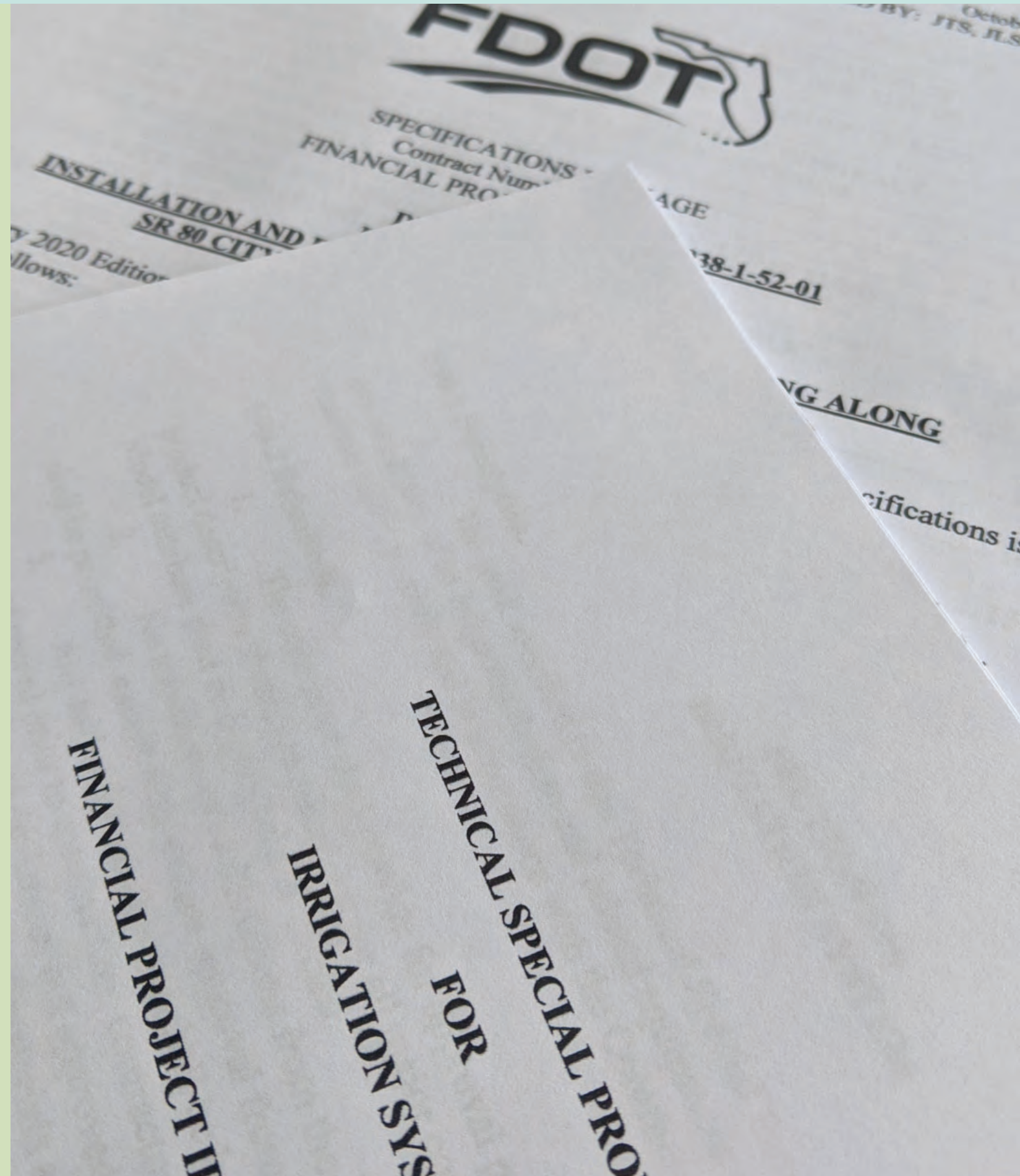


IRRIGATION TECHNICAL SPECIAL PROVISIONS

When specifying an irrigation system design, the consultant shall comply with the FDOT Specifications Handbook for developing the Irrigation Technical Special Provisions (TSP) package. The Irrigation TSP must complement the Irrigation Plans and incorporate all recommendations developed in the Irrigation Feasibility Study.

Additional information on preparing a Specification Package and a Technical Special Provision can be found on the FDOT Program Management website:

- » <https://www.fdot.gov/programmanagement/packagepreparation/default.shtm>



LANDSCAPE WORK PROGRAM

PROGRAMMATIC CONSIDERATIONS

Like many programs within FDOT, cost and budget are major factors that help to determine which landscape projects should be developed. Policy dictates that 1.5% of the roadway development program be allocated to the purchase of large plant material on a yearly basis.

To achieve balance, FTE has created a system for ranking potential landscape projects across all three regions (North, South and West). The hierarchy created as part of FTE's approach places the highest priority and budgets on those areas with the greatest traffic volumes and maximum opportunities for attracting business and tourism.



PROJECT RANKING CRITERIA

FTE has developed a system of project prioritization which informs the development of the five (5) year work program. Project sites are ranked in accordance with their volume of traffic, proximity to major commercial, cultural or recreational features, level of existing landscape treatments and other factors. Each year the work program will be updated to address completed projects, changing demographics or system needs.

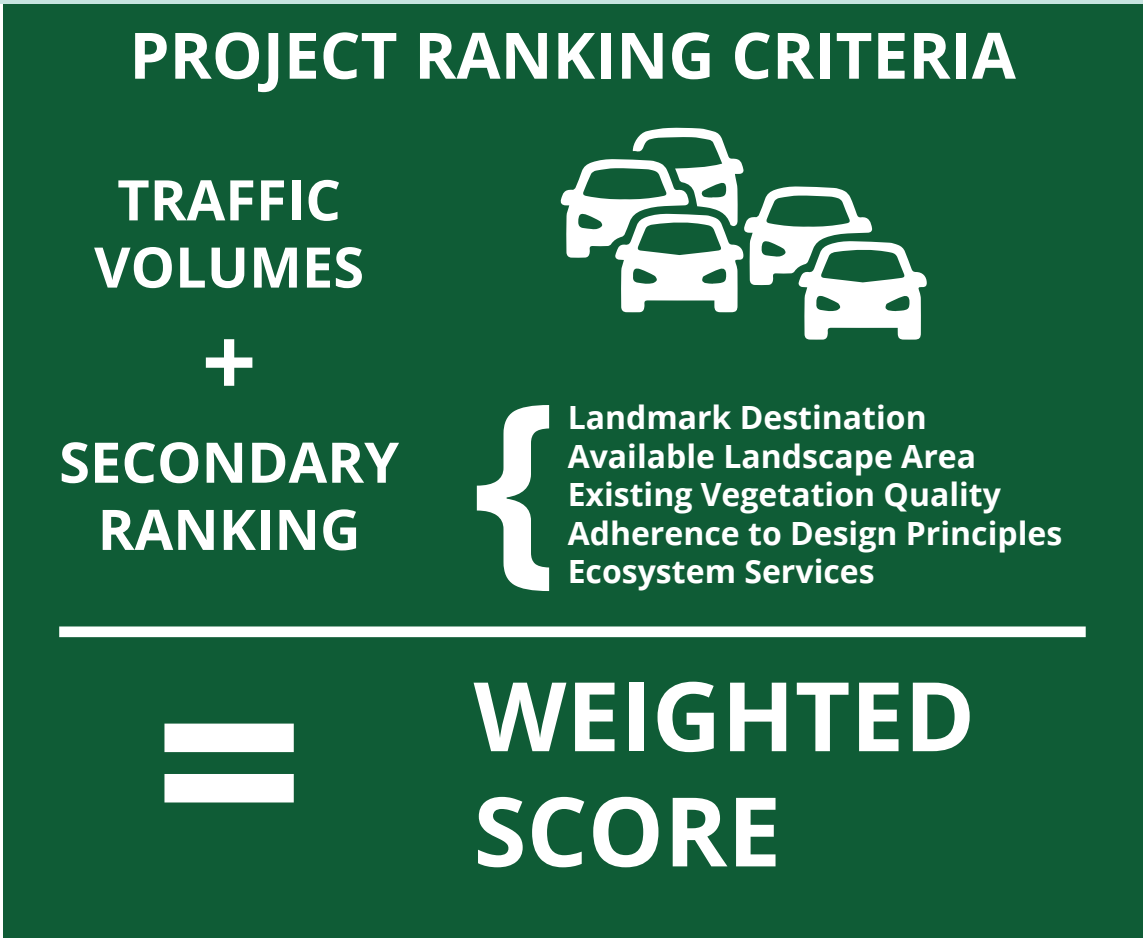
The Landscape Master Plan Ranking Spreadsheet is a planning tool that is used to assist in organizing and prioritizing interchanges on the system for the upcoming fiscal year(s). The categories in which the interchanges are scored are described as follows:

Traffic Volumes Ranking: The primary ranking utilizes traffic volume count in increments of 25,000 into a representative numerical score with the most highly traveled interchanges given priority.

Secondary Ranking: The top scoring projects from the Primary screen are further analyzed in accordance with the following values to determine eligible projects for the Five (5) year Tentative Work Plan:

- » Landmark Destination
- » Available Landscape Area
- » Existing Vegetation Quality
- » Adherence to Design Principles
- » Ecosystem Services

A weighted numerical score is assigned to each ranking category for an interchange. The interchange with the highest scores in the region are considered for further investigation based on interchange design and construction completion dates. The further investigation is based on reported projects associated with the interchange and final selection of the interchanges are based on the professional judgment of the District Landscape Architect and presented to Management for approval. The majority of landscape projects for FTE occur at interchanges. The occasional mainline roadside plantings can be addressed in association with an interchange project. There are also eight (8) rest areas which will be programmed independently.



RANKING SPREADSHEET MATRIX

Primary Ranking					Secondary Ranking										
Traffic Volumes Rank		Construction Complete Ranking		Primary Ranking Score	Landmark Destination		Available LS Opportunity		Existing Vegetation Quality		LS Redesign		Ecosystem Services		Secondary Ranking Score
Score	Description	Score	Description	Description	Score	Description	Score	Description	Score	Description	Score	Description	Score	Description	Description
1	0 ≤ 25,000	10	0 ≤ 1	The higher the number in relation to the data set, the higher priority the interchange is. There is not set maximum or minimum values nor is the priority based on set data ranges. The numbers displayed in the column are used to order the interchanged based on the primary ranking criteria.	2	Low Population Local (< 30,000 persons)	1	0-25% LS Area Available	0	Excellent (high hierarchy to 'planted' and/or native landscape, healthy plant material, no cleanup needed.	0	No Redesign			Similar to Primary Ranking, the higher the number is in this column to the rest of the numbers in this column the higher priority the interchange is. This should not be compared to the primary score in relation to each other. It is a secondary ranking system that builds on the primary ranking system.
2	25,000 ≤ 50,000	8	1 ≤ 2		4	Moderate Population Local (30,000 < > 60,000 persons)	2	25%-50% LS Area Available	1	Good (medium hierarchy to 'planted' and or native landscape, supplemental plantings would fill-in/strengthen design, healthy plant material, low level of cleanup needed)	5	Yes Redesign			
3	50,000 ≤ 75,000	4	2 ≤ 3		6	High Population Local (> 60,000)	3	50%-75% LS Area Available	2	Average (low hierarchy to 'planted' and/or native landscape, mixture of healthy/unhealthy/dead plant material, medium level of cleanup needed)					
4	75,000 ≤ 100,000	2	3 ≤ 4		8	Regional: Hospital, Mall	4	75%-100% LS Area Available	3	Fair (no hierarchy to 'planted' and/or native landscape, more unhealthy/dead plant material than healthy, medium-high level of cleanup needed)					
5	100,000 ≤ 125,000	1	4 ≤ 5		10	National: Major Tourist Destination		4	Poor (no hierarchy to planted and/or native landscape, majority plant material is dead, dying or damaged, high level of cleanup needed)						
6	125,000 ≤ 150,000	6	5+		Description: Landmark Destination refers to the typical destination type associated with an interchange. The descriptions used to describe the ranking category are merely suggestions and are not all inclusive. If the interchange is one of the only interchanges to reach a specific destination, then the appropriate ranking would be assigned to that intersection regardless of the distance of the destination.	5		Little to no landscape							
7	150,000 ≤ 175,000	Description: Construction Completion Year Ranking converts the construction completion year into a bracketed ranking. It is assumed that anything under a year will be completed before the landscape design will be let.				Description: The Available Landscape Opportunity ranking is related to the percentage of the plantable area of the interchange that is available for Landscaping. This includes areas that do not have landscape, either natural or planted, but does not include scrub vegetation.			Description: The existing vegetation quality refers to the type of vegetation at the site without regards to design quality.	Description: This ranking refers to how the existing landscape needs to be redesigned.					
8	175,000 ≤ 200,000														
9	200,000 ≤ 225,000														
10	225,000 ≤ 250,000														
Description: Traffic Volumes Ranking converts that total Traffic Volume into a bracketed ranking.															

LANDSCAPE WORK PROGRAM

The District Landscape Architect’s office manages the design, permitting, and implementation of landscape projects for over 480 miles of roadway. Learn how the program prioritizes projects and develops its five (5) year work program in this section.

ADOPTED FIVE-YEAR WORK PROGRAM

The adopted program begins with the current fiscal year and also includes the next four fiscal years.



WORK PROGRAM ANNUAL UPDATE

During annual update planning, fiscal year 1 is dropped. A new fiscal year 5 is added after the previous four years. The new five-year plan must be adopted by the secretary of transportation by July 1.



TENTATIVE FIVE-YEAR WORK PROGRAM

This plan outlines future system improvements for the next five fiscal years following the current fiscal year.



ADOPTED 5-YEAR LANDSCAPE WORK PROGRAM

ItemSeg	Ph	Sq	Sys	Description	Estimated	Committed	Notes
FY 2020							
190778-5	52	25		Unknown Zone 1 planting		\$400,000	
190778-5	52	67		Wildflowers		\$200,000	
190778-5	52	67		Maintenance		\$3,877,420	
190778-5	52	23		Suntrax Aesthetics		\$7,000,000	
190778-5	52	19		Port St Lucie Slope Planting		\$474,142	
TOTAL FY 2020						\$11,951,562	
FY 2021							
190778-5	52	67		Wildflowers	\$200,000		
190778-5	52	67		Maintenance	\$3,877,420		
427146-5	52	01		Bird Road Improvements W SR 821 HEFT MP - 23 Roadway Project Relocations	\$10,260		
190778-5	52	16		SR 528 Beachline Landscape Phase 1	\$2,631,128		
190778-5	52	18		Silverthorn Community Landscape Buffers	\$500,000		
TOTAL FY 2021					\$7,218,808		
FY 2022							
190778-5	52	67		Wildflowers	\$200,000		
190778-5	52	67		Maintenance	\$3,877,420		
190778-5	52	26		Beachline Landscape Phase 2	\$1,500,000		
190778-5	52	24		Suntrax Infield Landscape and Hardscape	\$1,000,000		
435461-1	52			Widen Sawgrass - Relocations N. of Atlantic to SR 7	\$2,000,000		
406143-7	52			TPK Relocations - WPB Service Plaza to Okeechobee Blvd.	\$483,228		
190778-5	52	15		Ft Pierce Service Plaza Landscape	\$1,200,000		
190778-5	52	20		SC PKWY SR 589-SR 52 Interchange/SC Ops Bldg	\$1,500,000		
190778-5	52	27		TPK SR 429/SR 50 Interchange Ph 3	\$2,350,000		
TOTAL FY 2022					\$14,110,648		
FY 2023							
190778-5	52	67		Wildflowers	\$200,000		
190778-5	52	67		Maintenance	\$3,565,000		
190778-5	52	21		TPK Boynton Beach Blvd Interchange	\$1,500,000		
190778-5	52	30		HEFT 3 Don Shula Pkwy MP 17 N. of Coral Reef	\$1,250,000		
190778-5	52	28		SR 429 US 192 MP 6	\$2,750,000		
190778-5	52	29		HEFT MP 12 to 12.7 Caribbean Blvd/SW 21st	\$1,200,000		
190778-5	52	31		HEFT Bird Road MP 23	\$1,200,000		
190778-5	52	32		HEFT Tamiami Trail MP 25	\$2,998,390		
190778-5	52	33		Braddock Road Roundabouts	\$200,000		
437300-9	52	34		Suntrax Visual Barrier LS and Irrigation	\$500,000		
190778-5	52			Sawgrass Relocations MP 8-18	\$1,000,000		
TOTAL FY 2023					\$16,363,390		
FY 2024							
190778-5	52	67		Wildflowers	\$250,000		
190778-5	52	67		Maintenance	\$3,827,425		
190778-5	52	35		Coral Reef Dr. (SW 152nd St) MP 16	\$1,200,000		
190778-5	52	36		HEFT 8 Quail Roost and Eureka Drive MP 13- MP 15	\$1,800,000		
190778-5	52	37		Snapper Creek Service Plaza	\$2,000,000		
190778-5	52	38		HEFT Kendall Drive N. of 104th St. to MP 21	\$1,200,000		
190778-5	52	39		SC PKY MP 19 -SR 54	\$1,200,000		
190778-5	52	40		TPK Orlando South Taft Vineland to N. of MP 257	\$2,800,000		
TOTAL FY 2024					\$14,277,425		

TENTATIVE 5-YEAR LANDSCAPE WORK PROGRAM

ItemSeg	Ph	Sq	Sys	Description	Estimated	Committed	Notes
FY 2021							
190778-5	52	67		Wildflowers	\$200,000		
190778-5	52	67		Maintenance	\$3,877,420		
427146-5	52	01		Bird Road Improvements W SR 821 HEFT MP - 23 Roadway Project Relocations	\$10,260		
190778-5	52	16		SR 528 Beachline Landscape Phase 1	\$2,631,128		
190778-5	52	18		Silverthorn Community Landscape Buffers	\$500,000		
TOTAL FY 2021					\$7,218,808		
FY 2022							
190778-5	52	67		Wildflowers	\$200,000		
190778-5	52	67		Maintenance	\$3,877,420		
190778-5	52	26		Beachline Landscape Phase 2	\$1,500,000		
190778-5	52	24		Suntrax Infield Landscape and Hardscape	\$1,000,000		
435461-1	52			Widen Sawgrass - Relocations N. of Atlantic to SR 7	\$2,000,000		
406143-7	52			TPK Relocations - WPB Service Plaza to Okeechobee Blvd.	\$483,228		
190778-5	52	15		Ft Pierce Service Plaza Landscape	\$1,200,000		
190778-5	52	20		SC PKWY SR 589-SR 52 Interchange/SC Ops Bldg	\$1,500,000		
190778-5	52	27		TPK SR 429/SR 50 Interchange Ph 3	\$2,350,000		
TOTAL FY 2022					\$14,110,648		
FY 2023							
190778-5	52	67		Wildflowers	\$200,000		
190778-5	52	67		Maintenance	\$3,565,000		
190778-5	52	21		TPK Boynton Beach Blvd Interchange	\$1,500,000		
190778-5	52	30		HEFT 3 Don Shula Pkwy MP 17 N. of Coral Reef	\$1,250,000		
190778-5	52	28		SR 429 US 192 MP 6	\$2,750,000		
190778-5	52	29		HEFT MP 12 to 12.7 Caribbean Blvd/SW 21st	\$1,200,000		
190778-5	52	31		HEFT Bird Road MP 23	\$1,200,000		
190778-5	52	32		HEFT Tamiami Trail MP 25	\$2,998,390		
190778-5	52	33		Braddock Road Roundabouts	\$200,000		
437300-9	52	34		Suntrax Visual Barrier LS and Irrigation	\$500,000		
190778-5	52			Sawgrass Relocations MP 8-18	\$1,000,000		
TOTAL FY 2023					\$16,363,390		
FY 2024							
190778-5	52	67		Wildflowers	\$250,000		
190778-5	52	67		Maintenance	\$3,827,425		
190778-5	52	35		Coral Reef Dr. (SW 152nd St) MP 16	\$1,200,000		
190778-5	52	36		HEFT 8 Quail Roost and Eureka Drive MP 13- MP 15	\$1,800,000		
190778-5	52	37		Snapper Creek Service Plaza	\$2,000,000		
190778-5	52	38		HEFT Kendall Drive N. of 104th St. to MP 21	\$1,200,000		
190778-5	52	39		SC PKY MP 19 -SR 54	\$1,200,000		
190778-5	52	40		TPK Orlando South Taft Vineland to N. of MP 257	\$2,800,000		
TOTAL FY 2024					\$14,277,425		
FY 2025							
190778-5	52	67		Wildflowers	\$250,000		
190778-5	52	67		Maintenance	\$3,827,425		
190778-5	52	41		TPK MP 257 to MP 261 I-4	\$2,000,000		
190778-5	52	42		SC PKY MP 54 - MP 56 US 98	\$1,200,000		
190778-5	52	43		Landscaping at US 17/92 at TPK Mainline	\$1,200,000		
TOTAL FY 2025					\$8,477,425		

RESOURCES

GLOSSARY DEFINITIONS

Analysis Plan – Plan which denotes existing site conditions including steep slopes, areas susceptible to erosion, existing vegetation, existing views to screen or enhance, utility clearances, roadway clearances or setback distances, etc.

Clear Sight – See “Sight Distance”

Bubble Diagram – Conceptual plan showing site context, landscape opportunity areas, and areas for proposed planting.

Clear Zone – Designated area offset from edge of pavement that should remain clear and free from plantings or other objects; should be plotted or noted on each plan set.

Clearance Pruning – Selective pruning performed by systematically cutting and reducing branches (by performing reduction cuts) on the sides of a tree to provide clearance from buildings, lighting, signage and more.

District Landscape Architect – Florida’s Turnpike or other district of FDOT who manages the landscape program and consultant contracts and is responsible for the overall quality of designs. A list of District Landscape Architects and contact information can be found here: <https://www.fdot.gov/designsupport/highwaybeautification/contacts.shtm>

Drainage Systems/Structures – Any underground or at grade structures, piping, sleeving, or other equipment for controlling and managing storm water.

Ecosystem Services – The many and varied benefits to humans gifted by the natural environment and from healthy ecosystems. Ecosystems functioning in healthy relationship, offer such things like natural pollination of crops, clean air, clean water, resilience and productivity of food crops, extreme weather mitigation, human mental and physical well-being.

Elevation Clearance – Raising or lifting the canopy done by selectively removing branches to provide vertical clearance underneath the canopy. Removal of the lower branches can provide clearance for buildings, signs, vehicle circulation, pedestrian circulation or visual clearance beneath a tree’s canopy.

ERCAR – Existing Roadway Condition Assessment Report; evaluation of all elements against new construction criteria. <http://www.floridasturnpike.com/design/Documents/Docs-Publications/ERCAR%20Sample%20Outline%2020180418.pdf>

FDOT – Florida Department of Transportation; a decentralized agency charged with the establishment, maintenance, and regulation of public transportation in the state of Florida.

Florida Grade #1 – Standard of tree aesthetics required for most landscape projects. Refer to current version of Florida Grades and Standards available from Florida Department of Agriculture and Consumer Services for further detail. <https://www.fdacs.gov/ezs3download/download/60817/1267268/Media/Files/Plant-Industry-Files/Grades-and-Standards/Grades%20and%20Standards%20FEB17%202017.1.pdf>

FTE – Florida’s Turnpike Enterprise; a unit of the Florida Department of Transportation employing private sector business practices to operate its 461-mile system of limited-access toll highways for the benefit of Florida’s traveling public.

FTE Project Manager – The design consultant must report to the Turnpike’s Project Manager throughout the design process and perform and deliver plan sets as directed by the Project Manager. <https://www.fdot.gov/designsupport/pm/default.shtm>

Gantry – An overhead structure, bridging over an area or roadway, with a platform supporting equipment such as signage, signals, lights or cameras.

Guardrail – protective guarding structures along roadway.

Guardrail Setback Line – distance from which objects can be placed behind (non-roadway side) of guardrail.

Horizontal Clearance – lateral offset distance from the edge of pavement or travel lane to a vertical roadside element or object.

High Intensity Maintenance Zone – The highest level of expected quality and utilization with a high degree of stress on plant material and wear and tear on pavements and site furnishings.

IFAS – University of Florida, Institute of Food and Agricultural Sciences

Intelligent Transportation Systems (ITS) – technology that advances transportation safety and mobility by integrating advance communications technologies into transportation infrastructure and into vehicles. This technology includes electronic toll collection, meters, radar and cameras. https://www.its.dot.gov/factsheets/benefits_factsheet.htm

Intensity (Low) – areas designated for low landscape maintenance such as meadow conditions, transitional native plantings, reforestation, and native plantings that are easily established.

Intensity (Moderate) – areas designated for moderate landscape maintenance such as secondary focal points and gateways combining native plantings and non-native Florida Friendly plantings.

Intensity (High) – areas designated for high intensity landscaping requiring a higher level of landscape maintenance

such as major focal points, gateways and high visibility areas suitable for high impact landscaping typically along the mainline in very visible areas.

Landscape Architect – licensed professional in environmental design; the discipline includes the analysis, planning, design, management and stewardship of the natural and built environments and the application of ecological design in development and restoration projects.

Landscape Intensity Zone – varying levels of landscape intensity or density identified per opportunities along a roadway. Levels include Low Intensity, Moderate Intensity, and High Intensity.

Landscape Opportunity Plan (LOP) – a plan typically prepared after the site analysis phase and during the roadway concept plan development. A LOP identifies areas that can be planted and planted at which Level. The components of a LOP can be found in Section 301.3.2 of the Turnpike Design Handbook (TDH). <http://www.floridasturnpike.com/design/Documents/DocsPublications/TDH/Final%20TDH/2019%20TDH%20Part%203%20Addendum%201.pdf>

Lateral Offset – setback distance from the edge of the pavement or travel lane to a vertical roadside element or object.

Open Landscape – limited to turf only, constrained by lateral offsets, sign view zones, ITS equipment, utilities, maintenance berms and utility offsets. Turf species vary depending on condition.

Outdoor Advertising (ODA) – a regulatory program based on federal law and regulations as well as state statute and rules. Federal law is set forth in the Highway Beautification Act. Local governments often have their own ordinances which regulate outdoor advertising in their community. The Department (FDOT) cannot issue a permit for an outdoor advertising sign which is not allowed by local ordinances. For ODA, such as billboards, ODA owners have view zone rights.

Pollinator Habitat Plan – plan that includes habitats and planting selections that attract and support natural pollinators such as bees, hummingbirds and butterflies.

Pruning – A method of cutting and removing parts of a tree or plant to control size, health and appearance.

Radar – Radar detection associated with ITS facilities to track speed of vehicles.

Reduction Pruning – Reduction is the selective removal of branches and stems to decrease the height and/or spread of a tree. This type of pruning is used to make the entire tree or portions of the tree smaller and should be accomplished with reduction cuts, not heading cuts. (A heading cut is a type of cut that prunes a shoot no more than 2 years old back to a bud.) No more than 20%-25% percent of live foliage should be removed from a mature tree in a single pruning.

Reforestation – Low maintenance landscape areas which are planted with indigenous trees in order to reestablish the native tree canopy.

Sight Distance/Clear Sight Distance – length of roadway visible to a driver; distances in which unobstructed views shall be maintained to allow for safe flow of travel.

Slope Stabilization – measures taken to reduce or eliminate erosion for embankments and slopes with 3:1 slope ratio or greater; can include physical structures such as retaining walls to assist in creating plantable areas or plantings to slow and reduce storm water runoff.

Stormwater Management Areas – Wet or dry storm water management areas that treat and attenuate storm water runoff.

Structural Pruning – The removal of live branches and stems to influence the orientation, spacing, growth rate, strength of attachment, and ultimate size of branches and stems. Structural pruning is used on young and medium-aged trees to help engineer a sustainable trunk and branch arrangement. If young trees are trained early, they will be more likely to remain healthy in the landscape longer than trees left unpruned prior to maturity. Canopy growth can be cleaned, thinned, reduced, raised, or restored to manage risk.

Sustainable Landscape Management Areas – Low maintenance landscape areas which are maintained to support healthy herbaceous plant materials other than turfgrass.

Transitional Native Plantings – Plantings that occur in areas that are neither aquatic nor upland plantings; these species are native to Florida and can be planted in low areas as they

can tolerate the fluctuation between periods of extreme moisture or dry conditions. These native plantings typically require little to no maintenance.

Turnpike Design Handbook (TDH) – Handbook/guide developed to provide consultants, reviewers and management with a single source of additional Turnpike-specific requirements that modify or add to the requirements included in the [Florida Department of Transportation \(FDOT\) Design Manual \(FDM\)](#) as part of the Turnpike’s continuing quality enhancement effort. (See those documents [here](#).) The FDM and the TDH are both 3-part documents: [Part 1 – Development and Processes](#); [Part 2 – Design Criteria](#); [Part 3 – Plans Production](#)

UF/IFAS - University of Florida, Institute of Food and Agricultural Sciences

Utilities Offset – landscape setbacks for trees, palms and narrow trees, shrubs and grasses from various utilities including various underground utilities, overhead wire, gas lines, light poles, and ITS utilities.

FTE SETBACKS

FLORIDA'S TURNPIKE ENTERPRISE (FTE) LANDSCAPE SETBACK CHART																																		
GENERAL NOTES:																																		
A. DIMENSIONS NOTED THAT ARE NOT INCLUDED IN THE FDOT DESIGN STANDARD INDEXES ARE THOSE ASSIGNED BY FTE. THESE DIMENSIONS MAY BE REDUCED IN SPECIAL CONDITIONS THAN NOTED BELOW SUBJECT TO FTE REVIEW AND APPROVAL ONLY.																																		
B. ROADWAY RELATED SETBACKS ARE MEASURED FROM THE EDGE OF TRAVEL LANE.																																		
MINIMUM & PREFERRED LANDSCAPE SETBACKS FOR INSTALLATION AND MAINTENANCE OPERATIONS																																		
Plant Type	Turnpike Mainline Travel Lane		Multi Lane Ramp		Auxiliary Lanes & Single Lane Ramp		Side Road Travel Lane		Back of Guardrail		M.S.E. Wall		R/W Fence		Drainage Structures		Storm Sewer Pipes		Stormwater Facilities		Wetlands, Open Water Bodies and Wet Stormwater Facilities		Miscellaneous Underground Utilities		Overhead Wires		Gas		Light Poles and Signage		ITS Poles		ITS Duct and Conduct Bank	
	(No Guardrail)		(No Curb and No Guardrail)		(No Curb and No Guardrail)		(With "F" Curb)														(from seasonal high water line)				(6)				(7)		(7)			
	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M
CANOPY TREES	40'	36'	24'	18' (1a)	15'	10' (1a)	10'	6'	15'	10' (2)	15'	10'	15'	10'	20'	15'	10' (8)	0' (3)			20'	15' (4)	15'	10'	30'	20'	25'	20'	30'	20'	30'	25'	10'	10'
			30'	24' (1b)	20'	14' (1b)																												
			36'	30' (1c)	24'	18' (1c)																												
			40'	36' (1d)	30'	24' (1d)																												
PALMS & NARROW TREES	40'	36'	24'	18' (1a)	15'	10' (1a)	10'	6'	10'	6'	10'	6' (5)	10'	6' (5)	15'	10'					20'	15' (4)	10'	5'	20'	10'	20'	15'	20'	10'	30'	20'	10'	6'
			30'	24' (1b)	20'	14' (1b)																												
			36'	30' (1c)	24'	18' (1c)																												
			40'	36' (1d)	30'	24' (1d)																												
SHRUBS & GRASSES	36'	20'	10'	4'	10'	4'	10'	4'	6'	6'	10'	4' (5)	10'	4' (5)	10'	5'					20'	15'	N/A	N/A	N/A	N/A	N/A	N/A	10'	4'	10'	6'	6'	4'
LEGEND: P=PREFERRED, M=MINIMUM																																		
NOTES:																																		
(1a) LESS THAN 45 MPH SPEED LIMIT																																		
(1b) 45-50 MPH SPEED LIMIT																																		
(1c) 55 MPH SPEED LIMIT																																		
(1d) GREATER THAN 55 MPH SPEED LIMIT																																		
(2) DISTANCE MAY BE GREATER DEPENDING ON MAINTAINED TREE SPECIES CANOPY. LAOR SHALL VERIFY WITH FTE FOR CONFIRMATION OF DIMENSION AS APPLICABLE.																																		
(3) PLANTING ON SLOPES OF DRY STORM WATER FACILITIES AND SWALES IS PERMITTED. NO OBLIGATE AND FACULTATIVE WETLAND SPECIES ARE PERMITTED WITHIN 25' FROM SEASONAL HIGH WATER LINE OF THE STORM WATER FACILITY. ONLY PINE STRAW MAY BE USED AT PROPOSED PLANTING LOCATIONS. PLANTING IN BOTTOM OF DRY PONDS SHALL NOT BE PERMITTED. EXCEPTIONS, HOWEVER, MAY BE PERMITTED BY FTE ON A CASE BY CASE BASIS AND ONLY IF ALL OBLIGATE AND FACULTATIVE WETLAND SPECIES ARE AVOIDED. WILDFLOWERS MAY ALSO BE CONSIDERED ON SITE BY SITE BASIS BUT SHALL BE SUBJECT TO FTE APPROVAL.																																		
(4) NO OBLIGATE AND FACULTATIVE WETLAND SPECIES ARE PERMITTED WITHIN 25' FROM SEASONAL HIGH WATER LINE OF THE STORM WATER FACILITY. ONLY PINE STRAW MAY BE USED AT PROPOSED PLANTING LOCATIONS.																																		
(5) DEPENDENT ON AVAILABLE LANDSCAPE AREA.																																		
(6) COMPLY WITH UTILITY COMPANY GUIDELINES AS APPLICABLE.																																		
(7) DIMENSIONS SHOWN ARE FROM LIGHT AND SIGN STRUCTURES. NO TREES OR PALMS SHALL BLOCK LINES OF SIGHT.																																		
(8) TREES MAY NOT BE PLANTED WITHIN 10 FEET OF THE OUTSIDE EDGE OF STORM SEWER PIPES.																																		

PREFERRED PLANT LIST - CENTRAL FLORIDA

TREES - LARGE

- » American Elm, *Ulmus Americana*
- » American Sycamore, *Platanus occidentalis*
- » Live Oak, *Quercus virginiana*
- » Loblolly Pine, *Pinus taeda*
- » Longleaf Pine, *Pinus palustris*
- » Northern Slash Pine, *Pinus elliottii*
- » Pond Cypress, *Taxodium spp.*
- » Red Maple, *Acer rubrum*
- » River Birch, *Betula nigra*
- » Shumard Oak, *Quercus shumardii*
- » Southern Magnolia, *Magnolia grandiflora*
- » Southern Red Oak, *Quercus falcata*
- » Southern Slash Pine, *Pinus elliottii* var. *densa*
- » Sweet Bay Magnolia, *Magnolia virginiana*
- » Winged Elm, *Ulmas alata*

TREES - MEDIUM

- » American Holly, *Ilex opaca*
- » Crape Myrtle, *Lagerstroemia indica*
- » Dahoon Holly, *Ilex cassine*
- » East Palatka Holly, *Ilex x attenuate*
- » Japanese Blueberry, *Elaeocarpus decipens*
- » Southern Red Cedar, *Juniperus silicola*

TREES - SMALL

- » Buttonbush, *Cephalanthus occidentalis*
- » Florida Privet, *Forestiera segregate*
- » Ligustrum, *Ligustrum japonicum*
- » Nellie R. Stevens Holly, *Ilex x ‘Nellie R. Stevens’*
- » Wax Myrtle, *Myrica cerifera*
- » Yaupon Holly, *Ilex vomitoria*

PALMS

- » Bismarck Palm, *Bismarckia nobilis*
- » Cabbage Palm, *Sabal Palmetto*
- » Chinese Fan Palm, *Livistonia spp.*
- » Date Palms, *Phoenix spp.*
- » European Fan Palm, *Chamaerops humilis*
- » Pindo Palm, *Butia capitata*
- » Washingtonia Palm, *Washingtonia robusta*

SHRUBS - LARGE

- » Buttonbush, *Cephalanthus occidentalis*
- » Bottlebrush, *Callistemon spp.*
- » Florida Privet, *Forestiera segregate*
- » Glossy Abelia, *Abelia x grandiflora*
- » Golden Dewdrop, *Duranta erecta*
- » Lady Palm, *Rhapis excelsa*
- » Loropetalum, *Loropetalum chinense*
- » Needle Palm, *Rhapidophyllum hystrix*
- » Podocarpus, *Podocarpus macrophyllus*
- » Saw Palmetto, *Serenoa repens*
- » Stoppers, *Eugenia spp.*
- » Thryallis, *Galphimia glauca*
- » Wax Myrtle, *Myrica cerifera*
- » Wild Coffee, *Psychotria nervosa*
- » Wild Olive, *Osmanthus americanus*
- » Yaupon Holly, *Ilex vomitoria*

SHRUBS - SMALL

- » Coontie, *Zamia pumila*
- » Fetterbush, *Lyonia lucida*
- » Rosemary, *Rosmarinus spp.*
- » Scrub Palmetto, *Sabal etonia*
- » Texas Sage, *Leucophyllum frutescens*
- » Weeping Lantana, *Lantana depressa*

GRASSES

- » Cordgrass, *Spartina spp.*
- » Fakahatchee Grass, *Tripsacum dactyloides*
- » Florida Gama Grass, *Tripsacum floridana*
- » Muhly Grass, *Muhlenbergia capillaris*

PREFERRED PLANT LIST - SOUTH FLORIDA

TREES - LARGE

- » Buttonwood, *Conocarpus erectus*
- » Live Oak, *Quercus virginiana*
- » Pond Cypress, *Taxodium* spp.
- » Southern Slash Pine, *Pinus elliottii* var. *densa*
- » West Indian Mahogany, *Swietenia mahagoni*
- » Wild Tamarind, *Lysiloma latisiliquum*

TREES - MEDIUM

- » American Holly, *Ilex opaca*
- » Crape Myrtle, *Lagerstroemia indica*
- » Dahoon Holly, *Ilex cassine*
- » East Palatka Holly, *Ilex x attenuate*
- » Geiger Tree, *Cordia sebestena*
- » Japanese Blueberry, *Elaeocarpus decipens*
- » Pigeonplum, *Coccoloba diversifolia*
- » Purple Trumpet Tree, *Tabebuia impetiginosa*
- » Royal poinciana, *Delonix regia*

TREES - SMALL

- » Bottlebrush, *Callistemon* spp.
- » Buttonbush, *Cephalanthus occidentalis*
- » Florida Privet, *Forestiera segregata*
- » Ligustrum, *Ligustrum japonicum*
- » Seagrape, *Coccoloba uvifera*
- » Simpson’s Stopper, *Myrcianthes fragrans*
- » Stoppers, *Eugenia* spp.
- » Wax Myrtle, *Myrica cerifera*
- » White Geiger, *Cordia boissieri*
- » Yaupon Holly, *Ilex vomitoria*

PALMS

- » Alexander Palm, *Ptychosperma elegans*
- » Bismarck Palm, *Bismarckia nobilis*
- » Brittle Thatch Palm/Key Thatch Palm, *Thrinax morrisii*
- » Buccaneer Palm, *Pseudophoenix sargentii*
- » Cabbage Palm, *Sabal Palmetto*
- » Carpentaria Palm, *Carpentaria acuminata*
- » Chinese Fan Palm, *Livistonia* spp.
- » Date Palms, *Phoenix* spp.
- » European Fan Palm, *Chamaerops humilis*
- » Florida Thatch Palm, *Thrinax radiata*
- » Foxtail Palm, *Wodyetia bifurcate*
- » Macarthur Palm, *Ptychosperma macarthurii*
- » Paurotis Palm, *Acolorrhaphe wrightii*
- » Pindo Palm, *Butia capitata*
- » Royal Palm, *Roystonea regia*
- » Washington Palm, *Washingtonia robusta*

SHRUBS - LARGE

- » Beautyberry, *Callicarpa Americana*
- » Buttonbush, *Cephalanthus occidentalis*
- » Cardboard Plant, *Zamia fufuracea*
- » Cocoplum, *Chrysobalanus icaco*
- » Firebush, *Hamelia patens*
- » Florida Privet, *Forestiera segregate*
- » Golden Dewdrop, *Duranta erecta*
- » Lady Palm, *Rhapis excelsa*
- » Loropetalum, *Loropetalum chinense*
- » Needle Palm, *Rhapidophyllum hystrix*
- » Pittosporum, *Pittosporum tobira*
- » Podocarpus, *Podocarpus macrophyllus*
- » Rusty Lyonia, *Lyonia ferruginea*
- » Saw Palmetto, *Serenoa repens*

- » Seagrape, *Coccoloba uvifera*
- » Simpson’s Stopper, *Myrcianthes fragrans*
- » Sparkleberry, *Vaccinium arboretum*
- » Stoppers, *Eugenia* spp.
- » Thryallis, *Galphimia glauca*
- » Wax Myrtle, *Myrica cerifera*
- » Wild Coffee, *Psychotria nervosa*
- » Yaupon Holly, *Ilex vomitoria*

SHRUBS - SMALL

- » Coontie, *Zamia pumila*
- » Fetterbush, *Lyonia lucida*
- » Firecracker Plant, *Russelia sarmentosa*
- » Natal Plum, *Carissa macrocarpa*
- » Scrub Palmetto, *Sabal etonia*
- » Texas Sage, *Leucophyllum frutescens*
- » Weeping Lantana, *Lantana depressa*

GRASSES

- » Cordgrass, *Spartina* spp.
- » Fakahatchee Grass, *Tripsacum dactyloides*
- » Florida Gama Grass, *Tripsacum floridana*
- » Muhly Grass, *Muhlenbergia capillaris*