Town of Lake Park Town Commission

Agenda Request Form

Meeting Date: October 19, 2022 **Agenda Item No._____**

Agenda Title: Update on Ordinance 34-11, Regulations for Tree Plantings and Improvements in Swales and on Other Town-owned or Controlled Property or Rights-of-ways, Related Enforcement, and Impacts on Effective Stormwater Management.

[ ] SPECIAL PRESENTATION/REPORTS [ ] CONSENT AGENDA
[ ] BOARD APPOINTMENT [ ] OLD BUSINESS
[ ] PUBLIC HEARING ORDINANCE ON ____ READING
[X] NEW BUSINESS
[ ] OTHER: _____

Approved by Town Manager _____ **Date:** 10/12/22

Roberto F. Travieso/Director of Public Works
Name/Title

Originating Department: **Public Works**	**Costs: None at this time.** Funding Source: Acct. # [ ] Finance _____	**Attachments:** 1. PowerPoint Presentation 2. Ordinance 34-11 3. Proposed and Current Native Tree Planting List 4. Proposal for comprehensive swale plantings survey 5. Stormwater Master Plan Executive Summary 6. Tree Planting Moratorium Letter 7. Minutes from Tree Board Meetings
Advertised: Date: _____ Paper: _____ **[X] Not Required**	All parties that have an interest in this agenda item must be notified of meeting date and time. The following box must be filled out to be on agenda.	Yes, I have notified everyone_____ or **Not applicable in this case** ____ **Please initial one.**

1. Summary Explanation/Background:

Figure 1. Typical swale before sodding.

The Town of Lake Park currently operates a stormwater utility for the purpose of managing and treating rainfall runoff and protecting public/private properties from flood damage. The Town's stormwater infrastructure consists of various components, including roadside swales, drainage structures and their interconnecting piping, and retention/detention areas. Though typically regarded as a landscape area, **swales** are a publicly-owned, key component of most stormwater systems, though adjacent property owners are usually responsible for their maintenance.

The swale's function is to slow stormwater runoff and convey it away from the roadway and gradually remove harmful particles from the storm water, before it is either absorbed into the ground water table or enters into the drainage system to be later discharged at tide (Lake Worth
Lagoon).

In addition, as a standard best practice, maintenance crews install sod over the swales to protect them from erosion and increase their water filtering effectiveness (Figure 1). Crews must also contour or reshape the swales regularly to promote water conveyance effectiveness and efficiency.

Finally, **Town roadside swales are the most noticeable and extensive component of the stormwater system**, encompassing an area of approximately 2.2 million square feet, or 183,040 linear feet or 34.67 miles.

Over the last three months, the Department of Public Works has been reviewing its stormwater utility maintenance program and has identified various areas for improvement to better comply with the requirements of our operating permit. The following paragraphs provide background on these concerns and recommendations to address them.

2. Town Ordinance 34-11

Figure 2. Nonnative swale plantings.

In 2009 and 2010, the Town Commission approved Resolutions No. 04-2009 and 02-2010, respectively, to update Ordinance 34-11, *Regulations for tree plantings and improvements in swales and on other town-owned or controlled property or rights-of-way.* The Ordinance provides that while swales are a Town right-of-way, their maintenance is the responsibility of the owner of the property abutting each swale **(Attachment 2)**. Additionally, the Ordinance directs that all swale plantings require a permit that is issued

as a right-of-way permit through the Department of Public Works.

Prior to or following adoption of these Ordinance, the Town did not complete an exhaustive inventory of tree plantings **(Attachment 4)**, nor established a proper tree planting permit form or its associated fee, which made the Ordinance unenforceable.

Furthermore, though the benefits of tree plantings are widely known and significant (I.e., environmental, social, economic, aesthetics, and other), unregulated tree plantings (Figure 2) and their root systems in the Town's right-of-way can have an adverse effect on the Town's underground stormwater, water and wastewater infrastructure, and electrical distribution lines/utility poles, and can significantly reduce or negate the swales' water filtering benefits.

3. Stormwater Master Plan

In 2021, the Town Commission adopted an updated Stormwater Master Plan (SWMP, **Attachment 5)**. The SWMP includes strategies for the conversion of five (5) percent of the roadside swales to green infrastructure (bioswales/biodetention areas). Implementation of this initiative will amplify swales' stormwater filtering benefits, while also addressing nuisance street flooding concerns and building resiliency to climate change effects.

For context, the Stormwater Master Plan proposes to gradually convert just 9,152 linear feet (5%) of Town swales to green infrastructure.

Additionally, the SWMP recommended adoption of regulations to promote native tree plantings only in the swales because of their increased resiliency to local weather and water-filtering benefits.

4. Swale Planting Moratorium

In 2019, the Town implemented a moratorium on new swale tree plantings **(Attachment 5)** to facilitate inventory and analysis of existing swale tree plantings and determine their compliance with the strategies prescribed in the updated SWMP.

5. Recommendations (For Discussion)

Based on the preceding analysis, Town Staff has presented recommendations to the Town' Tree Board on two occasions (July 12 and October 11, 2022). The Tree Board's comments have been addressed and are included as **(Attachment 7)** in this agenda package.

Town Staff is now is seeking direction from the Town Commission regarding the phase-in implementation of the following tasks (in suggested order of implementation):

a. Complete an exhaustive swale plantings inventory **(Attachment 4)**

b. Adopt policy to grandfather existing trees and begin permitting new plantings, unless specific objective criteria are met for the removal of a tree **(Attachment 3)**

c. Develop and codify a native tree planting list for use on both private and commercial properties

d. Modify applicable Ordinance to clarify language and increase enforceability

e. Adopt/update policy to require and promote the planting of native trees and shrubs in Town-owned swales and privately-owned swales

f. Limit swale's maintenance to those locations with free of tree plantings. Note: This recommendation will prevent the system from achieving maximum water conveyance efficiency

g. Limit types, quantities, and sizes of tree plantings allowed in swale pursuant to SWMP guidelines and best practices

h. Develop and publish an educational brochure of the approved native tree planting list; post to Town website and social media **(Attachment 4)**

i. Conduct public meetings and educational campaigns regarding swale plantings; install educational plant markers at various Town locations

j. Develop and implement swale planting permit form(s) and associated permit fees and fines for violations

k. Include utility/irrigation systems location clearance as part of permit process

l. Develop engineering design standard for use in all swale construction/maintenance

m. Manage tree giveaways and similar initiatives to ensure adherence with Ordinance (ongoing)

Recommended Motion: There is no motion associated with this agenda item; however, Staff is seeking input from the Town Commission on the proposed course of action to address concerns related to the effective operation of the Stormwater Utility.

Update on Ordinance 34-11, "Plantings in Swales", Related Enforcement, & Impacts on Stormwater Management

Roberto Travieso

Department of Public Works

Presentation Overview

1. Stormwater Utility
2. Roadside Swales
3. Ordinance 34-11
4. Stormwater Master Plan
5. Examples of Swale Plantings
6. Recommendations
7. Tree Board Presentations

Stormwater Utility

- Manages stormwater runoff
- Improves quality of stormwater discharges
- Protects public/private property from flood damage
- Includes drainage structures, piping, detention/retention areas
- Also includes roadside swales

Roadside Swales

- Publicly-owned rights-of-ways
- Most extensive/common component of stormwater systems
- Town's swale network encompass 2.2M Sq. Ft. (34.7 linear miles)
- Serve to slow and filter stormwater runoff
- Typically sodded to avoid erosion
- Must be recontoured regularly to maintain water conveyance

Ordinance 34-11

- Establishes Town ownership of all swale rights-of-way
- Assigns maintenance responsibility to the property owner
- Establishes permit and fee requirements for swale tree plantings (coordinated through Public Works Department)

Stormwater Master Plan (SWMP)

- Updated in 2019-2020
- Adopted by Town Commission in 2021
- Provided the incremental conversion of 5% roadside swales to green infrastructure (bioswales/biodentention areas)
- Swale Plantings Moratorium implemented in support of SWMP update

Examples of Town Swale Plantings

Recommendations

a. Complete an exhaustive swale plantings inventory

b. Adopt policy to grandfather existing trees and begin permitting new plantings, unless specific objective criteria are met for the removal of a tree

c. Develop and codify a native tree planting list for use on both private and commercial properties

d. Modify applicable Ordinance to clarify language and increase enforceability

e. Adopt/update policy to require and promote the planting of native trees and shrubs in Town-owned swales and privately-owned swales

Recommendations

f. Limit swale's maintenance to those locations with free of tree plantings. Note: This recommendation will prevent the system from achieving maximum water conveyance efficiency

g. Limit types, quantities, and sizes of tree plantings allowed in swale pursuant to SWMP guidelines and best practices

h. Develop and publish an educational brochure of the approved native tree planting list; post to Town website and social media

i. Conduct public meetings and educational campaigns regarding swale plantings; install educational plant markers at various Town locations

Recommendations

j. Develop and implement swale planting permit form(s) and associated permit fees and fines for violations

k. Include utility/irrigation systems location clearance as part of permit process

l. Develop engineering design standard for use in all swale construction/maintenance

m. Manage tree giveaways and similar initiatives to ensure adherence with Ordinance (ongoing)

Tree Board Presentations

- Item presented to the Tree Board on:
  - **July 12, 2022**
  - **October 19, 2022**
- Summary of Comments provided by Tree Board
- Recommendations have been updated in the Town Commission's version of this Agenda Item to include Tree Board's input

Discussion/Questions

Sec. 34-11. Regulations for tree plantings and improvements in swales and on other town-owned or controlled property or rights-of-way.

(1) *Sole risk property owner.* Liability for any injuries or damages which result from any work performed and/or improvements constructed, installed or placed in the swale area by the property owner(s), their successors or assigns shall be at the property owner's sole risk; and without recourse to the town, even if improvements and other materials placed in the swale area required to be removed by the town or other entity with jurisdiction.

(2) *[Root barrier.]* Newly planted trees on town-owned property or controlled rights-of-way or within five feet of sidewalks or parking areas shall have installed (at the time of planting) an approved root barrier.

(3) *Permitted improvement in swales.* The installation of trees or other improvements, objects, and structures, and the uses permitted within street swale areas within the town are limited to the following:

(a) Traffic control devices such as signal lights, stop signs and yield signs;

(b) Utility systems and appurtenant structures;

(c) Drainage systems and appurtenant structures;

(d) Sod or herbaceous ground cover installed according to the requirements of the rights-of-way use and maintenance standards and maintained in such a manner as not to exceed six inches in height. Grass sodding or grass seeding of the swale area is required and shall be maintained by the property owner(s);

(e) The planting of town-approved trees shall be permitted in swale areas, provided that the property owner or the owner's authorized agent, applies for and obtains a swale-planting permit for the proposed plantings from the town as provided herein;

(f) All trees to be planted shall have symmetric crown form, good crown color, no insect damage, well-spaced branches, healthy new leaves, healthy well-attached bark, strong crotches, adequate root space, and be of at least Florida No. 1 quality;

(g) Low-profile, dome-shaped decorative button stones, blocks or markers not to exceed six inches in diameter and four inches in height, placed no closer than four feet apart, shall not constitute items which interfere with the drainage of the swale areas and may be permitted by the town's director of public works along street rights-of-way, drives, and public walks in the town. These dome-shaped decorative blocks or markers shall have rounded surface areas and no corners which make a right-angle projection corner interface. In the event that dome-shaped decorative blocks or markers are placed in the swale area, they shall be painted white or with a white reflective material;

(h) Underground sprinkler systems with flush or pop-up heads;

(i) Mailboxes installed according to the requirements of the rights-of-way use and maintenance standards.

(4) *Swale planting permit required.*

(a) A town swale planting permit is required before any trees or decorative markers or underground sprinkler systems may be installed in a swale. The property owner or owner's authorized agent may apply for the swale planting permit using the form established by the town public works department, and must pay the permit fee which is established by resolution of the town commission. Proof of property ownership or owner's agent authorization must be provided to the town at the time the permit application is submitted, together with a site sketch identifying the location, species, size and

the number of trees and/or decorative markers to be installed in the swale area, and such other information as is required by the application form or as may be required by the public works director.

(b) Approval of the permit may be granted if the proposed plantings and/or improvements do not create infrastructure maintenance problems, encroach into the roadside recovery area, create a hazard, or otherwise adversely affect citizens of the town, or if the proposed improvement otherwise comports with the public interest. As a condition precedent to issuance of the swale area permit, the property owner shall execute an indemnification and hold harmless agreement in favor of the town, and in a form acceptable to the town attorney, which agreement shall be recorded against the property of the town. The acceptance of a swale planting permit by the person requesting a permit shall constitute acceptance of all obligations pertaining thereto, and the permit holder shall be held responsible for fulfilling all of the requirements thereof. The duties and obligations of the permit, specifically including the indemnification and hold harmless agreement, shall constitute covenants running with the land, and shall be binding on the permit holder, the property owner(s), and their respective heirs, successors, and assigns.

(c) Trees, vegetation and/or decorative markers, or other improvements, landscaping, structures or objects which are planted, installed, constructed or placed in the swale without a permit, shall be subject to immediate removal. When trees or decorative markers are placed in a swale without the required swale planting permit, the permit fee for the swale area permit shall be tripled; however, the payment of the triple fee shall not relieve any person from fully complying with the requirements of this section. Furthermore, if a permit is not applied for and obtained, the property owner and/or the tenant may be subject to code enforcement proceedings and the imposition of a fine, together with related administrative fees and costs through code enforcement proceedings. The town may remove and dispose of the nonpermitted plantings and/or markers, structures and other nonpermitted objects from the swale and charge the property owner and/or tenant, the responsible costs for removal and disposal, and the costs for restoration of the swale, in any, in addition to the fine and related administrative costs.

(5) *Variety and location of trees.* The following regulations shall govern the variety and location of trees planted in swale areas:

(a) Trees not considered nuisance trees which are determined to be of the same character and which are deemed suitable and appropriate trees for swale areas as determined by community development director, may be planted in a swale upon the issuance of a swale planting permit. Nonnative species and exotic, pest and invasive plants as listed by the Florida Exotic Pest Plant Council are specifically prohibited.

(b) Trees shall be planted not closer to the street pavement than one-half the distance between the property line and the street pavement and within three feet of a sidewalk.

(c) All large trees and palm trees to be planted in the swale will be not less than a three-inch caliper and 12 feet tall with one main trunk free of branches between five and six feet above ground. All small trees to be planted will be not less than two inches in diameter measured six inches above the ground, and six feet tall.

(d) All trees shall be planted in line or in an aesthetically ordered manner, except as may be delineated on a landscape plan authorized and approved by the town commission. Large trees shall be planted at a spacing of between 25 and 35 feet from each other; small trees and palm trees shall be planted at a spacing of between ten and 20 feet from each other.

(e) If roots and branches of any trees, hedges, or other plant growth on private property cause damage or destruction to any sidewalk, curb, gutter, street pavement, utility line or other town-owned or publicly owned property, code enforcement action and/or other legal action may be commenced by the town. In addition, the town may take action to bring the property into compliance with this section, including,

but not limited to, the trimming or removal of the trees and plant materials. In such event, the town shall charge the property owner the reasonable costs of the work, together with any fines and other fees and costs which may be imposed as provided in this Code and F.S. ch. 162.

(f) Trees shall be planted so as not to impede the flow and storage of stormwater. Trees shall be planted and maintained to provide safe sight triangle distances in accordance with this Code. Trees shall be planted in accordance with Florida Power and Light Company guidelines so as to avoid interference with overhead and underground utility lines. Trees shall be planted in accordance with Seacoast Utility Authority's guidelines so that no roots from any vegetation located upon private property or adjacent rights-of-way shall be permitted to grow in such a manner that causes damage to paved rights-of-way, water, or sewer lines, or other elements of the town's or utility's infrastructure.

(g) The tree species, exact location and the permissible number of trees shall be determined by the community development director in the permitting process.

(6) *Applicability.* The standards and regulations of this section shall apply to all swales within the town.

(a) Existing plantings as of August 16, 2006:

1. Existing trees which meet the requirements of this article shall be allowed to remain.

2. Existing plantings that pose a safety or maintenance hazard shall be removed immediately.

(7) *Reconstruction or repair by the town.* In the event it is necessary for the town to reconstruct or repair its water and sewer lines or other infrastructure, the town shall restore the swale areas, including approved trees, disturbed by the reconstruction or repair. Approved replacement trees must meet minimum planting standards of this article and be of a like nature to the tree being replaced. The town shall not be responsible for restoration of any nonstandard or nonconforming surfaces or plantings in a rights-of-way, whether public or private, including, but not limited to, surfaces such as bomanite, concrete block, slate, vegetation other than sod, or nonconforming pavement or other surfaces.

(8) *[Compliance alternative.]* Existing commercial properties and multifamily dwellings that are unable to meet minimum landscape requirements for street tree planting due to inadequate setbacks or other unique physical impairments may meet the frontage planting requirements by planting approved trees in the swale at the sole expense of the property owner.

(Ord. No. 04-2009, § 3, 2-18-2009; Ord. No. 02-2010, § 2, 2-17-2010)

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Memo

To: Roberto Traviesio, MPA
Director of Public Works, Town of Lake Park

From: Hays Henderson, PLA

Date: 8/25/2022

Re: Town of Lake Park Swale Plant List

The attached information is intended as a guideline for discussion to outline a broad selection of trees for the road right of way swale planting areas within the Town of Lake Park. The plants are selected to provide for a range of native trees and palms that are generally accepted as adapted to the soils, temperatures and rainfall patterns typically found within the city limits of the Town of Lake Park.

However, it is understood that vegetation being designated as a native plant does not also imply that a specific native tree or palm is adapted to all soil types and hydrological conditions found in South Florida. The built environment typically adjacent to a roadway area may have had the native topsoil removed or water flow patterns changed during development that could affect the health and vitality of the selected vegetation. Also, a common denominator is that the locations under consideration are roadway swale areas which are intended as water conveyance structures. For these reasons, the specific site conditions where the native vegetation is planted should be a primary consideration for the selection criteria.

Further, with vegetation being adjacent to a vehicular thoroughfare consideration must be given to the location that allows for clear lines of sight from and to the vehicle, adequate recovery room for vehicles that may stray from the travel lane, and safe passage for a variety of pedestrian users.

The authority used in preparation of the attached list is Native Trees for South Florida, Doc EES-57 by the Department of Environmental Horticulture, Florida Energy Extension Service, UF/ IFAS Extension. Reviewed April 2020. https://edis.ifas.ufl.edu

The attached list has been edited to remove trees that are noted as problem trees, weak branching, messy fruit litter or produce thorns.

Town of Lake Park Right of Way Plant List

Page 1

Scientific Name	Common Name	Natural Height (in feet)	Growth Rate	Soil pH	Hardiness Zone*	Salt Tolerance	Light Requirement	Drought Tolerance	Nutritional Require-ment
Acer rubrum	Red maple	35-50	Fast	Wide	C,N,ST	Low	High	Low	Low
Acoelorrhaphe wrightii	Paurotis palm, everglades palm	15-25	Slow	Acid to Neutral	C,ST,T	Med um	Medium, High	Medium	Medium to High
Bourreria suculenta var. revoluta	Strongbark	20	Medium	Wide	ST,T	Medium	High	High	Low
Bursera simaruba	Gumbo limbo, tourist tree	40-60	Medium	Wide	ST,T	Medium	High	High	Low
Chyrsophyllum oliviforme	Satin leaf	30-40	Slow	Wide	ST,T	Medium	High	High	Low
Citharexylum fruticosum	Fiddlewood	25-30	Slow	Wide	C,ST,T	Medium	High	High	Low
Clusia rosea	Pitch apple, Autograph tree	25-30	Slow	Wide	T	High	High	High	Low
Coccoloba diversifolia	Pigeon plum	25-30	Slow	Wide	ST,T	High	High	High	Low
Coccoloba uvifera	Sea grape	15-30	Medium	Wide	ST,T	High	High	High	Low
Coccothrinax argentata	Silver palm	10-20	Slow	Wide	ST,T	High	Medium, High	High	Low
Conocarpus erectus	Buttonwood	30-50	Medium	Wide	ST,T	High	High	High	Low
Cordia sebestena	Geiger tree	20-25	Medium	Wide	T	High	High	High	Low
Dipholis salicifolia	Willow-leaved bustic	30-50	Medium	Wide	ST,T	Low	High	Medium	Low
Eugenia spp.	Stoppers	15-20	Slow	Wide	ST,T	High	Medium, High	High	Low
Guapira discolor	Blolly	35-50	Medium	Wide	ST,T	Medium	High	High	Low
Gymnanthes lucida	Crabwood	15-30	Slow	Wide	ST,T	Medium	High	High	Low
Hype/ate trifoliata	White ironwood	30-40	Slow	Wide	ST,T	High	High	High	Low
Ilex cassine	Dahoon holly	25-40	Medium	Acid	C,N,ST	Medium	High	Medium	Low
Ilex krugiana	Tawnyberry holly	25-40	Medium	Wide	T	High	Medium	Medium	Medium
Ilex vomitoria	Yaupon holly	20-25	Medium	Wide	C,,NST	High	Medium, high	High	Low
Juniperus silicicola	Southern juniper	25-30	Medium	Wide	C,N,ST	High	High		Low
Krugiodendron ferreum	Black ironwood	20-30	Slow	Wide	ST,T	Medium	High	High	Low
Leucothrinax morrisii	Key thatch palm	15-30	Slow	Wide	ST,T	High	Medium. High	High	Low
Magnolia grandiflora	Southern magnolia	60-100	Medium	Acid	C,N,ST	High	High	High	Low
Magnolia virginiana	Sweetbay	40-60	Medium	Acid	C,N,STT	Low	High	Low	Low
Myrcianthes fragrans	Simpson's stopper, twinberry	20-30	Medium	Wide	ST,T	High	Medium, high	High	Low
Persea borbonia	Red bay	50-60	Medium	Wide	C,N,ST,T	Medium	High	High	Low
Pinus clausa	Sand pine	60-80	Slow	Wide	C,N,ST	High	High	High	Low

*C=Central; ST=Subtropical; T=Tropical; N=North

Town of Lake Park Right of Way Plant List

Page 2

Scientific Name	Common Name	Natural Height (in feet)	Growth Rate	Soil pH	Hardiness Zone*	Salt Tolerance	Light Requirement	Drought Tolerance	Nutritional Require-Ment
Pinus elliottii var. densa	South Florida slash	80-100	Fast	Wide	C,ST,T	Medium	High	High	Low
Piscidia piscipula	Jamaican dogwood , fish-poison tree	35-50	Fast	Wide	T	High	High	High	Low
Prunus myrtifolia	West Indi an cherry	15-40	Medium	Wide	T	Low	High	Me di um	Medium
Psuedophoenix sargentii	Buccaneer palm , cherry palm	10-15	Slow	Wide	ST	High	Medium, high	High	Medium
Quercus laurifolia	Laurel oak	60-100	Fast	Wide	C,N,ST	Low	High	High	Low
Quercus virginiana	Live oak	50-80	Medium	Wide	C,N,ST	High	High	High	Low
Roystonea regia	Royal palm	60-125	Medium	Wide	ST,T	Medium	High	Medium	Medium to High
Sabal palmetto	Cabbage palm	45-70	Slow	Wide	C,N,ST,T	High	High	High	Medium to High
Sapindus saponaria	Soapberry	35-45	Medium	Wide	C,ST,T	High	High	High	Low
Schaefferia frutescens	Florida boxwood	20-40	Slow	Alkaline	T	Medium	Medium	Medium	Medium
Simarouba glauca	Paradise tree	35-50	Slow	Wide	T	Medium	High	High	Medium
Swietenia mahogani	Mahogany	35-60	Fast	Wide	ST,T	High	High	High	Low
Taxodium ascendens	Pond cypress	60-100	Medium	Wide	C,N ST	Medium	High	High	Low
Taxodium distichum	Bald cypress	60-100	Medium	Wide	C,N ST	Medium	High	High	Low
Tecoma stans	Yellow Elder	10-20	Fast	Wide	ST,T	Medium	High	High	Medium

*C=Central; ST=Subtropical;
T=Tropical; N=North

South Florida - Rain Garden Plant List

Trees	
Scientific Name	Common Name
Quercus virginiana	Live Oak
Quercus laurifolia	Laurel Oak
Taxodium spp.	Cypress
Acer rubrum	Red Maple
Magnolia virginica	Sweetbay Magnolia
Ilex cassine	Dahoon Holly
Bursera simaruba	Gumbo Limbo
Cococoloba diversifolia	Pigeon Plum
Annona glabra	Pond Apple
Persea borbonia	Red Bay
Sabal palmetto	Cabbage palm

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May 9, 2022
Revised June 16, 2022

Mr. John Wille, Capital Improvements
Mr. Roberto F. Travieso, MPA, Director of Public Works
Mr. Dwayne Bell, Sr., Operations Manager
Town of Lake Park
640 Old Dixie Hwy.
Lake Park, FL 33403

VIA ELECTRONIC MAIL ONLY – jwille@lakeparkflorida.gov; rtravieso@lakeparkflorida.gov; dbell@lakeparkflorida.gov

RE: Landscape Architecture Services for Town of Lake Park Swale Planting Inventory Plan

Dear Mr. Wille, Mr. Travieso and Mr. Bell:

We appreciate the opportunity to submit the following proposal for the Swale Planting Inventory landscape plans. This proposal outlines the services necessary for the preparation and representation of landscape architecture services for the Swale Planting Inventory plans for the Town of Lake Park.

We understand your desire to prepare an updated inventory of all existing swale planting within the municipal limits that can be integrated into the Town's mapping system. JMorton Planning and Landscape Architecture will provide plan documents which work to implement the Client's vision to inventory all existing swale planting within the municipal limits of the Town of Lake Park.

The following proposal is divided into tasks and materials under a Preparation or Representation group. Generally, **Preparation** entails the preparation of documents and/or materials for review. Likewise, **Representation** entails such things as coordination, correspondence and attendance at meetings and/or conference calls.

Should you have any questions regarding this proposal, please contact our office. We look forward to working with you on this project and future developments.

Sincerely,

JMorton Planning & Landscape Architecture, Inc.

Jennifer L. Morton

Jennifer L. Morton, PLA, LEED AP
LA 0001666

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PROPOSAL FOR PROFESSIONAL SERVICES

for

Swale Planting Inventory

Section I: Approval Overview and Schedule

Landscape Design Services

1. **Preparation of Landscape Inventory Plan** **$48,950**
   - Preparation of base maps from the aerial plans as available from internet sources and/or as provided by the client, supplemented with notes or sketches from site visits.
   - Locate all trees and palms regardless of size or species with a sub-meter accuracy GPS unit that are located within the roadside swales (between existing sidewalks and street edge) on all streets and roads as listed in the attached Exhibit A.
   - No tree tags or survey tape will be applied to any of the trees or palms.
   - All trees and palms in the assessment area(s) will be provided a number, identified by species, size determined according to diameter at breast height (DBH) for trees, and grey wood (GW) height for palms.
   - A basic condition assessment of each tree and palm will be provided in terms of percent out of 100 according to visual heath and structure at the time of the survey.
   - Report summarizing inventory findings with recommendations to remedy non-conforming plant findings.

2. **Preparation of Swale Tree Guidelines** **$6,500**
   - Preparation of descriptive language and/or illustrations as required to define the swale tree planting requirements for inclusion in the Town of Lake Park land development code.
   - Attendance at one (1) progress meeting with consultant team and/or government representatives to review the draft code language and make any changes prior to preparation of the final planting requirements.

3. **Preparation of Master Plant List** **$3,500**
   - Preparation of a master plant list of preferred material from the owner supplied plant list for use as reference material and a visual aid.
   - These plans will depict an overall list of species types and photographic image.
   - Preparation of final plant schedule and plant image boards identifying the plant species by common name and botanical name.

3. **Representation of All Plans** **$6,250**
   - Attendance at three (3) progress meetings with consultant team and/or government representatives to discuss information pertinent to project (includes all project

coordination discussions). Total Project Manager hours for progress meetings not to exceed 25 hours.

4. Deliverables

- Tree or palm identification number, common name and botanical name of each tree and palm, DBH of each tree or GW height of each palm in spreadsheet format.
- Tree overlay onto an aerial map as part of the AutoCAD (DWF) file.
- Master plant list of the Town's preferred swale plants.
- Image board of the Town's preferred swale plants.
- Report summarizing inventory findings with recommendations to remedy non-conforming plant findings.
- Tree planting guidelines for inclusion into the land development code.

PROPOSAL TOTAL **$65,200**

Please note: Preparation of materials and submittals outside of this Scope are considered hourly work and will be billed under the Representation portion of the contract.

Retainer

A retainer in the amount of **$9,800** is required by our office along with the signed proposal prior to commencement of any work on this project. This sum will be retained until the completion of the project to assure payment.

Fees

This fee estimate is valid for ninety (90) days from the date of this proposal.

The above fees do not include the fees of other professionals or regular reimbursable expenses such as prints, sepias, mylars, travel expenses including mileage, photographic work, etc. Such expenses shall be billed at the rate of cost plus an additional 15%.

Fees billed shall become due and payable upon client receiving said invoice. Unpaid bills shall bear interest at a rate of eighteen percent (18%) per annum, commencing thirty (30) days after the invoice date until date paid. In the event legal action is required to collect past due fees, JMorton Planning & Landscape Architecture shall be entitled to recover all reasonable attorney fees and costs including appeal.

Payment

JMorton Planning & Landscape Architecture requires payment for all services rendered within thirty (30) days of the invoice date as specified above. If payment for services rendered is not received within thirty (30) days, a Stop Work Order will be issued for your project and no professional services or representation will be conducted by our firm until your account is paid in full.

Marketing
JMorton Planning & Landscape Architecture retains the right to post a marketing/information sign on the subject property.

Additional Work
The Scope of Services which is identified under this proposal as being included with the fee schedule cannot contemplate certain elements which are not controlled by our firm. The changes created by our clients, by governmental agencies, or yet a third entity which is beyond control of our firm, are not included in this proposal and are considered additional work. The following are some examples of items which are included in the proposal and those that are not:

Items included in this proposal are as follows:
- Documents and drawings for a complete application to a listed governmental agency if noted under Scope of Services.
- Attendance and representation at the number and types of meetings described under Scope of Services.

Items **not** considered as part of this proposal are as follows:
- Additional revisions to drawings above the number listed in this proposal.
- Preparation of revisions to documents after governmental submittal or changes requested by client, governmental agencies or third entities that are not listed as code requirement.
- Revisions to documents based on Conditions of Approval placed on a project.
- Attendance at additional meetings, site observation, public hearings, or other events, which are not specified in this proposal.
- Preparation of additional documents, drawings or coordination with other professionals is not considered part of this proposal.
- Preparation of revisions to drawings based on incomplete information being provided by client or other consultant, or changes in the project program.

If the terms of this proposal are acceptable, please sign below and return to our office as soon as possible.

Signature / Title	Date
Company	Mailing Address
Email for Billing	Email for Correspondence

Jennifer L. Morton

Jennifer L. Morton, PLA, LEED AP
LA 0001666

Town of Lake Park
Stormwater Masterplan Update
Executive Summary

Town of Lake Park, FL
535 Park Avenue
Lake Park, FL 33403
October 1, 2021

WRMA

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Section 1 Introduction

1.1 About the Town of Lake Park

The Town of Lake Park, originally founded as Kelsey City in 1923, was the first zoned municipality in Florida. The town contains 2.5 square miles of property, 2.2 square miles of dry land, and has a population of approximately 8,155.

Figure 1-1 includes an exhibit of the Town of Lake Park limits underlain with a 2019 Aerial photo.

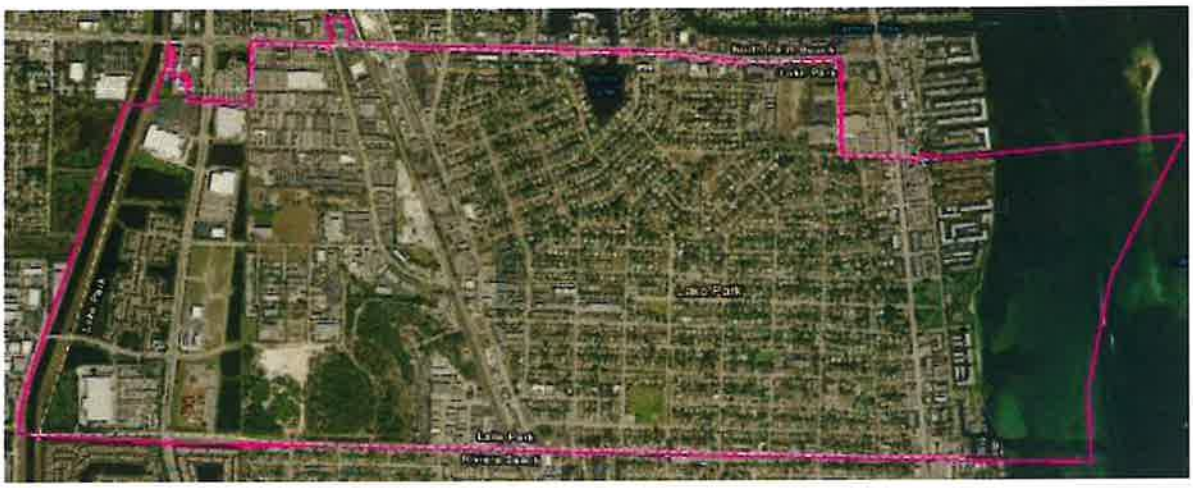

Figure 1-1 Town Limits of the Town of Lake Park, FL (2019)

1.2 Previous Stormwater Masterplan Updates

The Town's existing stormwater drainage system predominantly consists of grassed swales within the Right of Way for conveyance of excess runoff to roadside ditch bottom inlets. Discharges are either exfiltrated or conveyed to one of 14 major outfalls located on the Lake Worth Lagoon (Intracoastal Waterway) and the C-17 Canal. The original Town of Lake Park Stormwater Masterplan was created in 1980, with updates made in 1993 and again in 1996. Since the last update, the failure rate of existing drainage infrastructure has accelerated. In 2018, the town determined further updates were required to repair and/or replace existing stormwater assets and to identify opportunities to implement new infrastructure and incorporate low impact development (LID) stormwater management strategies.

1.3 2019 Stormwater Master Plan Update Goals

The 2019 Stormwater Masterplan (SWMP) update is intended to provide the Town with a strategy for addressing aged stormwater assets and capacity deficiencies over the next 20 years. As a seaside town, the strategy will also account for climatic variables such as projected sea level rise related to global warming.

The SWMP update will also utilize Green Infrastructure planning approaches and Low Impact Development (LID) Best Management Practices (BMPs) for stormwater management. Green infrastructure methods include the use of bio-retention, rainwater harvesting, and infiltration systems of varying size and configuration, in combination with traditional conveyance and end of pipe infrastructure.

1.4 Stormwater Masterplan Activities

In developing the 2019 SWMP update, the town identified eight (8) activities which analyze the town's stormwater management infrastructure and flood control strategies, and their impact on the town's financial health and economic development.

1. Collection and Cataloguing of Previous and Current Datasets
2. Performance review of the town's NFIP Community Rating System (CRS)
3. Public Outreach and Communication Plan for SWMP improvements
4. Assessment and Mitigation Plan for Climate Change Impacts
5. Review of Stormwater Operations and Maintenance (O & M) Program
6. Hydrologic and Hydraulic Modeling Analysis of Stormwater Management System
7. Analysis and Identification of Rehabilitation Alternatives for potential Nuisance, Storm Event, and Climate Change Flooding.
8. Analysis and Assessment of Stormwater Utility Fee, ESU Calculation, and Stormwater Utility Program Funding Opportunities.

Section 2 Data Collection and Management

2.1 Data Collection

Development of the Stormwater Masterplan requires the acquisition of topographic, hydrologic, and geologic data, as well as physical stormsewer system data. The data collected was acquired from the Town of Lake Park and other regional, state, and federal agencies, including:

- Palm Beach County
- The Northern Palm Beach County Improvement District (NPBCIDP)
- The South Florida Water Management District (SFWMD)
- The Florida Department of Transportation (FDOT)
- The Florida Department of Environmental Protection (FDEP)
- US Army Corps of Engineers (USACE)

- US Department of Agriculture (USDA)
- National Oceanic and Atmospheric Administration (NOAA) / U.S. Department of Commerce
- Federal Emergency Management Agency (FEMA) / U.S. Department of Homeland Security
- US Environmental Protection Agency (USEPA)

2.2 Data Cataloguing

Physical Stormsewer System Data

In 2019, Calvin Giordano and Associates, Inc. (CGA), developed an asset inventory of the Town's existing drainage infrastructure. CGA provided the town with Digital AutoCAD files, a GIS Map package, and an Excel Tabular database. WRMA noted the following:

- The map data and the tabular data had some minor inconsistencies.
- The Town's existing drainage system consists of approximately 10.6 miles of stormsewers and 589 hydraulic structures, with drainage pipes ranging in size from 8-inch to 72-inch in diameter.
- The structure asset identification system follows a 14-digit format that may be cumbersome for asset management purposes.
- Some inconsistencies in the physical survey of the stormwater sewer infrastructure may be due to a lack of available as-built drawing information.
- A detailed review of the Town's stormsewer system data was performed and selectively field verified for accuracy.

The US Highway 1 corridor through the Town of Lake Park jurisdiction extends from Palmetto Drive to Silver Beach Road for a length of 0.77 miles. The corridor right-of-way is served by a dedicated stormsewer system of inlets and storm sewers discharging through the Town's 72" RCP outfall to the Lake Worth Lagoon, located between Cypress Drive and Date Palm Drive.

The US Highway 1 drainage system consists of 0.93 miles of stormsewers and total of 41 Structures in the right-of-way (inlets and catch basins).

2.3 LiDAR Topographic Data Management

The Palm Beach County LiDAR database was acquired from the Palm Beach County GIS department and utilized to create a Town wide Digital Elevation Model for the purpose of performing 2-Dimensional

Hydraulic Modeling of the Town's stormsewer system. **Figure 2-1** shows the topographic range of elevations for the Town of Lake Park developed using the Palm Beach County LiDAR data.

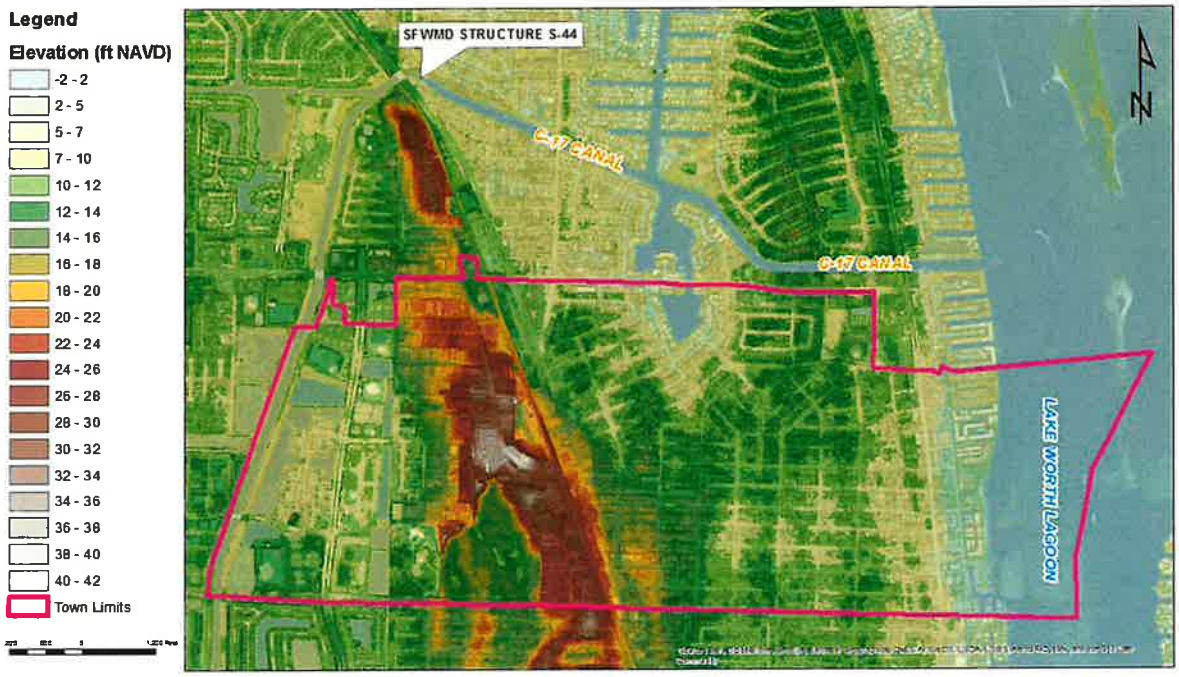

Figure 2-1 Digital Elevation Map of the Town of Lake Park based on 2018 PB Co. LiDAR Data

2.4 Hydrologic and Hydraulic Model Parameterization

WRMA identified data input parameters required for the development of the ICPRv4 Hydrologic and Hydraulic Model. These include:

Watershed Boundaries

Watershed boundaries are typically determined by the rainfall catchment area that contributes runoff for transport and discharge through the Town's stormwater management system.

Drainage Basin Delineation

Previous stormwater masterplan studies completed in 1986 and 1996 identified and mapped 26 separate basins within the Town's boundaries. Adjustments to the current drainage basin boundaries were made based on the 2018 detailed LiDAR elevation data. Sub-catchments within each basin were also defined to provide a higher level of detail based on the location of inlets throughout the Town.

Areas of Known Flooding

FEMA Maps #12099C0387F (Panel 387) and 12099C0391F (Panel 391), with effective dates of October 6, 2017, include the Town's flood hazard zone area designations.

Flood hazard areas depicted on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA areas are defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year. The 1% annual chance flood is also referred to as the base flood or 100-year flood.

Characteristics of Land Cover

There are approximately 1,116 total acres or 1.74 square miles contained within the corporate Town limits. Water areas constitute a 0.8% of the total area. The Town of Lake Park is considered built-out to approximately 84% of the corporate area. Only 16% of the total area is vacant and potentially available for future development.

Other data collected include *GIS Map Datasets, Design Storm Rainfall Data, Soil Data, and Geologic Data.*

Section 3 NFIP Community Rating System Overview

3.1 Current Program Activities

A review of the town's 2017 Digital Flood Insurance Rate Map Floodplain Management Plan Update and the current CRS Program was performed. The objective of the review was to provide technical support and expert guidance to maximize the Town's CRS classification. By accumulating additional CRS points, the town can achieve a lower (or better) rating. Key opportunities for obtaining additional CRS points were identified. Development tasks within the Stormwater Masterplan Update provide key opportunities to maximize CRS points.

3.2 Background

Communities participating in the CRS program commit to enforcing minimum floodplain management standards. The CRS Program recognizes and encourages community floodplain management activities that exceed the minimum NFIP standards. The CRS recognizes 19 creditable activities, organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness.

Accumulation of credit points determine a communities CRS classification. Flood insurance premium rates are reduced as the Community's CRS classification decreases (from 10 down to 1) with a rating of 1 being the "best" and resulting in the highest flood insurance premium reduction. There are a total of ten CRS classes. Class 1 requires the most credit points and gives the largest premium reduction. Class 10 provides no reductions in premiums. **Table 3-1** below shows the CRS class levels, corresponding credit points, and premium reductions percentages.

Table 3-1 NFIP Community Rating System - Class Summary

		Insurance Premium Reduction	
Class	**Credit Points**	**SFHA***	**Non-SFHA****
1	4,500+	45%	5%
2	4,000 – 4,499	40%	5%
3	3,500 – 3,999	35%	5%
4	3,000 – 3,499	30%	5%
5	2,500 – 2,999	25%	5%
6	2,000 – 2,499	20%	5%
7	1,500 – 1,999	15%	5%
8	1,000 – 1,499	10%	5%
9	500 – 999	5%	5%
10	0 – 499	0%	0%

*Special Flood Hazard Area

**Preferred Risk Policies are available only in X zones for properties that are shown to have a minimal risk of flood damage. The Preferred Risk Policy does not receive premium rate credits under the CRS because it already has a lower premium than other policies.

3.3 Town of Lake Park FEMA Floodplain Maps

FEMA flood zones are flood risk areas identified on the digital version of the Flood Insurance Rate Map (DFIRM). The FEMA DFIRM is used by lenders and insurance companies when evaluating whether borrowers are required to purchase flood insurance. Flood insurance is mandatory for properties in high-risk zones if owners have federally backed mortgages through Fannie Mae or Freddie Mac.

In October 2017, FEMA updated the Town's Special Flood Hazard Areas (SFHA's) as part of a Countywide Flood Insurance Study (FIS) for Palm Beach County. New DFIRMS were prepared using high accuracy LiDAR mapping data. FEMA Maps #12099C0387F (Panel 387) and 12099C0391F (Panel 391) include the Town's revised flood hazard zone area designations (**Figure 3-3** and **Figure 3-4**).

Figure 3-3 FEMA Flood Insurance Rate Map - Western Portion of Town (2017)

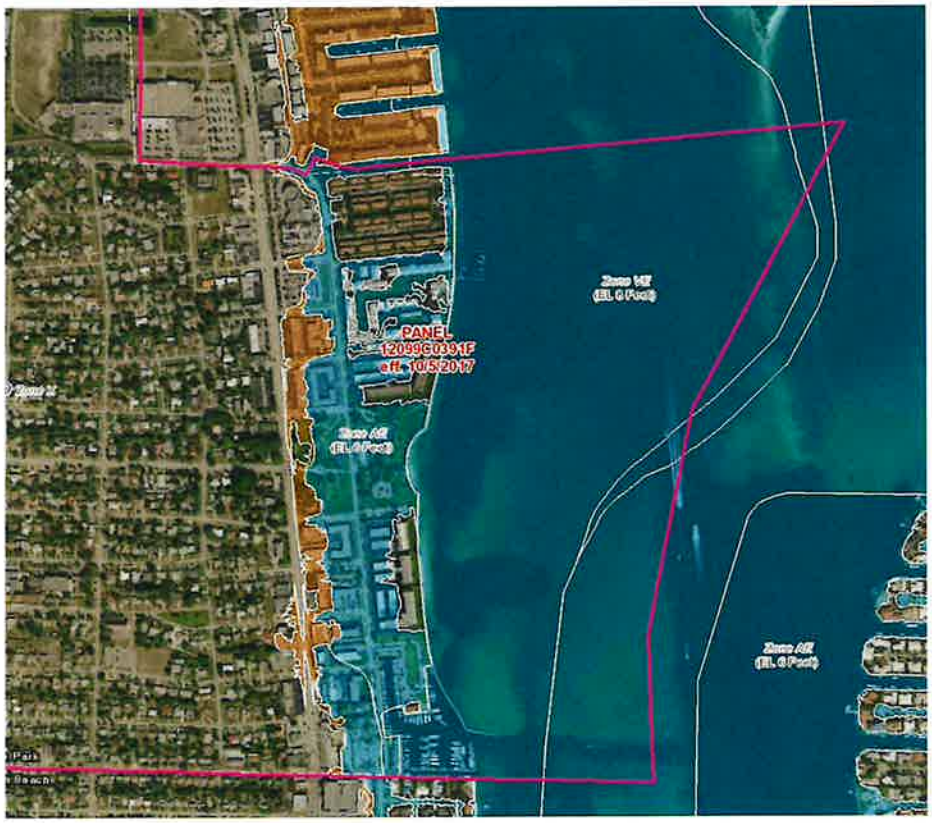

Figure 3-4 FEMA Flood Insurance Rate Map - Eastern Portion of Town (2017)

3.4 CRS Program Participation Compliance Review

Since 1978, the Town of Lake Park has been a voluntary participant in the CRS. The Town's current CRS classification is 8, which provides for a 10% insurance premium reduction for residents within a special flood hazard area (SFHA) and 5% for non-SFHA areas. Currently, the Town's goal is to accumulate enough credit points to qualify for a classification of 7 or lower with the implementation of the Stormwater Masterplan and inherent CRS activities. The CRS class upgrade will provide for an additional 5% flood insurance premium reduction for all policies issued within Special Flood Hazard Areas.

Section 4 Outreach and Communication

4.1 Background and Purpose of SWMP Outreach Plan

The primary objectives of the Stormwater Masterplan Update are to inform, educate, cooperate, and collaborate with the stakeholders throughout the Town. The purpose of the Outreach & Communications activity is to identify and engage stakeholders, and to establish the goals, activities, and expectations for involving stakeholder groups in the development of policies specifically relating to stormwater management, flood control, and water quality.

4.2 Framework of the Outreach and Communication Plan

The Town of Lake Park Outreach and Communication Plan is an element of the Stormwater Masterplan (SWMP) update, which maximizes the involvement of the public in the development and implementation of:

- Town Policies and Ordinances relating to Stormwater Management and Flood Control;
- Aiding town staff in the development of Stormwater Improvement Projects;
- Identifying and collecting information on flood prone areas; and
- Promoting sustainable Green Infrastructure and Low Impact Development (GI/LID) practices.

The town's *FMP Planning Committee*, known as the "Steering Committee", conducts outreach efforts based on the guidelines in FEMA's CRS Program Manual. The Committee's primary directive is to plan, organize, and conduct meetings or presentations to neighborhood councils, providing information on stormwater management and floodplain management activities, as well as providing opportunities to receive community input.

4.3 Outreach Plan Activities

- Flood Preparedness and Climate Change Awareness Public Surveys
- Development of Educational Materials and Events
- Public Outreach Meetings and Open Houses
- Local and Regional Stormwater Partnerships
- Website and Social Media Presence

4.4 Outreach Plan Implementation

Stormwater Policy "Steering" Committee

The town elected to consolidate the SWMP Technical and Policy Committees into a single committee. The single committee, known as the *Town of Lake Park Stormwater Policy Committee*, will be referred to as the Steering Committee (SC). It is composed of five members who will serve for the duration of the SWMP project update (completion projected sometime in the third quarter of 2020). The members of the steering committee were selected to represent a cross-section of views and interests within the town, coordinating SWMP Efforts with Stakeholders. The members are:

1. Chairman: Richard Scherle, Public Works Director
2. Vice Chairman: Dena Davis (Stakeholder)
3. CFM Consultant: Raul Mercado, PE, CFM (WRMA)
4. Planning Official: John D' Agostino, Town Manager
5. Stakeholder Participant: Ronnie L. Cohen

Section 5 Climate Change & Sea Level Rise Assessment

5.1 A Changing Climate

Climate stressors such as increasing temperatures, changing precipitation patterns, and extreme weather events are already affecting the environment of urban and agricultural communities. As the climate continues to change, communities may experience periods of drought and water shortages, and more frequent heavy precipitation events. At current greenhouse gas emission levels, the earth's temperature is projected to rise by 2.5 to 7.8 degrees Celsius by the end of this century. Human activities, including the release of Carbon Dioxide (CO2) and other greenhouse gases into the atmosphere have an impact on the climate. Changes in rainfall and other forms of precipitation will be one of the most critical factors

determining the overall impact of climate change. **Figure 5-1** details the projected changes in climate over the next forty years based on the current rate of CO2 emissions.

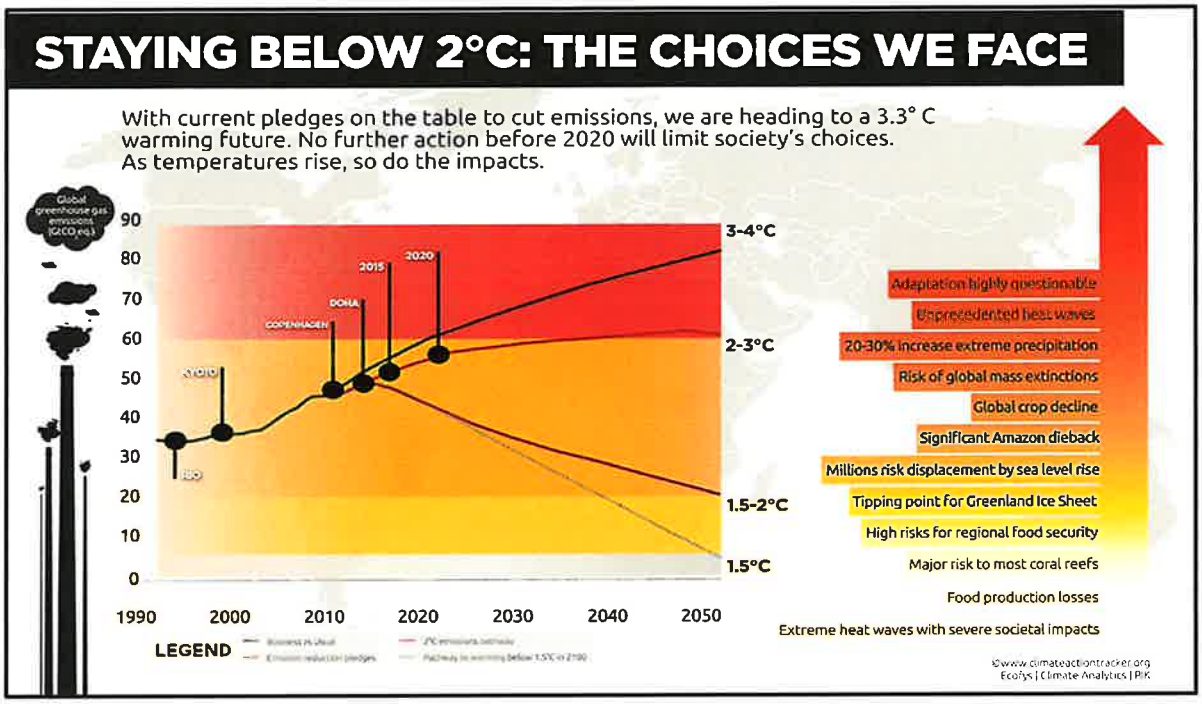

Figure 5-1 Climate Warming Trend (Source: Ecofys/Climate Analytics)

5.2 Climate Change and Stormwater Management

Connecting climate change impacts to stormwater management, with the goal of increasing ***resiliency*** to major storm events, requires a ***Vulnerability Analysis*** to assess the effectiveness and longevity of the Town's stormwater infrastructure as it relates to climate change stressors and sea level rise. The concept of ***Risk*** in a resilience assessment involves the consequence of a climate threat. Defining Vulnerability and Risk within a resiliency framework supports development strategies in stormwater master planning.

The U.S. Climate Resilience Toolkit is a website designed by the Federal Government to help people find useful information and subject matter related to climate change resilience. The toolkit recommends a five-step approach to assess a community's resiliency to climate change stressors. For the purpose of the Town's Stormwater Management Plan Update, a modified version of the Toolkit was applied as follows:

1. Assess Climate Change Hazard Exposure for Stormwater Management.
2. Assess Vulnerability and Risks of Exposed Stormwater Management Assets.
3. Perform Adaptation Assessment for each threat.

5.3 Climate Change Hazards for Stormwater Management

Climate Change Threats (*Hazard Stressors*)

Table 5-1 includes the types of natural flood hazards expected to be exacerbated by climate change that will affect the Town's stormwater management infrastructure.

Table 5-1 Flooding Hazards by Type & Exposure Level

Flooding Hazard	Source of Identification and Quantification	Exposure Type and Level of Hazard				
		Private Assets	Natural Area Assets	Government Assets	Critical Facilities	Road Assets
Nuisance Flooding, Runoff & Erosion	Throughout Town	Yes/Low	Yes, Low	Yes/Low	Yes/Low	Yes/High
Regional Canal Flooding	C-17 Canal/ Earman River	Yes/High	Yes/Low	Yes/Low	Yes/Low	Yes/High
Coastal Storm Surge Flooding	Atlantic Ocean Lake Worth Lagoon	Yes/High	Yes/Low	Yeas/Low	Yes/High	Yes/High
Coastal Sea Level Rise	Atlantic Ocean Lake Worth Lagoon	Yes/High	Yes/Low	Yes/Low	Yes/Low	Yes/High

Exposure Analysis of Nuisance Flooding, Runoff and Erosion Threats

The threat of nuisance flooding (urban flooding), runoff, and erosion includes events caused by extreme or heavy precipitation that results in minor flooding or erosion from runoff. NOAA defines nuisance flooding as events that overwhelm stormwater infrastructure and result in inconveniences, such as road closures and damage to infrastructure. Two examples of localized ponding are provided in **Figure 5-4.** Town of Lake Park flooding locations are shown in **Figure 5-5.**

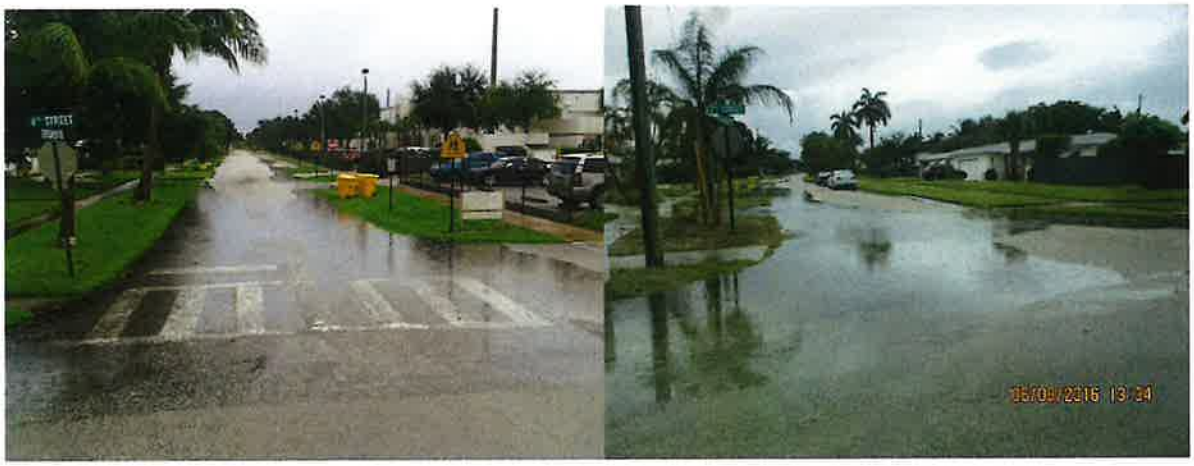

Figure 5-4 Flooding at 2nd Street & Evergreen Drive, and at 4th Street & Evergreen Drive

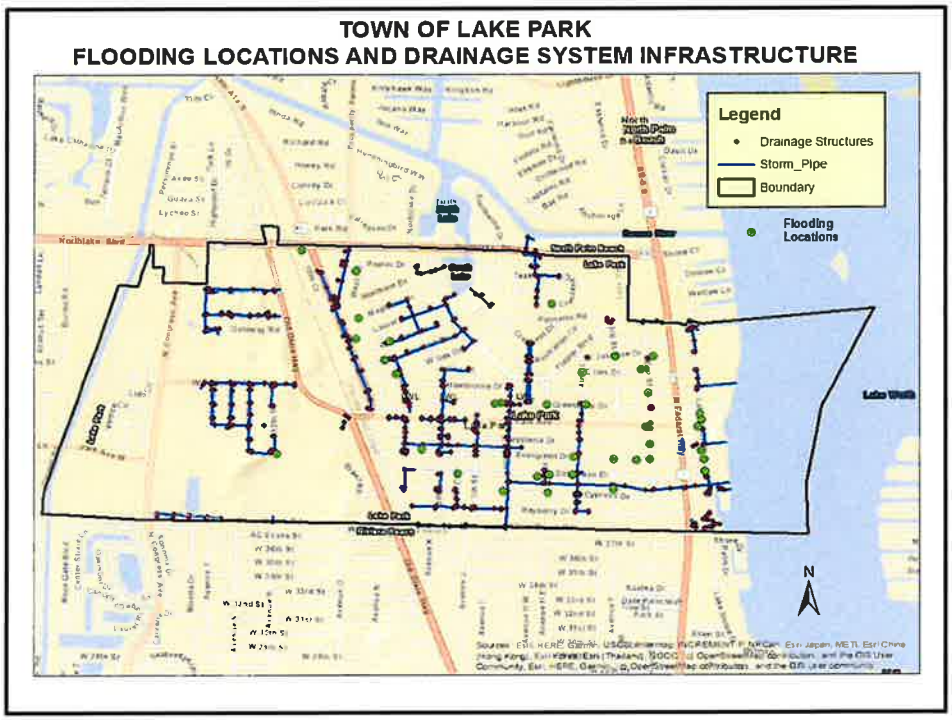

Figure 5-5 Nuisance Flooding Locations

Sources of nuisance flooding can be traced to the following occurrences:

An Underperforming Stormwater Management System

These are systems that lack downstream hydraulic capacity to pass through or discharge runoff volumes from entering inlets, stormsewers, and road culverts. The lack of capacity produces a "Backwater" pressure effect that results in inlet surcharge and surface ponding. **Figure 5-6** shows a typical inlet surcharge at Ilex Street.

Figure 5-6 Inlet Surcharge at Ilex Street

High (King) Tides / Sunny Day Flooding

Nuisance flooding is also associated with coastal tidal flooding (Sunny Day Flooding) during extreme (King) tide events in the fall and/or as induced by Sea Level Rise. This type of nuisance flooding is observed in low lying coastal areas with an average topographic elevation of 2 to 4 feet NAVD. **Figure 5-7** shows the minimum and maximum depths (above mean sea level) for the Town of Lake Park on February 6-7, 2019. A maximum tide depth of 2.76 feet was experienced at 5:50 AM on February 6, 2019.

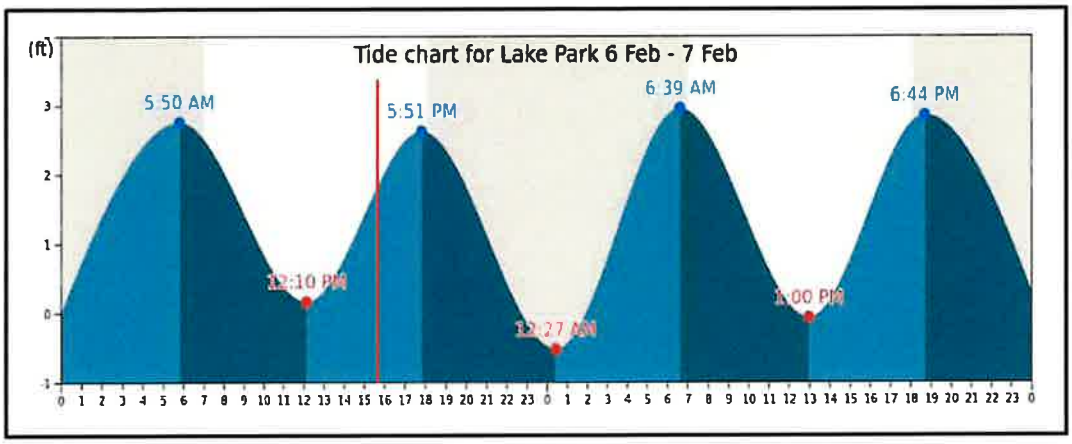

Figure 5-7 Tide Depth Ranges at Town of Lake Park

The elevation of Lake Shore Drive along the eastern boundary of the Town adjacent to the LWL varies between 2 and 4 feet NAVD. Inlets along the road and at canals will experience shallow flooding as shown in **Figure 5-8.**

Figure 5-8 High Tide (SLR) Flooding Along Lake Shore Drive

Potential Risks Due to Nuisance Flooding, Runoff, Erosion Threat

Risk involves the likelihood and consequence of a climate threat such as Nuisance Flooding. Likelihood involves assessing the frequency and duration of the type of rainfall events responsible for localized flooding. The Annual Exceedance Probability (AEP) for a 2- year storm event is approximately 50%, and less than 10% for a 10 to 15-year storm event. This means that risk of Nuisance Flooding in the Town of Lake Park is approximately 50% of the time for storm events of less than 2 inches, and very infrequently for storm events of less than 4 inches.

Measures for Identifiable & Quantifiable Risks Due to Nuisance Flooding

As warming trends indicate, Climate Change will affect the increased intensity of rainfall in the Town of Lake Park.

Runoff is a function of imperviousness as rainfall that cannot infiltrate impervious surfaces such as pavement and driveways will "runoff" from the site. A measure of adaptation to the impending warming trend and higher rainfall intensity stressors is the reduction (or conversion) of impervious areas to pervious "green areas".

This Climate Change-based stormwater management approach retains on-site small storm events in an attempt to simulate pre-development runoff conditions. *This approach is referred to as Low Impact Development (LID) or Green Infrastructure (GI) for stormwater management* and is an integrated approach that uses site planning and small engineered stormwater controls spatially distributed throughout a development site to capture stormwater runoff at the location or vicinity of its origination. This includes the use of Bio-detention/Bio-retention filters, landscaped (green) roofs, rainwater cisterns, constructed wetlands, underground infiltration chambers and infiltration trench BMPs for stormwater control. Even small, decentralized stormwater management practices like *rain gardens* can make a substantial cumulative difference to the resiliency of an urban watershed.

GI/LID BMPs are a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project's design, especially its landscaping and open space.

The long-term adaptation practice for the Town of Lake Park entails the Town-wide implementation of GI/LID BMP's. These will include:

- Home Site Level: Rain Barrels and Rain Gardens
- Commercial/Light Industrial Sites: Bio-detention/Bio-retention, Pervious Pavement
- Road/Parking Lot Sites: Bio-Swales, Underground Storage/Infiltration Chambers
- Building Sites: Green Roofs

Figure 5-13 shows the proposed use of roadside swales for 5% of all Town Right-of-Ways as a function of the nuisance flooding locations and drainage system.

The placement of roadside bio-swales will significantly reduce the frequency and occurrence of nuisance flooding as roadside runoff will be captured in the bio-swales prior to entering the stormsewer system for downstream conveyance. It is also proposed to encourage the implementation of rain gardens at the private lot site level. The Town is leading by example through the planned use of rain gardens at the historical Town hall Building along Park Avenue.

A Town Stormwater Masterplan Steering Committee (SC) is in the process of implementing an Outreach Plan that includes the dissemination of Climate Change, Green Infrastructure literature and will also undertake public presentations to encourage the use of rain gardens at the home-site level.

Figure 5-13 Proposed Town-wide Roadside Bio-swales Plan

Exposure Analysis for Regional Canal Flooding Threat

The C-17 Canal is utilized as a major stormwater discharge canal. Excess water in the C-17 Basin is discharged into the Earman River tidewaters and the Lake Worth Lagoon through the S-44 Salinity Control Structure. Climate change-based warming trends and increasing precipitation intensity in the watershed area may result in increased discharges and larger peak flows. Furthermore, the Earman River is subject to tidal fluctuations from the LWL. Increasing Sea Level Rise may also result in higher tail-water controls at the S-44 saline water control structure. Consequently, a higher threat of flood stages can be expected. **Figure 5-14** shows the C-17 canal watershed and the Town of Lake Park boundaries.

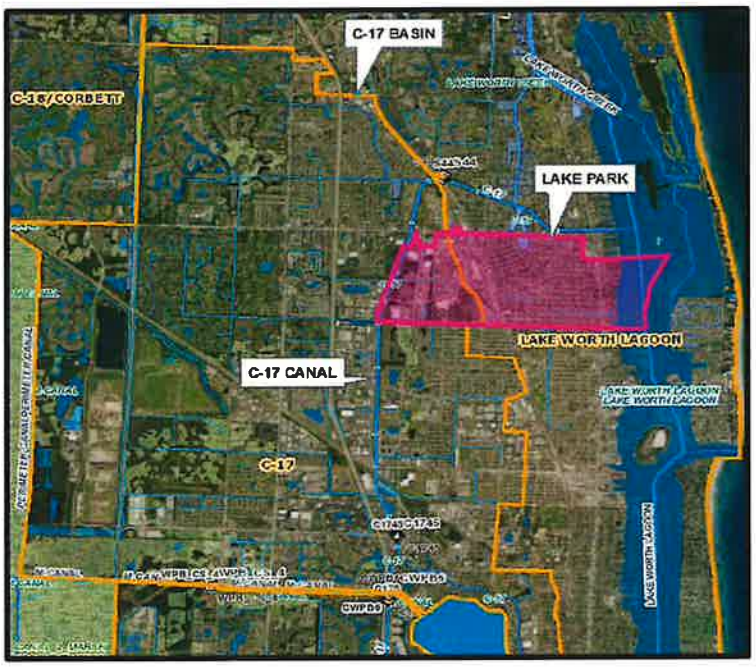

Figure 5-14 C-17 Canal Watershed and the Town of Lake Park Boundary

Measures for Identifiable and Quantifiable Risks Due to C-17 Canal Flooding

Although the Town of Lake Park has not experienced a flood of a 100-year event magnitude to date, the risk of the C-17 Canal overtopping does exist and may increase as a consequence of long-term warming trends and increased rainfall intensities. To address this Risk, the town is enhancing the C-17 Canal Banks and Berms.

Exposure Analysis for Coastal Storm Surge Flooding

The Town of Lake Park eastern boundary is situated along 0.8 miles of the Lake Worth Lagoon (LWL). The LWL is part of the Intracoastal Waterway separating Singer Island from the Atlantic Ocean. The Singer

Barrier Island and the LWL Estuary are directly exposed to tropical and subtropical storm events. A surge forms when strong winds over the ocean combine with low pressure to drive water onshore. Storm surges can produce sea levels much higher than normal high tide, resulting in extreme coastal and inland flooding.

Potential Risks for Coastal Storm Surge Flooding

The most frequent potential risks associated with Tropical Storms and Hurricanes are high intensity winds. However, "storm tides" storm surges can also cause tremendous damage. If they coincide with high tide, storm surges can raise water levels by as much as 20 feet or more above mean sea level.

Coastal surge storm events can have a direct impact on the stormwater management system as it affects all coastal outfalls. The National Flood Insurance Program (NFIP) has mapped the potential from flooding due to coastal storm surges.

These areas are shown on FEMA's Flood Insurance Rate Maps (FIRMS) published as part of the Palm Beach Countywide Flood Insurance Study (FIS). Coastal surge inundation can also impact key town infrastructure including roads, utilities, fire protection and medical facilities (hospitals). **Figure 5-19** shows the FEMA 2019 updated coastal flooding, designated as "V" zones, along the ocean and as SFHA's "AE" along the LWL. Coastal surge inundation can also impact key Town infrastructure including roads, utilities, fire protection and medical (hospital) facilities.

Figure 5-19 2019 FEMA Coastal SFHA's

Exposure Analysis for Coastal Seal Level Rise Flooding

The National Oceanic and Atmospheric Administration (NOAA) indicates that the sea has risen about half a foot since 1970. Sea levels are expected to continue to rise. According to the Southeast Florida Regional Climate Change Compact guidelines, in the short-term, sea-level rise is projected to be 36 inches by 2060 (above the 1992 mean sea level). In the long-term, sea-level rise is projected to be 31 to 61 inches by 2100. For critical infrastructure projects with design lives in excess of 50 years, use of the upper curve is recommended with planning values of 34 inches in 2060 and 81 inches in 2100. **Figure 5-23** shows the Sea Level Rise Progression through 2060.

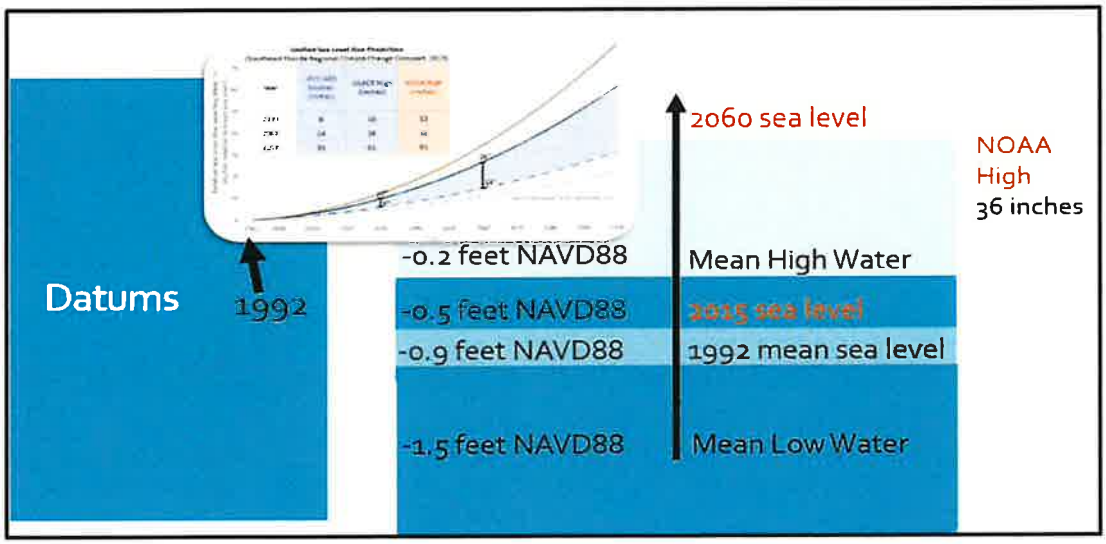

Figure 5-23 Sea Level Rise Progression Through 2060

Potential Risks for Coastal Sea Level Rise Flooding

SLR inundation is often confined to marginal areas of properties, impacting existing drainage infrastructure. The Lake Shore Drive ROW area and commercial and multi-family (condominium buildings) parking lots will be at risk of flooding with potential for first floor elevation flooding in older buildings and homes.

Measures for Risks Due to Tidally Influenced Sea Level Rise Flooding

The SWMP addresses the need for resilience planning to adapt to SLR impacts, and the need to assess any existing stormwater infrastructure along the Town boundaries impacted by tides (South Lake and LWL outfalls), as well as the town's seawall. There is also a need to install in-line valves and/or pump stations to address the higher tide levels and inland flooding. There are three (3) outfalls to South Lake (Earman River) and eight (8) outfalls to the LWL, and three (3) to the C-17 canal. As part of the SLR Adaptation process, the town is implementing a project to provide flood relief to the Lake Shore Drive coastal areas

subject to SLR flooding. With funding assistance from the Florida Department of Environmental Protection (FDEP) and FEMA's Hazard Mitigation Grant Program (HMGP), the Town is in the final process of implementing the $6.2 million Lake Shore Drive Drainage Improvement Project. **Figure 5-31** shows the project area.

Figure 5-31 Lake Shore Drive Drainage Improvement Project

Figure 5-32 shows the SLR pump station site for the Lake Shore Drive Drainage Improvement project.

Figure 5-32 Pump Station for Lake Shore Drive Drainage Improvement Project

An additional adaptation project includes the retrofit of the 72" outfall. The Southern Outfall Drainage Improvement Project is under design and has been proposed for implementation funding to the Palm Beach

County Local Mitigation Strategy (LMS) group. FEMA has indicated that funding of this second costal SLR project is also viable in the FY2022 period. This project will also include a pump station to address future SLR.

The Town also applied and was successful in obtaining a grant from the Florida Resilient Coastlines Program to assess the vulnerability of the Town's system of bulkheads and seawalls along the LWL waterfront. The grant was used to perform a physical survey of the seawall to establish top elevations, and to assess the structural integrity of the seawall and bulkheads. The grant was also used to perform a detailed SLR inundation analysis using survey data and the latest (2017) LiDAR data from Palm Beach County.

Figure 5-34 shows the location of the proposed seawall vulnerability assessment project in relation to the Lake Shore Drive Drainage Improvement Project.

Figure 5-34 Proposed Seawall Assessment Project Location

Other future proposed SLR Adaptation projects include the SLR Retrofit of three (3) additional outfalls to South Lake and the Earman River using In-line check valves. These project proposals will be developed in conjunction with the proposed C-17 Canal top of berm hardening project.

Section 6 Operations and Maintenance (O&M) Program Review

6.1 Organizational Structure, Mission & Equipment

Stormwater operations and maintenance is a function of the Public Works Department. The Town of Lake Park Public Works Department is organized into seven (7) divisions to maintain the town's roadways, buildings, fleet, grounds, parks, and drainage infrastructure.

1. *Administration Division*
2. *Sanitation Division*
3. *Grounds Maintenance Division*
4. *Facilities Division*
5. *Vehicle Division*
6. *Streets and Roads Division*
7. *Stormwater Division*

The Town is responsible for and committed to operating and maintaining a storm sewer network, comprised of swales and stormsewer pipes with a wide range of diameter and material, as well as other infrastructure such as storm inlets, manholes, and outfalls.

Figure 6-1 shows the extent of the drainage system.

Figure 6-1 Town of Lake Park Stormwater/Drainage System by Basins

Stormwater O&M staff are deployed daily to perform scheduled activities, many of which are associated with NPDES MS4 permit compliance and are available 24 hours a day for emergency situations. Services provided by Stormwater O&M staff for MS4 permit compliance include, but are not limited to the following:

- Litter control programs;
- Street sweeping;
- Completion of various flood control and retrofit projects;
- Controls and programs to minimize water resource impacts resulting from application of pesticides, herbicides, and fertilizer;
- Prevention and enforcement actions for illicit discharges;
- Staff training on spill response;
- Inventory and enforcement (as needed) for high risk facilities;
- Controls and actions for reducing impacts from runoff for construction sites; and
- Staff training regarding various methods to prevent non-point source pollution.

In order to help meet its service commitments, the Stormwater Division staff has been provided with the following equipment to perform the assigned duties:

- 2009 Vac-Con Vacuum truck
- Tymco model 600 Street sweeper
- 2006 New Holland LS190 skid steer loader
- ¾ ton Chevy pickup truck
- 12' manhole ladder
- 2000-watt generator w/ confined space ventilation
- Miscellaneous electric power tools
- Miscellaneous hand tools

6.2 Recommended SOP's & Contracting Procurement Procedures for O&M

WRMA reviewed Standard Operating Procedures (SOP's) for stormwater system operation and maintenance applied by municipalities similar to the town's size, location, and resources, and compiled a list of SOPs that are recommended for adoption by the town's O&M Division. The SOP list is to be used as a resource and for adaptation of specific O&M issues.

6.3 Recommended Guidelines for O&M of Green Infrastructure-Based Drainage

The SWMP update will be based on the application of Green Infrastructure Low Impact Development (GI/LID) Best Management Practices. Low Impact Development (LID) is a planning and design approach that aims to mimic naturalized water balances. GI/LID BMPs include bioretention, biodetention, bioswales, rain gardens, pervious pavements, and green roofs.

6.4 O&M Stormwater Rehabilitation Practices Review

A review of town's repair and replacement rehabilitation program was performed including review of the process for acquisition of stormwater system condition assessment (CCTV) data. Condition assessment data acquisition and technical requirements have been developed as a part of the O&M activity of the SWMP in order to establish a standardized process for the collection of inspection and condition assessment data.

Condition Rating Scale and Use

Similar to the inspection process, the summary output from the inspections of an overall asset condition rating should be standardized. The overall linear asset condition score should take into account the number of defects identified, the type of defects and the severity of those defects. This is how the NASSCO system produces a condition rating for PACP and MACP inspections. The condition scores should be grouped into a condition grade classification that provide basic recommendation(s) for further action. **Table 6-3** provides a recommended condition rating scale; this scale is aligned with the NASSCO 1 to 5 rating scale.

Table 6-3 Stormwater Pipe, Inlet & Manhole Asset Condition Rating Scale

Condition grade	General description	Detailed description	Recommended inspection frequency[a]
0	New or excellent condition	Asset with no defects. No action needed.	No more frequent than the inspection cycle period
1	New or excellent condition	Asset with very few minor defects. Inspection frequency would be at the end of the planned system inspection cycle period.	No more frequent than the inspection cycle period
2	Good condition – minor defects only	Asset in good structural and maintenance condition but there are several minor defects or one or two more moderately severe defects. Inspection frequency could be 60 to 80% of the planned system inspection cycle period.	60-80% of inspection cycle period
3	Fair Condition – moderate deterioration	Defects have degraded to a moderate level and are affecting the performance of the asset. Could be a combination of a number of minor and moderate defects. Point repairs or maintenance could be required. Inspection frequency should be within a 3 to 5 year time frame.	3-5 years
4	Poor condition – significant deterioration	Several moderate defects and at least one or more major defects. Point repairs or maintenance may correct deficiency or may need more comprehensive repair or replacement such as lining. May need frequent maintenance. Inspection frequency should be within a 1 to 3 year time frame.	1-3 years
5	Failing or failed asset	Several severe defects are found in most sections of the asset. Replacement, comprehensive rehab, should be scheduled. Emergency repair may be required. Inspection frequency should be on a monthly basis and no greater than one year.	<1 year

Section 7 Water Resources Engineering Modeling Science

7.1 Software & Model Selection

Model Methodology & Availability

The purpose of stormwater and water quality modeling is to mathematically predict natural processes. Models range from simple spreadsheets that predict a single process to complex simulations that predict multiple, inter-related processes, including performance of multiple BMPs.

The Town of Lake Park watershed is urban in nature and almost completely developed with residential, commercial, and light industrial land uses. Green or grassed areas are found along swales in wide (60 ft) right-of-ways and at a large park along the waterfront (Kelsey Park). This indicates that an urban-type hydrologic model is required for the development of the Town's stormwater masterplan.

The Interconnected Pond Routing (ICPR 4) Hydrological/Hydraulic/Hydrodynamic Model

WRMA recommended the use of the ICPR4-2D model as a basis for development of the Town of Lake Park model. ICPR4-2D is an integrated surface/groundwater model that describes the unsaturated zone. ICPR-2D allows for detailed hydrodynamic simulation of wetlands, reservoirs, culverts, structures, gates, pumps, an interconnected network of canals, ponds, reservoirs, and wetlands such as found in the Town of Lake Park study area.

WRMA utilized the ICPR4-2D model for storm event 1 and 2D simulation to address flooding problems, and to develop a long-term, continuous basin-scale water budget/hydraulic model for studying water management during low, average, and high flow, and during extreme event conditions. This model will also be used to develop short- and long-term water management strategies to address current flooding issues and to meet the objectives of the Stormwater Management Plan.

Model Development Hydrology

New advances in digital topographic terrain mapping using high resolution Light Detection and Ranging (LiDAR) allows for the detailed breakdown of sub-catchment contributory drainage areas. Using the LiDAR DEM, WRMA used ArcHydro-based GIS techniques to delineate 174 new sub-catchments. The delineation methodology entailed the computation of a contributory drainage area to stormsewer pipes 15 inches or larger in diameter to obtain a manageable number of sub-basins. In this manner, drainage areas were created for most of the pipes in the Town's drainage systems. If there is a need to assess the capacity of a 12-inch diameter pipe, the sub-basin area can easily be updated or re-partitioned. **Figure 7-3** shows the updated sub-basin areas.

Figure 7-3 Updated Basins for the Town of Lake Park

The ICPR4 model was also run for specific storm events for the purpose of level of service (LOS) analysis. **Table 7-3** includes design storms depths to be based on simulations based on Atlas 14 Point rainfall estimates:

Table 7-3 NOAA Atlas 14 Point Rainfall for Various Frequencies and Durations

Frequency / Duration	Rainfall (in)
3-Year / 1-Hour	2.6
3-Year / 24-Hour	6.5
10-Year / 24-Hour	9.2
25-Year / 72-Hour	13.3
100-Year / 72-Hour	18.3
500-Year / 72-Hour	25.6

7.2 Water Quality Assessment

NPDES/MS4 Permit Program

The Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) permit allows a permittee to discharge stormwater from its stormwater collection and conveyance system into a receiving water owned by the state and/or federal government. The permit is issued with detailed requirements that are intended to reduce stormwater pollutant discharges into receiving water bodies.

Program Goals

The Town of Lake Park must file a Cycle Assessment MS4 Plan and an MS4 SWMP Assessment Program Annual Results Report. The purpose of this assessment program is to provide information for the Town of Lake Park to determine the overall effectiveness of its Stormwater Management Program (SWMP) in reducing stormwater pollutant loadings from its Municipal Storm Sewer System (MS4) to receiving water bodies.

Town of Lake Park Water Quality Monitoring Program

As a co-permittee of the Palm Beach County NPDES/MS4 permit program, the Town of Lake Park collects quarterly ambient water quality data throughout the Town at four (4) designated sampling sites.

As required by the MS4 Permit, the Town utilizes an FDEP approved lab using NPDES-approved procedures to perform quarterly sampling at these locations for five test parameters, including Chlorophyll-A, Dissolved Oxygen (DO), Total Phosphorus (TP), Total Nitrogen (TN), and Total Suspended Solids (TSS). **Figure 7-24** shows the location of the four sampling sites.

Figure 7-24 Town of Lake Park NPDES Sampling Location Sites

Pollutant Loading

Figure 7-44 shows the Town of Lake Park MS4 areas as a function of the receiving water bodies for which pollutant discharges are being monitored as part of the Palm Beach County NPDES Group permit. The

western MS4 areas discharge toward the C-17 Canal, and the eastern MS4 areas discharge toward the Earman River/Lake Worth Lagoon (LWL).

Figure 7-44 Town of Lake Park NPDES/MS4 Area

The purpose of the Town of Lake Park Water Quality Assessment Program, as a participant within the Palm Beach County NPDES/MS4 Group Permit, is to provide information for the Town of Lake Park to determine the overall effectiveness of its Stormwater Management Program in reducing stormwater pollutant loadings from its Municipal Storm Sewer System (MS4) to the C-17 and LWL receiving water bodies.

Evaluation and Response Plan

The Town of Lake Park is currently in the process of updating the Stormwater Masterplan (SWMP) with the proposed implementation of Green Infrastructure, Low Impact Development (GI/LID) Best Management Practices such as bioswales, raingardens, bioretention, pervious pavement, etc. The implementation of GI facilities Town-wide will significantly enhance the Plan's effort to reduce pollutant loading to the LWL north watershed.

Various scenarios were studied and are based on the physical availability of green areas and cost of implementation. One of these scenarios contemplates placing bioswales in approximately 5% of all road rights-of-way in the Town. Although the 5% Bioswales program will be implemented completely within the town right-of-way and targeted to areas of known road flooding, the final placement of each roadside bioswale will be coordinated with the Public Works Department and with residents to address any issues of swale repurposing (i.e., if trees or other structural features are located in target roadside swales).

Section 8 Alternatives Analysis

8.1 Drainage Level of Service (LOS) Analysis

Level of Service

The level of service an urban drainage system provides is dependent on multiple variables. This includes but is not limited to the rate of urbanization, the required frequency of routine sewer/street maintenance and review (asset management), sewer design life, the occurrence of natural disasters and climate change.

Town of Lake Park Drainage System

The Town's stormwater collection system is composed of over 12 miles of storm sewer ranging in materials and size from 8 inches to 72 inches in diameter and serving a drainage area of approximately 1,000 acres (70% of the Town). In general, pipes are between 15 inches and 36 inches in diameter, with only 10% being 42 inches or larger. The size threshold for the hydraulic model was selected to be 15 inches (or equivalent) and greater, which represents 95% of the stormsewer system.

Types of Level of Service

In stormwater management there are four basic levels of service.

1. The level of flooding for a local drainage system of storm sewers, ditch inlets, swales, and driveway culverts.
2. The level of flooding that will overtop a local road used for daily ingress and egress to private and public property.
3. The level of service associated with the overtopping of a stormwater management system of lakes, ponds, and control structures serving a designated watershed area.
4. The level of service associated with flooding of the first floor of habitable property.

Local Drainage System Level of Service (3-year, 24-hour)

The level of flooding for a local drainage system of storm sewers, ditch inlets, swales, and driveway culverts, varies depending on location, topography, soils, and drainage system infrastructure efficiency. "*Nuisance Flooding*" has a typical ponding depth of less than 4 inches. **Figure 8-3** shows documented frequent nuisance flooding locations as a function of the existing system of stormsewers and inlets.

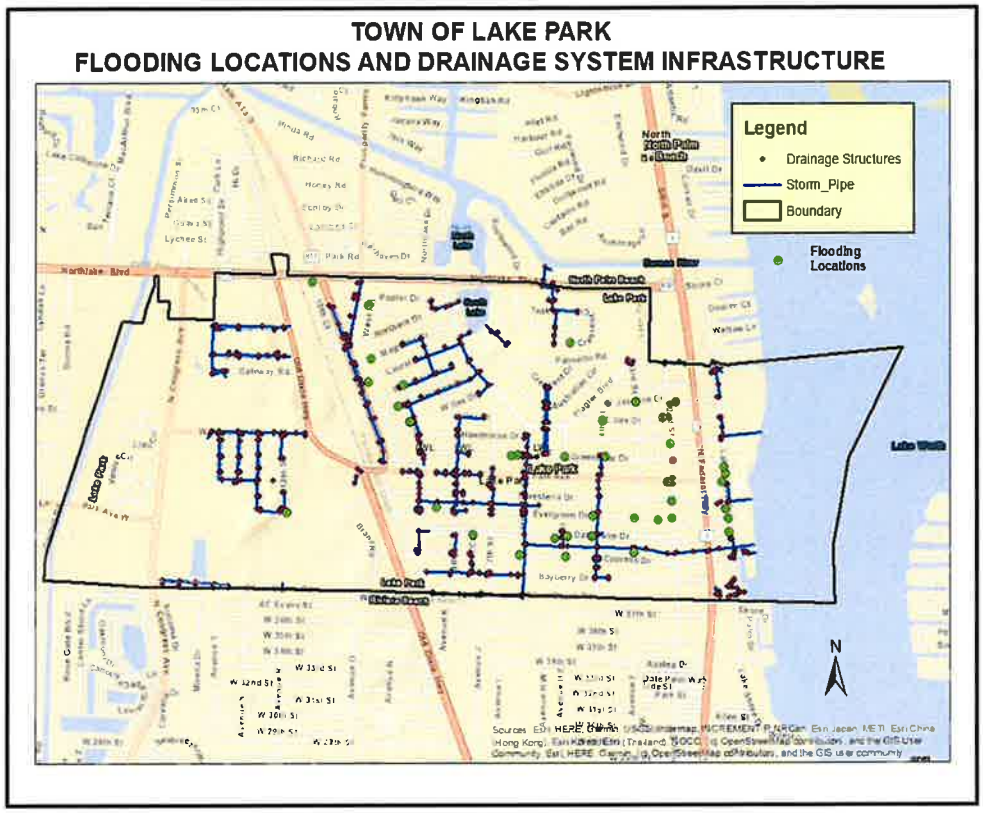

Figure 8-3 Lake Park Nuisance Flooding Locations

Sources of nuisance flooding can be traced to an underperforming stormwater management system, high (king) tides/sunny day flooding, and lack of drainage infrastructure.

Topography

To model overland surface flows, a Digital Elevation Model (DEM) is required, which characterizes the topography. A DEM raster of the Town was obtained from the Palm Beach County Light Detection and Ranging (LiDAR) point cloud data. The Interconnected Pond Routing Model (ICPR), the model selected for the development of the Town's H&H model, has the capability of modeling 2-dimensional ground water flows in addition to overland surface flow.

Boundary Conditions

The Town of Lake Park is bounded by the Lake Worth Lagoon to the east and (functionally) bounded by the C-17 Canal to the North. Several sewer networks within the Town also discharge to a system of stormwater retention ponds to the west along W. Congress Ave. These three water bodies affect the tailwater condition of Lake Park's stormsewer network and as such, are critical aspects to be modeled.

Existing Condition Analysis

The "existing condition" refers to the functioning of the current drainage system of stormsewers, exfiltration trenches, roadside swales, ditch, and curb inlets. The ICPR4 hydrologic and hydraulic model was selected to perform the required simulations. The purpose of the Hydrologic & Hydraulic (H&H) analysis is to determine the peak flow in cubic feet per second (cfs) and the flood stage (feet) for each subbasin of analysis. The resulting flow and stage data are indicative of the LOS being provided by the drainage system under current or existing conditions. To assess the results of the H&H analysis, the ICPR4 model has been applied in a 2-dimentional mode to be able to visually depict the level of flooding at a given location in the watershed.

Existing Condition Analysis – Current Rainfall w/o Sea Level Rise

3-year, 24-hour Design Storm Event Analysis

The ICPR4 model was applied in hydrodynamic (time variant) mode to assess the response of the existing drainage system to 6.5 inches of rainfall corresponding to a 3-year, 24-hour Storm Event. **Figure 8-23** shows the results of the simulation.

Figure 8-23 Maximum Flood Depths for the 3-Year/24-Hour Storm Event

Figure 8-23 shows that that there are six (6) locations of concern where flooding can accumulate to a depth of 2 to 3 feet as the result of a 3-Year, 24-Hour storm, which would produce an average point rainfall of

6.5 inches. Readily visible is the fact that most flooding occurs along the main trunk of the Southern Outfall system serving a watershed area of 318 acres. Flooding is also evident along the stormsewer system discharging to South Lake.

10-year, 24-hour Design Storm Event Analysis

The ICPR4 model was applied in hydrodynamic (time variant) mode to assess the response of the existing drainage system to 9.2 inches of rainfall corresponding to a 10-year, 24-hour Storm Event. **Figure 8-26** shows the results of the simulation.

Figure 8-26 Maximum Flood Depths for the 10-Year/24-Hour Storm Event

Figure 8-26 indicates that the flooding resulting from a 10-Year, 24-Hour storm event will result in increased flood depths primarily around South Lake (over 2.5 feet). The main purpose of the 10-year, 24-hour storm event simulation is to assess the level of service the current drainage system affords to local roads and collectors throughout the Town. As **Figure 8-26** indicates, there are many roads that will be overtopped by the 10-year, 24-hour storm event. Eleven mile of roads or 58,640 feet, will be flooded in the town. Totaling approximately 64 miles of roads, this corresponds to 17.3% of all roads.

The ICPR4 model was applied to simulate a 100-year, 72-hour storm event of 18.3 inches of rainfall. **Figure 8-29** shows the 100-year flood extent. As with the 10-year, 24-hour storm event simulation, flooding resulting from the 100-year, 72-hour storm event is more widely experienced along the Southern Outfall

but more specifically concentrated around South Lake. Many dwellings in the town were built in the 1970's and 1980's with finished first floor elevations at or just above the road centerline with high flooding potential. The purpose of the 100-Year, 72-Hour Storm Event simulation is to assess the level of inundation that will result and the number of dwellings that may be temporarily flooded above the first-floor elevation.

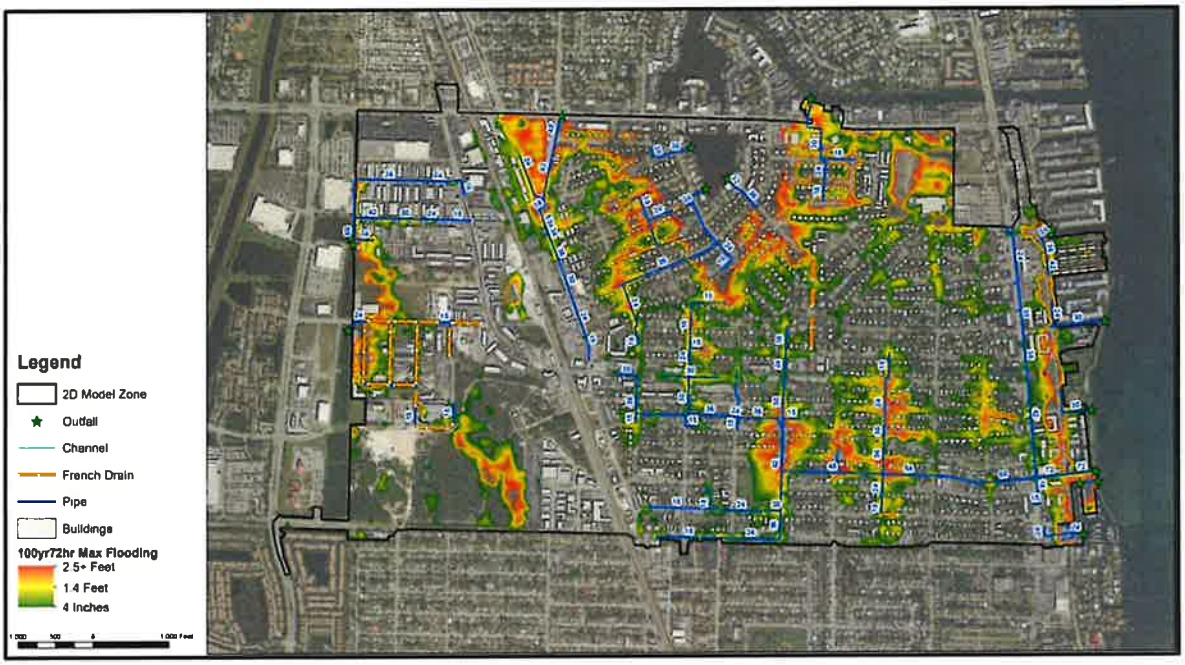

Figure 8-29 Maximum Flooding Depths for the 100-Year/72-Hour Storm Event

Figure 8-30 Structures Identified to be Flooded due to a 100-Year/72-Hour Storm Event

Figure 8-30 provides the model simulation result of the 100-Year/72-Hour storm. The result indicates that numerous structures throughout the Town of Lake Park would be flooded as a result of a 100-Year Storm Event (1% Annual Exceedance Probability). There are 558 inundated buildings affected by the 100-year storm event.

While it would be difficult and costly to elevate all affected dwellings above the predicted 100-year, 72-hour flood stages, the Town through its Community Rating System (CRS) efforts as a participating community in the National Flood Insurance Program, has made it possible for owners to obtain affordable federally backed flood insurance policies.

It should be noted that the 100-year Base Flood with a 1% probability of occurrence has not yet occurred in the Town of Lake Park based on the available record, and the probability of experiencing a storm of that magnitude (18.3 inches of rain in 3 days) is extremely small.

8.2 Development of Alternatives

The existing condition analysis indicates that there are many locations throughout the Town that currently experience flooding or ponding due to Level of Service deficiencies within the stormwater management system. As the result of a historically unplanned development process, too much runoff is directed at specific locations overwhelming the capacity of the existing stormsewers.

The 2-dimensional nature of the ICPR4 model allows the assessment of localized solutions at the sub-catchment level or at the basin level for aggregated sub-catchment areas. This is the main reason for re-distribution of the original 26 sub-basins into 174 sub-catchments.

Organizational Structure of Proposed SWMP Improvement Projects

Proposed stormwater infrastructure improvement project alternatives within the Stormwater Masterplan are organized by lettered "Divisions". Each Division represents a major improvement project, or in some instances groupings of smaller improvements projects. Each lettered divisional project will be implemented based on funding availability and the priorities of the Commission. Projects assigned a divisional letter have typically been developed beyond the conceptual stage and are either already funded or may currently have submitted (or pending) applications in process for grant funding. **Figure 8-31** shows the locations of Divisional projects that currently have an assigned letter.

Figure 8-31 Current Divisional Projects in Progress (or Development)

Alternatives to Address Inadequate LOS Due to Lack of System Capacity

Figure 8-31 shows a significant amount of flooding along Lake Shore Drive located parallel and east of US Highway 1 at the Town's waterfront. This is a special type of flooding as the lack of stormsewer system capacity along Lake Shore Drive is compounded by the influence of high tides and Sea Level Rise (i.e., high tailwater condition for discharge). Lake Shore Drive frequently becomes impassable during rainstorms and "king tides" for varying periods of time. The roadway has become a safety concern to residents requiring EMS, fire, and police services.

Division D – Lake Shore Drive Drainage Improvements

Project Objective: To address flooding and system capacity issues along Lake Shore Drive and provide Sea Level Rise Mitigation and Water Quality Treatment prior to Discharge into the Lake Worth Lagoon.

Division C – Southern Outfall Replacement and Green Infrastructure Improvements

Project Objective: To replace a portion of the existing 72" outfall pipe previously installed in the early 1970's and provide water quality treatment prior to discharge into the Lake Worth Lagoon.

Division B – Southern Outfall Diversion: Bostrom Park Renewal & Green Infrastructure Project

Project Objective: Upstream Diversion to Bert Bostrom Park Subsurface Storage Filtration Facility and Park Renewal.

Division E – Lake Park Municipal Complex Pavement Restoration and GI Improvements

Project Objective: Pavement restoration of the Municipal Complex parking lot, as well as the addition of additional drainage infrastructure to accommodate a green infrastructure facility on the southwest corner.

Sea Level Rise Mitigation Studies

South Lake Sea Level Rise Flooding Assessment Study. The entire South Lake watershed area is low in elevation and increasing Sea Level Rise will adversely affect any type of discharge into the lake. Further investigation will assess the potential placement of a tide barrier at the connection of South Lake and the Earman River.

Town of Lake Park Vulnerability, Risk and Adaptation Study. The assessment entails the physical examination of the Seawalls and bulkheads through the Town waterfront, including topographic surveying, structural coring, and tie-back excavation. The data will be used to prepare inundation mapping of the Town per seawall overtopping at intervals through the year 2027 when approximately 40" of SLR is expected along the waterfront.

Alternatives to Address Inadequate LOS Due to Lack of a Drainage System

There are many locations that lack a dedicated drainage system. Runoff from these areas tends to accumulate in low lying depressions at intersections along grassed areas. These are nuisance flooding locations that will be addressed with a combination of GI/LID BMP's including Raingardens and Bioswales.

Division A – 10th Street Corridor Restoration and Green Infrastructure Improvements

Project Objective: Pavement Restoration of the 10th St ROW corridor and installation of a drainage system via Green Infrastructure BMPs.

Division F – C-17 Canal Berm Flood Protection Improvements

Project Objective: To remove the existing areas East of the C-17 Canal from the existing FEMA Flood Map, by increasing the top of berm elevation along the East Bank of the C-17 canal.

Division G – 2nd Street Corridor Roadside Swale and Green Infrastructure Improvements

Project Objective: To install bio-retention planters and grade a roadside swale system along both sides of the Right of Way and at each intersection along 2nd Street to alleviate nuisance flooding at multiple intersections.

Projects in Early Development to Address Lack of a Drainage System

Bio Detention and Bio-Swale Design

Project Objective: Per the SWMP objectives, to add new drainage infrastructure, or improve existing drainage infrastructure through the implementation of green infrastructure facilities town wide.

Flagler Drive and Northlake Boulevard Flooding Relief Project: The Flagler Drive and Northlake Blvd. intersection area is known to experience periodic flooding with significant storm events. Placement of Bioswales or underground infiltration trenches along the intersection of Flagler Drive and Northlake Blvd. may be contemplated per consultation with the O&M staff.

***Federal Highway Green Infrastructure Facilities*:** Redevelopment of approximately 800 acres along the ROW of US Highway 1 from Palmetto Drive to Silver Beach Road. This growth area of potentially multiple high-rise condominiums and commercial shops could accelerate/increase the discharge of untreated runoff to the LWL. To address these water quality issues, it is envisioned that GI/LID Biodetention facilities be installed at all road intersections to the US Highway 1 corridor.

***Prosperity Farms Rd Commercial Area Drainage Improvements*:** Address the untreated runoff from an approximately 150 acre urban and commercial drainage area discharging to South Lake and the Lake Worth Lagoon.

Evaluation of Alternatives

The H&H modeling assessment has demonstrated that drainage LOS is deficient for all stormsewer systems and drainage retrofit alternative projects need to be prioritized for five (5) key areas where flooding depths can reach over 4 inches for the 3-year, 24-hour design storm event:

- Div A – 10th Street Corridor (60% design already underway)
- Div B – 6th Street and Cypress Drive/Bostrom Park (60% design project underway)
- Div C – Southern Outfall 72" CAP Replacement and GI Facility (100% design underway)
- Div D – Lakeshore Drive Drainage Improvement Project (In Construction)
- Div G – 2nd Street Corridor (part of 5% Roadway Bioswale Program / Grant Application Pending)

Matrix Development

The current choice of alternative projects will take 3-5 years to implement. The choice of additional alternative projects to be developed for the SWMP implementation per the Division concept will be refined

working jointly with Town staff and elected commissioners to agree upon a matrix and methodology for evaluation.

8.3 Alternative Design Prioritization & Recommendations

Flood damage has been estimated as a function of LOS for the 3-year/24-hour, 10-year/24-hour, 25-year/72-hour, and 100-yr/72-hour design storm events. A list of initial (3-5 years) alternative projects has been formulated.

Traditional CIP prioritization of retrofit rehabilitation alternatives using the standard Benefit/Cost analysis is not sufficient as it does not take into account the condition or the criticality of the system of pipes being analyzed. Asset Management-based Condition and Criticality assessment methodology will be performed to prioritize projects and has already been applied to qualify the expedited implementation of the Southern Outfall Phase 1 (72" CAP Outfall Replacement). The condition assessment results and the criticality of cost of expected damages resulted in the immediate implementation of the project through Stormwater Utility funding.

Cost Estimates

In addition to projects already considered in FY2020 and projected for implementation in the FY2021-FY2025 planning period, there is a need to perform preliminary cost estimation for project implementation during the 20-year planning horizon of the SWMP update program. The proposed Town of Lake Park SWMP update is based on two premises:

1. Continued renewal of the existing stormsewer system via field survey (condition assessment/CCTV inspections) and trenchless CIPP repairs, and occasional (emergency) open cut replacement.
2. Implementation of Green Infrastructure/Low Impact Development (GI/LID) Best Management Practices (BMPs) such as rain gardens, bioswales, bioretention, underground infiltration chambers, and porous pavement.

Stormwater Linear System O&M Renewal Cost

Asset Management principles indicate that renewal of stormsewer linear assets entails three types of activities: Rehabilitation, Repair, and Replacement.

System Rehabilitation Data & Typical O&M Costs

The Data Collection & Management Task identified the stormwater/drainage system infrastructure elements. **Table 8-11** and **Table 8-12** provide summary statistics for the system's hydraulic structures and pipes per type and material.

Table 8-11 Town of Lake Park Storm System Structures by Type

Curb Inlet (C)	Ditch Inlet (D)	Closed Flume Inlet (F)	Gutter Inlet (G)	Manhole (M)	Null Structure (N)	Endwall (W)
67	401	0	3	107	5	6
Total	589 Structures					

Table 8-12 Town of Lake Park Storm System Pipes by Type

Pipe Diameter (in)	RCP (ft)	HDPE (ft)	CAP (ft)	Metal (ft)	PVC (ft)	Total (ft) (%)
8	-	-	48	-	238	286 (0.51)
10	-	36	-	-	-	36 (0.064)
12	451	927	251	16	39	1,684 (3.0)
15	12,889	3,163	597	119	-	16,768 (29.8)
18	5,229	2,851	75	-	-	8,155 (14.5)
24	7,095	1,713	54	391	-	9,253 (16.5)
30	7,893	559	-	172	-	8,624 (15.3)
34	729	-	-	-	-	729 (1.3)
36	4,367	482	520	603	-	5,972 (10.6)
42	545	-	54	-	-	782 (1.4)
48	1,305	-	237	-	-	1,542 (2.7)
54	894	-	-	-	-	894 (1.6)
60	1,516	-	-	-	-	1,516 (2.7)
72	-	-	162	-	-	162 (0.29)
Total Length (ft) (%)	**42,913 (76.33)**	**9731 (17.31)**	**1,998 (3.55)**	**1,301 (2.31)**	**277 (0.5)**	**56,220 ft (10.65 miles)**

As shown in **Table 8-11** and **Table 8-12**, the Town's existing drainage system consists of approximately 10.6 miles of stormsewers and 589 hydraulic structures, with drainage pipes ranging in size from 8-inch to 72-inch in diameter. A total of 6,900 and 3,972 feet or 10,872 feet of the system has already been field-surveyed and CCTV'd as of FY2019. A remaining amount of 45,209 feet or 80.6% (56,081-10,872) of stormsewers need to be cleaned and televised, with an estimated cost of **$363,276.00.**

System Rehabilitation Implementation Cost

CIPP is the preferred option to repair storm pipes, as it can be installed in larger runs. Slip-lining is useful in more limited applications, particularly where access is difficult, like under roads or for outfall repairs. The average Florida CIPP lining costs range from $89.14/LF to $685.83/LF.

The Town PWD/O&M staff has indicated that approximately 71% of the stormswers linear infrastructure has already been rehabilitated via CIPP trenchless or selected open cut methodology. Assuming that 29% of the remaining system of 45,209 feet of stormsewers would need rehabilitation, the cost for Cured in Place (CIPP) lining of the sewers would be **$1,805,819** over the 20-year SWMP update planning period. This translates into a **$90,291.00** per year expenditure beginning in FY2021.

Cost of Green Infrastructure Implementation

The proposed SWMP update does not contemplate adding any additional stormsewers to the system to address lack of capacity. Instead, the stormsewer system will be decentralized and emphasis will be put into retaining or detaining runoff at its source.

Green Infrastructure/Low Impact Development Implementation Cost

The Town of Lake Park has approximately 64 miles or 337,920 feet of road right-of-ways. Per previous assessments, approximately 5% of this total is impacted by some type of nuisance flooding often at road intersection and low points. Estimated costs for bioswale installation vary depending on key factors such as the depth to the water table, the type of soils beneath the topsoil horizons, and the depth and width of the swale design. Assuming that 5% of the Town's swales will be converted to bioswales, the estimated cost would be **$3,801,600.**

Biodetention/Bioretention Cost

WRMA has identified Town-owned lot locations totaling approximately five (5) acres that could potentially be used as biodetention/bioretention facility in combination with other BMP's. The cost of development of these facilities is estimated to be **$2,613,000.**

Typical Subsurface Storm Chamber Specifications

Subsurface storm infiltration chambers can only be applied where there is adequate depth to the water table. The design is modular and adjustable to irregular spaces and requires the design of inflow and outflow control structures. The estimated cost of the 6th Street & Cypress Underground Chamber Facility is **$3,500,000.**

Typical Rain Tree Specifications

A typical Rain Tree is a tree with underground root grids for runoff capture. The estimated cost is between $3,000 and $5,000. The estimated cost of 40 Rain Trees is **$80,000.**

Typical Pervious Pavement Specifications

A median cost for pervious installation is $4.00 per square foot. Approximately 1,000 linear feet of pavement or 25,000 square feet will be converted to permeable road surface, with an estimated cost of **$100,000.**

Total Estimated Preliminary Construction Cost: $13,595,200.00

Table 8-16 Total Projected Preliminary Cost of GI/LID Implementation

GI/LID ITEM		COST
BioSwales	$	3,801,600.00
BioDetention	$	2,613,600.00
Subsurface Storm Chambers	$	7,000,000.00
Raintrees	$	80,000.00
Pervious Pavement	$	100,000.00
Subtotal 1	$	13,595,200.00
Design (10% of Subtotal Cost)	$	1,359,520.00
Permitting (7% of Subtotal Cost)	$	951,664.00
Design & Permitting Subtotal	$	2,311,184.00
Mobilization (5% of Total Cost)	$	679,760.00
MOT (3% of Total Cost)	$	407,856.00
Contractor OH, Profit & Risk (25% of Total)	$	3,398,800.00
Construction Subtotal	$	4,486,416.00
Subtotal 2 (Design, Construction)	$	20,392,800.00
Contingency (5% of Subtotal 2 Cost)	$	1,019,640.00
Owners Reserve/Allowance (5% of Subtotal 2 Cost)	$	1,019,640.00
Total Cost (Over a 20 Year Period)	$	22,432,080.00

The total cost of GI/LID implementation is **$22,432,080** over a planning period of 20 years **(Table 8-16)**. However, this estimate includes a HUD CDBG grant of $3.5 million (applied to FY2020) for underground filtration chambers at Bert Bostrom Park, Phase 2 of the Southern Outfall. If the HUD CDBG grant funding

is secured, the SWMP program implementation is approximately $970,000 per year over the next 20 years. If not secured, the annual estimated cost of the SWMP program implementation is approximately $1.1 million per year over the next 20 years.

Recommendation of Alternatives & Funding

A preliminary cost estimate for a 20-year O&M Rehabilitation and Green Infrastructure Implementation Plan has been prepared. Final recommendations will be made upon review and discussion with Town staff and elected officials. The list of recommended projects for the FY2021-FY2025 implementation planning period include:

(FY2021) Division A – 10th St Corridor Restoration & Green Infrastructure Project

Project Description: A system of Bioswales and underground infiltration chambers will be placed along 10th Street south of Park Avenue to Silver Beach Road.

(FY2021) Division B – Bostrom Park Renewal & Green Infrastructure Improvements

Project Description: A large system of underground infiltration chambers will be placed at a regional recreational park located between 6th and 7th Street north of Bayberry Road.

(FY2021) Division C – Southern Outfall Replacement & Green Infrastructure Improvements

Project Description: Replacement of an aging 72-inch corrugated aluminum pipe (CAP) with an in-kind high-density polyethylene (HDPE) outfall, inline valve and Sea Level Rise pump station and the placement of a large Bio-detention facility for water quality treatment.

(FY2021-FY2022) Stormsewer System Rehabilitation

Project Description: The SWMP includes the rehabilitation of the existing stormsewer system of pipes, inlets and catch basins. Three projects for the implementation of Cure-In-Place-Pipe (CIPP) trenchless have been scheduled.

(FY2022) Division G – 2nd Street Corridor Drainage and Green Infrastructure Improvements

Project Description: The second street corridor was selected as a priority project based on periodic shallow flooding along 2nd Street at the intersections of Evergreen Dr., Foresteria Dr., and Ilex Dr.

(FY2022) Division E – Park Ave Municipal Complex Pavement Restoration & GI Improvements

Project Description: Water quality treatment at the Town Hall Municipal Complex.

(FY2023) Division F – C-17 Canal Berm Flood Protection Improvements

Project Description: Increasing height of C-17 Canal Berms to avoid berm overtopping and 100-year flooding of commercial and residential property along the Canal.

(FY2023-2025) Multi-Divisional – 5% Roadway Bioswales Program

Project Description: The 5% roadway Bioswales program will be implemented in a 20-year period. Every year, the CIP list will include new locations that are coordinated with the available grant funding process.

Section 9 Stormwater Utility Administration and Funding Sources

9.1 Stormwater Utility Program Review

On August 6, 2008, The Town of Lake Park created and implemented (by ordinance) a stormwater management utility to fund the cost of operating and maintaining the Town's drainage system, and to provide for financing necessary repairs, replacements, and improvements.

Purpose of the Stormwater Utility

The stormwater utility was established by the Town of Lake Park Commission to:

A. Provide effective management and financing of a stormwater management system within the Town.
B. Provide a mechanism for mitigating damaging effects of uncontrolled and unplanned stormwater runoff from a water quality and water quantity standpoint.
C. Provide for the safe and efficient capture and conveyance of stormwater runoff and the correction of stormwater problems.
D. Authorize the establishment and implementation of a master plan for stormwater drainage including design, coordination, construction, management, operations, maintenance, inspections, and enforcement.
E. Establish a reasonable stormwater management assessment based on each property's estimated contribution of stormwater runoff to the system and the benefit derived by each property from the use of the facilities of the system.
F. Encourage and facilitate urban water resources management techniques, including but not limited to the retention-detention of stormwater runoff, minimization of the need to construct storm sewers and the enhancement of the environment.
G. Provide for the issuance of bonds or levy of assessment to finance additions, extensions, and improvements to the system.

Stormwater Utility User Fee Concept

The basic attributes of a User Fee utility are:

A. A stormwater utility must be expressly established and defined by ordinance by a duly authorized jurisdiction.
B. The enabling legislation creates an organizational entity charged with specified stormwater management responsibilities.
C. Rates set by Ordinance or resolution through a public process as appropriate.
D. The entity is intended to be largely financially self-sufficient, with revenues only used for specified stormwater management purposes. The entity can be established as a special revenue fund or as an enterprise fund.
E. Financial self-sufficiency based on a user charge concept.
F. The utility has a defined service area.

9.2 Stormwater Utility Fee Structure Review

The Town of Lake Park Stormwater Utility rate is based on a spatial approach that applies an Effective Impervious Area for All Residential Units. The town determined that the base billing unit, the Equivalent Stormwater Unit (ESU), would be the runoff area of the average single-family parcel. The town then determined that the Runoff Area from the average single-family parcel would be considered as one (1) ESU. The ESU was calculated as follows:

The average single-family parcel for the Town of Lake Park was calculated to have a total area of 10,382 square feet, a Building Area of 2,260 square feet, with 1,215 square feet of Other Impervious Area, and 6,908 square feet of Pervious Area. For the average single-family parcel, the Runoff Area is:

AR = 2,260 + 1,215 + 0.25 * 6,908
AR = 5,202 square feet

The Town then determined that the Runoff Area of 5,202 square feet from the average single-family parcel would be considered as one (1) ESU. ESU's were to be assigned to the following land use codes:

a) Residential single-family property
b) Residential condominium property
c) Multifamily property

d) Multifamily property < 10 Units property

e) Non-residential property

Capital Contributions: The town may accept a capital contribution (fee-in-lieu) from a developer or property owner and waive construction requirements where the town has constructed or plans to construct stormwater facilities which are proposed to be used by the contractor or property owner.

Credits: Credit means a reduction in a customer's stormwater service fee given for certain qualifying activities which reduce or mitigate the runoff impact that the property improvements have on the Town's stormwater management systems and facilities.

9.3 Alternative Funding Analysis

Prior to analyzing the alternative sources of stormwater master plan funding, a review of the current stormwater utility expenditures is necessary to identify whether the utility rate can or could be increased to partially offset future required expenditures. Typically, operating expenditures are the costs associated with those activities that maintain the current existing stormwater infrastructure. Data indicates that the Stormwater Utility Fund has been operated in the last two years (FY2018/2019) with adopted budgets slightly higher than actual revenues.

A preliminary assessment of the cost of implementation of the proposed GI/LID system update was provided and concluded that the Stormwater Utility Fund will not be the primary vehicle for funding. It was estimated that the implementation of GI/LID BMPs in approximately 5% of the Town's right-of-ways will cost approximately $20 million to be implemented in a 20-year planning period. Capital outlays of $1 to $1.5 million per year will be required to implement the proposed GI/LID-based SWMP update. The Stormwater Utility Capital Improvement Program (ICIP) funding need will be augmented by the annual procurement of grants for GI/LID BMP project implementation.

Proposed Storm Water Utility Fund Rate Changes and Budgets

Storm Water Utility Fund rate changes will be proposed to address the needs of the current level of expenditures, forecasted increases in labor costs, operations, and the proposed 5-year Capital Improvement program proposed in FY2019. A modest increase from the current rate of $12/ESU to $14/ESU will be proposed in the FY2021 through FY2025 CIP period beginning in FY2022.

Minutes
Town of Lake Park, Florida
Tree Board Meeting
Tuesday, July 12, 2022, 6:00 PM
Town Hall Commission Chamber,
535 Park Avenue, Lake Park, Florida 33403

The Tree Board met for the purpose of a regular meeting on Tuesday, July 12, 2022 at 6:00 p.m. Present were Chair Brady Drew, Board Members Pamela Frazier, Shana Phelan and Gillian Kennedy Wright. Town staff included Community Development Director Nadia DiTommaso, Public Works Director Roberto Travieso, Stormwater Infrastructure Forman John Wylie and Town Clerk Vivian Mendez.

Chair Drew performed the roll call and led the pledge of allegiance.

Appointment of a Vice-Chair

1. Appointment of a Vice-Chair to the Tree Board.

Chair Drew passed the gavel to his left.

Motion: Chair Drew moved to appoint Board Member Pamela Frazier as Vice-Chair; Board Member Phelan seconded the motion.

Vote on Motion:

Board Member	Aye	Nay	Other
Board Member Frazier	X		
Board Member Phelan	X		
Board Member Wright	X		
Chair Drew	X		

Motion Passed 4-0

Chair Drew retained the gavel.

Presentation:

2. Lake Park Mobility, Streetscape & Street Trees Plan.

This item was the same as agenda item number 6. The agenda was reordered to allow WGI to present to the Board first.

New Business:

5. Discussion on the progress of the WGI Parks Master Plan and proposed landscaping implications (presentation will be provided by WGI at the meeting).

Angela Biagi of WGI presented to the Board (see Exhibit "A"). Board Member Phelan asked for clarification regarding moving the Pickleball courts to Kelsey Park. Ms. Biagi explained that due to the Deed restrictions they were not sure if it would be possible to

move the courts. Chair Drew asked for clarification regarding a proposed parking lot on one of the slides. Ms. Biagi explained that with the additional activities they expect that additional parking would be necessary for the parks.

Board Member Wright asked for clarification regarding the water activities at the park. Ms. Biagi explained that having boats near water activities would cause safety concerns, which was the reason it was moved to the park area.

The Board thanked Ms. Biagi for the presentation.

4. Update on Ordinance 34-11, Regulations for Tree Plantings and Improvements in Swales and Other Town-owned or Controlled Property or Right-of-ways, Related Enforcement, and Impacts on Effective Stormwater Management.

Public Works Director Travieso presented to the Board (see Exhibit "B"). Chair Drew asked for clarification regarding the included photo of trees in the swales. Public Works Director Travieso explained that the swales should be a channel for water to travel through. With trees in the swales it does not allow for the proper travel and filtration of the water. Stormwater Infrastructure Forman Wylie explained that the swales should be lower than the roads to allow for the water to drain into the swales. Vice-Chair Frazier asked if trees were being moved from the swales within the three-years discussed in the presentation. Public Works Director Travieso explained that the Town would remove the tree and replace it with a native tree. The homeowner would be given a choice as to which native tree they would be agreeable to having placed in front of their property. The swales in Town are Town owned, so staff would work with the homeowner to remove the tree, replace it at the Town's expense. Board Member Wright asked what was done with the removed trees. She asked if they would be sold to a nursery. Public Works Director Travieso stated that the idea could be considered and would check to see if that was possible. Board Member Wright asked if there was a different type of sod that could be used in the swales. Stormwater Infrastructure Forman Wylie stated that there has been no other options at the moment than sod. There was ground covering on Lake Shore Drive that was not sod in order to improve the quality of the swales in that area. Chair Drew asked what would be the difference between the native and non-native trees that are planted in the swales if the goal was for the water to filtrate through the swales. Stormwater Infrastructure Forman Wylie explained that the new plantings would be contoured into the new swale area, which would allow for proper draining. Public Works Director Travieso explained that the permit process would regulate the planting process. Board Member Phelan asked what would be the permit fee. Public Works Director Travieso stated that $100 would be proposed to the Commission. Board Member Phelan asked who would approve the permits. Public Works Director Travieso stated the Public Works would receive the permits and go through the process. Board Member Phelan asked if the funds would go to the Stormwater Fund. Public Works Director Travieso stated "yes" because the Stormwater Fund was an enterprise fund, which could not be used for any other purpose. Board Member Phelan asked if there was a penalty for not maintaining the swales. Community Development Director DiTommaso explained that it would be a Code Compliance issue, which would go through the Code Compliance process. Board Member Phelan asked if the funds would go to Stormwater fund. Community Development Director DiTommaso explained that depending on if the fine were paid would determine if the funds would be returned to the

Stormwater fund. Board Member Wright asked if cars are parked in the swales are they ticketed. Community Development Director DiTommaso explained that there were two processes in place to handle cars parked in the swales per the Town Code. Board Member Phelan asked about the native plant list. Public Works Director Travieso explained that the list was provided to the Board in the past, but there was room for changes to the list. Board Member Wright asked if pebbles could be used in the swales instead of sod. Public Works Director Travieso would research if pebbles would be allowable and get back to the Board. Chair Drew asked if a rain garden could be placed in the swales. Public Works Director Travieso explained that it was still in the strategy that has not been applied into the swales. Chair Drew asked if the Stormwater crew would be creating an inventory of the trees in the swales. He asked if that could be used as the tree inventory. Public Works Director Travieso explained that the Stormwater crew would be going out every few years, so they could miss the trees that are being planted instead of piece meal it. Board Member Phelan stated that an aggressive educational program would be helpful instead of the homeowner getting a fine or getting a few options for replacement. Public Works Director Travieso agreed that the Town wants to work with homeowners. Vice-Chair Frazier asked where in the process does the Town reach out to new homeowners to make them aware of the Code. Public Works Director Travieso explained the campaign that would be used to notify the public prior to implantation. Chair Drew asked if there was an appeal process. Public Works Director Travieso would take into consideration an appeal process, but felt it may cause disruption to the goal of drainage in swales.

The Board thanked Public Works Director Travieso and Mr. Wylie for their presentation.

Consent Agenda:

3. April 12, 2022 Tree Board Meeting Minutes.

Motion: Board Member Phelan moved to approve the April 12, 2022 meeting minutes; Vice-Chair Frazier seconded the motion.

Vote on Motion:

Board Member	Aye	Nay	Other
Board Member Frazier	X		
Board Member Phelan	X		
Board Member Wright	X		
Chair Drew	X		

Motion Passed 4-0

New Business:

6. Discussion on the progress of the Mobility Plan and Fee Ordinance and proposed streetscape street trees and landscape enhancement plan (presentation will be provided by NUE Urban Concepts at the meeting).

Community Development Director DiTommaso presented the item (see Exhibit "C"). The Board thanked Community Development Director DiTommaso for her presentation.

PUBLIC COMMENT:

None

BOARD MEMBER COMMENTS:
Vice-Chair Frazier had no comment.

Board Member Phelan

Board Member Wright

Chair Drew asked if funds could be placed in the budget to purchase shirts. He proposed updates to Tree planting list in the Town Code. He asked that an agenda item be added to the next agenda for discussion. Staff agreed to bring it back to the next meeting.

STAFF COMMENTS:
No comments.

ADJOURNMENT

There being no further business to come before the Board, and by unanimous vote, the meeting adjourned at 7:45 p.m.

Chair Brady Drew

Town Clerk, Vivian Mendez, MMC

TOWN OF LAKE PARK
Town Seal
SEAL
FLORIDA

Approved on this 9 of August, 2022

Town of Lake Park Tree Board

Agenda Request Form

Meeting Date: July 12, 2022 **Agenda Item No._____**

Agenda Title: Update on Ordinance 34-11, Regulations for Tree Plantings and Improvements in Swales and on Other Town-owned or Controlled Property or Rights-of-ways, Related Enforcement, and Impacts on Effective Stormwater Management.

[ ] SPECIAL PRESENTATION/REPORTS [ ] CONSENT AGENDA
[ ] BOARD APPOINTMENT [ ] OLD BUSINESS
[ ] PUBLIC HEARING ORDINANCE ON ____ READING
[X] NEW BUSINESS
[ ] OTHER: _____

Approved by Town Manager _____ **Date:** _____

Roberto F. Travieso/Director of Public Works
Name/Title

Originating Department: **Public Works**	**Costs: N/A** Funding Source: Acct. # [ ] Finance _____	**Attachments:** 1. PowerPoint Presentation 2. Ordinance 34-11 3. Stormwater Master Plan Executive Summary 4. Tree Planting Moratorium 5. Proposal for comprehensive swale plantings survey 6. Native Tree List
Advertised: Date: _____ Paper: _____ **[X] Not Required**	All parties that have an interest in this agenda item must be notified of meeting date and time. The following box must be filled out to be on agenda.	Yes, I have notified everyone_____ or **Not applicable in this case ____** **Please initial one.**

1. Summary Explanation/Background:

The Town of Lake Park currently operates a stormwater utility for the purpose of managing the runoff from rainfall and protecting public and private properties from flood damage. The Town's stormwater system consists of various components, including roadside swales, drainage structures and their

interconnecting piping, and retention/detention areas. Though typically regarded as a landscape area, swales are a publicly-owned, key component of most stormwater systems, though adjacent property owners are responsible their maintenance.

Figure 1. Typical swale before sodding.

Moreover, swales slow stormwater runoff and conveys it away from the roadway and properties, gradually filtering it to remove harmful particles before the stormwater runoff is discharged into the Lake Worth Lagoon. In addition, as a standard best practice, maintenance crews install sod over the swales to protect them from erosion and increase their water filtering effectiveness (Figure 1). Crews must also contour or reshape the swales regularly to promote water conveyance.

Finally, **Town roadside swales are the most noticeable and extensive component of the stormwater system**, encompassing an area of approximately 2.2 million square feet, or 183,040 linear feet or 34.67 miles.

Over the last three months, the Department of Public Works has been reviewing its stormwater utility maintenance program and has identified various areas for improvement to better comply with the requirements of our operating permit. The following paragraphs provide background on these concerns and recommendations to address them.

2. Town Ordinance 34-11

In 2009 and 2010, the Town Commission approved Resolutions No. 04-2009 and 02-2010, respectively, to update Ordinance 34-11, *Regulations for tree plantings and improvements in swales and on other town-owned or controlled property or rights-of-way.* The Ordinance provides that while swales are a Town right-of-way, their maintenance is the responsibility of the owner of the property abutting each swale **(Attachment 2)**. Additionally, the Ordinance directs that all swale plantings require a permit that is issued as a right-of-way permit through the Department of Public Works.

Figure 2. Nonnative swale plantings.

Prior to or following adoption of these Ordinance, the Town did not complete an exhaustive inventory of tree plantings **(Attachment 5)**, nor established a proper tree planting permit form or its associated fee, which made the Ordinance unenforceable.

Furthermore, though the benefits of tree plantings are widely known and significant (I.e., environmental, social, economic, aesthetics, and other), unregulated tree plantings (Figure 2) and their root systems in the Town's right-of-way can have an adverse effect on the Town's underground stormwater, water and wastewater infrastructure, and can reduce or negate the swales' water filtering benefits.

3. Stormwater Master Plan

In 2021, the Town Commission adopted an updated Stormwater Master Plan (SWMP, **Attachment 3)**. The SWMP includes strategies for the conversion of five (5) percent of the roadside swales to green infrastructure (bioswales/biodetention areas). Implementation of this initiative will amplify swales' stormwater filtering benefits, while also addressing nuisance street flooding concerns and building resiliency to climate change effects.

Additionally, the SWMP recommended adoption of regulations to allow only native tree plantings in the swales because of their increased resiliency to local weather and water-filtering benefits.

4. Swale Planting Moratorium

In 2019, the Town implemented a moratorium on new swale tree plantings **(Attachment 4)** to facilitate inventory and analysis of existing swale tree plantings and determine their compliance with the strategies prescribed in the updated SWMP.

5. Recommendations (For Discussion)

Based on the preceding analysis, Town Staff is seeking recommendations regarding the phase-in implementation of the following tasks (in suggested order of implementation), following completion of the Town-wide inventory/analysis of existing swale plantings:

a. Complete an exhaustive swale plantings inventory **(Attachment 5)**
b. Grandfather native swale tree plantings only **(Attachment 6)**
c. Remove non-native tree plantings during each swale's scheduled maintenance interval, which is typically 36 months or 3 years (suggested at Town's expense)
d. Plant native tree of property owner's choice (suggested at Town's expense)
e. Develop native planting brochure; post to Town website and social media **(Attachment 6)**
f. Conduct public meetings on swale plantings
g. Conduct marketing campaigns on swale plantings
h. (Ongoing): Manage tree giveaways and similar initiatives to ensure adherence with Ordinance

Other Recommended Tasks (For information only):

i. Modify applicable Ordinance to clarify language and increase enforceability
j. Public Works shall develop and implement swale planting permit form(s)
k. Include utility/irrigation systems location clearance as part of permit process
l. Establish fees related to swale planting permitting and associated fines for violations for Town Commission review and approval

m. Limit type, quantities, and sizes of tree plantings allowed in swale pursuant to SWMP guidelines and best practices

n. Develop engineering design standard for use in all swale construction/maintenance

Recommended Motion: There is no motion associated with this agenda item; however, Staff is seeking input from the Tree Board on the proposed course of action to address concerns related to the effective operation of the Stormwater Utility.

Town of
LAKE PARK

Department of
PUBLIC WORKS

STORM WATER

Dear Customer,

The Town of Lake Park is working on revising the 1999 storm water master drainage plan. The new plan will rely on the latest technologies and management techniques, such as the adoption of Green Infrastructure and Low Intensity Development practices. This effort is being undertaken to address the drainage issues the town is currently experiencing. The new storm water master drainage plan will be publicly presented to town residents and Commissioners in the near future.

One of the primary areas that will be examined with this new storm water drainage master plan is the town's right-of-ways, including swales. The swale area is the grassed area in between the roadway and the property owners property line. These right-of-ways / swales are adjacent to every property located within the Town of Lake Park.

What is a swale and what is its purpose?

A grassed swale is an engineered and graded landscape feature appearing as a linear, shallow, open channel. The design of grassed swales promotes the conveyance of storm water at a slower, controlled rate and acts as a filter medium removing pollutants and allowing storm water infiltration, encouraging water quality improvements through infiltration, filtration and sedimentary deposition.

Grassed Swales are an appropriate storm water management practice for most regions of North America. Swales are a low cost, low maintenance option to remove sediments, nutrients and pollutants. Typically, grassed swales are used as an environmentally preferential solution and an enhancement to the more traditional curb and gutter based storm sewer system.

Currently, plantings in the swale require a permit by order of the Town of Lake Park Code of Ordinances Section 34-11, created in May 2006 and updated February 2010. Property owners that have planted trees or have made any other improvements without the required permit are in violation. In preparation of the storm water master drainage plan, the Public Works Department is placing a moratorium on all new approvals of the swale planting permits. This is because the swales are being targeted for improvement. The planting of improper trees in swales harms the ability of the swales to effectively manage storm water run-off. The new plan will include new ways of using swales to enhance our ability to manage storm water, so that drainage is improved and our Town becomes more environmentally friendly.

We appreciate your patience and understanding as the storm water master plan process is undertaken. Please note, that once the master planning process is completed, future swale plantings may be granted with a permit – but there may be restrictions insofar as the types of trees and plants that can be planted.

Also – if you are interested in serving on a committee to help make decisions related to this new plan, we are accepting applications through the Town Clerk's office. If you are interested, we invite you to participate and submit an application for the Floodplain Management Committee. The goal is to make Lake

Park a more sustainable and aesthetically pleasing community, so that we can thrive even under adverse future environmental conditions (such as sea-level rise, more severe storm events, etc.).

Minutes
Town of Lake Park, Florida
Tree Board Meeting
Tuesday, July 12, 2022, 6:00 PM
Town Hall Commission Chamber,
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Chair Drew performed the roll call and led the pledge of allegiance.

Appointment of a Vice-Chair

1. Appointment of a Vice-Chair to the Tree Board.

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Motion: Chair Drew moved to appoint Board Member Pamela Frazier as Vice-Chair; Board Member Phelan seconded the motion.

Vote on Motion:

Board Member	Aye	Nay	Other
Board Member Frazier	X		
Board Member Phelan	X		
Board Member Wright	X		
Chair Drew	X		

Motion Passed 4-0

Chair Drew retained the gavel.

Presentation:

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New Business:

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The Board thanked Ms. Biagi for the presentation.

4. Update on Ordinance 34-11, Regulations for Tree Plantings and Improvements in Swales and Other Town-owned or Controlled Property or Right-of-ways, Related Enforcement, and Impacts on Effective Stormwater Management.

Public Works Director Travieso presented to the Board (see Exhibit "B"). Chair Drew asked for clarification regarding the included photo of trees in the swales. Public Works Director Travieso explained that the swales should be a channel for water to travel through. With trees in the swales it does not allow for the proper travel and filtration of the water. Stormwater Infrastructure Forman Wylie explained that the swales should be lower than the roads to allow for the water to drain into the swales. Vice-Chair Frazier asked if trees were being moved from the swales within the three-years discussed in the presentation. Public Works Director Travieso explained that the Town would remove the tree and replace it with a native tree. The homeowner would be given a choice as to which native tree they would be agreeable to having placed in front of their property. The swales in Town are Town owned, so staff would work with the homeowner to remove the tree, replace it at the Town's expense. Board Member Wright asked what was done with the removed trees. She asked if they would be sold to a nursery. Public Works Director Travieso stated that the idea could be considered and would check to see if that was possible. Board Member Wright asked if there was a different type of sod that could be used in the swales. Stormwater Infrastructure Forman Wylie stated that there has been no other options at the moment than sod. There was ground covering on Lake Shore Drive that was not sod in order to improve the quality of the swales in that area. Chair Drew asked what would be the difference between the native and non-native trees that are planted in the swales if the goal was for the water to filtrate through the swales. Stormwater Infrastructure Forman Wylie explained that the new plantings would be contoured into the new swale area, which would allow for proper draining. Public Works Director Travieso explained that the permit process would regulate the planting process. Board Member Phelan asked what would be the permit fee. Public Works Director Travieso stated that $100 would be proposed to the Commission. Board Member Phelan asked who would approve the permits. Public Works Director Travieso stated the Public Works would receive the permits and go through the process. Board Member Phelan asked if the funds would go to the Stormwater Fund. Public Works Director Travieso stated "yes" because the Stormwater Fund was an enterprise fund, which could not be used for any other purpose. Board Member Phelan asked if there was a penalty for not maintaining the swales. Community Development Director DiTommaso explained that it would be a Code Compliance issue, which would go through the Code Compliance process. Board Member Phelan asked if the funds would go to Stormwater fund. Community Development Director DiTommaso explained that depending on if the fine were paid would determine if the funds would be returned to the

Stormwater fund. Board Member Wright asked if cars are parked in the swales are they ticketed. Community Development Director DiTommaso explained that there were two processes in place to handle cars parked in the swales per the Town Code. Board Member Phelan asked about the native plant list. Public Works Director Travieso explained that the list was provided to the Board in the past, but there was room for changes to the list. Board Member Wright asked if pebbles could be used in the swales instead of sod. Public Works Director Travieso would research if pebbles would be allowable and get back to the Board. Chair Drew asked if a rain garden could be placed in the swales. Public Works Director Travieso explained that it was still in the strategy that has not been applied into the swales. Chair Drew asked if the Stormwater crew would be creating an inventory of the trees in the swales. He asked if that could be used as the tree inventory. Public Works Director Travieso explained that the Stormwater crew would be going out every few years, so they could miss the trees that are being planted instead of piece meal it. Board Member Phelan stated that an aggressive educational program would be helpful instead of the homeowner getting a fine or getting a few options for replacement. Public Works Director Travieso agreed that the Town wants to work with homeowners. Vice-Chair Frazier asked where in the process does the Town reach out to new homeowners to make them aware of the Code. Public Works Director Travieso explained the campaign that would be used to notify the public prior to implantation. Chair Drew asked if there was an appeal process. Public Works Director Travieso would take into consideration an appeal process, but felt it may cause disruption to the goal of drainage in swales.

The Board thanked Public Works Director Travieso and Mr. Wylie for their presentation.

Consent Agenda:

3. April 12, 2022 Tree Board Meeting Minutes.

Motion: Board Member Phelan moved to approve the April 12, 2022 meeting minutes; Vice-Chair Frazier seconded the motion.

Vote on Motion:

Board Member	Aye	Nay	Other
Board Member Frazier	X		
Board Member Phelan	X		
Board Member Wright	X		
Chair Drew	X		

Motion Passed 4-0

New Business:

6. Discussion on the progress of the Mobility Plan and Fee Ordinance and proposed streetscape street trees and landscape enhancement plan (presentation will be provided by NUE Urban Concepts at the meeting).

Community Development Director DiTommaso presented the item (see Exhibit "C"). The Board thanked Community Development Director DiTommaso for her presentation.

PUBLIC COMMENT:

None

BOARD MEMBER COMMENTS:
Vice-Chair Frazier had no comment.

Board Member Phelan

Board Member Wright

Chair Drew asked if funds could be placed in the budget to purchase shirts. He proposed updates to Tree planting list in the Town Code. He asked that an agenda item be added to the next agenda for discussion. Staff agreed to bring it back to the next meeting.

STAFF COMMENTS:
No comments.

ADJOURNMENT

There being no further business to come before the Board, and by unanimous vote, the meeting adjourned at 7:45 p.m.

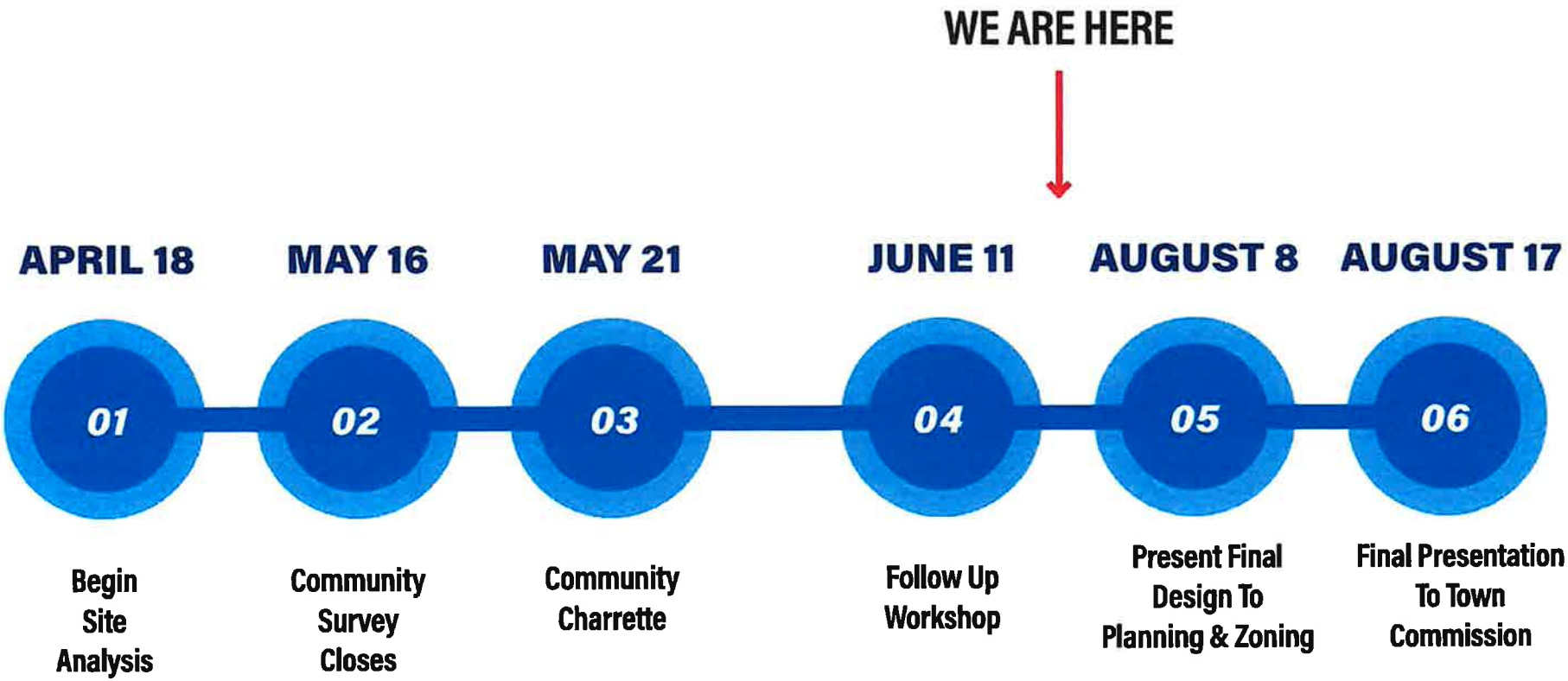
Chair Brady Drew

Town Clerk, Vivian Mendez, MMC

TOWN OF LAKE PARK
Town Seal
SEAL
FLORIDA

Approved on this 9 of August, 2022


WGI
TOWN OF LAKE PARK, FLORIDA
1923
KELSEY PARK MASTER PLAN
TOWN OF LAKE PARK • FL
PROJECT UPDATE



PROJECT SCHEDULE AND NEXT STEPS

PUBLIC INPUT REGARDING TREES

What park amenities need to be improved or are unsatisfactory?

1. Children's amenities
2. **Shade (canopy trees)**
3. Water access, lighting / night time visibility
4. Adult amenities

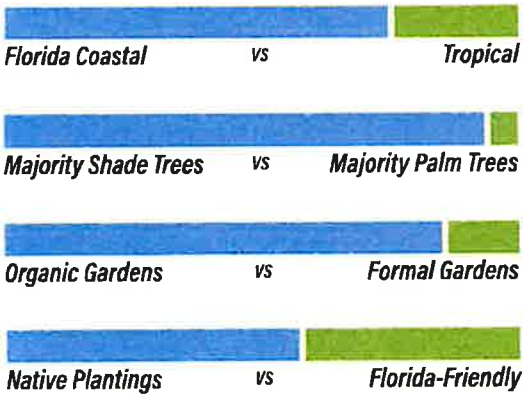
What do you want to Preserve in Kelsey Park?

- **Greenery**
- Small-town Feel
- Exercise Paths
- **Shade**
- Water Access

What do you want to Add to Kelsey Park?

- **Shade**
- Seating
- Art
- Community Events
- Color

Preferred Landscaping




Florida Coastal Plantings


Shade Trees


Organic Gardens


Native Plantings

COMMUNITY ENGAGEMENT RESULTS

DEVELOPING CONCEPTS

Two alternative concept plans were developed and presented to the public at a second workshop. The public provided input on their preferred plan as well as further input of design elements.

CONCEPT 1

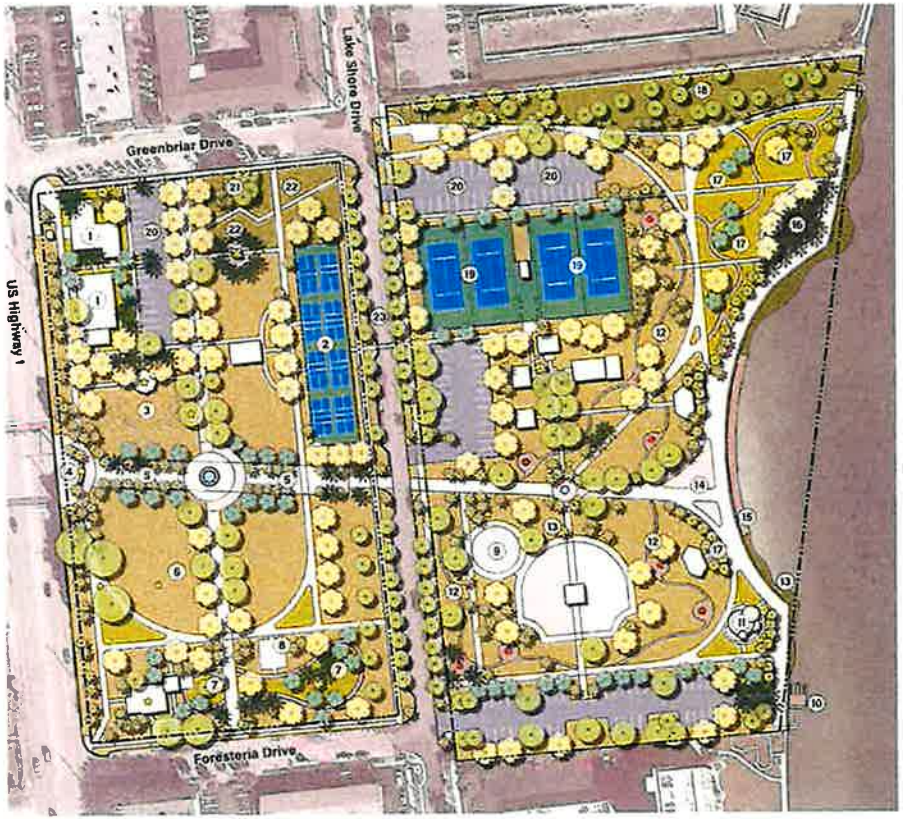
Concept 1 unifies Kelsey Park and Lake Shore Park with two rings of pedestrian circulation flanking the main axis. A memorial garden is proposed in the southwest corner. The northeast corner contains a strolling garden plaza for quiet reflection. The seawall steps down to the water with hybrid living shoreline proposed on the northern and southern portions.

DEVELOPING CONCEPTS

Two alternative concept plans were developed and presented to the public at a second workshop. The public provided input on their preferred plan as well as further input of design elements.

CONCEPT 2

Concept 2 unifies the two parks with an angular sidewalk network. The historic east-west axis and existing palms are retained and emphasized with associated flowering trees. Existing memorials are kept in place. Two public tennis courts are re-striped into eight pickleball courts. Two historic homes are proposed for relocation to the northwest corner for commercial re-use. A central boardwalk is flanked by a naturalized living shoreline.



THE FINAL PLAN

The final plan is currently in development. The plan is incorporating guidance form Town Staff and the public input results. Elements and goals for the final plan include;

Increasing shade

Expanding the tree canopy

Focusing more heavily on canopy trees instead of palm trees

Recommending Florida native plant materials

Avoiding invasive species or high maintenance plantings

Establishing a living shoreline to parts of the seawall

Using environmentally friendly stormwater management practices.

NEXT STEPS

Add to your calendar!

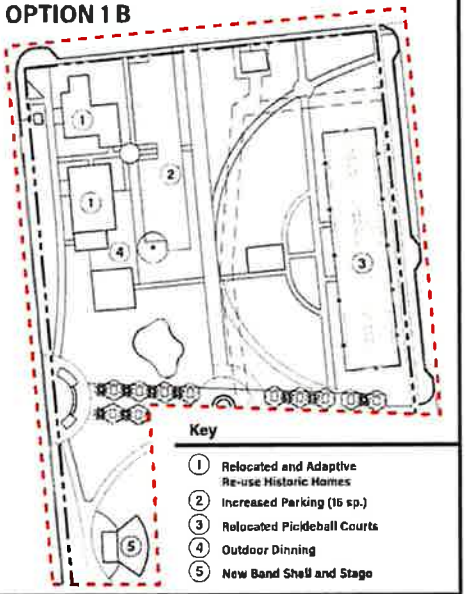
AUGUST 8

Present Final Design To Planning & Zoning

AUGUST 17

Final Presentation To Town Commission

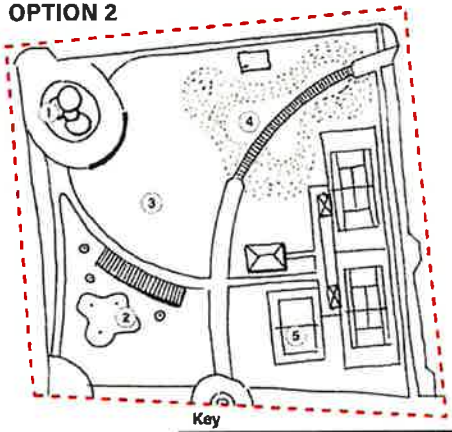
OPTION 1 B



Key

1. Relocated and Adaptive Re-use Historic Homes
2. Increased Parking (16 sp.)
3. Relocated Pickleball Courts
4. Outdoor Dinning
5. New Band Shell and Stage

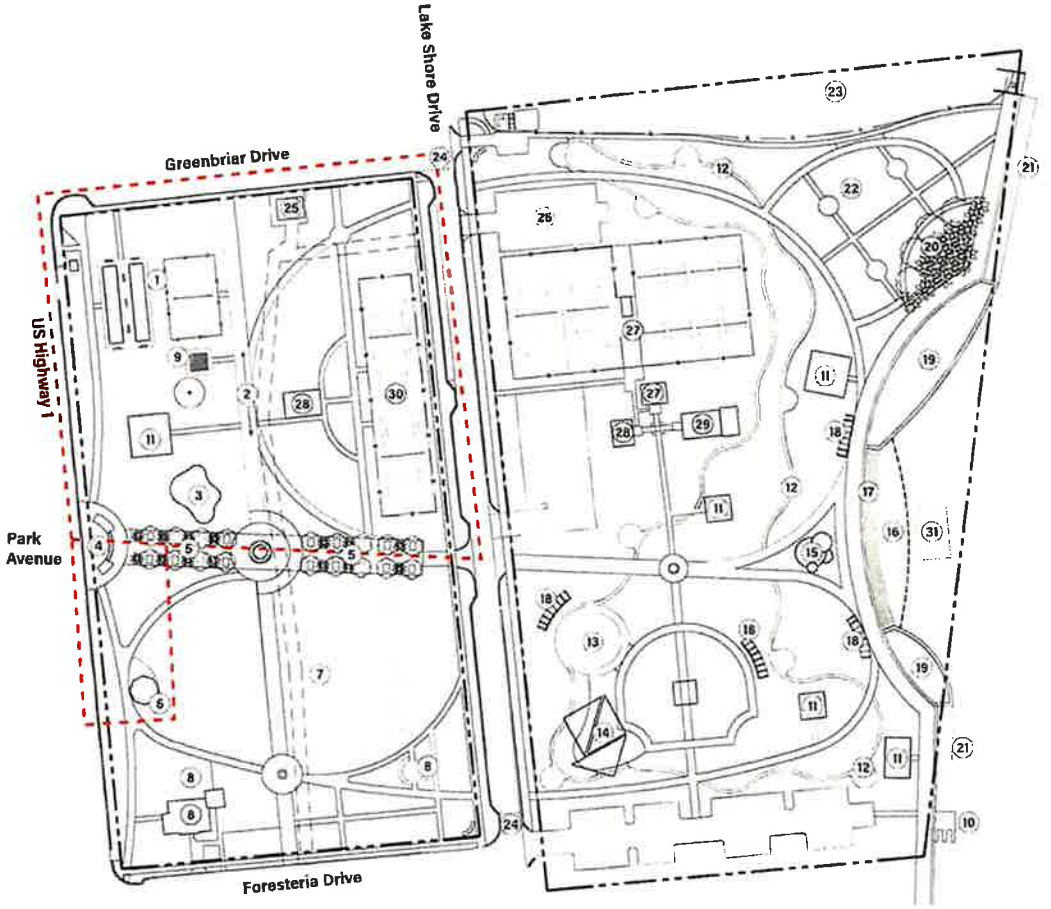
OPTION 2



Key

1. Gateway Plaza w/ Public Art
2. Putting Green + Covered Seating Area
3. Raised Lawn
4. Rain Garden with 12 and up Nature Play
5. Sand Volleyball Court

OPTION 1 A



Key

1. Bocci and Sand Volleyball Courts
2. Market/Event Space
3. Putting Green
4. Historic Gateway Plaza + Gates
5. Replanted Historic E-W Axis
6. Blakely Commons Band Shell
7. Great Lawn
8. Evergreen House + Memorial Gardens
9. Chess Court
10. Kayak Launch
11. Picnic Pavilion, Typ.
12. Fitness Trail
13. Splash Pad
14. Shade Sail + Parent's Plaza
15. Public Art Shade Structure
16. Beach
17. Stepped Sea Wall
18. Swinging Benches
19. Living Shoreline
20. Palm Court + Sunrise Plaza
21. Fishing Platform
22. Strolling Gardens
23. Bioswale (Existing)
24. Lake Shore Dr. (Retractable Bollards Close for Events)
25. Lift Station (Existing)
26. Additional Parking (20 sp.)
27. Vendor Operated Tennis Center (Existing)
28. Restrooms (Existing)
29. Community Meeting Room (Existing)
30. Public Tennis Courts (Existing)
31. Floating Stage

THANK YOU

QUESTIONS?

WGI

Update on Ordinance 34-11, "Plantings in Swales", Related Enforcement, & Impacts on Stormwater Management

Department of Public Works

Stormwater Utility

- Manages stormwater runoff
- Improves quality of stormwater discharges
- Protects public/private property from flood damage
- Includes drainage structures, piping, detention/retention areas
- Also includes roadside swales

Roadside Swales

- Publicly-owned rights-of-ways
- Most extensive/common component of stormwater systems
- Town's swale network encompass 2.2M Sq. Ft. (34.7 linear miles)
- Serve to slow and filter stormwater runoff
- Typically sodded to avoid erosion
- Must be recontoured regularly to maintain water conveyance

Ordinance 34-11

- Establishes Town ownership of all swale rights-of-way
- Assigns maintenance responsibility to the property owner
- Establishes permit and fee requirements for swale tree plantings (coordinated through Public Works Department)

Stormwater Master Plan (SWMP)

- Updated in 2019-2020
- Adopted by Town Commission in 2021
- Provided the incremental conversion of 5% roadside swales to green infrastructure (bioswales/biodentention areas)
- Swale Plantings Moratorium implemented in support of SWMP update

Examples of Swale Plantings

Recommendations (For Discussion)

a. Complete an exhaustive swale plantings inventory (Attachment 4)

b. Grandfather native swale tree plantings only (Attachment 5)

c. Remove non-native tree plantings during each swale's scheduled maintenance interval, which is typically 36 months or 3 years (suggested at Town's expense)

d. Plant native tree of property owner's choice (suggested at Town's expense)

e. Develop native planting brochure; post to Town website and social media

f. Conduct public meetings on swale plantings

g. Conduct marketing campaigns on swale plantings

h. (Ongoing): Manage tree giveaways and similar initiatives

Other Recommendations (For info only)

i. Modify applicable Ordinance to clarify language and increase enforceability

j. Public Works shall develop and implement swale planting permit form(s)

k. Include utility/irrigation systems location clearance as part of permit process

l. Establish fees related to swale planting permitting and associated fines for violations for Town Commission review and approval

m. Limit type, quantities, and sizes of tree plantings allowed in swale pursuant to SWMP guidelines and best practices

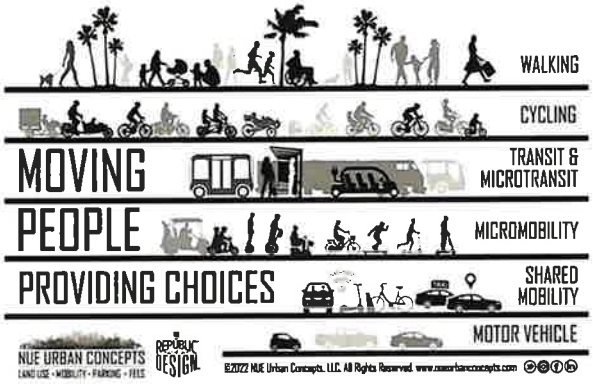
n. Develop engineering design standard for use in all swale construction/maintenance

Discussion/Questions

TOWN OF LAKE PARK
MOBILITY PLAN & MOBILITY FEE
FREQUENTLY ASKED QUESTIONS (FAQ)

WHAT IS A MOBILITY PLAN?

The Town of Lake Park Mobility Plan is a vision, over the next 22 years, to emphasize the **movement of people**, versus moving cars. This is done by planning for multimodal transportation projects that provide people choices: whether they want to walk, bicycle, ride microtransit, transit, micromobility devices or shared mobility, or continue to drive their cars.



WHY DOES LAKE PARK NEED A MOBILITY PLAN?

The Town is projected to add new homes, businesses, and shops over the next 22 years. The new residents and businesses will result in additional traffic and demand for multimodal transportation projects to move around the Town and to and from surrounding communities and neighborhoods.

WHAT TYPES OF MULTIMODAL PROJECTS ARE IN THE MOBILITY PLAN?

The Mobility Plan includes multimodal projects such as new sidewalks, bike lanes, multimodal lanes (for bicycles, micromobility, microtransit), shared-use paths, multi-use trails (boardwalk, greenway, outside street right-of-way), traffic calmed streets (low speed streets), high visibility crosswalks, rectangular rapid flashing beacons (RRFB), high-intensity activated crosswalks (HAWK), and safety enhancements. The Mobility Plan also includes adding turn lanes or roundabouts at existing intersections, adding a raised center median and turn lane to existing streets, and constructing new streets. There are five recommended programs for the Town to develop after the Mobility Plan: (1) Transit Stops Program; (2) Residential Traffic Calming Program; (3) Streetscape, Street Trees & Landscape Enhancement Program; (4) Green Alleys Program; and (5) Micromobility & Low Speed Electric Vehicle Program (Microtransit).

HOW COULD THE TOWN FUND MOBILITY PLAN PROJECTS?

The projects identified in the Mobility Plan could be funded through a **variety of sources such as** federal and state appropriations, funds, grants, and programs allocated through the Palm Beach County Transportation Planning Agency (TPA). Gas taxes, special assessments, County infrastructure surtax (requires referendum, subject to residents voting to approve), road and utility upgrades, road impact fees, and mobility fees are all potential funding sources for mobility plan projects.

WHAT IS A MOBILITY FEE?

A mobility fee is a **one-time fee** paid to the Town by **new development activity** (e.g., new or expanded homes and businesses) to off-set (mitigate) any increases in travel demand and pay for its share of **the multimodal projects** adopted as part of the **Mobility Plan.** Mobility fees were established by the Legislature to provide **new development activity** an alternative to transportation concurrency, proportionate share, and road impact fees. Mobility fees are not taxes on existing homes and businesses. Mobility fees are assessed if new development activity results in an increase in travel demand.

2045 LAKE PARK MOBILITY PLAN

Streetscape, Street Trees & Landscape Enhancement Plan

DRAFT VERSION 4

July 11, 2022