



CAPITAL IMPROVEMENTS





CAPITAL IMPROVEMENTS ELEMENT

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INTRODUCTION

The Capital Improvements Element establishes standards and principles that guide the allocation of City resources to provide high quality public infrastructure and facilities to meet the health, safety, and welfare needs of all residents.

The capital planning process and the Capital Improvement Program provide procedures for identifying, evaluating, and implementing current and future capital projects. The capital planning process provides an orderly and routine method of proposing, planning, and financing capital improvements, and also makes capital expenditures more responsive to community needs by informing and involving the public in programming and approval.

The City of Delray Beach updates its Capital Improvements Program annually, with the annual budget, to effectively guide the City in planning and implementing capital improvements. Capital improvements are the construction of new facilities or repairs to existing facilities, such as roadways, parks, water and sewer systems, and City buildings. As Delray Beach continues to flourish and redevelop, many programmed improvements focus on maintaining the established levels of service for existing facilities through renewal or replacement, and the correction of deficiencies in existing systems. These improvements are often part of on-going programs, funded annually, such as street resurfacing. In some cases, replacement of existing systems is provided through new facilities. These improvements are identified in master plans (water, sewer, stormwater, etc.) that are designed to improve, expand, or more efficiently provide the established level of service and meet the quality-of-life desires of the community.

In 1989, the City had significant challenges with infrastructure and capital projects. Water lines previously installed were undersized and deteriorating due to age. Some areas of the city had low water pressure. Sewer transmission lines had high levels of salt

content, and the city was experiencing saltwater intrusion. Storm water flooding was significant in several areas. Streets and sidewalks were in a poor state of repair or non-existent in several areas. The City's major roadways were also deteriorating, having a negative impact on the City's image and was discouraging visits to and investment in the downtown area.

That same year, the City took action and approved the "Decade of Excellence Bond" to make critical improvements to City infrastructure to usher in a new chapter in the City. Those projects were the catalyst to a revitalized Downtown, which has maintained its desirability as a destination to this day. The City also established annual renewal and replacement funding to improve and maintain the infrastructure that was in place or being installed during this period. Instead of focusing on dollars from new development, the City focused more on improving values of existing real estate. By improving infrastructure and beautifying areas of the city, private investment in the city followed and a demand was created for vacant buildings, improving the overall image and reputation of the city. The private investment in Delray Beach has continued over the last three decades, but work is still necessary to address infrastructure needs and continue to address the quality-of-life expected by residents and visitors.

In 2017, the City approved a revenue bond based on projected revenue from the one cent sales tax passed across Palm Beach County for schools and municipal governments. The City will use the funds for a range of municipal needs, including a new fire station to replace the 50-year old station on Linton Boulevard, sidewalk, roadway and infrastructure improvements, and the final phase of the Beach Master Plan. City schools will also benefit from the School District's use of the sales tax funding, including fixing deferred maintenance in all schools, kitchen expansion at Village Academy, and expansion of Plumosa to a K through 8 program.



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REVENUE SOURCES

The City receives revenue from the following major sources each fiscal year starting October 1, and ending September 30, which are described in detail in the approved budget. In addition, the City administers the revenues from the Delray Beach Community Redevelopment Agency (CRA), which provides funds for projects within the CRA boundary.

Table CIE-A General Sources of Revenue	
Ad Valorem Property Taxes	\$6.9611 per \$1,000 of assessed valuation
Sales/Use Taxes	County gas tax levy on motor and special fuel
Utility Taxes	Taxes imposed on electricity and metered or bottled gas.
Other Taxes	Communication Service Tax Act, comprised of the Local Option Tax and State Tax
Licenses & Permits	This category includes fees collected for providing services such as beach cabanas or valet parking.
Intergovernmental Revenue	City's distribution by the State of Florida for State sales and gas taxes, the Half-Cent State Sales Tax, and mobile home license taxes. Also included in this category are County, State, and Federal grants for the Children's Services Council, Community Policing Officer Grant Program, and the Parks and Recreation after school programs.
Charges for Services	Revenues derived from a variety of governmental services to include public safety services (Fire/Emergency Medical Services) to Highland Beach and Gulf Stream, parking fees, parks and recreation fees, and development applications.
Fines & Forfeitures	Fines for traffic violations, non-compliance with building regulations and codes, and late payment of property taxes.
Miscellaneous	Interest earnings, collections from vending machines, license fees for the Riverboat, contributions from other entities for expenses, transfers from other funds of the City, and funding from the Drug Enforcement Agency and Community Action Foundation.
Other Revenues	
Connection Fees	Water/Sewer
Enterprise Funds	Stormwater Utility Fund Water and Sewer Fund Sanitation Fund Municipal Marina Fund Delray Beach Municipal Golf Course Fund Lakeview Golf Course Fund
Special Revenue Funds	
Law Enforcement Trust Fund	Forfeitures of confiscated property by Police Department
Community Development Fund	Federal, state and local (County) grants to improve targeted areas of the city
Beautification Fund	1.2% utility tax for landscape installation and maintenance of beautification on median strips and other landscaped areas
Community Development Block Grant	Funds from a federal entitlement program to support low- and moderate-income residents
Recreation Impact Fee Fund	Impact fees from new residential unit construction
Beach Restoration Fund	Fund to provide project costs until reimbursement is received. There is an interlocal agreement with Palm Beach County that provides for funding of the local share of project costs. This agreement extends through the year 2023.
Special Projects Fund	In lieu of parking fees, parking license fees, and public arts program fees.
Building Permit and Inspection Fund	Fees collected from building permits and inspections



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FINANCING MECHANISMS

The financing methods in use by the City include:

- “Pay-as-you-go” from operating and non-operating revenues
- Short-term and long-term borrowing from banks using operating revenues
- Short-term capital leasing
- Developer contributions
- Donations
- Interim-term borrowing from banks using operating revenues
- Grants, both participating and non-participating
- Long-term borrowing from municipal bond sales paid for by operating revenues:
- Two outstanding general obligation bonds
 - Two outstanding special revenue bonds
 - Four outstanding water and sewer revenue bonds

LEVEL OF SERVICE STANDARDS

Level of service (LOS) standards are established to ensure that adequate facility capacity will be maintained for the current population and also provided to address the increased demand generated by future development (as required by F.S. Section 163.3202(2)(g)). The City has adopted level

of service standards for transportation, potable water, sanitary sewer, drainage (stormwater management), and solid waste (garbage and recycling). The adopted level of service standards are listed in **Table CIE-2 “Level of Service Standards”** within the Capital Improvements Element Goals, Objectives, and Policies. These LOS standards are established to guide the City in prioritizing capital improvements. The LOS standards are regularly evaluated, and specific projects are identified to address existing or projected deficiencies or projected future needs.

CAPITAL IMPROVEMENT PROGRAM

The Capital Improvements program includes methods of collecting public input, criteria to determine public purpose of potential improvements, guidelines to help prioritize identified improvements, and the Capital Improvement Plan, which is the adopted list of projects over \$25,000 in cost that are planned for the next five years. The program considers the priorities and goals of the City Commission along with projects identified in adopted neighborhood and redevelopment plans, as well as input from the advisory boards and the residents (some of which are submitted during the Annual Infrastructure Hearing process).

Table CIE-B Capital Improvements Criteria	
Criteria Description	Criteria Measurements
Supports Objectives of the City Commission	<ul style="list-style-type: none"> • Supports formally adopted plans or actions by the Commission. • Supports long-term goals established by the Commission.
Maintains What The City Has	<ul style="list-style-type: none"> • Public Safety • Replacing or repairing our existing assets • Maintaining current level of service • Reducing maintenance costs
Project Enhancements and Improvements	<ul style="list-style-type: none"> • Enhance and/or improve current services • Create new revenues • Streamlining operations through technology
Leverages City Resources	<ul style="list-style-type: none"> • Apply for grants and low cost loans • Engage in joint projects with our partners • Encouraging projects which spur smart economic growth
New Construction/Projects	<ul style="list-style-type: none"> • Complete neighborhood improvements
Source: City of Delray Beach	



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GUIDELINES FOR PRIORITIZING CAPITAL IMPROVEMENTS PROJECTS

The projects included in the Capital Improvements Plan are considered using initial vetting based upon:

- (1) The correction of a health hazard,
- (2) The correction of a deficiency,
- (3) The replacement of an existing facility,
- (4) And/or projected need to accommodate new or expanded development.




In addition to correcting deficiencies and maintaining level of service standards, the City considers the *Guidelines for Prioritizing Capital Improvement Projects* (Guidelines). The City Guidelines establish a hierarchy: **Critical Items**, **Mandatory Items**, and **Desirable Items**. The hierarchy expressed in the Guidelines is followed in the development of both the annual Capital Improvements Budget and the Five-Year Capital Improvement Plan.





Critical Items

Critical items are those that must be satisfied in the current fiscal year (or year one of the Capital Improvements Plan). The projects are necessary for the continued operations of the City and to maintain the regular delivery of services to the community. These items may force changes in project priority, displacing or delaying scheduled capital projects.

The most important of these items are correcting service interruptions. Service interruptions include any failure in the physical systems of the City that prevent the delivery of a service. For example, major potable water system breaks or the failure of the emergency communication system that would prevent service delivery to a portion or all of the community. These interruptions are usually unforeseen, but will take precedence over any other programmed project.






Other critical (short-term, immediate) needs could include projects related the following issues:

-  Storm damage
-  Facility damage (leaks, roof collapse, etc.)
-  Facility contamination

-  Emergency equipment breakdown or damage
-  Unforeseen, one-time circumstances
-  Severe neighborhood flooding
-  Structural integrity of public facilities





Mandatory Items

Mandatory items are short term needs that should be satisfied within one year. Similar to critical needs, they are necessary for the continued operation of the City and the regular delivery of services to the community. Unlike critical needs, these items will not necessarily displace other planned projects, and can be planned ahead. Examples of such needs are:

-  Upgrading infrastructure to meet the adopted LOS standard
-  Corrections of deficiencies in internal (operations) infrastructure
-  Correction of deficiencies in external infrastructure
-  Legal/contractual requirements and commitments, bond covenants and commitments to capital projects after bonds are sold, annexation agreements, and grant requirements
-  Maintenance of infrastructure

Desirable Items

Desirable items are the long-term needs identified by the community to maintain and improve quality of life. These needs should be satisfied in a time frame that exceeds one year and can be planned for the most efficient use of available funds. Examples of such needs include:

-  Extension of infrastructure to areas where none exists
-  Improvements to the efficiency of service provision or to productivity
-  Provision of new services and facilities
-  Upgrading outdated technology

CAPITAL IMPROVEMENT SPENDING CATEGORIES

A city growing through reinvestment and redevelopment, such as Delray Beach, has different priorities for infrastructure projects compared to a community with large vacant areas with virtually no infrastructure. Major infrastructure systems, such as water, sewer and roads, are already in place. Capacity for



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major systems such as water and wastewater treatment, street networks, and stormwater conveyance are largely available to serve the existing population. These facilities need to be monitored for future upgrades or capacity deficiencies to serve the projected population.

The City continues to work with new developments and redevelopments to ensure upgrades are programmed for impacted facilities to maintain established LOS. The City's primary focus has shifted from accommodating new development to preparing for future sustainability and resilience of all existing and future systems and addressing impacts of redevelopment. The City is also addressing deficiencies and infrastructure needs in specific neighborhoods to assure that all parts of the city receive the same level of service and achieve the highest quality-of-life desired by the community.

The Capital Improvement Plan is prepared annually in coordination with the annual budget and contains updated and/or new projects for the next five years, with projects programmed for year one and planned for years two through five. This process reflects continued investment to provide for the health, safety and quality-of-life of Delray Beach residents and visitors. To assist in balancing and prioritizing needs across the city, projects are identified by one of the following "spending categories:"

Facilities

- a. Government Facilities. Government facilities with primarily government employee occupancy.
- b. Stormwater Management. Improves drainage conditions and reduces flooding.
- c. Parks. Buildings, grounds and/or recreational facilities within a park.
- d. Mobility. Widening or reconfiguring roads; interchanges, overpasses and intersection improvements; road resurfacing; sidewalks and bike paths repair and installation; and, landscaping, tree planting, lighting, and streetscape improvements.

Technology

- a. Government Services / Facilities – Hardware or software that improves the level of service of government services and facilities.
- b. Mobility – Hardware or software improving transportation systems or mobility within the city.
- c. Economic Development – Infrastructure investment advancing the city's businesses or attracting new businesses, consistent with the city's economic development goals.

Economic Development

- a. Private Development Support – Provision of grants and loans for public infrastructure and project development.
- b. Targeted Economic Development – Stimulates private investment through investment in public infrastructure, public transportation, or other public facilities.

Public Safety / Quality of Life

- a. Public Safety –Relating to public safety, including facilities.
- b. Quality of Life –Promote or improve the environment for the citizens of Delray Beach (e.g. water treatment plants).

Sustainability / Resiliency

- a. Addresses sustainability initiatives, such as green buildings, and resiliency needs, such as infrastructure needed to address the effects of climate change.

Project Phases

A typical capital project is planned and executed in the following phases:

- a) *Project Development* – Identify project requirements and define a project's work scope including preliminary design studies, permitting requirements, data collection, public involvement, legal and technical documentation, cost estimates, environmental impacts, and assessment of alternatives.
- b) *Engineering/Design* – Design a project in accordance with the scope of work set forth in the project development



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phase. This includes legal and technical documentation, constructability review, data collection, advertising, assessment of alternatives related to project design, construction management services, and bid reviews.

- c) *Land* – This may include the purchase of land, easements, and/or right-of-way. This also includes surveys, appraisals, environmental audit, permitting, legal costs, maps, charts, aerial photography, and other costs such as wetlands restoration.
- d) *Construction* – All construction related tasks required to place a project in service. This includes project construction contracts, professional and technical assistance, advertising, legal and technical documentation, inspections, testing, and permitting.
- e) *Contract Administration* – This includes in-house project management, supervision and administration of capital projects. Administration includes project design, technical reviews, construction management, construction inspection, technical specifications, surveying and mapping, cost of preparing reports and maintaining the capital projects log/management information system, eminent domain, contract management, monitoring, and processing the related financial transactions.

CAPITAL IMPROVEMENT PLAN

The Capital Improvement Plan (CIP) is a listing of the projects with capital expenditures over \$25,000 that the City plans to initiate over the next five fiscal years. The Capital Improvement Budget (CIB) is the first year of that plan, to which the City Commission commits funding as part of the adopted annual budget.

Table CIE -1 ~ Capital Improvements Plan is the Five-Year Capital Improvements Schedule of Projects > \$25,000 and is adopted by ordinance annually in the Goals, Objectives and Policies of the Element. This table lists the projects that the City has identified throughout

the various elements to support its adopted LOS for the next five years.

The Capital Improvements Plan is the implementation mechanism for the Capital Improvements Element. The schedule includes the timing, location, projected costs, and revenue sources for funding the projects. The Capital Improvements Plan is updated each year, and the CIE is amended to reflect completed projects and new improvements at this time. The data for the schedule is based upon the inventory and assessments of facilities.

The Fiscal Year (FY) 2018 – 2023 Capital Improvements Plan contains projects for the FY 2018/19 Capital Improvements Budget from various City departments and agencies. The entire CIP budget totals \$211.84 million for the next five years. The attached current adopted CIP (FY 2017-18 through FY 2021-22) and proposed CIP (FY2018-19 – FY2022-23) are organized by funds, and then line items. Line items can be individual project (i.e. Osceola Park Improvements), or annual allocations for repair and replacement such as “Vehicle Replacement”. Expenditures on current projects which are not completed in the current fiscal year will “carry over” into the next fiscal year. The CIP outlines the project costs, the funding sources, and the estimated future operating costs/savings associated with each capital improvement. The CIP is designed to ensure that capital improvements will be made when and where they are needed. The current adopted plan includes the following major projects:

- a) Osceola Park Improvements \$13,000,000
- b) Roadway Construction: \$5,000,000
- c) City Seawall Renovation: \$3,500,000
- d) Reclaimed Water Expansion: \$8,000,25,000
- e) Stormwater Improvements: \$8,166,395
- f) Water Treatment Plant, Wells and Storage Facilities: \$90,000,000



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REVIEW, MONITORING, & EVALUATION

Monitoring and evaluation of the Capital Improvements Element is necessary to ensure effectiveness and to update progress on projects and needs. The Capital Improvements Plan is reviewed annually to program projects that provide or upgrade facilities so that service is available concurrent with the impacts of growth and development and maintain adopted levels of service (Chapter 163 (Part II), F.S.).

The monitoring and evaluating progress on the projects contained in the Capital Improvements Plan is accomplished by multiple departments in conjunction with the Finance Department. The resulting recommendations are formally reviewed by the Planning and Zoning Board (also referred to as the Local Planning Agency) on an annual basis prior to action by the City Commission. The steps of the annual review shall be as follows:

1. All appropriate departments shall report the status of approved capital projects, projects that are scheduled for the next fiscal year, and any changes that are desired in the schedule of capital improvements. The departments shall also provide an update of their individual capital improvement programs.
2. Departments also prepare and submit a request for any new projects, and prioritize all Capital Improvements Plan projects and requests.
3. Projects and changes which can be accommodated through the normal budget review and adoption process are identified. Those projects which require a change to the schedule of improvements are also identified.
4. The projects are then reviewed for prioritization, reasonableness related to costs, operating budget and level of service impact.

5. As a part of the annual budget preparation process, the Planning and Zoning Board (Local Planning Agency) reviews the Capital Improvement Plan and Capital Improvement Budget at a public meeting and issues its findings as to consistency of individual projects with the Comprehensive Plan by providing a recommendation to the City Commission. All projects included in the Capital Budget must be found consistent with the Comprehensive Plan.

The annual review process addresses:

- public hazards
- existing capacity deficits
- locational needs based upon projected growth patterns
- new development or redevelopment service demands
- Current and future concurrency statue

In addition to City staff review, the City hosts an Annual Infrastructure Hearing to solicit input from the public regarding needed improvements. This process assists in raising awareness of neighborhood needs or new deficiencies. The Plan stipulates the hearing be held in winter months to maximize public participation in the process. The Planning and Zoning Board (acting as the Local Planning Agency) hosts the opening of the comment period in a public hearing. Ultimately, the board reviews the comments collected and officially forwards the requests to the City Commission for consideration as part of the annual budgeting process.



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FISCAL ASSESSMENT

A current review of the General Fund and Enterprise Funds finds that capital improvement implementation needs could be accomplished without additional bonds, and the attendant impacts upon operating costs can be met with conservative increases in revenue. A five-year Forecast of General Fund Revenues and Expenses is provided in Table CIE - C.

The table outlines the City's forecast of general fund revenues and expenses for FY 2020 through FY 2022. The forecast shows the potential for challenging future budget preparation as growth in expenditures are expected to outpace growth in revenues. These projections are based on a series of conservative assumptions and do not reflect actions the City will take during this period to close the projected gaps.

Table CIE-C
5-Year Forecast of General Fund Revenues and Expenses

CATEGORY/DEPARTMENT	2017 Actual	2018 Revised	2019 Budget	2020 Projeccction	2021 Projection	2022 Projection
REVENUES						
Taxes	71,264,434	75,717,366	79,799,477	81,794,464	83,839,326	85,935,309
Franchises, Licenses and Permits	14,479,778	12,629,304	13,134,049	13,462,400	13,798,960	14,143,934
Intergovernmental	7,610,863	7,722,564	7,929,881	8,128,128	8,331,331	8,539,615
Charges for Services	11,909,744	12,306,886	13,682,332	14,024,390	14,375,000	14,734,375
Fines and Forfeitures	1,203,779	1,290,039	1,302,000	1,334,550	1,367,914	1,402,112
Miscellaneous	10,099,787	12,177,145	9,892,696	10,140,013	10,393,514	10,653,352
Transfers In	3,591,728	4,063,060	4,172,374	4,276,683	4,383,600	4,493,190
Total Revenues	120,160,113	125,906,364	129,912,809	133,160,629	136,489,645	139,901,886
EXPENSES						
General Government	11,377,712	14,231,322	14,732,881	15,101,203	15,478,733	15,865,701
Police Department	32,441,781	32,536,553	35,248,621	38,186,258	39,140,914	40,119,437
Fire Department	27,428,806	29,583,733	30,950,528	33,528,001	34,366,201	35,225,356
Community Improvement	2,338,760	2,938,863	3,177,516	3,256,954	3,338,378	3,421,837
Building Inspection	2,066,979	2,278,739	2,905,424	2,978,060	3,052,511	3,128,824
Public Works	6,548,164	11,017,747	11,879,161	12,176,140	12,480,544	12,792,557
Parks & Recreation	11,636,500	13,032,976	11,170,466	12,354,728	12,663,596	12,980,186
Grants	11,884,048	13,803,011	15,009,674	15,537,166	16,085,685	16,656,071
Debt Service	1,469,648	2,024,323	1,913,128	1,960,956	2,009,980	2,060,230
Miscellaneous	171,996	242,260	46,260	47,417	48,602	49,817
Contingency	0	1,338,860	368,000	750,000	750,000	750,000
Capital	0	0	0	0	0	0
Transfers Out	9,661,642	9,161,338	5,659,591	5,801,081	5,946,108	6,094,760
Total Expenses	117,026,035	132,189,725	133,061,250	141,677,962	145,361,252	149,144,777
REVENUES OVER/(UNDER) EXPENSES	3,134,078	(6,283,361)	(3,148,441)	(8,517,333)	(8,871,607)	(9,242,891)



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General Fund Revenues

Revenues come from a variety of sources, but are ultimately paid by the citizens. A large part of revenues are received in the form of local, state and federal taxes; charges for services or user fees; and fines and forfeitures. The largest source of revenue is derived from taxes. These taxes include a \$6.7611 property tax levy per \$1,000 of assessed value. Other taxes include utility taxes, such as those appearing on your monthly electric bills, the City's portion of the County gas tax on motor fuel and the Communications Services Tax.

Where the Money Comes From

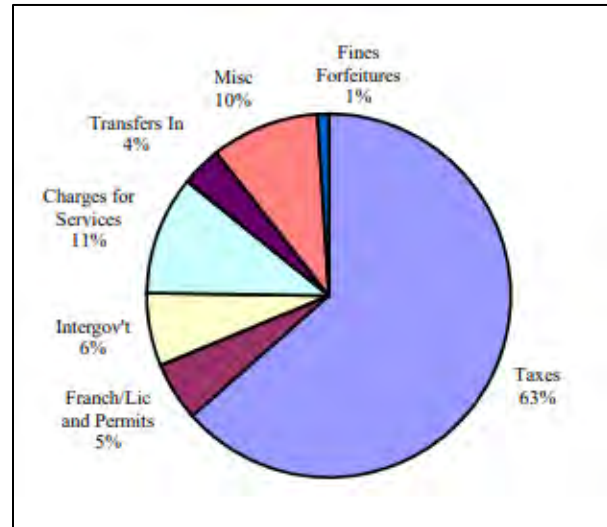


Table CIE-D 2017 – 2018 General Fund Revenues				
Revenues	2017 Actual	2018 Revised	2019 Budget	% Change FY 18 to 19
Cash Balances Brought Forward:				
Prior Year Surplus	\$ -	\$ 6,274,361	\$ 3,148,441	NA
Revenues:				
Taxes	71,264,434	75,717,366	79,799,477	5.39%
Franchises, Licenses and Permits	14,479,788	12,629,304	13,134,049	4.00%
Intergovernmental	7,610,863	7,722,564	7,929,881	2.68%
Charges for Services	11,909,744	12,306,886	13,682,332	11.18%
Fines and Forfeitures	1,203,779	1,299,039	1,302,000	0.23%
Miscellaneous	10,099,787	12,177,145	9,892,696	-18.76%
Total Revenues	116,568,395	121,852,304	125,740,435	3.19%
Other Financing Sources:				
Operating transfers in	3,591,728	4,063,060	4,172,374	2.69%
Total Other Sources	3,591,728	4,063,060	4,172,374	2.69%
Total Revenue & Other Sources	\$ 120,160,123	\$ 132,189,725	\$ 133,061,250	0.66%
Source: City of Delray Beach Annual Budget				



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General Fund Expenditures

A large part of the services provided on a day-to-day basis are funded through the General Fund. This fund includes police and fire protection, code enforcement, street maintenance and maintenance of the City's grounds, parks and facilities, as well as the less visible services such as the executive management of the City, financial accounting, legal counsel, and development services, such as permitting, plan review, and long range planning.

To fund unforeseen critical needs and provide cash flow prior to the receipt of ad valorem tax distribution, the City will continue its policy to maintain a general fund reserve of at least 25% of the recurring annual operating budget, excluding major one-time costs such as those related to bonding, should be maintained.

Where the Money Goes

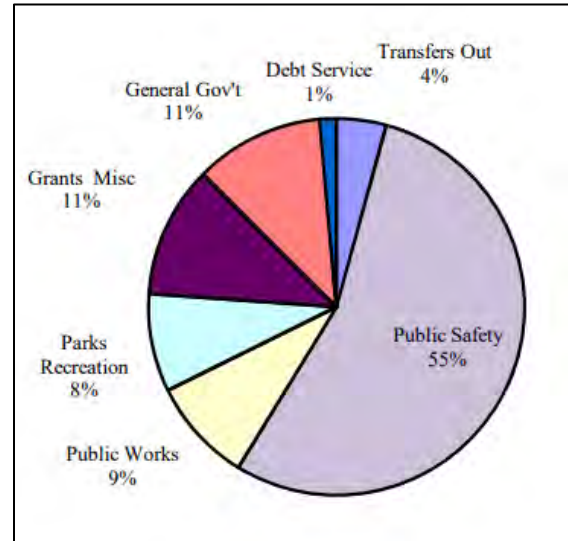


Table CIE-E
2017 - 2018 General Fund Expenditures

Expenditures	2017 Actual	2018 Revised	2019 Budget	% Change FY 18 to 19
Expenditures:				
General Government	\$ 11,377,712	\$ 14,231,322	\$ 14,732,881	3.52%
Public Safety	64,276,326	67,337,888	72,282,089	7.34%
Public Works	6,548,164	11,017,747	11,879,161	7.82%
Parks & Recreation	11,636,500	13,032,976	11,170,466	-14.29%
Grants	11,884,048	13,803,011	15,009,674	8.74%
Debt Service	1,469,648	2,024,323	1,913,128	-5.49%
Miscellaneous	171,996	242,260	46,260	-80.90%
Land Acquisition and costs	-	-	-	NA
Contingency	-	1,338,860	368,000	NA
Total Expenditures	107,364,393	123,028,387	127,401,659	3.55%
Bond Refinancing	-	-	-	NA
Other Financing Uses:				
Operating transfers out	9,661,642	9,161,338	5,659,591	-38.22%
Total Other Uses	9,661,642	9,161,338	5,659,591	-38.22%
Total Expenditures & Other Uses	\$ 117,026,035	\$ 132,189,725	\$ 133,061,250	0.66%
Source: City of Delray Beach Annual Budget				



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RECOMMENDATIONS

Delray Beach generally follows a “pay-as-you-go” philosophy accomplishing as much as can be funded by the general fund or special funds. For certain projects, the City utilizes bonding or increasing rates and taxes when the time frame required to fully implement the projects using pay-as-you-go may not be acceptable to the community. Community desires, timing, and overall project cost efficiency may dictate financing for specific needs.

Capital improvement needs are specifically identified in Master Plans for several public facilities, including water supply, water distribution, wastewater transmission, and the stormwater (drainage) system. Other desired improvements are identified in Neighborhood and Redevelopment Plans. The programming and scheduling of these capital improvements follow the guidelines in this element.

A new focus on sustainability by the City will add a policy consideration to the prioritization of projects in the Capital Improvements Element. Improvements that offer increased energy efficiency or advance sustainability goals provide an important aspect to planned improvements.

Projected Capital Needs by Element

The Always Delray Update includes three new elements (Healthy Community, Historic Preservation, and Economic Prosperity) and updates the existing 10 elements. Each element identifies needs and recommendations for the future. Capital projects will be programmed using the process outlined in this element. A summary of capital needs, by theme and element, are presented below. The summary identifies the general type of programs and projects that are identified and highlights new priorities identified in each element as part of the Always Delray update. The Capital Improvements Plan is updated annually and is provided in a Table within the adopted Goals, Objectives and Policies.

Live

Mobility Element



Transportation capital improvements are funded by the General Capital Improvements

Fund with potential funding from the TPO (Transportation Planning Organization).

Community survey respondents overwhelmingly support investments in mobility improvements. The City currently allocates funds annually for items such as street resurfacing, street reconstruction, traffic calming, bicycle lanes, and sidewalks. The City is developing a master plan for all components of the street system, including roadways, sidewalks, street lights, drainage, utilities, reclaimed water, landscaping, signs, and markings. These components are currently being added to the GIS system to improve project planning.





Multi-modal improvements contribute to a high quality of life and will be necessary to accommodate future growth. A Mobility Plan supported by a Mobility Fee is a priority and is a new strategy to plan and fund capital projects related to transportation.

Mobility Element Recommendations:

-  Develop a Mobility Plan supported by a Mobility Fee to fund multi-modal improvements.
-  Plan for the design, construction, and funding of the Tri-Rail Coastal Link Station

Housing Element

Capital improvement projects in the area of housing are funded by the Neighborhood Services Fund. Major funding expenses support:

-  Workforce Housing
-  Residential Mitigation Program
-  Housing Rehabilitation
-  Neighborhood Housing

Respondents to the Community Survey expressed strong support for a diverse mix of housing types.

Healthy Community Element

The Healthy Community Element is new to the Comprehensive Plan. The most crucial project in realizing the Goals, Objectives, and Policies is collecting the relevant data needed to obtain



CAPITAL IMPROVEMENTS ELEMENT

a full picture of the current state of both physical and mental health for city residents.

Historic Preservation Element

Historic properties are a vital part of the Delray Beach community fabric because of the aesthetic and cultural benefits they provide to residents and visitors – and the economic benefits that fuel both the tourist industry and increased property values.

Historic Preservation Element Recommendations:

- Continue to partner with Federal, County, and local partners to offer tax incentives for the rehabilitation of historic properties.

Work

Economic Prosperity Element

Economic Prosperity is a new Element to the Plan. The focus on growing the city's economy is crucial to increasing the tax base, which ultimately helps fund needed improvements; and, likewise investing in strategic improvements can help grow the economy.

Strategic Partnerships Element

The Economic Development Administration (EDA), the US Department Housing and Urban Development (HUD), and the Florida Department of Transportation (FDOT) are just a few examples of agencies who offer competitive grants that can provide funding for large projects. Some funding from these agencies is allocated to local and regional organizations (such as the Metropolitan Planning Organization) that then fund projects in municipalities on a competitive basis.

Play

Conservation, Sustainability, & Resilience Element

Planned ongoing improvements in Conservation, Sustainability, and Resilience:

- Maintain/Replace/Enhance existing facilities
- Continue the Beach Erosion Control Program
- Provide for Projected New Conservation Facilities

- Preservation Program for the Florida Inland Navigation District (FIND) parcels

New concerns regarding the impacts of sea level rise and climate change require a vulnerability assessment that "identifies one or more areas that experience coastal flooding due to extreme high tide and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning" [F.S. 163.3164(1)].

Conservation, Sustainability, & Resilience Element Recommendations:

- Develop a Community Vulnerability Assessment to guide investment in capital improvements that respond to climate change.

Open Space, Parks, & Recreation Element

Capital expenditures to open space and recreation facilities are funded by the General Capital Improvements Fund, the City Marina Fund, and the Municipal Golf Course Fund.

- Maintain/replace existing parks and facilities
- Develop new parks and facilities
- Redesign the park at Old School Square
- Create a unique community park at the Family Recreation and Fitness Center Playground.

Open Space, Parks, and Recreation Element Recommendations:

- Develop a unique recreation opportunity for the western communities at the Family Recreation and Fitness Center Playground.

Coastal Management Element

The City of Delray Beach is dependent upon sound management of the coastal areas for its role as an economic development driver in the tourist industry, as well as its actual survival due to the potential impacts of natural erosion exacerbated by sea level rise, due to climate change.

- Maintain existing beachfront conditions



CAPITAL IMPROVEMENTS ELEMENT

- Continue the City's award-winning Beach Nourishment Program
- Develop a Seawall Maintenance and Repair Program

Coastal Management Element Recommendations:

- Improvements needed based upon the Seawall Evaluation and Vulnerability Study will require a Capital Improvements strategy in the next 3 to 5 years.

Grow

Neighborhoods, Districts, and Corridors Element

The City will continue to provide an appropriate mix of land uses to meet the needs of current and future residents and businesses. The City of Delray Beach will continue to provide development incentives to attract reinvestment to areas targeted for revitalization in Neighborhood or Redevelopment plans or similar initiatives, such as the Congress Avenue corridor. The City will continue to provide LOS analysis to ensure that adequate infrastructure is in place to meet the demand of new development and growth. The City will maintain the land use protections for Industrial parcels throughout the city to protect and grow those industries.

Public Facilities Element

Capital improvements to public facilities are funded by the Water/Sewer Fund, the Water/Sewer Renewal and Replacement Fund, the Storm Water Fund, the General Capital Improvements Fund, and the Garage Fund. Capital improvements are generally made in the following areas:

- Maintain/replace existing facilities, equipment and infrastructure
- Renewal and replacement programs for infrastructure components, including streets, stormwater management, water, sewer, and buildings and facilities mainframe, software and other computer equipment
- Golf course improvements
- Vehicle replacements
- Inflow and Infiltration Reduction Program

- Provide for projected new facilities, equipment and infrastructure
- Water main extensions
- Sewer main extensions
- Stormwater facilities pursuant to the Stormwater Master Plan
- Stormwater facilities compliant with the National Pollutant Discharge Elimination System (NPDES) permit
- Reclaimed water system

Public Facilities Element Recommendations:

- Continue to invest in reclaimed water systems.
- Prioritize projects that result in improved energy efficiency and help reach sustainability goals.
- Develop and being implementing a Water Supply and Treatment Plan that incorporates the City's water treatment goals.

Education Element

The City is completely within the Palm Beach County School District. Delray Beach is not directly responsible for capital improvements to educational facilities, as development falls under the jurisdiction of the School District. The School District of Palm Beach County Five-Year Capital Improvement Schedule is adopted as a supplement to the City's Capital Improvement Plan. The District has planned capital investments in the following facilities in the FY 2018-2022 Capital Plan:

- Delray Full Service Center remodel
- Fields for Village Academy
- Demolition of old Plumosa Elementary School

Education Element Recommendations:

- Continue to adopt the Palm Beach County School Board's Capital Improvements Schedule by reference to the City's plan.



COASTAL MANAGEMENT



DATA, INVENTORY, AND ANALYSIS



COASTAL MANAGEMENT ELEMENT

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COASTAL MANAGEMENT ELEMENT



INTRODUCTION

The City of Delray Beach is well known for its vibrant downtown leading up to an award-winning beachfront with plentiful public access. The purpose of the Coastal Management Element, in agreement with the Florida Department of Economic Opportunity, is “to plan for, and where appropriate, restrict development activities that would damage or destroy coastal resources, endanger human life, and limit public expenditures in areas that are subject to destruction by natural disaster, such as within the Coastal High Hazard Area”. Coastal management is a multifaceted effort. Proper management ensures both the protection of life and property from natural disasters, as well as the conservation of natural resources. It strives at once to maintain and enhance the quality of life of citizens who value the area as a recreational asset, to protect wildlife and natural ecosystems, to maximize economic benefits generated from tourism, and to safeguard human life and public investment from natural disasters. Coastal Management requires a careful balance between the natural and built environments.

To effectively provide management, it is important to understand the existing components of the coastal zone, how they have been developed over time, and what the projected needs are for the future. The data, and analysis provided in this Element provides an inventory of coastal resources

to guide the City’s decision-making, support the City’s Coastal Management Goals, Objectives, and Policies, and be consistent with adopted plans and permits covering activities in the Coastal Planning Area.

Coastal High Hazard Area

According to the Federal Emergency Management Agency (FEMA), the Coastal High Hazard Area is identified as Zone V on Flood Insurance Rate Maps (FIRMs). Special floodplain management requirements apply in V Zones, including the requirement that all buildings meet minimum elevation criteria.

Section 163.3178(2)(h)9, Florida Statutes, defines the Coastal High Hazard Area as an area particularly vulnerable to the effects of coastal flooding from tropical storm events, specifically the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model. This definition is used for this Element.

THE COASTAL PLANNING AREA

The Coastal Planning Area includes the offshore reef, the barrier island, the Intracoastal Waterway, and the waterway’s western shoreline. The Coastal Planning Area (CPA) for the City of Delray Beach includes all land within the Coastal High Hazard



COASTAL MANAGEMENT ELEMENT

Area (CHHA), as defined by Florida Statutes and depicted on Map AD-13 (Coastal High Hazard Area).

The City's Coastal Planning Area historically was bounded by the north and south City limits, the Atlantic Ocean to the east, and including properties along the western edge of the Intracoastal Waterway. The Coastal Planning Area has been extended westward to include all properties located along waterways that adjoin the Intracoastal Waterway, as well as properties more susceptible to flooding in major storm events (1% annual chance of flood) based on updated Flood Insurance Rate Maps (FIRM) provided by Federal Emergency Management Agency (FEMA) and adopted by the City in October of 2017. The Coastal High Hazard Area is approximately 786 acres; the most recent flood zones are depicted on Map AD-15 [Coastal Areas Subject to Flooding (FEMA Flood Zones)].

INVENTORY & ANALYSIS

Land Uses

The land uses within the Coastal Planning Area are depicted in Map AD-14 (Coastal High Hazard Area and Existing Land Uses). The barrier island varies in width from 1,000 to 2,000 feet and is essentially built-out, with only individual lots available for development. The land use is mostly residential with more than half of the area zoned for single family detached housing. Some commercial land uses are found along Linton Boulevard, Atlantic Avenue, and George Bush Boulevard.

TABLE CME-A Coastal Planning Area Land Use		
LAND USE	AREA (ACRES)	% OF TOTAL AREA
Residential	632.50	80.49%
Commercial	50.97	6.49%
Education, Public, & Intuition	30.97	3.90%
Industrial	0.00	0.00%
Recreation & Open Space	61.97	7.89%
Vacant	9.67	1.23%
TOTAL	785.78	100.00%

Beach and Dune System

The beach and dune system serve as the City's primary protection against storm surge and waves. This critical protective system has been managed over time by a series of nourishment events since 1973 and has been calculated to provide annual storm damage reduction benefits valued over \$16 million (CPE, 2001). Analyses conducted for the United States Army Corps of Engineers (USACE), which consider only primary benefits (storm damage reduction and loss of land benefits, not including recreational or tourism benefits) have determined that the Delray Beach renourishment project has a Benefit-to-Cost Ratio of over 11:1 (CPE, 2001).

An Analysis and Recommendations for the Management of the Coastal Dune at Delray Beach was prepared for the City in 2015 (Barron, 2015). According to the Study, the man-made dune measures the entire 6840 foot shore parallel length of the Public Beach, with the shore normal width averaging 160 feet from the seaward edge of the turfgrass along A1A east to the limit of native dune grass on the nourished beach. Width of the dune varies along the private shoreline from 140 shore normal feet to the north of the public beach, to 200 feet between Casuarina and Atlantic Dunes Park, and 125 feet south of Linton.

Windblown sand has accumulated in the vegetation, throughout this area, with as much as eleven vertical feet of accretion above the nourished beach elevation of +9 feet NGVD, in some places. This increased elevation has created a foredune ridge and left one or two low troughs, or swales, between the grassy foredune and the scrub plants along the sidewalk. Short term growth of the profile can be rapid, in the exposed seaward area, especially during a strong, dry, onshore wind event, while sand trapping and the general microclimate farther upland in the swale is buffered. The development of this foredune/backdune zonation is allowing species succession to proceed on a compressed scale, and providing an environment for a broader palette of plant choice for continued City



COASTAL MANAGEMENT ELEMENT

replanting efforts to restore a more complete strand zone habitat.

The seagrape near the roadway is pruned semi-annually to maintain height at about three feet above grade, and the sea oats dominated foredune grows without management, expanding seaward at five to eight feet yearly, controlled by active beach use.

Eight species had been planted, and about 25 native and ruderal species had voluntarily recruited to the renourished Delray Beach, prior to 1995, when the City conducted the first of several projects to remove the invasive exotic scaevola hedge, prune seagrape trees, and revegetate the hedge zone with native dune species.

A total of fifty native species have been added to date, including several listed as endangered or threatened by the State of Florida or the U. S. Fish and Wildlife service. Another 73 native plant species have recruited as volunteers into the system. The Floristic Inventory identifies an additional forty non-native species of a few individuals or small populations, which should be targeted for eradication

Atlantic Dunes Park, which has been managed by the City since the 1970s, is one of the few remaining coastal ecosystems in South Florida with a full transverse section of Beach/Dune, Coastal Strand and Maritime Hammock communities. The species diversity of the Park has suffered in the past thirty years from overshadowing by exotic plants, and more than a dozen of the native species, which used to exist there, have been lost. The maintenance and ongoing restoration of this area is a high priority.

Due to the significant risk posed by coastal erosion and the economic value of protecting the resources within the city, the City's entire beach is federally authorized as the Delray Beach Segment of the Palm Beach County Shore Protection Project. The Shore Protection Project for Palm Beach from the Martin County Line to Lake Worth

Inlet and from South Lake Worth Inlet to the Boca Raton Inlet was authorized by Section 101 of the River and Harbor Act of October 23, 1962 (PL 87-874). The project was authorized in accordance with the report of the Chief of Engineers, Department of the Army. The Chief's report and project description are contained in House Document 164/87/1. Through authorized extensions, the project authorization also provides federal participation in the cost of the periodic renourishments. (CPE, 2001) The current federal authorizations are set to expire in 2023.

Water-Dependent and Water-Related Uses

Water-related uses are depicted in Map CME-4. "Water Related Uses". The uses include beach and four marinas along the Intracoastal Waterway (Delray Harbor Club, Delray Beach Yacht Club, Marina Delray, and the City's Marina). Water-related uses include docking facilities and private marinas which are secondary to residential use. Three City parks provide water-related amenities: Veterans Park, with fishing and short-term dockage, Knowles Park, with boat ramp facilities, and Mangrove Park, with boat ramp facilities.

No additional water-dependent sites are needed relative to meeting level of service needs of the Coastal Planning Area; however, the City desires to provide additional water access through continued enhancement of Intracoastal Waterway and beach access opportunities, including enhancement of street ends that abut the Intracoastal Waterway. Potential grant funding from the Florida Inland Navigation District (FIND) may be available to support new street-end parks and water access improvements. New amenities, such as benches, picnic tables, trash receptacles, and launches for non-motorized vessels may be desirable additions in the community. These improvements could be coupled with seawall maintenance and improvement projects.

Conflicts Among Shoreline Uses

Delray Beach's ocean shoreline does not have fishing piers or public docks, and with limited redevelopment potential, conflicts among shoreline uses is not an issue. The most significant



COASTAL MANAGEMENT ELEMENT

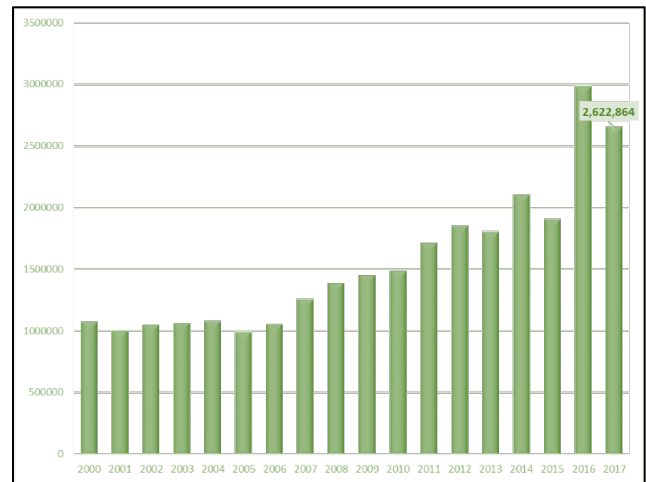
potential for conflict occurs with the preservation of the dune system and its vegetation, while providing accessibility to the beach. Continuation of existing beach and dune management programs will work to avert any such conflicts. The ongoing management plan calls for removal of invasive exotics and replacement with indigenous species, replicating the diversity of native dune environments as well as dune trimmings. The continued vitality of this ecosystem is to be retained through maintenance activities by the Parks and Recreation Department. Training by a biologist/dune professional on techniques for managing seagrasses and removal of exotics can help establish the most efficient and effective outcome of maintenance efforts.

Economic Base

Tourism and hospitality are legacy industries for the City of Delray Beach. The economy of the Coastal Planning Area is reflective of the economy of the city as a whole, and in turn, of the region: primarily residential, with limited commercial development that provides support for residents and visitors. A significant tourist and seasonal component within the local economy is oriented toward the beach resource.

In addition to the storm protective function, the coastal environment of Delray Beach is rich in both cultural and natural resources. As a result, the beach and nearshore waters are heavily used for recreational activities such as sunbathing, volleyball, surfing, and other watersports. The proximity, diversity and aesthetic beauty of the natural reef system, as well as the presence of a shallow shipwreck in the nearshore waters of Delray Beach also offers opportunities for fishing, snorkeling, scuba diving and boating. Annual beach attendance has been on the rise since the early 2000's Figure CME-1 Beach Visitors per Year.

Figure CME-1
City of Delray Beach Visitors per Year



Source: Delray Beach Ocean Rescue as reported to The United States Lifesaving Association.



COASTAL MANAGEMENT ELEMENT

Infrastructure

Public infrastructure facilities in the Coastal Planning Area include water and sewer systems, seawalls, stormwater inlets and outfalls and streets that serve the mostly built-out area. Future infrastructure improvements will be those to provide the Coastal Planning Area with a reasonable level of service in the future. On the barrier island, the existing infrastructure systems for potable water, sewer, and streets accommodate existing development. The City has completed projects to provide reclaimed water to a significant portion of the island and has capital improvements plans to continue to expand the system to most of the other potential residents.

The Coastal Planning Area experience increased seasonal flooding within certain areas, such as the Marina Historic District, Atlantic Dunes parking lots, and select residential streets. The City has recently completed a seawall improvement project at Veterans Park to address flooding by raising the seawall elevation. A Sea Wall Vulnerability Analysis is in the process of evaluating other flood prone areas. In 2018 seawalls, stormwater inlets, and outfalls along the Intracoastal Waterway and connecting canals were surveyed to inventory current conditions. These surveys identified that backflow prevention devices, such as flap gates, duckbills, and inline valves are installed on select, but not all, outfalls. In addition, varying levels of maintenance are required on these devices to optimize performance. This data will assist the Public Works Department in setting priorities for future installations.



Inline Valve, Image courtesy of APTIM 2018.



Duckbill Installed - Courtesy of APTIM 2018

Historic Resources

Two locally designated Historic Districts are within the Coastal Planning Area. They are the Nassau Street Historic District and a portion of the Marina Historic District. In addition, ten individually designated structures are on the local historic register. Those historic resources are shown on Map AD-17 (Coastal High Hazard Area and Historic Resources). The City has a Historic Preservation Ordinance that is administered by the Historic Preservation Board. That ordinance requires issuance of a Certificate of Appropriateness by the Board prior to modification or new construction on properties in Historic Districts and on individually designated sites. No conflicts between the Future Land Use Map and historically designated sites exist.



Historic Marker for the Orange Grove House of Refuge. Image courtesy of APTIM 2018



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Cultural Resources

The settling of Delray Beach began in the later part of the 19th Century. One of the first buildings constructed there was the Orange Grove House of Refuge No. 3 in 1876 that served as a safe-haven for victims of shipwrecks. Other refuge houses similar to the Orange Grove House were constructed up and down the east coast during this time after the federal government decided to require more aids to sailors, which also included the construction of more lighthouses. Unfortunately, the Orange Grove House burned down in 1927.



Photo Source: Historical Society of Palm Beach County (HSPBC).
<http://www.hspbc.org/>

In 1998, the Sandoway Discover Center opened in Delray Beach. The Sandoway Discovery Center is a coastal ecosystems and marine life center, which is open to the public. The Center presents educational exhibits and programs for locals, tourists, and visitors of all ages. The Center currently hosts field trips and offers educational outreach programs related to sea climate change, coral reefs, amphibians and birds, insects, plants and seeds, sea turtles, and reptiles. The Center represents early beach-front living, the lawn is thick with natural local beach dune vegetation. The Sandoway House Nature Center is a historic home built in 1936, where one can experience Delray's rich history through a self-guided tour. Palm Beach County owns the property and leases it to the City of Delray Beach, who in turn, sublet the property to the Friends of Sandoway Nature Center, inc. The City could coordinate with the Friends of Sandoway House to create and coordinate public education programs.

On September 11th, 1903 the S.S. Inchulva wrecked during a hurricane while transiting from Galveston, TX to Newport News, VA. Nine sailors were lost during the event and the remaining survivors found refuge at the Chapman house in Delray Beach. Following the wrecking, the S.S. Inchulva was heavily salvaged. During the 1920s and 30s the hull was dynamited to continue the salvage efforts and to alleviate the navigational hazard it had become. Masts and superstructure could be seen out of the water.

The S.S. Inchulva, also known as "the Delray Wreck", is located in about 20 feet of water offshore of the south end of the Municipal Beach. Currently, when exposed, the hull and boilers serve as a substrate for marine organisms. Over the years it has become a popular location for recreational SCUBA divers and snorkelers. Divers and snorkelers can view five different sections of the hull, one section associated with a barge that sank during the salvage efforts during the early 20th Century.



The SS Inchulva
Image courtesy of APTIM 2018



COASTAL MANAGEMENT ELEMENT

Dredge and Spoil Disposal Sites

No dredge spoil disposal sites have been identified as needed within the city throughout the planning period. Three parcels in the city that are owned by Florida Inland Navigation District (FIND) are designated as spoil disposal sites for United States Army Corps of Engineers for maintenance dredging of the main Intracoastal Waterway channel. If the City has a need to conduct canal dredging activities, permission for temporary stockpiling of dredge spoils would have to be granted by the FIND board to utilize those parcels. Permission is unlikely to be granted for dredging of private canals. Ongoing coordination with FIND is recommended and should be expanded to discuss future needs as sediment accumulates in both public and private canals.

Natural Resources

Reef

Delray Beach is unique in South Florida in that it does not have any nearshore natural hard-bottom, but does have an extensive offshore reef in about 60 feet of water, located approximately $\frac{3}{4}$ mile from the beach. This reef is part of the Continental Southeast Florida Reef Tract that extends from southeast Miami to north of West Palm Beach. These reefs run parallel to shore and are made up of a ridge complex (closest to shore), an inner, middle and outer reef, all separated by sand deposits of varying thickness. Moving north, the nearshore ridge complex disappears under the modern shoreline at Hillsboro Inlet in Broward County and, continuing north, the Inner and Middle Reefs also disappear leaving only the Outer Reef just north of the Boca Inlet in Palm Beach County. This area is where the Delray reef is located and why only one shore parallel reef tract is just offshore of the City of Delray Beach.

The Delray Beach Reef is dominated by octocorals and sponges both in size and density. The most abundant octocorals include sea rods and sea whips, and giant barrel sponges are also very common among the benthic community making up a large part of the reef biomass (CPE, 1997, 2005; CB&I, 2013). There is also a complex

macroalgae community that supports a diverse assemblage of herbivores including reef fish and sea turtles. Although this reef is not a stony coral dominated community, it supports a large variety of stony corals, including the federally listed coral species of *Acropora*, as well as several other listed coral species.

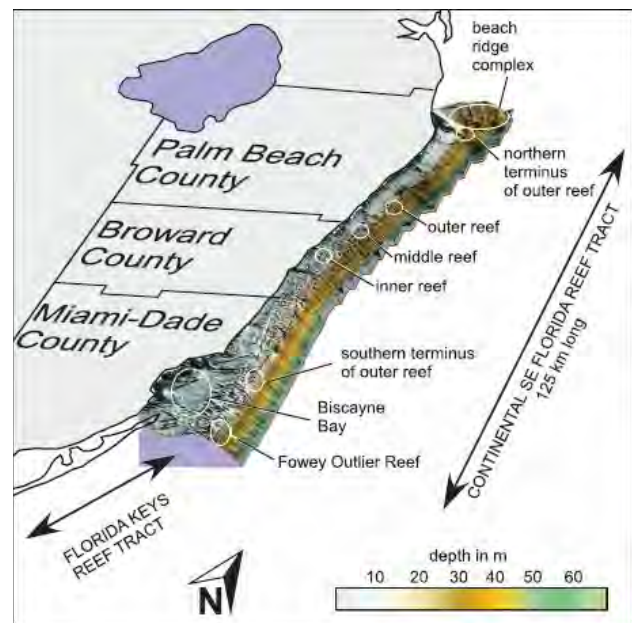


Figure Source: Banks et. Al. 2018



Reef image courtesy of APTIM 2018

The reef edge is often defined by a very clear ledge on the western boundary where the reef rises about 10 ft. and plateaus toward the east. Many schooling fish assemble along the edge



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where the change in relief is greatest. There are also areas where the edge is rather patchy and characterized by rock outcroppings (large and small) that also support benthic and fish assemblages characteristic of coral reef habitat.

Beach

The city has 2.7 miles of oceanfront shoreline, all of which are deemed critically eroded shoreline by the State (FDEP, June 2018). The beach is 100% publicly accessible and 51% of the ocean frontage is within two public parks: Delray Municipal Beach and Atlantic Dunes Park. The beach seaward of the Erosion Control Line (ECL) throughout the city is public land, jointly managed by the City, County, State and United States Army Corps of Engineers as the federally authorized Delray Beach Segment of the Palm Beach County Shore Protection Project. The beach nourishment project has successfully provided storm protection for upland property. Since 1973, no damage to upland property due to erosion or wave damage has occurred.



Municipal Beach, image courtesy of APTIM 2018



Municipal Beach, image courtesy of APTIM 2015

In addition to storm protection and recreation, Delray's beach provides habitat for many species of flora and fauna, including nesting and roosting shorebirds and nesting sea turtles. The primary nesting sea turtle in Delray is the loggerhead sea turtle; however, endangered leatherback turtles have also been documented to nest on the beach in Delray. The beach and nearshore marine habitat are designated as critical habitat to loggerhead sea turtles. Recognizing the valuable habitat that the beach provides to nesting sea turtles, the City began the Sea Turtle Monitoring and Conservation Program in 1984 and has monitored the beach for sea turtle nests annually since, whether required by permit or not.



Courtesy of APTIM

Another important resource for wildlife on the beach is present along the water line where



COASTAL MANAGEMENT ELEMENT

beach wrack washes on shore and provides valuable food resources for many shorebirds. The wrack creates an energetic link between marine and terrestrial systems at this interface.

The intertidal habitat, or wet beach, in Delray is made of up softbottom substrate (sand) and serves as a feeding ground for many shorebirds and finfish. The infaunal community is generally comprised of polychaete worms, coquina clams and mole crabs, which are considered indicator species for the health of beach habitat by Florida's Comprehensive Wildlife Conservation Strategy. The surfzone and subtidal habitat is home to shellfish, foraging fish, predatory fish and the occasional offshore migratory predators (Greene, 2002).



Courtesy of APTIM

The softbottom substrate found in the intertidal and subtidal habitats, as well as the water column are designated as Essential Fish Habitat. The softbottom provides habitat for benthic organisms to live on and within and is an important element in the food web. The water column is that habitat where highly migratory species are found, such as king mackerel and sailfish. The beach is accessible to residents and visitors through a number of beach walkways throughout the two public parks. Mobi Mats® installed at the first access south of Atlantic Avenue, create a more stable surface for access by wheelchair, stroller, etc. The Ocean Rescue department also has four surf chairs available for the physically challenged to enjoy the beach, available on a first come, first served basis at the following lifeguard towers: South 1, South 3, South 5 and Atlantic Dunes Park. at Atlantic Dunes Park has over 100 parking spots and over 500 public parking spots are available within ¼ mile of the Municipal Beach. In addition to

personal car, beach goers can access the beach by the Downtown Roundabout Trolley or by bicycle and utilize one of the many bicycle racks.



Mobi Mats at Atlantic Avenue Access - Courtesy of APTIM 2018



Courtesy of APTIM 2018

Dunes

Starting from the western boundary of the beach, Delray boasts an extensive dune habitat. Early on, the City recognized the protection that a dune offers to the upland infrastructure and has maintained the vegetated dune since the initial dune restoration and planting in 1974. The City also



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recognizes that removal of exotic vegetation and planting native Florida dune vegetation promotes a healthy ecosystem and provides a protective barrier between the ocean and the upland infrastructure.



Courtesy of APTIM 2018

Coastal dunes serve a number of functions. The dune vegetation traps and stabilizes wind-blown sand, slowly growing in elevation into an important storm protection feature that can reduce flooding and wave damage during heavy storms. The success of this dune system can be measured by the large accumulation of wind-blown sand that has formed into a storm protective dune approximately 100-200 feet wide. The sandy dune also provides a habitat for over two hundred plant and animal species (Barron, 2015).

An important component of the Dune program at Delray Beach has been the rescue and relocation of a number of plants listed as endangered or threatened by the State and Federal governments. Plants such as Sea Lavender, Golden Creeper, Silver Palm, and Beach Clustervine have been grown from seed or transplanted from development sites or areas of neglected management, and reintroduced to the Municipal Beach to establish functioning populations, and preserve a genetic storehouse for future restoration efforts. This work has been conducted and supported by high school and college students, local native plant nurseries, and a Federal grant program.

The City's decision, years ago to allow access pathways to evolve naturally, rather than to build elevated structures, has proven prudent. The only evidence of harm from pedestrian load even at the access points nearest the most concentrated parking, is the fanning of the seaside of a few paths, such as at South 3/Sandoway path, which allows sand to blow and accumulate farther into the backdune.



Courtesy of APTIM 2018

Intracoastal Waterway

Technically, there is no estuarine environment in the approximately 21.4 miles of tidally influenced canals within the Delray Beach Coastal Planning Area. The Intracoastal Waterway has been channelized throughout the city, and most of the shoreline is protected by seawalls of varying age and structural condition. The natural areas that remain are not estuarine in a technical classification. Nonetheless, the City and other responsible agencies consider the waterway to be more than a transportation route and seek to protect its estuarine features.

The City does not have any significant areas that support manatees and the estimates of manatee sighting are relatively low. Even so, the City supports speed restrictions in the Intracoastal Waterway designed to protect this endangered species. The majority of the Intracoastal Waterway maintains a boating speed of 25-30 mph with slow speed and idle speed zones. The narrow canals



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and waterways off of the Intracoastal Waterway are “Slow Speed All Year” areas, as is the area from 300 feet north of the Atlantic Avenue Bridge to 500 feet north of the Knowles Park boat ramp. “Idle Speed All Year” zones are present between 300 feet north and 600 feet south of the George Bush Boulevard Bridge and from 500 feet north of the Knowles Park boat ramp to 300 feet north of the Linton Bridge.

Three publicly owned parcels that front the Intracoastal Waterway have potential as preservation areas. The sites include Florida Inland Navigation District Parcels MSA 645 and 650, and the City-owned Donnelly Tract. All three sites have conservation land use designations and are zoned as conservation or open space areas. One of the most significant activities to be undertaken along the Intracoastal Waterway involves the preservation of these sites. No known point sources of pollution exist along the Intracoastal Waterway, other than storm water discharge areas. Implementation of projects and programs under the National Pollution Discharge Elimination System (NPDES) permit, together with standards already adopted in the Land Development Regulations for new construction and reconstruction, keep the City compliant with state and national standards for the quality of storm water runoff.

Offshore Sand

Between the reef and shore is sand bottom, there are no hardbottom areas or outcrops of reef or rock. The City of Delray Beach has proactively managed their coastal resources by implementation of a Beach Nourishment Program since 1973. To date, this program includes an initial nourishment, five periodic nourishments, and two

storm damage repair projects all built with beach compatible sand dredged from permitted borrow areas directly offshore of the City.



Courtesy of APTIM 2016



Courtesy of APTIM 2016



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HISTORY OF MANAGEMENT OF COASTAL RESOURCES

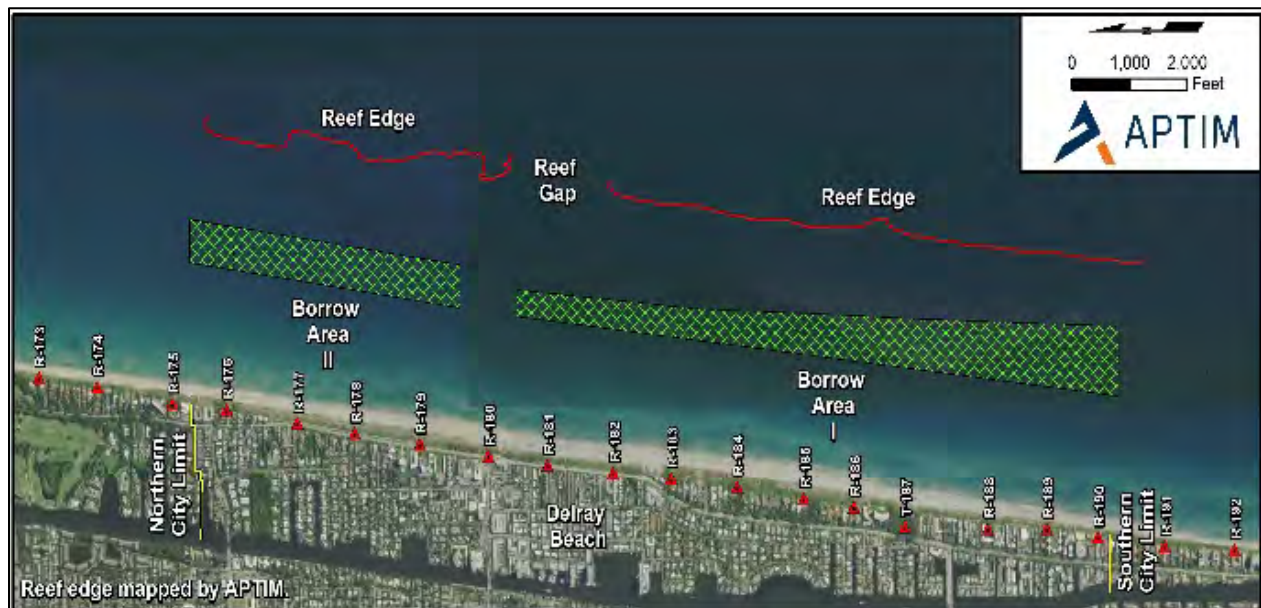
Reef Monitoring

Monitoring of biological communities on the barrier reef occurred from 1993 through 1996 in conjunction with the 1992 renourishment project. The post-construction monitoring report describes the reef community observed offshore of the borrow areas as typical of the southeast Florida coast, with octocorals and sponges being the dominant fauna both in size and density (CPE, 1997). Reef surveys were again conducted in conjunction with the 2005 Storm Damage Repair Project and similar flora and fauna assemblages were reported (CPE, 2005). As of 2008, the reef offshore of Delray was designated as critical habitat for the threatened coral species *Acropora* spp. Prior to the 2013 5th Periodic Nourishment, the reef was surveyed for *Acropora* by implementation of the NMFS Recommended Protocol (CPE, 2011).

During dredge and fill activities, all vessels are required to remain at least 400 ft. from the reef at all times and must travel to and from the beach

through the gap in the reef, which is about 1,800 ft. wide. The borrow areas directly offshore of Delray's beach have been used multiple times since program inception in 1973. The short distance and direct route from the borrow area to the beach also minimizes risk for incident during dredge and fill operations.

Due to the distance of the reef from the beach and borrow areas, the gap in the reef allowing safe ingress and egress of vessels, and the nearby proximity of the borrow areas to the fill area, monitoring has not been required by regulatory agencies since the 2005 project, except for *Acropora* surveys. Even so, the City has adopted a proactive approach to ensure protection of the reef by mapping at a minimum, the reef edge before and after project construction in order to document conditions (CPE, 2013).





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Infauna Monitoring

Monitoring of infaunal communities, the critters that live in the sand, took place in the borrow areas and on the beach for the 1992 renourishment project. The benthos is an important element in the food web, providing food for wading birds, shorebirds and fish. The post-construction monitoring report compared pre-construction, mid-construction and post-construction infauna data and documented that annelids were most abundant, with arthropods, nemerteans and molluscs the second, third and fourth most abundant groups (CPE, 1997). Based on comparisons of community structure, species composition, infauna densities and species diversity, the report concluded that dredging of the borrow areas had little or no long-term effect on the associated infaunal communities or the mean grain size and silt/clay or organic content of the sediment. This type of monitoring has not been required since.

Beach Nourishment Projects

In the 1960's and 1970's severe coastal erosion threatened A1A and upland infrastructure in the city. The Delray Beach Restoration Project, covering the entire City limits, was federally authorized by the United States Army Corps of Engineers (USACE) and initially constructed in 1973. Delray Beach's beach nourishment

program is one of the longest and most successful programs in the country and is often used as an example throughout the field of coastal engineering and management.

To date, the City has participated in eight beach nourishment projects. Approximately 7.9 million cubic yards of sand from offshore borrow areas have been placed as a result of the City's and United States Army Corps of Engineers beach preservation efforts. Since the initial nourishment of 1973, the City has maintained the beach through planned, periodic beach renourishments on five occasions, including 1978, 1984, 1992, 2002 and 2013. Storm damage repair projects were constructed by the United States Army Corps of Engineers in 2005 in response to losses from the active 2004 hurricane season and in 2014 to repair damages from Hurricane Sandy (October 2012).

Physical monitoring in the form of beach profile surveys on the R-monuments, and engineering analysis, are conducted annually to assess the conditions of the beach. These surveys and analysis are used to satisfy pre-construction and post-construction State and Federal permit requirements, as well as document beach conditions before and after storm events.



Pre-nourishment conditions.
Photos provided by Paul Dorling in 2014



Pre-nourishment conditions.
Photos provided by Paul Dorling in 2014



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TABLE CME-B Chronology of Beach Nourishment Events				
Project	Construction Date	Placed Volume (CY)	Location	State Permit Number
Initial Nourishment	1973	1,634,500 ¹	R-175 to R-188	BBS 72-24
1 st Periodic Renourishment	1978	701,300 ¹	R-176 to R-182 and R-186 to R-188	BBS 75-10
2 nd Periodic Renourishment	1984	1,311,000 ²	R-175 to R-188	BBS 75-10M1
3 rd Periodic Renourishment	1992	1,196,500 ³	R-180 to R-188.5	DBS890242 and 501662809
4 th Periodic Renourishment	2002	1,230,000 ³	R-179 to R-188A	0178582-001-JC
USACE FCCE SPP ⁷	2005	250,000 ⁴	R-175 to R-188	0178582-003-EM
5 th Periodic Renourishment	2013	1,158,500 ⁵	R-179 to R-188A	0303553-001-JC and 0303553-002-BV
USACE FCCE SPP	2014	381,200 ⁶	R-175+300 to R-180	0303553-001-JC
	Total to Date	7,863,000	R-175 to R-188.5	-
References: (1) 1990 LRR (USACE, 1990), (2) 2001 LRR (USACE, 2001), (3) 2002 Post-Construction Report (CPE, 2003), (4) 2005 Post-Construction Report (CPE, 2006) (5) 2013 Post-Construction Report (CPE, 2013), (6) 2014 FCCE Post-Construction Report (CB&I, 2014). (7) USACE FCCE SPP = U.S. Army Corps of Engineers' Flood Control and Coastal Emergencies Shore Protection Project				



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2017 photo from GoogleEarth. 1973 photos courtesy of APTIM.

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Coastal Awards:

2013 ASBPA Best Restored Beach award

2005 ASBPA Project Award

2002 American Coastal Coalition Top Restored Beaches



2013 Award Winner!

"The beach has performed better with every project and is the quintessential example of a beach nourishment success story."





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Dunes

The coastal dune is almost entirely man-made, installed and enhanced through several dune planting projects that began as an effort to solve the problem of sand blowing into the street after the first major beach nourishment in 1973. In 1995, the City conducted the first of several projects to remove the invasive exotic scaevola hedge, prune seagrape trees, and revegetate with native dune species. At that time, eight native species had planted and about 25 native and ruderal species had voluntarily recruited to the renourished dune.

In 2015, an analysis of the dunes was completed again. A total of fifty native species had planted, including several listed as endangered or threatened by the State of Florida or the U. S. Fish and Wildlife service. Another 73 native plant species had recruited as volunteers into the system. The Floristic Inventory appendix to the Dune Management Plan, identifies an additional 40 nonnative species of a few individuals or small populations.

In 2015, the City completed a program of contracted removal of the six most common invasive exotic species at the Municipal Beach. Populations of those six invasive species were mapped for Atlantic Dunes Park as well as for the private areas within the City limits to facilitate control efforts and as part of the City's Dune Management Plan (Barron, 2015).



Example of Dune Replanting Event – Courtesy of APTIM



1973 Initial Plantings to Prevent Wind Blown Sand



2018 Dune Conditions – Courtesy of APTIM

Atlantic Dunes Park, which has been managed by the City since the 1970's, is one of the few remaining coastal ecosystems in South Florida with a full transverse section of Beach/Dune, Coastal Strand and Maritime Hammock communities. The species diversity of the Park has



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been on the decline over the past thirty years, likely due to overshadowing by exotic plants. More than a dozen of the native species that used to exist in Atlantic Dunes Park, have been lost. (Barron, 2015)

In 2017, the City performed a crown reduction and pruning event of sea grape trees in the central portion of the Municipal Beach (from The Marriot to Dover House), and supplemental pioneer zone and strand zone replantings to comply with Federal Department of Environmental Protection (FDEP) permits for sea grape pruning. The City currently holds FDEP field permits for dune prunings that are contingent upon performance of continued exotic removal and compliance to lighting protocols.

Sea Turtles

The City has had an on-going sea turtle conservation program since 1984. This program includes nest monitoring and protection, and data collection such as nesting and hatching success, provided in Table CME-C, Delray Beach Turtle Nesting Data (2017). Artificial lights can deter females from nesting and disorient hatchling turtles; therefore, the City adopted Ordinance 11-14 in May 2014, setting requirements for new and existing beachfront lighting. Lighting inspections are conducted by the City's Code Enforcement staff to confirm compliance. Most recently, the City has made efforts to educate and guide coastal residents on sea turtle conservation and lighting requirements through mailing of sea turtle brochures prior to the start of nesting season on March 1, 2018.

TABLE CME- C Delray Beach Turtle Nesting Data (2017)				
	<i>C. caretta</i> Loggerhead	<i>C.mydas</i> Green Turtle	<i>D. coriacea</i> Leatherback	Total Species
Total # of Nests	252	46	6	304
Total # of False Crawls	900	120	2	
Date of First Nest	04/23/17	05/30/17	04/13/17	
Date of Last Nest	08/19/17	08/25/17	05/11/17	
Source: Florida Fish and Wildlife Conservation Commission, <i>Fish and Wildlife Research Institute, Annual Report for the Statewide Nesting Beach Survey, 2017.</i>				

Intracoastal Waterway

Delray Beach has experienced more frequent and increased seasonal flooding within its coastal communities, streets, parks, and other facilities that border the Intracoastal Waterway in recent years. These seasonal flooding events have been primarily caused by inundation from the Intracoastal Waterway during elevated water levels. Similar to other coastal Florida communities, the City seeks to assess its

vulnerability to future seasonal flooding and to identify potential options to protect its infrastructure and citizen's property. The City has started this assessment with the 2018 Intracoastal Waterway Water Level & Infrastructure Vulnerability Study.

The study included review of available water level data, analysis of return periods of extreme events, and consideration of sea level rise guidance to



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determine water level projections for 30-year and 75-year planning horizons. Field investigations were performed to catalogue existing conditions of seawalls, stormwater inlets and outlets, and backflow prevention devices along 21.4 miles of canals within the City's study area in early 2018. The analysis is in progress and will result in a 30-year projected water level and both public and private recommended actions to improve the city's resistance to tidal flooding events.

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APTIM Performing Outfall Inspections - Spring 2018



Flooding within the City of Delray Beach, October 5, 2017 – Courtesy of APTIM



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EXISTING AND POTENTIAL COASTAL THREATS

Beach Nourishment Funding

The beach nourishment program is largely funded by federal, state and county funding partners. In order to maintain these funding partners, the City must comply with the conditions of the agreements and pursue reauthorization prior to expiration of existing agreements.

Depletion of Nearby Sand Resources

There is a finite amount of beach compatible sand within the existing offshore borrow areas. These areas do not quickly recharge with sand due to their offshore distances and depth. The City is to conduct an offshore sand search to identify and permit borrow area(s) for future renourishment events.

Flooding

Map AD-15 (FEMA Flood Zones) depicts the flood zone designations of the areas within the Coastal Planning area and include Zones VE, AE, and X. While the city is at a slightly higher elevation than other urbanized areas in Miami Dade and Broward County, flooding associated with King Tides has been documented along Marina Way, Veteran's Park and other low-lying areas on either side of the Intracoastal for years. The Rising Waters Task Force identified three types of flooding:

- 🌊 Coastal flooding due to tides
- 🌊 Flooding due to inundation of the stormwater management systems and diminished capacity
- 🌊 Flooding due to rising water tables, leading to flooding in low lying inland areas.

Addressing these impacts is a priority for the City.

Sea Level Rise

The City of Delray Beach is a member of the Southeast Florida Regional Compact for Climate Change (SFRCCC) and is committed to collaborating with the Compact members to foster sustainability and climate resilience at a regional scale. Map AD-18 (Sea Level Rise)

depicts the properties impacted at 1 foot, 2 feet, and 3 feet of sea level rise.

Invasive Exotic Pest Plants

The Florida Exotic Pest Plant Council designates certain plant species as Category I and II Invasive Exotic Pest Plants, generally when the species is known to crowd out native plants and produce a profusion of seeds which are spread by wildlife and wind, contaminating other areas. The problem of exotics on Delray Beach are also shallow rooted, compared to native dune species, and more likely to uproot or wash out in a storm. (Barron, 2015)

Light Pollution

All of Delray's beach is nesting habitat for sea turtles. If light illuminates the nesting habitat it may discourage nesting females or cause disorientation of sea turtle hatchlings as they instinctually use the light of the moon to guide them to the ocean.

Saltwater Intrusion

Due to a dense population and the permeability of the Biscayne Aquifer, Southeast Florida is at a high risk of saltwater intrusion – higher than other areas in the state. An aquifer is defined as a geological formation containing or conducting ground water, especially one that supplies the water for wells, springs, etc. The Biscayne Aquifer extends from Monroe County to Palm Beach County and provides nearly all the water used by South Florida residents and businesses.

Saltwater intrusion occurs when large amounts of saltwater infiltrate an aquifer's fresh water supply, creating brackish water. This typically occurs when an aquifer's water supply is depleted at a faster rate than it is replenished. As non-permeable surface area increases due to development, the permeable areas that allow for rainfall to infiltrate the ground and recharge the aquifer decrease. Furthermore, increased development creates an increased withdraw demand, and a decrease in recharge potential. As the well fields draw inward, saltwater replaces freshwater. Intrusion



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of this nature is problematic, as it makes the water undrinkable – requiring expensive technology, such as reverse osmosis to make the water potable again.

The South Florida Water Management District's presentation titled "Five-Year Saltwater Intrusion Mapping Update" given to the Palm Beach County Water Resources Task Force on January 30, 2020 shows the saltwater interface/line migrating eastward, toward the ocean in the vicinity of the City of Delray Beach wellfield. The City strives to operate both of their eastern wellfields within the permitted water use allocation. This has helped to maintain low chloride levels and mitigate further westward migration of the saltwater interface.

Nearshore Artificial Nearshore Reef

During Community Workshops, residents expressed interest in creating a nearshore artificial reef as a recreational amenity. Incorporating a nearshore artificial reef is complicated for Delray Beach because of the city's unique geology. Although neighboring cities have swimmable nearshore reefs, the nearshore ridge complex doesn't exist in Delray Beach. Without a naturally occurring hard substrate underlying the sand, boulders deployed in the nearshore would eventually subside into the sandy bottom.

However, engineered materials such as a marine mattress could be incorporated into a design that would support boulders, prevent reef subsidence and allow deployment within a swimmable distance from the beach. Additionally, the potential artificial reef would need to be located in such a way that it is not affected by the City's federally authorized Shore Protection Project.

With proper field investigation, design and permitting coordination, it is possible for the City to locate an acceptable site for a recreational artificial reef. It is important to properly set expectations of the ecosystem that may colonize the artificial reef. Once

installed the reef will attract fish, and it is likely that flora and fauna such as opportunistic species of macroalgae, tunicates and sponges will colonize the reef, however, it is less likely that coral colonies will naturally recruit. If corals are important to the public's goals, there may be opportunities to participate in coral transplantation programs. Transplanting corals will require coordination with regulatory agencies and may include monitoring to ensure certain levels of success are met. The level of effort or scope of these tasks are unknown at this time.

The City coordinates with Palm Beach County's artificial reef program. The County is currently in the process of permitting a new artificial reef site offshore of Delray Beach. This project does not have funding or a vessel identified for use, and will require access from boats, yet within a matter of a few years, the City may have an additional recreational dive site.

NATURAL DISASTER PLANNING

Natural disaster planning in the Coastal Planning Area involves all disasters, including hurricanes, tornadoes, floods, freezes and droughts. Due to the City's geographic location, the emphasis is directed toward hurricane response, including hurricane preparation and evacuation, post-storm evaluation and clean up, and long-term post disaster redevelopment. As flooding is a key issue in the city associated with these Natural Disasters and can cause serious damage and potential loss of life, the City will continue to look for mechanisms to better monitor the "Peril of Flood" strategies as noted in F.S. 163.3178(2)(f).

Hurricane response plans are fully discussed in the City of Delray Beach Comprehensive Emergency Management Plan. The City has designated the Natural Incident Management System (NIMS) as the City's incident management standard for emergencies (including hurricanes) occurring within the city (Resolution 51-05). City personnel training is



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regularly updated through annual and pre-storm briefings, as tabletop exercises.




coastal flooding from tropical storm events, specifically the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model.

Evacuation Planning

The evacuation area in Delray Beach consists of the entire barrier island, together with mobile home parks, as directed by the Palm Beach County Division of Emergency Management. These areas are evacuated more because they can be isolated from emergency services than the threat of flooding.

Planning for evacuation is accomplished under the auspices of the Palm Beach County Division of Emergency Management. A coordinated program exists between that agency and the City, based on the Hurricane Evacuation portion of the Palm Beach County Comprehensive Emergency Management Plan. In Delray Beach, all of the barrier island would be evacuated in a category 1 hurricane, together with mobile home parks. In the case of more intense hurricane categories, the evacuation area would be expanded as stated in the City of Delray Beach Comprehensive Emergency Management Plan.








Map AD-12 (Evacuation Routes) depicts the three evacuation routes off of the barrier island, all of which provide bridges over the Intracoastal Waterway. Bridge operations are directed by the Coast Guard and Palm Beach County Emergency Management Division to assure safe evacuation. The evacuation routes are:

-  George Bush Boulevard to I-95, via Swinton Avenue and Atlantic Avenue
-  Atlantic Avenue to I-95
-  Linton Boulevard to I-95

Coastal High Hazard Area

This area, as defined in F.S. 163.3178(2)(h), is particularly vulnerable to the effects of

In summary, the significant aspects of hurricane evacuation planning are:

-  5,403 residential units are located within the City of Delray Beach Coastal High Hazard Area, (source: Palm Beach County Information Services, 2018)
-  Based upon Census data from Tracts 7410, 7412, part of 64.02, and part of 64.01, the estimated population in the Coastal High Hazard Area is 7,552 people, 2860 of whom live on the barrier island.
-  Evacuation routes can accommodate the population of the Coastal High Hazard Area with an evacuation time of 7-10 hours.
-  One designated hurricane shelter (Atlantic Community High School) is located within the city limits, with a total capacity of 5,760 based upon a standard of 20 sq. ft. per person.
-  There are no constraints to evacuation other than localized street flooding along evacuation routes and backlog traffic on I-95 and the Florida Turnpike, the regional evacuation routes.
-  There are no hospitals or facilities for groups with special needs in the Coastal Planning Area, except for a life care retirement community with a nursing home component on Linton Boulevard, on the west side of the Intracoastal Waterway. CM - 9
-  No significant changes in these conditions would be created through development allowed by the Land Use Map.

Long-Term Post Disaster Redevelopment

Post disaster redevelopment will replicate the existing land use pattern and character in the Coastal Planning Area. The Coastal Planning Area will remain primarily residential with a high



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level of public access to the beach. Commercial uses are restricted to the area along Atlantic Avenue and its intersection with SR A1A. Except as provided for post-disaster reconstruction, all redevelopment will be required to conform to existing criteria as described in the Land Development

Regulations. In addition to local regulations, the rules and regulations of the Florida Department of Environmental Protection regarding shoreline development (i.e. Erosion Control Line, Coastal Control Line, etc.) have been incorporated by reference in the Land Development Regulations.

RECOMMENDATIONS

The following needs and recommendations comprise tasks are needed to comply with existing state and federal permits, to execute

currently planned improvements to environmental systems within the Coastal Planning Area or reflect community desires.

Reef Recommendations:

- Monitor and protect the offshore reef in compliance with state and federal permits.
- Follow NFWF Acropora monitoring protocols
- Conduct turbidity monitoring during beach construction events in compliance with state and federal permits
- Continue coordination with Palm Beach County Artificial Reef Program to plan for future offshore artificial reef
- Continue monitoring of the reef pre and post-renourishment events regardless of permit requirements
- Study the possibility and cost of creating a near shore artificial reef.

Dune Recommendations:

- Perform annual maintenance of sand fencing, removal of exotic plants, replantings with native species, and pruning as prescribed in the City's Dune Management Plan (Barron, 2015)
- Scarp repair with sand and plantings as needed
- Lighting surveys in compliance state and federal permits and continued public education on light pollution
- Prune seagrapes in height and trim radially in compliance with permits
- Implementation of detailed dune management recommendations included in the Dune Management Plan (Barron, 2015)
- Increase public awareness associated with exotic contamination, provide maps and encourage their participation to eradicate non-native species.
- Coordinate with FDEP to develop and carry out a plan for remedial reduction of the seagrape footprint to predefined permit limits and replant with pioneer zone species.
- Review pruning methods and train Parks Staff in recognition and appropriate care of special dune areas, and rare species.



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Beach Recommendations:

- 🌈 Continue implementation of periodic beach renourishment program
- 🌈 Conduct an offshore sand search investigation and pursue permit modifications to incorporate the identified beach compatible borrow area(s)
- 🌈 City to pursue federal reauthorization prior to the expiration of the current project authorizations in 2023
- 🌈 Maintain 1 MCY of sand within permitted borrow areas so that the City is able to be resilient and respond to storm impacts swiftly if they are to occur.
- 🌈 Investigate new technologies such as in-line screening equipment to allow for use of borrow areas that may be considered marginal in quality due to rock or shell content
- 🌈 Survey the beaches at least annually regardless of permit requirements
- 🌈 Dependent upon impending storm and relative timing of the most recent monitoring beach survey, consider having additional pre-storm or post-storm beach surveys done
- 🌈 Continue to submit Local Government Funding Requests to the State for cost-sharing on permit required beach renourishment tasks
- 🌈 Monitor sea turtle nesting activities annually regardless of permit requirements as this information is useful data for future permitting and comprehensive dataset.
- 🌈 Conduct pre-turtle nesting season nighttime surveys, taking geotagged photographs of all point source illuminants visible from the nesting beach, allowing Code Enforcement time to proactively engage property owners and suggest resolutions before nesting begins.

Intracoastal Waterway Recommendations

- 🌈 Install backflow prevention devices on vulnerable stormwater outfalls
- 🌈 Complete Seawall Assessment, adopt standards, and prioritize seawall improvements on publicly owned lands
- 🌈 Preserve City-owned parcels
- 🌈 Create new Street end park improvements
- 🌈 Improve water quality and facilitate oyster beds
- 🌈 Maintain boating speed restrictions

Natural Disaster Planning Recommendations:

- 🌈 Continue to prohibit changes in future land use or zoning that would increase density or intensity within the Coastal High Hazard Area/Coastal Planning Area.
- 🌈 Continue to provide public outreach regarding storm preparedness and evacuation procedures and routes.

Climate Change & Peril of Flood Recommendations:

- 🌈 Create a Sustainability and Climate Action Plan.
- 🌈 Designate vulnerable areas based on the Sustainability and Climate Action Plan.
- 🌈 Update to the land development code to respond to climate change impacts, such as accommodating freeboard
- 🌈 Seawall and other infrastructure updates.



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CONSERVATION, SUSTAINABILITY AND RESILIENCY



DATA, INVENTORY, AND ANALYSIS



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

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CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

INTRODUCTION

Section 163.3177(6)(d), Florida Statutes, requires local governments to include a Conservation Element providing for the conservation, use, and protection of natural resources within its Comprehensive Plan. The City of Delray Beach (herein referred to as "Delray Beach" or "City") has elected to create an enhanced conservation element that also addresses sustainability and resiliency strategies for a comprehensive approach to managing the natural and built environment.

Conservation, sustainability, and resiliency are discrete but overlapping disciplines. Conservation acknowledges that some resources are finite, and should be preserved. Sustainability typically addresses the interdependence of environmental, social, and economic systems through management of resources to maintain their availability for future generations. Sustainable development is typically defined as development which meets the needs of the present without compromising the ability to meet the needs of future generations. Sustainable actions are those that conserve, maintain, support, and enhance the environmental, economic, and social systems. Resilience refers to the capacity of systems to recover quickly after adverse situations such as disruptions or disasters. Resiliency strengthens systems to prepare for shocks, absorb impact, and recover from, and adapt to both persistent threats or single events.

Urban resiliency has become an important goal for many local governments with the onset of climate change impacts such as rising temperatures, extreme weather events like drought or storms, sea level rise, and large volume precipitation events. Proactive adaptation planning calls for an innovative approach which plans for ecological conditions which might not be "normal" as characterized by past trends, but looks to the future and characterizes changing conditions which may currently be underway or anticipated by the science community. Sustainable policies such as curbing greenhouse gas emissions, or reducing energy and water consumption are important actions which can contribute to larger long-term resiliency and sustainability efforts to avoid the worst impacts of climate change.

Delray Beach is committed to addressing global climate change at a local level. Development of modern society and our reliance on fossil fuels, has caused the release of excess gases (Sulfur dioxide, Methane, Nitrogen oxide, Carbon dioxide), creating a layer of gas in earth's atmosphere which allows light to pass but traps heat, preventing its escape. Models predict earth's temperature will increase over the next 100 years anywhere from a 2-10-degree Fahrenheit temperature.

For Delray Beach climate change has the capacity to cause the following impacts:

- 🌈 Increased annual rainfall with higher volume rain events,
- 🌈 Warmer weather with increased heat waves,
- 🌈 Damage to ecological and natural systems,
- 🌈 Increased algae blooming,
- 🌈 Increased coastal erosion,
- 🌈 Greater flood risks,
- 🌈 Extreme weather events which may cause drought or coastal storm surge, and
- 🌈 Sea level rise which will threaten coastal infrastructure, water supplies, ecosystems, and potentially cause the inundation of stormwater systems.

Local governmental units have large conservation, resiliency, and sustainability potential because they provide citizens with goods, resources, and basic services such as drinking water, public, transportation, and waste management. Plus, local governments are largely vulnerable to resource challenges and climate change impacts. Local governance drives the consumption of materials and energy, regional economic growth, the local production of waste, and the emission of greenhouse gases. Local decision-makers have the ability to impact the level of resource use in the community and to manage economic growth in such a way that will ensure long-term viability.

An important philosophy of the City is to enhance the "triple bottom line". This concept combines social equity, economic, and environmental considerations. The phrase, "people, planet, and profit" is often used to describe the triple bottom



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

line and the goal of sustainability, which serve as a basis for the expansion of this Element. The social component provides benefit to many constituencies across socio-economic dimensions. The economic component incorporates concepts of gain for all sectors of the community and, finally, the environmental component that reduces the ecological footprint of the city by, among other things, carefully managing its consumption of energy and reducing manufacturing waste as well as rendering waste less toxic before disposing of it in a safe and legal manner. This includes improvements to overall environment of the city for the entire community.

The Conservation, Sustainability, and Resiliency Element employs a coordinated public policy and planning approach to maintain the protection and conservation of natural resources, to promote the acceptance of sustainable practices, and to proactively prepare for future disturbances by increasing community resiliency.

INVENTORY

The following section identifies the natural resources found within the Delray Beach Planning

Area and is prepared to facilitate review with the requirements of Section 163.3177(6)(d), Florida Statutes.

Florida Statutes provide, "[t]he following natural resources, where present within the local government's boundaries, shall be identified and analyzed and existing recreational or conservation uses, known pollution problems, including hazardous wastes, and the potential for conservation, recreation, use, or protection shall also be identified: [r]ivers, bays, lakes, wetlands including estuarine marshes, groundwaters, and springs, including information on quality of the resource available; [f]loodplains; [k]nown sources of commercially valuable minerals; [a]reas known to have experienced soil erosion problems; [a]reas that are the location of recreationally and commercially important fish or shellfish, wildlife, marine habitats, and vegetative communities, including forests, indicating known dominant species present and species listed by federal, state, or local government agencies as endangered, threatened, or species of special concern." Section 163.3177(6)(d), Florida Statutes.

TABLE CSR-A HYDROLOGY

Surface Waters
The Intracoastal Waterway
Lake Ida (80 acres)
SFWMD Canal C-15
Lake Worth Drainage District lateral canals and equalizers
Private water bodies used primarily as water retention areas
The Atlantic Ocean
Groundwater
Surficial aquifer system, an unconfined unit, it is the primary source of the City potable water supply through municipal wells.
Intermediate Confining Unit (Hawthorn Formation)
Floridan aquifer system, a confined unit, it is currently used to supplement the Surficial Aquifer system for potable water supply and is a potential long-term water supply resource with reverse osmosis treatment.
Wetland Areas
There are no publicly-held wetlands in the Delray Beach Planning Area.



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

TABLE CSR – B GEOLOGY

Soil Erosion
Construction Areas: after vegetation is cleared prior to construction parcels are highly subject to wind erosion.
Canal Areas: canal banks can erode, resulting in sediment build-up in the canals. This can be caused by runoff from adjacent streets or high-speed boat traffic.
Beach and Intracoastal Area: the Delray Municipal Beach experiences erosion from the ocean's winds, waves, and storms, and is mitigated by the Palm Beach County Shoreline Protection Plan. The soil behind seawalls can erode due to poor compaction or fluctuating water table and sea level heights. This type of erosion can be mitigated by backfilling and seawall repairs.
Areas containing Sandy Soils: areas containing sandy soils in conjunction with slope and intense water runoff are erosion prone.
Source: PBS&J Report, 1989 Delray Beach Conservation Element
Commercially Valuable Minerals
No commercially valuable minerals are being mined or extracted in the Delray Beach Planning Area. Some concentrations of coquina, dolomite and sand exist below the surface but are located in developed areas.
Source: Florida Mining Atlas
Hazardous Waste Sites
No hazardous waste sites are located in the Delray Beach Planning Area. The City has one waste transfer site located at 1901 SW 4 th Avenue that is leased to the Solid Waste Authority (SWA).

TABLE CSR – C Natural Environments

Native Ecosystems
Delray Oaks (24.48 acres, Low Oak Hammock)
Leon Weekes Environmental Preserve (12.37 acres, Florida Scrub)
Orchard View Park (5.94 acres)
Atlantic Dunes Park (4.64 acres, Beach Strand Community)
Hurricane Pines (0.14 acres, Florida Scrub)
Environmentally Sensitive Sites
Donnelley Tract (1.64 acres, Mangroves)
FIND Parcel MSA 645 (7.41 acres, Mangroves)
FIND Parcel MSA 650, known as Mangrove Park, (4.05 acres, Mangroves)
Hammock Reserve Preserve Area (4.86 acres, Oak Hammock)
Marine Habitat
Atlantic Ocean
Intracoastal Waterway
Continental Southwest Florida Reef Tract
Inter-tidal Habitat
Surf zone and Subtidal Habitat



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

TABLE CSR - D Species of Special Concern		
Plants		Mammals
Curtiss Milkweed		West Indian Manatee Threatened
Wild Cotton		Florida Mouse
Dancing Lady Orchid		Sherman's Fox Squirrel
Hand Fern		
Tropical Curly-grass		
Amphibians / Reptiles		
Loggerhead Turtle		Endangered & Threatened
Greenback Turtle		Endangered & Threatened
Leatherback Turtle		Endangered
Eastern Indigo Snake		Threatened
Florida Gopher Frog		
Gopher Tortoise		Threatened
Florida Scrub Lizard		
Birds		
Least Tern		Endangered
Scrub Jay		Threatened
Cedar Waxwing		
Burrowing Owl		
Limpkin		
Grasshopper Sparrow		Endangered
American Kestrel		
Sandhill Crane		
Short-tailed Hawk		
Black- whiskered Vireo		
Invertebrates		
Stoney Coral Species (such as <i>Acropora</i>)		Threatened
Florida Tree Snail		
Scarab Beetle		
Source: PBS&J Report, 1989 Delray Beach Conservation Element; United States Fish and Wildlife Service, <i>Environmental Conservation Online System</i> , (Last visited Sept. 9, 2018).		



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

PROTECT AND IMPROVE THE QUALITY OF THE CITY'S AIR RESOURCES

Clean air is a highly important natural resource which must be protected. Air pollution is known to be linked to decreased lung function, asthma, chronic bronchitis, irregular heartbeat, heart attack, and early death for those suffering from heart or lung disease. Arden Pope III, *Environmental Health Perspectives*, 2000. Certain populations are more susceptible to health risks from air pollution, such as young children and infants, the elderly, and individuals with chronic conditions. Paul Mohai *et al.*, *Environmental Justice*, 2009.

The National Clean Air Act, requires the United States EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment.

The Florida DEP maintains a comprehensive ambient air monitoring network involving over 220 monitors positioned across the state. In 2016, a monitor for particulate matter was relocated from the AG Holley site in Lantana to a site off of Congress Avenue proximate to Atlantic Avenue (AQS Site #12-099-2005). Florida DEP, 2016-2017 *Annual Air Monitoring Network Plan*.

In late 1993, the Florida DEP (DEP) submitted a request to the United States Environmental Protection Agency (EPA) to re-designate the Southeast Florida Area (Dade, Broward, and Palm Beach County) from non-attainment to a maintenance area for ozone (effective 1995). The region has been in maintenance status, and continued compliance with air quality standards is anticipated. It has been achieved to date through new control methods including less evaporative gasoline, vapor controls for retail gasoline fueling, and replacement of older vehicles with less polluting ones. In addition, gasoline dispensing facilities within the city have been outfitted with vapor recovery systems, and all underground corrosive (steel) storage tanks have been replaced.

The Palm Beach County Department of Health maintains an Air Quality Index online and is responsible for programs supporting the permitting and licensing of air pollution sources; conducting inspections and enforcing air pollution regulations;

encouraging effective growth management programs including transportation planning; promotion of pollution prevention and conservation; technical assistance to residents reporting indoor air pollution; control of open burning; asbestos abatement and building demolition; and monitoring molds and moistures in the atmosphere. The air quality within Delray Beach and Palm Beach County as a whole continues to comply with all National Ambient Air Quality Standards.

The National Oceanic and Atmospheric Administration through the National Weather



Service has partnered with the United States EPA and provides daily air quality forecasts as part of a national Air Quality Forecasting Capability.

Palm Beach County has generally good air quality throughout the year. The City of Delray Beach is encouraged to continue to participate with regional and state efforts to maintain current air quality levels in conformance with the National Air Quality Standards.



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

Smoke-Free Environment

In order to protect air quality in the Delray Beach Planning Area the City has adopted a smoke-free policy on the Delray Municipal Beach, a tobacco ban for City employees, and an ordinance limiting e-cigarette or vape use to outdoor areas only. The City will continue to maintain these practices.



Greenhouse Gas Emissions

Reducing greenhouse gas emissions within the Delray Beach Planning Area will improve air quality, contribute to broader efforts to combat climate change, and translate into energy cost savings in the community. As the City graduates to relying on cleaner energy technologies to support its existing and future capital investments, community stakeholders and residents will also transition to more sustainable practices. If the growing global energy demand continues to be met mostly with fossil fuels, it is expected that earth's average temperatures and levels of atmospheric carbon dioxide will continue to increase. Delray Beach prioritizes the transition to cleaner energy technology in order to protect local air quality.

Delray Beach pledged to participate in the Sierra Club Cool Cities Program in 2006, and is committed to reducing greenhouse gas at a local level by conducting a greenhouse gas emission inventory, creating a reduction plan, monitoring progress, and implementing a greenhouse gas reduction plan.

Quick Fact:

In 2015, Florida was the fourth largest carbon dioxide emission emitting State in the United States. Source: United States Energy Information Administration, *Rankings: Total Carbon Dioxide Emissions, 2015*.

Delray Beach also committed to adopt, honor, and uphold the United Nations / Framework

Convention on Climate Change (2015), Adoption of the Paris Agreement, 21st Conference of the Parties, Paris: United Nations (or Paris Agreement) goals through the Mayors National Climate Action Agenda and the United States Conference of Mayors. Climate Mayors, *Members*, CLIMATE MAYORS, (last visited Sept. 10, 2018); The United States Conference of Mayors, *Meet the Mayors* (last visited Sept. 10, 2018). The Paris Agreement encourages government entities to inventory, track, and curb greenhouse gas emissions. These climate initiatives represent collective action towards intensifying efforts not to exceed temperature increases of more than 1.5 degrees Celsius and to create a 21st century clean energy economy, both of which are key initiatives in the Paris Agreement.

A greenhouse gas inventory is a tool which can be utilized by Delray Beach to identify its emission contribution, set reduction targets, and to develop strategies to reduce city and community-wide emissions, while tracking the progress of such strategies. A typical greenhouse gas inventory pursued by a city would include an analysis of emission sources from both citywide operations (emissions related to facilities, vehicles, and infrastructure owned by Delray Beach) and community-wide aspects.

A community-wide inventory identifies the emissions originating from activities such as transportation and mobile sources; commercial electricity and natural gas consumption; residential electricity and natural gas consumption; water and wastewater treatment, nitrification, denitrification, and the electricity consumed from potable water and wastewater treatment; solid waste energy consumption, and fugitive emissions from natural gas distribution. A City operations inventory accounts for the same activities but from City owned and operated sources. A City operations greenhouse gas inventory is considered a subset of the community-wide inventory.

City and community-wide inventories are necessary to effectively plan to reduce emissions overtime. Delray Beach would benefit from a greenhouse gas emission forecast to understand how factors such as energy use, water use, and



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transportation might affect emissions under a business as usual scenario. A business as usual scenario assumes no policy or technological changes are put in place to affect the initial greenhouse baseline inventory analysis. By comparing the business as usual forecast with a greenhouse gas inventory baseline, Delray Beach can evaluate targeted investments to reduce emissions.

To effectively support broader efforts to reduce emissions, local governments across the nation are adopting greenhouse gas reduction targets. Greenhouse gas reduction targets can be identified for City operations or community-wide activities.

REDUCTION OF FOSSIL FUEL DEPENDENCE

Improving atmospheric conditions in Delray Beach can also be accomplished through support of a diversified transportation system, promotion of compact urban design, and use of cleaner vehicles. The existing transportation network can be enhanced to further support bicycle and pedestrian traffic, public transit, and automobiles. Sustainable design includes multimodal connectivity between neighborhoods and

economic centers to facilitate different modes of travel.

Increasing the use of alternatively fueled vehicles is another way to protect air quality. By promoting the use of alternative transportation modes such as buses, the Downtown Roundabout Trolley, carpools, and bikes, the Delray Beach will conserve resources, reduce traffic, and increase social equity.

Delray Beach operates a free fixed-route trolley service, the Downtown Roundabout Trolley, providing public transportation throughout downtown Delray Beach, connecting the Tri-Rail station to the beach via Congress Avenue and Atlantic Avenue. The City is in the process of considering adding a point-to-point service within the downtown to augment the fixed-route system. The Downtown Roundabout Trolley is an excellent means of alternative transportation and its possible expansion or augmentation connecting to other modes would increase community sustainability and resiliency.

Delray Beach Rail Transit

Delray Beach is currently serviced by two passenger rail services: Amtrak Passenger Rail and Tri-Rail commuter rail services. Both rail services use the CSX railroad line, which is located west of I-95. Tri-Rail provides commuter transportation for Palm Beach County, Broward, and Dade County residents. The Delray Beach Tri-Rail Station is located behind the South County Government Complex south of West Atlantic Ave, off of Congress Avenue. The Station has bicycle lockers, bicycle racks, parking, and has connection stops for the Palm Tran and the Downtown Roundabout Trolley.

Tri-Rail is in the process of preparing to provide additional passenger rail service on the Florida East Coast (FEC) railway, which runs through the downtowns of the coastal communities in the region. In preparation of the new Tri-Rail Coastal Link commuter rail service, the City recently adopted the Delray Beach Tri-Rail Coastal Link Transit-oriented Development Master Plan. The plan was a multi-agency effort led by the Treasure Coast Regional Planning Council in conjunction with the South Florida Regional Transportation





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Authority and the Palm Beach County Transportation Agency, funded by the Federal Transit Authority and the Delray Beach Community Redevelopment Agency.

The plan identifies the location of the future station and provides recommendations for the ½-mile area surrounding the station, including transit-oriented development techniques, and bike-pedestrian infrastructure improvements. A Tri-Rail Station in the center of downtown Delray Beach will ultimately enhance livability, expand multi-modal transportation opportunities, create enormous economic growth opportunity for local businesses, and provide regional connectivity for commuters and visitors alike. South Florida Regional Transportation Authority, *Tri-Rail Coastal Link Station Area Opportunities*, 2013, *Tri-Rail Coastal Link Transit-Oriented Development Master Plan*, 2018.

To reduce vehicle traffic within Delray Beach and protect air resources the City will continue to support rail transportation connectivity within the region.

Bicycle and Pedestrian Opportunities

Increased bicycle and pedestrian traffic within the Delray Beach Planning Area can be further enhanced by strategies promoted by the Bicycle Friendly Community Program and the Pedestrian Friendly Community Program. The Walk Friendly Community Program is a nationally recognized tool for improving walking conditions and promoting pedestrian safety. The Bicycle Friendly Community Program was established by the League of American Bicyclists which provides a roadmap for improving bicycle conditions within individual communities and participating jurisdictions receive a detailed report and community rating.

Multi-Modal Strategies

The Palm Beach Transportation Planning Agency completed a 2017 US-1 Multimodal Corridor Study to examine improved pedestrian and bicycle safety, and to promote the Palm Beach County Palm Tran Bus Service. The study has been converted into a corridor project which includes (short-term and long range) recommendations to improve the segment of US-1 that runs through the

Delray Beach Planning Area, with new bicycle and pedestrian features. The improvements will include the addition of new bicycle lanes, converting existing bicycle lanes into buffered bicycle lanes, road resurfacing, the addition of green space and street trees with stormwater management features, and upgraded pedestrian intersection crossings. Palm Beach Transportation Planning Agency, *US-1 Multimodal Corridor Study*, 2018.

A number of multi-modal improvements are planned by the Palm Beach Transportation Planning Agency for the Delray Beach Planning Area contained in the *List of Priority Project FY 2020-2024*.

Promoting sustainable transportation modes in Delray Beach will attract new residents while meeting the needs and desires of current residents who appreciate convenient public transportation, a bicycle friendly atmosphere, and strategies to enhance transit while conserving fuel and energy.

Fuel Efficient Vehicles

Policies and programs can be employed to promote fuel-efficient vehicle use within Delray Beach and transition the City fleet to cleaner technologies. Increasing the efficiency of the City fleet not only will improve air quality and reduce greenhouse gas emissions, but the City will realize fuel-related cost savings overtime. To depart from gasoline powered vehicle, use within Delray Beach, the City could undertake an electric changing station needs assessment, City fleet right sized vehicle study, and pursue electric vehicle infrastructure training.

Quick Fact:

Electric vehicles require substantially lower fuel cost per mile than gasoline vehicles.

The annual greenhouse gas emissions emitted by a gasoline vehicle is approximately 11,435 pounds of CO₂ equivalent; whereas, an all-electric vehicle only emits 4,664 pounds of CO₂ equivalent.

Source: United States Department of Energy, *Florida Transportation Data for Alternative Fuels and Vehicles*, (last updated Mar. 14, 2018).



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Currently, the City provides three free public electric vehicle charging stations located within the Banker's Row parking lot. In addition to public infrastructure, new private development must comply with charging station requirements. Within the Central Business District (CBD), all new parking must provide 3% as alternative fuel spaces, which accommodate both electric vehicles charging stations and an outlet for recharging golf carts.

CONSERVATION, EXISTING USE, AND PROTECTION OF WATER RESOURCES

Groundwater

Groundwater is water beneath Earth's surface, captured in soil or rock pores and fractures. Underground soils and rock formations that are saturated are known as aquifers. Aquifers are considered either confined or unconfined. Unconfined aquifers are bounded by permeable rock and recharged by soil and rock layers above from precipitation. Confined aquifers are bounded by impermeable or semi-permeable formations, where recharge from precipitation occurs from rock or formation fractures.

Florida's geology is predominantly Karst in nature consisting of carbonate rich formations that are characterized by underground streams, fissures, sinkholes, and other related connections, allowing aquifer recharge through rainfall. Because of this Karst topography, surface and groundwater in southeast Florida are closely interrelated as part of the hydrologic system—effective management of both is crucial to maintaining a safe, quality water supply.

The Surficial aquifer system, an unconfined unit, is the primary source of the City's potable water supply through municipal wells. The City's City has one Floridan water supply well which aquifer storage and recovery well taps into the Floridan aquifer system, a confined unit. This well and can be used to store water during low water demand times to supplement the surficial aquifer system for potable water supply during high demand and is a potential long-term water supply resource which would require more expensive treatment such as reverse osmosis, could be blended with the surficial raw water and treated with membranes in the future.

Wellfield Protection

Palm Beach County maintains a Wellfield Protection Program and has established zones of protection around wellfields which pump drinking water from the surficial aquifer. The zones are codified in the Palm Beach County Unified Land Development Code, Article 14, Chapter B, and are protected by the Palm Beach County Wellfield Protection Ordinance which regulates the existing and new nonresidential use, handling, storage, and production of hazardous and toxic materials within the zones of influence of the wellfields.

Water Supply

Delray Beach withdraws from 30 active Surficial aquifer system wells in four wellfields (Eastern, Morikami, Golf Course and 20-Series) and 1 Floridan Aquifer system. The City holds a water use permit (WUP) from the SFWMD, Water Use Permit No. 50-00177-W (issued Dec. 20, 2010; expires Dec. 20, 2030). The City's water use permit was first issued in 1975, having since been modified three times, and renewed six times by the SFWMD, Water Use Permit No. 50-00177-W. The location of wellfields is portrayed on Map AD-20 (Wellfield Protection Areas).

TABLE CSR - E Delray Beach Permitted Water AllocationWater Usage		
Annual Allocation	Monthly Allocation	Daily Allocation
6,972 million gallons	654 million gallons	19.19 million gallons per day

As governed by the permit, annual groundwater allocation shall not exceed 6,972 million gallons annually, or 19.10 million gallons per day (MGD). Currently, more than 1,000 domestic wells within the Delray Beach Planning Area are mostly used for irrigation. There are no major groundwater recharge areas in the Planning Area, however, the eastern portion of Palm Beach County has been identified as a prime aquifer recharge area by the U.S. Geological Survey and the Palm Beach County Comprehensive Plan. SFWMD, Water Use Permit No. 50-00177-W.



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The Florida DEP and the Department of Health both have responsibility for monitoring the quality of public drinking water. The Well Surveillance Program was created by the State of Florida in 1984, to ensure potentially contaminated wells are located and tested. The Palm Beach County Health Department personnel are responsible for field sampling and surveys. The City of Delray Beach does not have any ground water quality problems. However, there are several potential sources of contamination within the radius of influence of the city's wellfields. These sites are either closed, undergoing remediation, or have ongoing investigations. The point source problem identified in 1988, in the Series 20 Wellfield (Aero-Dri site), has been mitigated through the use of air scrubbers at the water treatment plant. Water quality has improved to the extent that air scrubbers are no longer in use.

To reduce the possibility of soil and groundwater contamination, the Florida Department of Environment Protection mandated the replacement of all single-wall non-corrosive underground storage tanks and piping with double-wall systems (effective Dec. 31, 2009).

The Delray Beach water supply is tested regularly for contaminants on the list of the United States EPA primary and secondary drinking water standards. The potential movement of contaminants from known pollution sources as a result of withdrawal of the permitted allocation is considered minimal. SFWMD, Water Use Permit No. 50-00177-W.

Water Conservation, Saltwater Intrusion, and Projected Need for Water Resources

The Floridan aquifer system contains water with higher chlorides throughout southern Florida than are experienced in many other parts of the state. Saline intrusion has been a concern for Delray Beach's eastern wellfields due to the proximity to the Intracoastal Waterway and the Atlantic Ocean. To effectively move withdrawals further west, the City of Delray Beach constructed six surficial wells, western (20-Series wellfield)s. To avoid saltwater intrusion, withdrawals from eastern wellfield wells are restricted and operated on a daily rotation. Only the 20-Series (western location) wellfields are consistently in use.

Delray Beach utilizes one water treatment plant (WTP) with a potable water distributed system to provide water for users. The City's related capacity for the WTP is 26 million gallons per day and uses lime softening for treating water from the Surficial aquifer system according to the Lower East Coast Regional Water Supply Plan (2018). The City has six emergency interconnects with neighboring municipal water systems (Boynton Beach, Palm Beach County Utilities and City of Boca). To prevent any changes in location, timing, and volume of withdrawals from the Lower East Coast Everglades Waterbodies with increased water demand, the City has replaced permitted Surficial aquifer system irrigation withdrawal systems with reclaimed water within the Delray Beach service area. The entire demand of the city will be met by withdrawals from the Surficial aquifer system.

The City projects optimizing use of the Florida aquifer system which can be accomplished without exceeding maximum concentration levels of chloride. The City will continue to: operate the eastern wellfields according to permit restrictions (effective Apr. 11, 1991), monitor wells within the Planning Area, and maintain chloride concentration data.

The City will continue to operate its wellfields according to the water use permit and to monitor wells within the Planning Area and maintain chloride concentration data.

Between 2003 and 2016, the City installed a phase I of a reclaimed water system with a re-pump station adequate to serve the barrier island infrastructure in the south-east service area, and approximately 20 miles of transmission and distribution lines, with a system capacity of 3.0 MGD and 2020 demand flow of 2.29 MGD.

The SFWMD provides cost-share funding for alternative water supply projects. From FY2013 through FY2018, the SFWMD provided more than \$11 million in funding for 31 projects Districtwide. The City received funds for three projects:

1. Reclaimed Water System – Area 12A Phase I (2013) 0.11 mgd
2. Reclaimed Water System - Area 12A Phase II (2014) 0.08 mgd



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

3. Reclaimed Water System Expansion – Area 12C (2017-2018) 0.16 mgd

City reclaimed water customers average about 2.5 million gallons per day (MGD) of irrigation use with an anticipated expansion of the system to about 3.8 MGD by 2025 to meet the ~~Leah Schaeffer Ocean Outfall Legislation~~ Ocean Outfall Law requirements. The ~~2003~~ 2016 reclaimed water master plan identified ~~45~~ 16 reclaimed water service areas and recommended developing and expanding the system based on proximity to the SCRWTP and the highest irrigation use. There are currently ~~570~~ 600 metered connections to the reclaimed water system, primarily on the barrier island, with the biggest users consisting of the golf courses and homeowner associations. The City is in the process of expanding the reclaimed water distribution system, by adding at least an additional 50 customers. As the major reclaimed water trunk lines are installed, the City connects customers whenever physically possible along a corridor route. When the reclaimed system is complete, it is estimated that it will offset as much as 4.7 3.93 MGD of potable water, reducing irrigation withdrawals from the Surficial aquifer, shaving peak demands often caused by irrigation, and deferring capital costs required to develop expensive alternative water supplies for potable water use. The City's reclaimed water system, along with other conservation measures, has helped stabilize the average water use to approximately 16.5 14.9 MGD, despite growth.

The City has also converted its aquifer storage and recovery well in the upper Floridan aquifer to a public water supply well to supplement withdrawals from the Surficial aquifer during periods of repairs and maintenance. Withdrawals from the Floridan aquifer system are limited to 1.5 MGD in order to keep the chloride level in the blended water to within the water quality requirements.

Significant improvements to water use operations in Delray Beach have been achieved:

- 🌿 Landscape Regulations are codified in the Delray Beach Land Development Regulations, Section 4.6.16. The Section provides the conservation of potable and non-potable water; the implementation of Florida-friendly

landscaping principles; proper tree selection adjacent to or within utilities to mitigate damages which may be caused by trees; encouraging the creation or preservation of open space; maintaining permeable land areas essential to surface water management and aquifer recharge; encouraging the preservation of existing plant communities; encouraging the planting of site specific, native and drought tolerant plant materials; establishing guidelines for the installation and maintenance of landscape materials and irrigation systems; reducing air, noise, heat, and chemical pollution through the biological filtering capacities of trees; reducing the temperature of the microclimate through the process of evapotranspiration; and promoting energy conservation through the creation of shade. The standards are to be considered minimum standards which may be increased as applicable.

- 🌿 Chapter 59, of the Delray Beach City Code of Ordinances requires the use reclaimed water for irrigation of residential and nonresidential lawns, golf courses, cemeteries, parks, landscaped areas, edible crops (as set forth in Chapter 62-610, Florida Administrative Code), highway medians, dust control, on construction sites, mixing of concrete, and cleaning of roads and sidewalks is mandatory within the city where the connection is available.
- 🌿 The City Code adopts the mandatory year-round water restrictions from 40E-24 in the Florida Administrative Code. In times of crisis both the City and SFWMD may impose restrictions on the outdoor use of water (irrigation, car washing, etc.) pursuant to F.A.C. Chapter 40E-21.
- 🌿 The City has adopted the Florida Building Code which requires ultra-low volume plumbing fixtures.
- 🌿 Leak detection program: in 2018, the City finished migrating from an automatic meter reading system to an advanced automatic metering infrastructure metering system for over 22,000 meters. The advanced metering infrastructure can identify areas of water loss,



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abnormally high-water use, and reduces the duration of leaks.

- The City uses a water conserving or inverted rate structure, where water rates increase with increasing use, which encourages conservation and reduction of use.
- In 2018, the Utilities Department initiated an enhanced water conservation program with components such as public information outreach at City events, and a water conservation outreach effort to 5th grade students in city public schools.

While such efforts have been sufficient in the past, greater demands upon the area's water resources dictate that additional water conservation measures, particularly those directed toward reduction in normal consumption, irrigation use, Florida friendly landscaping, and leak detection and repairs, should be continued by the City.

Previously, it was predicted that the demand for water use in agriculture would decrease over a ten-year period, based on the anticipation that the few remaining agricultural uses would be abandoned in favor of residential development. The Saltwater Brewery, a craft microbrewery with tasting room that opened in 2013, is one example of a local food production business that impacts water use. Local agricultural or food production activities should be monitored for their impact on water use, and sustainable practices used where feasible, in order to effectively manage demand.

The overall demand for water by commercial and industrial uses is calculated as a part of the per capita demand upon which water needs are projected. No special needs have previously been identified for industrial water through the intensification of industrial uses. The impact of new businesses on water use should be monitored in planning.

The City expects a demand of 6,752,619,400 million gallons (48.516.97 MGD) annually by 2030, based on an estimated population of 82,556,78,374. There are eight additional Surficial aquifer system wells proposed in the current SFWMD WUP, and because some of the existing wells have diminished capacity and water demand is starting to rise, the City plans to evaluate wellfield limits,

rehabilitate and/or replace placing some wells and developing alternative water resources. Per capita use rate is expected to be reduced largely due to the expansion of reclaimed water use, new leak detection technology, and potable water use for irrigation. SFWMD, Water Use Permit No. 50-00177-W.

Surface Water Quality

The Florida DEP and the Department of Health both monitor water quality. The Florida DEP has included Lake Ida, the E-3 and E-4 Canals, and the Intracoastal Waterway in the list of impaired waterbodies within Palm Beach County. Waterbodies on this list have been verified as impaired for a particular pollutant. Waterbodies verified as impaired are described as follows:

The "verified list" is the list of Florida's waterbodies that fail to attain any of its designated uses and/or meet the minimum criteria for surface waters established in the Surface Water Quality Standards (62-302, F.A.C.) and the Impaired Waters Rule (IWR, 62-303, F.A.C.). The entire state of Florida is divided into five basin groups in which each waterbody is re-assessed on a rotating basis every five years. If a waterbody is assessed as impaired, a TMDL (Total Maximum Daily Load) must be developed to determine the maximum amount of a pollutant that a waterbody can receive and remain healthy. Once a TMDL has been completed, the waterbody is removed from the verified list regardless of whether or not the waterbody meets standards.

The Total Maximum Daily Load is the maximum amount of a given pollutant that a water body, such as a canal, river or an estuary, can absorb and still maintain its designated uses. Designated uses include; drinking, fishing, recreation, and shellfish harvesting. The purpose of a Total Maximum Daily Load, is to limit pollutant loading to water bodies that are not meeting their intended uses and therefore determined to be impaired by Rule, based on water quality monitoring. Pollutant loading reductions are placed on known pollutant sources such as drainage systems and other permitted discharges. Impaired waterbodies in the Delray Beach Planning Area are listed below in Table CSR-F.



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

Within the Delray Beach Planning Area, Lake Ida is the southernmost of five interconnected lakes called the Chain-of-Lakes. The Chain-of-Lakes is an integral part of the drainage system for central and southern Palm Beach County. While these waterbodies are lakes, the hydrology is atypical of a lake/watershed regime, due to the interconnection with the Central and Southern Flood Control Project, and the Lake Worth Drainage District.

As part of a Chain-of-Lakes restoration project Palm Beach County has removed existing muck sediments, graded the shoreline, excavated channels to create wetland habitat, and added wetland plants and trees. Continued natural restoration activities will improve the water quality of Lake Ida.



TABLE CSR-F			
Delray Beach Verified Impaired Waterbodies			
Water Segment Name	Waterbody ID	Parameter	Comments
Intracoastal (Palm Beach County)	3226F3	Copper	This waterbody is impaired for this parameter based on planning period data and is being added to the 303(d) List. This WBID was created from the retired WBID 3226F that was on the Verified List for this parameter.
E-4 Canal	3262	Nutrients (Chlorophyll-a)	This waterbody is impaired because the annual average Chl-a value exceeded the listing threshold of 20.0 µg/L in 2002 and 2008. Based on TN/TP ratio median of 8.63, TN was identified as the limiting nutrient. New listing from cycle 2.
Lake Ida	3262A	Biology	This waterbody is impaired for this parameter based on failing bioassessments and nutrients have been determined to be the causative pollutant. This parameter is being added to the 303(d) List.
Lake Ida	3262A	Nutrients (Chlorophyll-a)	This waterbody is impaired for this parameter. The annual geometric means exceeded the nutrient criteria more than once in a three year period. This parameter is being added to the 303(d) List.
Lake Ida	3262A	Nutrients (Total Phosphorus)	This waterbody is impaired for this parameter. This parameter was assessed against the minimum nutrient criterion because corrected chlorophyll-a annual geometric means exceeded the applicable chlorophyll-a threshold. The annual geometric means exceeded the nutrient threshold more than once in a three-year period. This parameter will be added to the 303(d) list.
E-3 Canal	3262D	Nutrients (Chlorophyll-a)	This waterbody is impaired because the annual average Chl-a value exceeded the listing threshold of 20.0 µg/L in 2002, 2007, and 2008. Based on TN/TP ratio median of 10.55, TN was identified as the limiting nutrient.
Source: Florida DEP, <i>Comprehensive Verified Impaired Waterbodies List</i> , 2018.			

Palm Beach County monitors and manages the Chain-of-Lakes, and periodically produces reports detailing the condition of the Chain-of-Lakes, including Lake Ida. The County also maintains the Chain-of-Lakes Water Quality Monitoring Program to protect, restore and enhance the natural resource values the lakes.

Historical and recent water quality data reveals concentrations of total nitrogen, total phosphorus, and chlorophyll-a in Lake Ida are highly variable. Delray Beach should continue Lake Ida restoration efforts and create policies to reduce overgrowth of algae biomass which can cause excessive algae and diminish the ecological functions of Lake Ida. From north to south in the Chain of Lakes, there has been an increase in pH values—8.01-8.11. High pH



CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

can be an indicator of pollution or other environmental conditions. Palm Beach County, *Palm Beach County Chain-of-Lakes Water Quality Evaluation and Analysis*, 2015.

The Florida Healthy Beaches Program of the Florida Department of Health monitors water quality at Florida's beaches. Since 2000, the Beach Water Sampling Program has conducted periodic beach water sampling of the 30 coastal counties in Florida, with weekly water sampling since 2002. In 2016, Florida Healthy Beaches Program of the Florida Department of Health adopted new water quality criteria for the Program from the U.S. EPA 2012 Recreational Water Quality Criteria.

Chapter 2008-232, Laws of Florida, created the ~~Leah Schad Memorial~~ Ocean Outfall Program, which prohibits the construction of new domestic wastewater ocean outfalls and the expansion of existing outfalls. The law requires domestic wastewater discharge through ocean outfalls to meet advanced wastewater treatment and management requirements and establish a timeline for the elimination of existing discharges except as backup (by 2025). Six ocean outfalls are located along the Florida's Southeast coastline, one of which is located on the border of Boynton Beach and Delray Beach.

The South Central Regional Wastewater Treatment Facility is co-owned by the Cities utilities of ~~Boynton Delray Beach~~ and ~~Boynton Delray Beach~~ and is operated pursuant to Interlocal Agreement. SCRWTF no longer does not regularly discharge through an ocean outfall; thus, the Atlantic Ocean and beach area do not show any indications of pollution. The South Central Regional Wastewater Treatment and Disposal Board holds the permit for the outfall located within the Delray Beach Planning Area. The irrigation quality reclaimed water plan is 10 MGD, with the entire rated capacity of the plant at 24 MGD. It is currently be expanded to a capacity of 30 MGD. The facility disposes of its treated wastewater through deep injection wells and/or through irrigation reuse. The City Cities and the South Central Regional Wastewater Treatment and Disposal Board initiated a wastewater effluent reuse program for irrigation in 2003, to reduce effluent disposal to the ~~Boynton/Delray Beach~~ ocean outfall and as a

demand management and potable water conservation measure, which helps defer more costly alternative water supply and treatment options.

The ~~Boynton/Delray Beach~~ ocean outfall is currently only used to handle peak flows during significant wet weather events, during mechanical integrity testing of its deep well to exercise ocean outfall pump stations, or as an emergency disposal method. Florida DEP, Division of Water Resource Management, *Implementation of Chapter 2008-232, Laws of Florida Domestic Wastewater Ocean Outfalls*, 2015. According to the Lower East Coast Water Supply Plan (2018), the 2025 reuse target for the South Central Regional Wastewater Treatment Facility is ~~13.30~~ 11 million gallons per day.

An additional deep injection well hasis being been designed and planned for drilling, testing and permitting within the next five four years. While only small amounts of treated wastewater are disposed through the outfall and plans for to phase out all ocean discharges are ongoing, the City of Delray Beach should continue to work with the South Central Regional Wastewater Treatment and Disposal Board to ensure management plans account for increase volume participation events, sea level rise, and emergency situations which could involve power outages.

Surface Waters

Waterways in the Delray Beach Planning Area are used for swimming, boating, fishing and other recreation activities. The Intracoastal Waterway has three commercial marinas (Delray Harbor





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Club, Delray Beach Yacht Club, and Marina Delray) and one municipally operated marina. Three City parks, two of which provide boat launching facilities, are located along the Intracoastal Waterway. Other public access points along the Waterway are via street ends. The Delray Beach Marina maintains approximately 22 slips. Extensive boat traffic originates from marinas and waterfront properties within Delray Beach, and locations outside the city.

Lake Ida is extensively used for boating. On the west side of the lake is a regional park, and a neighborhood park is located on the east side, both are operated by Palm Beach County. North of Lake Ida Park, partially within the City of Boynton Beach, Delray Beach has acquired a small parcel that is currently not programmed. Restoration of the parcel will improve lake water quality. The Palm Beach County Department of Environmental Resource Management, *State of the Lakes*, report recommends monitoring the water quality, conducting aquatic management surveys, and enhancing shorelines through removal of upland and aquatic exotic vegetation, as well as establishing native wetland and aquatic plant populations (1997).

There is no commercial usage of the South Florida Water Management Canal (C-15) nor of the several Lake Worth Drainage District laterals and equalizer canals. The only recreational use of the canals is for small craft.

There is no commercial use of the private water bodies within the Delray Beach Planning Area, nor is there significant recreational use since they are used primarily as water retention areas and use is restricted by SFWMD and the Lake Worth Drainage District regulations.

No commercial use is located along the shoreline of the Atlantic Ocean within the city, except for the concessions renting cabanas and recreational equipment, and the permitted parking of Sailboats. The one and one-half miles of municipal beach are a major recreational center.

Recreational and commercial boat traffic on the Intracoastal Waterway and Lake Ida may see an increase, due to the proposed "Intracoastal

Waterway Plan for Palm Beach County" and the Blueway Trail project of the Treasure Coast Regional Planning Council and Palm Beach Transportation Planning Agency. The goal of the Intracoastal Waterway Plan, is to preserve working waterfronts and build the regional economy and quality of place through improved linkages to enhanced environmental and cultural assets. Recommendations impacting Delray Beach in this context include support of the development of a marina village in Delray Beach, support for ecotourism, and a possible countywide water taxi service and high-speed ferry service. Two water taxi stops are proposed in or adjacent to Delray Beach.

The Blueway Trail project is one future use recommendation of the Intracoastal Waterway Plan, designed to foster eco-tourism. The Trail will provide two-way connectivity between the Chain of Lakes, Lake Worth Lagoon, Intracoastal Waterway and the Atlantic Ocean. The project will have a boat-lift and portage system. It will also include a pier at the boatlift, and refurbishment of existing natural habitats and upgrades to existing fishing piers. The boatlift will be located at Spillway Park on a canal dividing Lake Worth and West Palm Beach, and is designed to accommodate boats shorter than 23.5 feet, no more than 5.5 feet above the water line. The preliminary feasibility analysis and engineering plans were completed in 2017, but project permitting is expected to take 2 years.

CONSERVATION, EXISTING USE, AND PROTECTION OF MINERAL AND SOIL RESOURCES

Commercially valuable minerals are not mined or extracted in the Delray Beach Planning Area and there is not any active or inactive mineral mining sites. There are concentrations of coquina, dolomite, and sand below the surface throughout the city.

Soil erosion is not a concern, except beach erosion, which is mitigated by the Palm Beach County's Shoreline Protection Plan Program discussed later in this document. Detailed information can also be found in the COASTAL MANAGEMENT ELEMENT.



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The non-coastal related erosion problems identified (within the 1989 Delray Beach Conservation Element) are governed by Ordinance No. 53-87. The Ordinance sets out soil erosion control methods, standards, and procedures required to be used in the Delray Beach Planning Area. The ordinance provides specific management strategies for soil erosion in connection with land development, land clearing, grading, filling and excavation, the construction of buildings and utilities, paving activities, drainage facilities demolition, and any other land disturbing process.

In 2013, Delray Beach was recognized as “Best Restored Beach” by the American Shore and Beach Preservation Association. The City was also designated as a Blue Wave Beach by the Clean Beaches Coalition, for the City’s demonstrated commitment to maintaining a clean, healthy, and environmentally well-managed beach.

PROTECTION OF ENDANGERED, THREATENED, AND SPECIES OF SPECIAL CONCERN

Preservation of species and diversity is an important goal. Species of special concern include the Florida Manatee that continues to be subject to danger from boat traffic. Palm Beach County administers a State-approved Manatee Protection Plan which includes manatee data, strategies, and management actions aimed at protecting manatees. Florida is home to a subspecies of the West Indian Manatee, a federally listed endangered species and is afforded protection by the Florida Manatee Sanctuary Act of 1978. Manatees in the Delray

Beach Planning Area are more abundant in the winter season in comparison to the summer season.

Boat speed restrictions have been established for the Intracoastal Waterway throughout the city. The manatee is seen in the Intracoastal Waterway and the C-15 Canal. Palm Beach County ranks 10th for all manatee deaths between 1974 and 2003, and 6th for all documented watercraft-related fatalities. The Intracoastal Waterway between Delray Beach and Boca Raton (along with the Lake Worth Lagoon and Jupiter Sound) has the highest number of watercraft-related manatee deaths in the county.



Several species of sea turtles’ nest on the municipal beach. The turtles are protected by the Delray Beach Sea Turtle Monitoring and Conservation Program, as well as, lighting restrictions codified in the Delray Beach Land Development Code. Section 4.6.8, involves restrictions on artificial lighting. In intensely developed coastal areas artificial lighting can deter sea turtle nesting and disorient hatchlings. The City is working to darken point source light and ambient light, turtle-friendly lighting required in a 600’ zone. The Sea Turtle Monitoring and Conservation Program involves nest monitoring and protection, with data collection on nesting and hatching success.





CONSERVATION, SUSTAINABILITY, AND RESILIENCY ELEMENT

The 2017 Delray Beach Turtle Nesting Data resulted from a survey over the course of two hundred and forty-two days on beaches located in Delray Beach (2.8 miles). The overall total of turtle nests increased from 2016 reports. Nesting disturbances prior to hatching can be attributed to a wide range of impacts, including foxes, erosion, accretion, inundation, and storm-related events. Recent research from Florida Atlantic University has found that sampled nests over the past few years contained 100% female turtles, raising concern that warmer temperatures are resulting in all female offspring, potentially impacting future reproduction rates. The 2015, 2016, and 2017 turtle count is provided in Table CSR-G.

opportunities for new informational signage and materials for residents and visitors.

The threatened or endangered wildlife species recently observed within the city include the least tern (bird), scrub jay (bird), cedar waxwing (bird), burrowing owl (bird), limpkin (bird), and eastern indigo snake (reptile). The City of Delray Beach has established a bird sanctuary within the corporate limits of the Planning Area, and therefore the take (capture or killing) of any wild bird is unlawful. Delray Beach Code of Ordinances, Sec. 91.04.

To increase public awareness of turtle and manatee protection, the City could seek

TABLE CRS-G Delray Beach Turtle Nesting Data				
<u>2017 Turtle Nesting Data</u>				
	<i>C. caretta</i> Loggerhead	<i>C.mydas</i> Green Turtle	<i>D. coriacea</i> Leatherback	Total Species
Total # of Nests	252	46	6	304
Total # of False Crawls	900	120	2	
Date of First Nest	04/23/17	05/30/17	04/13/17	
Date of Last Nest	08/19/17	08/25/17	05/11/17	
<u>2016 Turtle Nesting Data</u>				
	<i>C. caretta</i> Loggerhead	<i>C.mydas</i> Green Turtle	<i>D. coriacea</i> Leatherback	Total Species
Total # of Nests	249	6	9	264
Total # of False Crawls	854	19	3	
Date of First Nest	4/29/16	6/20/16	3/25/16	
Date of Last Nest	8/16/16	9/12/16	6/21/16	
<u>2015 Turtle Nesting Data</u>				
	<i>C. caretta</i> Loggerhead	<i>C.mydas</i> Green Turtle	<i>D. coriacea</i> Leatherback	Total Species
Total # of Nests	198	26	11	235
Total # of False Crawls	722	76	1	
Date of First Nest	Data not Available.	Data not Available.	Data not Available.	
Date of Last Nest	Data not Available.	Data not Available.	Data not Available.	



CONSERVATION, SUSTAINABILITY, AND RESILIENCY

CONSERVATION, EXISTING USE, AND PROTECTION OF NATURAL AREAS

Delray Beach recognizes the need to protect and restore the natural communities within the Planning Area. Natural communities are groupings of plants and habitats that occur together in recurring patterns based on available resources such as soils, water, nutrients, and climate. Environmental changes associated with global warming will put pressure on the natural communities in Delray Beach. The preservation and maintenance of natural areas is important to their continued existence.

Various sections of the Delray Beach Land Development Code require the preservation of local natural features, all future and current development is required to comply with applicable codes and ordinances regarding the protection, preservation, or conservation of natural resources.

Delray Beach has committed to the policies promoted by Tree City USA since 1999. Delray Beach has retained this designation by meeting four core standards for urban forestry management: maintaining a tree board or department, having a community tree ordinance, spending at least \$2 per capita on urban forestry, and celebrating Arbor Day. Trees are an extremely important resource for the City, as trees are known to reduce energy costs, stormwater run-off, and boost property values.

There are no City managed wetlands in the Delray Beach Planning Area. Privately held wetland areas within the Delray Beach Planning Area are conserved, protected, and managed according to Army Corps of Engineers and Florida DEP rules.

PRESERVATION OF PUBLICALLY HELD NATURAL AREAS

Within the Delray Beach Planning Area there is a diverse park system which involves native vegetative communities, various water access points, and environmentally sensitive sites which must be protected and conserved.

The Municipal Beach area in Delray Beach is approximately three miles long. The City owns the 1-mile Municipal Beach, Palm Beach County owns

and the City leases, the south 100 feet of the 500-foot-long Atlantic Dunes Park. The approximately remaining two miles of beach within the Planning Area are adjacent to private lands. The City is responsible for platting the Coastal Construction Control Line to fix the mean high-water line. The sandy beach east of the Coastal Construction line is vested in the State. Section 161.191, Florida Statutes.



Delray Beach's coastal dune is almost entirely man-made, the dune has been installed and enhanced during several projects dating back to 1973. The coastal dunes provide habitat for over two hundred plant and animal species. A total of fifty native species have been added to date, which includes several listed as endangered or threatened by the State of Florida or the U.S. Fish and Wildlife service. Natural coastal sand dunes are known to be dominated by saw palmettos, with a mix of herbaceous and shrubs species.









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There is no commercial usage along the Municipal Beach, except for concessions renting cabanas and recreational equipment, and the beachside storage of sailboats for permitted vessels. The Delray Beach Parks and Recreation Department monitors beach boat storage.

The City of Delray Beach contracted with Coastal Management and Consulting in 2015, to inspect and survey the Delray Beach dune system. Coastal Management and Consulting identified exotic plant contamination in the dune system, generated maps depicting invasive species, and produced a report for with various best management principles for managing the dune system in Delray Beach.

The Delray Beach Management of Coastal Dune Plan suggests the following recommendations:

-  Pioneer Zone Support: plant sea oats and dune panic grass in barren areas greater than 100 square feet.
-  Dune Shrub Pruning: coordinate with Florida DEP to develop and carry out a plan for remedial reduction of the sea grape footprint, develop protocol for lateral control during regular pruning events, and review pruning methods and train staff.
-  Scrub/Strand Zone Renovation: proceed with permitted dune section renovations as funding becomes available.
-  Sailboat Storage: the City could review and update the Sailboat Storage Area Rules and Regulations to address specifics for securing in the designated area, and the City should continue to monitor the Sailboat Storage Area to maintain dune protection.

Barron, Coastal Management and Consulting, *Analysis and Recommendations for Management of the Coastal Dune at Delray Beach, Florida*, 2015.

There are interpretive nature trails in Atlantic Dunes Park, and at the Delray Oaks and Leon Weekes preserves. The City could enhance recreation opportunities by providing for a contiguous trail system throughout the Delray Beach Planning Area where possible.

Atlantic Dunes park is a public beach access point in Delray Beach located one block north of Linton Boulevard and beach side of A1A. The park is an elevated wooded area with a large pavilion, boardwalk, and 300-foot nature trail through the dunes. There are two parking lots with metered parking for visitors, public restrooms, and a life guard tower. The park has accessible handicap parking near the beach access point and two Surf Chairs are available for the physically challenged to enjoy the beach (located at the lifeguard tower). The Pavilion at Atlantic Dunes has been reconstructed after a fire in 2016 burnt down the original 1977 structure.

Delray Beach has managed Atlantic Dunes Park since the 1970's; the park is owned by Palm Beach County. Atlantic Dunes park represents a native coastal ecosystem with a full transverse section of Beach/Dune, Coastal Strand, and Maritime Hammock Communities. The Park is home to many native plant and animal species. More than a dozen of the native species which used to exist there have been lost, the decline in species diversity is likely due to overshadowing of exotic plants. Barron, Coastal Management and Consulting, *Analysis and Recommendations for Management of the Coastal Dune at Delray Beach, Florida*, 2015.

Delray Oaks is a 24.48 acre preserve within the Planning Area, owned by Palm Beach County. This site is managed as a countywide system of natural area and features an observation platform, as well as, paved and sandy trails. The area is protected to maintain the diversity of biological communities and species in the Delray Beach Planning Area. The Delray Oaks property represents examples of native ecosystems such as: prairie, xeric hammock ecosystems, and mesic flat woods. The tree canopy is made up of live oaks and sabal palms. Large tracts of oak hammock are unusual in Palm Beach County due to urban development and because oak hammock communities only develop in areas where fires have not occurred for at least thirty years.

Orchard View Park is a 5.94-acre neighborhood park located west of Old Germantown Road. The park was purchased by Delray Beach from the Blood Family in 2000. Prior to purchase, the land



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was formally known as Blood's Hammock Groves. The park has pavilions, barbecue grills, playground area, restrooms, and a walking trail. The park is filled with berry trees and is often frequented by runners, bird watchers, and nature photographers.

The Leon Weekes Preserve is located between Linton Boulevard and Lindell Boulevard, west of Old Dixie Highway. The Preserve is named after Leon M. Weekes, who served as Delray Beach Mayor from 1978-1982. The property was purchased by the City of Delray Beach in 1988, to preserve the site's 12.37 acres of high-quality scrub and scrubby flatwood communities which includes species such as gopher tortoise, Curtiss' milkweed, common wild pine, and scrub palmetto. Florida Scrub is one of the oldest habitats in Florida, this vegetative community is specialized to live in periodically burned areas with high, well-drained, nutrient poor soils. The preserve features nature trails, a playground, gazebo, and parking area.

Water-related uses of natural areas within the Delray Beach Planning Area include docking facilities and marinas. There are three City parks that provide water-related amenities: Veterans Park (fishing and short-term dockage), Knowles Park (boat ramp facilities), and Mangrove Park (boat ramp facilities).

Veterans Park is north of Atlantic Avenue, west of the Intracoastal Waterway. The park features a playground facility, gazebo, restrooms, a recreation center, and a public dock area for Atlantic Avenue visitors on the Intracoastal Waterway.

Knowles Park is located at 1001 South Federal Highway, the park features parking, restrooms, and a boat ramp providing public access to the Intracoastal Waterway. The natural shoreline includes mangrove trees, sea grapes, and other vegetation which protects the park from storm damage and erosion.

The "environmentally sensitive area" designation is used for natural areas where significant flora or fauna communities have been identified and need special protection because of its landscape, wildlife, or ecological value. The Delray Beach Land Development Code has specific restrictions

for development involving environmentally sensitive areas in Section 3.2.4.



Publicly-owned environmentally sensitive areas have been identified on the Land Use Map by an "Open Space" or "Conservation" symbol. Conservation areas include: the Donnelly Tract, and Florida Inland Navigational District (FIND) Parcels 645 and Parcel 650 (Mangrove Park)



Mangrove Park (south of Knowles Park) is a 4.05-acre environmentally sensitive site, also known as Florida Inland Navigational District (FIND) Parcel 650. This area was originally a spoil area for Intracoastal Waterway dredging. The City negotiated a long-term lease on the site to take over management developing Mangrove Park on the site. The park offers a boat ramp leading to the inter coastal, public parking, and restrooms.



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The Florida Inland Navigational District, is the local sponsor of the State and Federal navigation project for the Atlantic Intracoastal Waterway, ensuring lands are available for dredged materials removed from the waterway. Generally, FIND properties are utilized only as dredged material management sites and are not available for use by the general public, but several FIND sites have been leased to a county or municipality for passive recreational activities.

Florida Inland Navigational District (FIND) Parcel 645 is a 7.41-acre mangrove site located on the east side of the Intracoastal just south of George Bush Blvd. The City will continue to negotiate with the Florida Inland Navigational District for utilization and potential ownership of Parcel 645 and Mangrove Park.

The Donnelly Tract is a small (1.64 acre) mangrove tract located on the west side of the Intracoastal Waterway approximately one-quarter mile north of George Bush Boulevard. The site is owned, preserved, and maintained by the City.

The Donnelly Tract and FIND parcel 645, are both environmentally sensitive areas, which feature densely vegetated mangrove wetlands. There are no current plans for developing these parcels. To preserve the diverse biological species in these areas the City should pursue a biological assessment and habitat analysis for both parcels.

In 2015, the City of Delray Beach acquired 5-acres of undeveloped land west of Lake Ida (outside of the Delray Beach Planning Area), referred to as the Lake Ida Open Space Parcel. The City of Delray Beach has partnered with Delray Beach-based nonprofit Institute for Regional Conservation to restore the parcel's shoreline. Restoration of this area will improve overall water quality of Lake Ida and it will also offer protection for Lake Ida from stormwater run-off and pollution. There is currently no public access point to this parcel, or plans for development.

PRESERVATION OF PRIVATELY-OWNED NATURAL AREAS

Privately-owned natural areas are limited. The Hurricane Pines site was developed as part the private Heritage Club development one mile south

of Downtown Delray, off of Southeast 10th Street. Three portions of the site (0.4 acres), have been preserved as part of the open space designation for the private housing development.

The oak hammock in the Hammock Reserve development has been preserved through conditions of a development order and has been set aside as a preservation area through zoning (Open Space) and platting. The Reserve includes 3 acres of broad-leaved trees, known as a hardwood hammocks ecosystem.

EXOTIC PLANTS

Preserving the natural landscape of Delray Beach is important to protect native species and water quality. Palm Beach County spends over two million dollars a year removing exotic plants from natural areas within the county and regulates vegetation through the Palm Beach County Unified Land Development Code to limit unnecessary native vegetation removal, to promote the use of native vegetation in landscape plans, and to eradicate invasive nonnative vegetation. The main focus of the Prohibited Invasive Non-native Vegetation Removal Ordinance is to support the removal of the County's nine prohibited plant species on properties within 500-feet of publicly owned natural areas. Palm Beach County Department of Environmental Resources, *Best Management Practices for Protection of Native Vegetation*, 2009.

As part of a Chain-of-Lakes restoration project, Palm Beach County, Florida Fish and Wildlife Commission, and Florida DEP have removed exotic vegetation like Brazilian Pepper, Java Plum, and Pongam Trees from the shoreline of Lake Ida.



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Federal and state laws were passed in the 1970's, to prevent the further spread or importation of weeds that pose an economic threat to agriculture and navigation. The United States Department of Agriculture and the Florida Department of Agriculture and Consumer Services maintain individual Noxious Weed Lists that identify plants known to interfere with Florida's native ecosystems.



Coastal Habitat

As discussed in the Coastal Management Element, the city has numerous coastal resources. One of which is an offshore coral reef that is part of the Continental Southeast Florida Reef Tract. The natural offshore coral reef is located in approximately $\frac{3}{4}$ of a mile from the beach in about 60 feet of water. The Delray reef is home to octocorals and sponges, a complex microalgae community, stony corals (including the federally listed coral species of *Acropora*, and other listed coral species), and schooling fish. Coastal habitats must be monitored and protected in order to preserve the animal and plant species found in the Delray Beach Planning Area.

Historic Natural Reservations

Delray Beach has a rich architectural heritage with structures dating back to the late 19th Century. The City has five historic districts and twenty-six individually listed properties.

Two locally designated Historic Districts are inherently vulnerable to climate change impacts due to their coastal location, and risk of flooding.

The Nassau Street Historic District is the only historic site located on the barrier island, and the Marina Historic District borders the eastside of the Intracoastal Waterway. These historic resources



should be monitored to ensure their unique character is preserved. To mitigate climate change impacts to historic sites, infrastructure improvements in historic areas should be prioritized.

The historic character of Delray Beach attracts visitors supporting the heritage tourism cluster of local economy. To focus on reuse of existing buildings, the City could administer programs to assist existing buildings and historic properties with improved sustainability by promoting efficient design choices and recycling of old materials. Many building materials and practices which will never be duplicated again. Historic structures can be rehabilitated and retrofitted with sustainable building techniques. Sustainable historic stewardship will contribute to a rich sense of place and spread local history.

SUSTAINABLE USE AND MANAGEMENT OF RESOURCES

Delray Beach is continuously engaged in maintaining and upgrading existing assets, infrastructure, and the building stock owned and operated by the City. While the urban structure of Delray Beach cannot easily be modified, 'grey' infrastructure can be efficiently managed and retrofitted to improve performance. Grey infrastructure refers to roads, railways, buildings, street lighting, and utilities managed by the City. Sustainable strategies should guide future Delray



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Beach capital expenditures, acquisitions, and improvements in order to avoid misuse of resources.

As Delray Beach strives to become more sustainable the City can promote programs that help the entire community work towards increased resource efficiency and renewable energy use. By reducing resource consumption and achieving resource efficiency Delray Beach will realize cost savings and offer a better quality of life for its residents.

The concept of sustainable use of resources can be factored into City decision making. "Sustainable use" refers to the use of Delray Beach resources in a cognizant manner that improves the socio-economic wellbeing of people and does not waste unnecessary value or lead to long-term decline of the environment. "Resource" refers to raw materials such as fuels, minerals, metals, energy (oil, natural gas, coal, biomass), but also refers to food, services, water, wind, biomass, funding, knowledge, and our ecosystems, etc. Resources are consumed in many ways. Whether in the form of gasoline burning in our cars or the electricity and water used in our homes, our daily resource consumption contributes to harmful environmental impacts and the depletion of vital resources on which our lifestyles depend. Delray Beach recognizes the scarcity of natural resources poses a threat to the continued prosperity of the community and well-being of its citizens, thus conservation of resources ultimately contributes to community resiliency.

The City can develop productive and efficient ways to manage resources by monitoring production and consumption while also using an integrated resource management planning approach. Financial costs should not be the only consideration when evaluating the profitability of a potential capital improvement project or policy, social and environmental benefits must also be recognized. This is known as the "triple bottom line" of a project. Many of the policies within the Conservation, Sustainability, and Resiliency Element of the Comprehensive Plan have the ability to provide more than just economic benefit; for example, recommissioning City owned buildings with energy efficient fixtures has the

capacity to enhance the indoor comfortability of buildings for staff, while also protecting air quality by decreasing greenhouse gas emissions.

ENERGY EFFICIENCY

Local governments have immense opportunity to seek solutions to current power challenges and to promote technological changes within the community. Evaluation of current energy use is the first step towards understanding potential opportunities to conserve resources, increase resiliency, and to reduce Delray Beach's contribution to global climate change. A large portion of energy consumed within the Delray Beach Planning Area can be contributed to the built environment. Existing buildings and lighting infrastructure represent two sources of energy use that can be improved by technological and policy development.

Delray Beach should pursue a baseline resource assessment to measure City performance in categories such as energy, fuel, water, and waste, by characterizing Delray Beach's electricity use, natural gas consumption, water use, fleet energy use, and energy consumed by waste management. A resource baseline assessment can be used as a starting point to identify areas where resources can be conserved and also to understand originating sources of greenhouse gases and flag opportunities to reduce consumption.

Delray Beach would benefit from tracking and reporting on utilities data (electric, water, other commodity billings). Existing City owned buildings and street lighting fixtures could be retrofitted to increase energy efficiency which in turn would result in cost saving, a reduction in greenhouse gas emissions, and lessen wasteful practices. Delray Beach should also study the potential costs and savings associated with the installation of solar photovoltaic systems on compatible City owned buildings and the need for additional electric vehicle infrastructure.

Delray Beach can begin investigating and analyzing the performance of buildings owned or operated by the City in order to optimize performance and correct deficiencies. The City can undertake routine energy and water audits to



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understand usage and retro-fit potential for existing infrastructure systems and City owned facilities. The data generated by an audit can be used to determine the return on investment associated with a citywide retrofitting program. The data can be managed in a consolidated database to monitor City progress over time. By managing the data in a transparent manner, the City can create accountability by promoting its actions to the local community and can promote its actions to the local community.

Building recommissioning is a cost-effective sustainability strategy that improves energy and water performance, resolves maintenance problems, and improves indoor environmental comfort. Best management practices promote recommissioning important facilities on a five-year cycle to maintain a high level of performance and to capture new performance opportunities. The City could undertake a building performance study including energy and water efficiency; HVAC upgrades and needs; automated thermostats; indoor lighting controls; interior lighting, and solar energy potential.

Delray Beach is already engaged in recommissioning existing systems and use of sustainable design techniques in new projects to become more sustainable and to save resources. Steps have been taken to install low-use lighting and more efficient cooling systems in City buildings, as well as light-emitting diode (LED) street light replacements on West Atlantic and use of high efficiency lights for the sports fields at Pompey Park. In conjunction with Waste Management, Delray Beach has also installed solar trash compactors at City owned sites. Delray Beach will continue this momentum by utilizing the goals, objectives, and policies defined in this Element.

Sustainable Building Standards

"Sustainable building" is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle, from siting to design, construction, operation, maintenance, renovation and deconstruction.

Sustainable building practices conserve energy, materials, water, and natural land areas, and can also accomplish preservation of existing structures, and the diversion of old construction materials from land disposal sites through reuse and recycling. Additionally, Florida Statutes state City owned buildings "shall be constructed to comply with a national green building code or a sustainable building rating system." Section 255.2527, Florida Statutes.

Multiple nationally recognized guides, codes, and certification programs are available that can be used to fulfill the Florida legislature's requirement, and to encourage sustainable building in Delray Beach. The United States Green Building Council created the most widely used green building certification program in the world, the current program is commonly referred to as Leadership in Energy and Environmental Design ("LEED"). LEED certification provides a framework for creating highly efficient and cost-saving green buildings.

The International Green Construction Code is a sustainable building code created by the International Code Council that provides model language for municipalities to adopt within their Land Development Regulations to accomplish baseline sustainable building requirements. The Living Building Challenge Petal Certification is a program developed by the International Future Institute, providing building strategies to achieve net-zero or net-positive energy buildings, structures free of chemicals, and with overall lower net-energy footprint.

The Florida Green Building Coalition is a non-profit Florida corporation dedicated to improving the built environment which offers membership to individuals, companies, and local governments. The Coalition certifies buildings (bronze, silver, and gold), according to a proprietary grading system, which considers Florida's climate and geography. The Florida Green Building Coalition is a resource for green building strategies, Delray Beach decided to pursue Green Local Government designation in 2007 and became a certified "silver" local government in 2016. The Florida Green Building Coalition Green Local Government Standard acknowledges cities and counties for outstanding environmental stewardship.



Delray Beach currently has established green building standards for proposed new construction projects in the Central Business District Zone that requires buildings 50,000 square feet or more within that Zone to be certified as Silver by the United States Green Building Council Leadership in Energy and Environmental Design standards or equivalent. Amd. Ord. 28-15 12/02/15.

To incentivize compliance, developers are required to post a performance bond to ensure construction projects within the Central Business District Zone achieve the identified green building standard. Once the project obtains the required level of certification the City refunds the value of the posted performance bond. If the developer achieves a lower certification level than required, or achieves partial certification, only a partial bond refund is offered proportional to the achieved criteria.

Delray Beach should evaluate the success of current green building practices and the Central Business District Zone performance bond. Delray Beach can then establish more rigorous standards for new City facilities and commercial development projects beyond the Central Business District Zone. The City should extend its sustainable building practices to all City facilities either through requiring participation in a prominent national rating system, or by designing their own menu of requirements, by borrowing techniques from various sustainable building codes. Adopting a green certification requirement for City owned buildings and facilities is a nationally accepted practice.

Currently, all new development within the Central Business District is required to use reflective roofing or rooftop plantings. The reflective / green roofing is a design strategy that can improve cooling and heating energy use in buildings and benefit the urban climate. The reflective / green roof regulation should be included in new, citywide sustainable design standards. A further discussion of reflective roofs is included in the Resiliency portion of this document addressing the Heat Island Effect.

Diversified Energy Mix

Delray Beach can promote opportunities to shift the city away from fuels that generate greenhouse gases to cleaner, alternative, and renewable energy sources. By facilitating the use of renewable energy, Delray Beach can establish community and environmental leadership while furthering the goals of National and International coalitions promoting the reduction of greenhouse gas emissions (Climate Mayors Pledge and Sierra Clubs "Ready for 100" Campaign). Non-renewable sources of energy contribute to the degradation of land, water, and air, while releasing greenhouse gases into the atmosphere. There are many forms of renewable energy sources. Solar, wind, hydroelectric, biomass, geothermal power, hydrogen, are all recognized sources of renewable energy. Alternative fuels are transportation fuels other than gasoline and diesel, including but not limited to liquified natural gas, biodiesel, compressed natural gas, electricity, ethanol, hydrogen, and propane. Alternative fuels are cleaner can reduce harmful emissions and pollutants, specifically carbon dioxide (CO₂), which is a primary contributor to climate change.

Renewable energy strategies can increase community resiliency by providing alternative sources of electricity during fuel supply disruptions. Delray Beach has started to promote the transition towards renewable energy alternatives. The City became a Bronze SolSmart designee in 2017, for encouraging solar energy growth and removing obstacles to solar development in the community, making it easier for homes and businesses to go solar. SolSmart is a program by the Solar Foundation and the International City/County Management Association funded by the U.S. Department of Energy SunShot Initiative.



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Currently, other initiatives are developing across the state that provide support for communities wanting to increase solar generation at the neighborhood level. Cooperatives take advantage of a group of property owner's bulk-purchasing power to get discounted pricing and a quality installation. Volunteer participants choose an installer on behalf of the entire group through an open and competitive bidding process. The selected installer provides co-op participants a personalized proposal for their consideration. The City should ensure that land development regulations do not inadvertently prevent the development of solar cooperatives.

Quick Facts

- 🌞 In Florida, natural gas, a nonrenewable fossil fuel, continues to be the dominate fuel source for electricity generation.
- 🌞 In 2017, natural gas represented 71.6% of Florida's total utility-scale electric generation.
- 🌞 In contrast, Florida's renewable energy facilities currently provide approximately only 3.8% of Florida's overall electric generation.
- 🌞 Florida's three top renewable energy sources are solid biomass, solar energy, and municipal solid waste (largest source first).

Source: Florida Public Service Commission, *Review of the 2017 Ten-Year Site Plans of*

Florida's Electric Utilities.

The City of Delray Beach currently has three free public parking electric charging stations and plans to install two more. Charging is free to the public, but there is a two-hour charging limit. Electric vehicle drivers frequently choose Delray Beach for charging due to the ample entertainment and dining options. The City now requires new private development within the Central Business District to provide 3% alternative fuel spaces.



In 2018, eight new life guard towers were installed on the Delray Municipal Beach, equipped with solar panels used to power fans or for charging purposes. The solar panels provide a more comfortable work environment for the Ocean rescue staff.

Delray Beach could pursue a renewable energy and alternative energy feasibility study to understand City opportunities to transition away from fossil fuels. A feasibility study will determine the viability and cost/benefit of such transition for systems rather than a piecemeal approach. For example, solar system feasibility studies are routinely used for proposed solar projects and include a site analysis, environmental issues, financial modeling, interconnection costs analysis, permitting requirement analysis, etc. Renewable and alternative projects are often costly expenditures, and a feasibility study is the first step in transitioning the City away from fossil fuel dependence.

Promoting the use of renewable energy and alternative energy within the Delray Beach Planning area will help the community maintain a viable quality of life, assist in ensuring the reliable transmission of power, conserve environmental resources, and possibly provide a backup power supply and protect water quality.



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Finally, the City of Delray Beach offers Property Assessed Clean Energy (PACE) financing to residential and commercial property owners as a source of funds to retrofit properties for energy efficiency, renewable energy and wind resistance projects. The property owner voluntarily enters into the program and works with their selected contractor, but then pays the financing back as a non-ad valorem assessment on their property tax bill.

Quick Facts

On September 10, 2017, Hurricane Irma knocked out power to 64% of all electricity customers in the Florida, nine days later (on September 19, 2017) about 1% or 100,000 customers remained without power.

According to the United States Energy Information Administration, Hurricane Irma caused substantially more outages than Hurricane Wilma in 2005 which impacted only 36% of Florida customers. Hurricane Irma cut power to nearly two-thirds of Florida's electricity customers.

Source: United States Energy Information Administration, *Today in Energy*, Sept. 20 2017.

SUSTAINABLE WASTE MANAGEMENT

The Palm Beach County Solid Waste Authority manages a countywide recycling program. Section 403.706(2)(a), Florida Statutes, requires each county to achieve the following recycling rate of solid waste: 70% by December 1, 2018, and 75% by December 31, 2020.

The Palm Beach County Solid Waste Authority collects recyclable materials in blue and yellow bins. The following items are recycled in blue bins: aluminum cans, drink boxes, glass bottles and jars, milk and juice cartons, plastic bottles and containers, and steel cans. The following items are collected in the yellow bins: paper bags, unwanted mail, newspaper, cardboard, old paper, tissue/beverage boxes, magazines, catalogs, and telephone books. There are also multiple community drop-off locations for paper, cardboard, and oil/grease within the city.

For construction and demolition materials the Palm Beach County Solid Waste Authority has an approved list of "Roll-Off Haulers," in order to ensure construction materials are disposed of legally. These haulers are required to dispose of the materials in permitted landfills or recycling facilities.

Hazardous materials placed in the waste stream can present multiple dangers. The Palm Beach County Solid Waste Authority provides for the proper disposal of chemical produces and hazardous substances at the Home Chemical and Recycling Center, at 1901 SW 4th Avenue (east) or 13400 South State Road 7 (west). County residents can also bring old outdated electronics to any of the Palm Beach County Solid Waste Authority locations. Old paints and coatings can be disposed of at Palm Beach County Authority transfer stations.

The City of Delray Beach has plans for ten textile recycling bins within the Planning Areas. Textile recycling is the process by which old clothing and other textiles are recovered for reuse or material recovery. Benefits of textile recycling include: a decrease in the amount of materials ending up in landfills, reduced consumption of energy and water, and pollution avoidance. It is important to note, natural fibers can take hundreds of years to decompose (which may also involve the release of greenhouse gases), and synthetic fiber textiles will never decompose.

Delray Beach could promote increased recycling in City managed areas, such as on Atlantic Ave, on the municipal beach, and in Pineapple Grove by providing additional recycle receptacles and educational signage.

Recycling and proper waste disposal requires a robust, multi lingual public engagement program. Delray Beach should continue to work with the Palm Beach County Solid Waste Authority and the designated waste hauler to: increase recycling rates and to promote the proper disposal of other materials, enhance community waste disposal outreach and education, collect data on waste disposal throughout the city, and maintain a centralized waste disposal database.



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Tracking waste disposal data can help the City identify new opportunities to improve sustainable waste disposal and work with its selected waste hauler. Currently, the City receives monthly data reports from the waste hauler, the data includes tonnage for garbage, recycling, vegetation, and bulk. While this allows the City to track trends, data collection could be improved by collection tonnage data by route. Such data could be utilized to identify and target low performing areas of the city.

Composting

Compost is decomposed organic material that provides essential nutrients for plant growth. Composting programs exist throughout the nation at the neighborhood, city, and regional levels, in urban, suburban, and rural areas.

Composting locally provides benefits such as: breeding a sustainable community culture, local job creation, improved soil composition, reduction of soil erosion, decreased need for garbage hauling, and diversion of materials from landfills, which in-turn extends the life of regional landfills.

Composting programs are categorized by source materials, such as the composting of yard trash (landscaping or land clearing debris), vegetative waste (source-separated material from non-residential sources such as fruits, vegetables & grains, including decomposable packaging), pre-consumer vegetative waste (that has not come in contact with end use or animal products / byproducts), and animal byproducts (source separated waste such as meat, fat, dairy or eggs from non-residential sources).

A Solid Waste Management Facility Permit is required by the Florida DEP to construct or operate a solid waste management facility producing compost. However, permits are not required for "disposal by persons of solid waste resulting from their own activities on their own property, if such waste is ordinary household waste from their residential property or is rocks, soils, trees, tree remains, and other vegetative matter that normally result from land development operation." Furthermore, a compost operation that produces less than 50 cubic yards of compost per year when the compost is produced and used on the

property where the compost operation is located also does not require a permit. Section 403.707(2)(g), Florida Statutes.

Delray Beach can promote household composting practices and community garden composting less than 50 cubic yards, plus on-site composting of trash or yard debris associated with farming or agricultural activities. In the future, Delray Beach could explore opportunities to work with Mounts Botanical Garden of Palm Beach County, as well as, waste management agencies and haulers, to create community composting opportunities for the city.

Urban Agriculture And Community Gardens

Urban agriculture is the practice of cultivating, processing, and distributing food within a local community. Urban or Suburban agriculture is an opportunity to reduce urban poverty and food insecurity, while enhancing the urban environment. The cost of supplying and distributing goods from rural areas to urban ones is rising. Similarly, "urban farming" is growing or producing food in a city or heavily populated town or municipality. Growing food within Delray Beach can help residents save money, provide access to fresh produce, and create jobs.

Backyard farming is when ordinary homeowners turn a portion of their backyard into a micro farm. Backyard farming can help families save money on food costs and enhance the natural environment of neighborhoods.

Delray Beach Ordinance Number 07-17 provides for urban agriculture such as commercial rooftop gardens, productive green walls, indoor farm facilities, urban farms, and other innovative food production in the urban area. Failure to maintain an outdoor Urban Agriculture site shall be a violation of City's Code of Ordinances. Urban farms are permitted to sell produce, flowers, and plants on site from 7:00 AM to 9:00 PM. A site plan is required for all Urban Agriculture.

Delray Beach is home to the wildly popular GreenMarket, where local businesses can sell their products. There is the Winter GreenMarket which opens on October 28th and is open every Saturday through May (at Old School Square Park on NE 2nd



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Avenue). The Summer GreenMarket runs from June 2nd through July 28th, and returns every Saturday (at the Tennis Center, 201 West Atlantic Avenue). The Winter GreenMarket was established in 1996, by the Delray Beach Community Redevelopment Agency. The GreenMarket hosts more than 65 premier food vendors featuring farm-to-fork produce, juice, eggs, milk, butter, cheese, jams, baked goods, vegan and organic products, fresh cut flowers, and other unique gourmet items.

Another approach to increasing access to fresh fruits and vegetables is to encourage local production at community gardens. A “community garden” is defined as a garden space within an urbanized area that cultivated and cared for by the community. Delray Beach adopted a Community Garden Policy by Resolution 40-17 in 2017, to benefit the public health, the environment, the economy, and the quality of life in neighborhoods. The Community Garden program is intended to support the local production of fruits, vegetables, and herbs. The City neither sponsors nor organizes the community gardens in the Delray Beach Planning Area. Instead, local residents are encouraged to come together to establish their own garden by complying with the rules, regulations, laws, and ordinances of Delray Beach’s program.

Community gardens are not intended to be used for commercial operation, however if organizers of a community garden wish to grow and sell produce at the community garden they can seek a permit for an Urban Farm. Community gardens are encouraged to donate surplus food to organizations that help feed less privileged members of the community. Community garden organizers are also permitted to sell the produce at the Delray Beach GreenMarket and use monies to support the garden’s operating costs or to recover expenses associated with the gardening activities of its members.

Community gardens and urban agriculture present immense opportunity for enriching natural areas and cultivating a sense of community for residents. For example, in Delray Beach’s Catherine Strong Park, over 300 trees have been planted to create a young orchard of leafy fruit trees. Community Greening, a Delray Beach

nonprofit, brought together volunteers on Arbor Day in 2017, to plant mango, sugar apple, avocado, and guava trees. The orchard is intended to provide free fruits for community members and is an innovated example of utilizing public-private partnership for the benefit of the community. Catherine Strong Park is located at the southwest corner of Southwest 125 Terrace and Southwest Sixth Street. Community Greening is also engaged in similar projects throughout the city and county, revitalizing greenspaces and bringing the community together to learn about the long-term resiliency and sustainability benefits of green spaces.

GREEN IMPLEMENTATION ADVANCEMENT BOARD

Delray Beach should continue to support the activities of the Green Implementation Advancement Board. The Green Task Force was created by the City Commission 2009 and was tasked with reviewing City operations and policies and recommending strategies and projects for making Delray Beach a more sustainable community.

The Green Task Force produced *the Delray Beach Green Task Force Report* in 2009, and then became the Green Implementation Advancement Board in 2011. Projects include the installation of 138 solar trash compactors, the donation and installation of 6 electric voltaic charging stations, development of the annual Earth Day Celebration, and the expansion of water reuse infrastructure. The Delray Beach Green Implementation Advancement Board actively produces policy and project suggestions to advance environmental conservation and reduce the production of harmful greenhouse gases within the city. Most recently the Green Implementation Advancement Board created the “Skip the Straw Initiative,” a textile recycling program, and are working with local developers to update the Delray Beach green building requirements. Meetings are held in the Swinton Operation Complex, on the third Thursday of each month at 9:00 AM.

SUSTAINABLE PRODUCT USE







Delray Beach recognizes the need to encourage local businesses to use sustainable products and to incite change in today’s throwaway culture.



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Single-use plastic products are defined as items intended to be used only once before they are thrown away or recycled. Plastics are harmful to the environment and often end up polluting surface waters like the Atlantic Ocean, Lake Ida, and the canal system within the Delray Beach Planning Area.

Examples of single-use plastic products include:

-  Plastic forks and knives,
-  Plastic shopping bags,
-  Plastic coffee cup lids,
-  Plastic water bottles,
-  Styrofoam and plastic take out containers, and
-  Plastic straws.

In 2018, Delray Beach established the “Skip the Straw Initiative.” The City started by engaging local businesses in the campaign and sharing information about the harmful impacts of single-use products. Public outreach is necessary in order to garner the support of the community. Participating establishments can promote the initiative by putting a “Skip the Straw” decal in their window and by educating customers on the sustainable benefits of ending plastic straw usage. The City of Delray Beach is planning on introducing an ordinance addressing single-use plastic products to first reduce and then eliminate the use of plastic straws by the businesses and restaurants in Downtown Delray Beach.

Quick Fact:

About 150 million tons of plastic is floating in the world’s oceans. World Economic Forum, *The New Plastics Economy 2016*.

Sustainable Procurement

Delray Beach acknowledges the interrelated nature of economic, environmental, and social impacts of sustainability within City procurement and purchasing. The City seeks to create a sustainable procurement program that incentivizes the use of local, organic, environmentally friendly, re-useable, chemical free products, and vendors.

Sustainable procurement requirements are criteria that are compatible with the protection of the environment and society as guidelines for City purchasing. Sustainable procurement programs can provide cost savings, reduce waste, enhance the city’s image, improve resource efficiency and drives markets for new products and services.

Delray Beach will develop a sustainable procurement plan that prioritizes energy-efficiency, renewable energy, and recycled, healthy, or environmentally preferable products. The City could promote bulk buying and reducing the variety of products purchased which can result in a net savings for the City.

Sustainable procurement also offers the dual benefit of increasing City employees’ awareness of the City’s sustainability goals objectives and policies. Delray Beach government might also consider the benefits of expanding City storage potential, so that left-over durable goods can be saved rather than new procurement.

Greening City Events

A “green” event is one that provides ample opportunities for recycling, discourages the use and sale of bottled water and other single-use plastic products, utilizes local foods/services, and even allows for public composting opportunities. Delray Beach can encourage “green” community events by developing a green event policy document with criteria to guide the planning of City sponsored events and providing incentives for privately held green events.

Green Blue Economy

The local Delray Beach economy and business atmosphere would benefit from the development of a sustainable business program that promotes public health, environmental conservation, and community resiliency. The program could serve as a resource for business stakeholders of all sizes, and provide assistance with implementation of resilient, environmentally friendly, energy efficient, and greenhouse gas reduction strategies. Increasing the sustainability and resiliency of Delray Beach can only be achieved through local action.

A “green” economy is commonly associated with economic growth due to sustainable



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practices/technologies and reduction of environmental risks. A “blue” economy specifically relates the unique range of economic sectors and activities found in coastal communities and related policies that ensure the sustainable use of oceanic resources. Typical blue economies are related to tourism, maritime, other water related activities, and coastal protection. A blue economy promotes economic growth, environmental conservation, resilient business practices, and social inclusion. Implementation of the Conservation, Sustainability, and Resiliency Element will support the growth of a local green blue economy in Delray Beach.

The City can collaborate with organizations including, but not limited to, the Delray Beach Community Redevelopment Agency, Delray Beach Downtown Redevelopment Authority, and the Greater Delray Beach Chamber of Commerce to create a blue green business program. Creation of a blue green business program will support economic growth, resiliency, sustainability, and create employment opportunities in Delray Beach’s emerging green blue economy. By fostering partnerships with the business community, Delray Beach will create an increased demand in skilled labor needed for energy efficiency retrofits, solar installation, new use for recycled materials, growing and processing of local food, and designing /maintaining the public infrastructure. Reduction of greenhouse gases and energy conservation can produce direct cost savings for local business owners. The City will engage local business stakeholders in sustainability and resiliency education, programs, and best practice strategies while promoting economic growth.

INCREASING CITYWIDE RESILIENCE TO SEA LEVEL RISE, FLOODING, STORMS AND OTHER DISRUPTIVE EVENTS

The conservation and sustainability strategies discussed in this document are integrally tied to the resiliency of Delray Beach. The incorporation of

resiliency and sustainability strategies into local government planning is vital for protecting Delray Beach’s infrastructure, planning for future capital improvement projects, and preparing Delray Beach for climate change impacts.

Southeast Florida’s climate naturally experiences variability in weather patterns that historically have included periods of extended droughts and water shortages; high volume rain events and associated flood threats; and, storm events such as hurricanes that bring severe wind and storm surge risks. Gainesville Climate Institute, *Florida’s Climate: Changes, Variations, & Impacts*.

Delray Beach has a tropical climate with rainfall throughout the year, the average annual temperature is 74 degrees Fahrenheit. The city experiences a short dry season and receives on average 4.9 feet of rain annually. June is known as the wettest month, and December as the driest. In the coming decades, temperatures across the southeast region of the United States are expected to increase along with the number of hot days (95 degrees or hotter) during the year. Higher temperatures have the capacity to increase the intensity of hurricanes in the Atlantic and the amount of rainfall in precipitation events. Hot weather contributes to the formation of harmful air pollutants and allergens, increased algae blooms, and disease-causing agents in inland and coastal waterways. National Climate Assessment, *United States National Climate Assessment*.

The coastal location of Delray Beach, combined with a high-water table, and the variability of the Intracoastal Waterway, makes the city vulnerable to flooding, rising sea levels, and coastal erosion. While hurricanes, tropical storms, and heavy rains are part of Delray Beach’s seasonal weather patterns, Palm Beach County has also experienced weather extremes in recent years. Strategic decision making is necessary to prevent and recover from severe inland flooding, annual King tides, extreme high tides – all which strain the flood control system, impact private property and public infrastructure, and disrupt essential pristine ecosystems. As the City plans for new capital improvement projects and economic development within the Delray Beach Planning

Quick Fact

For every 1\$ spent on hazard mitigation and resilience saves an average of 6\$ in future disaster costs. Source: National Institute of Building Sciences, *Natural Hazard Mitigation Saves: 2017 Interim Report*.






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Area, the variability of ecological conditions should be factored into design.

It is important to note that not only coastal areas will receive climate change impacts, but that inland areas will also be faced with the challenge of managing higher-volume and frequency rain events that will stress drainage and other infrastructure. Interior portions of the city may become vulnerable with the diminished drainage capacity of the regional system. As a result, swales may have to be widened or deepened, stormwater pipes may need upgrading, and the wastewater systems may need additional capacity to handle increased water table heights.

Delray Beach has annually experienced flooding in low lying areas near the Intracoastal Waterway during seasonal high tides or during the raining season. "Nuisance flooding" refers to low levels of stormwater inundation that can cause standing water throughout a community which may disrupt routine daily activities. Canals which drain into the Intracoastal Waterway utilize gravity, thus when sea levels are experiencing a seasonal high the water control gate on the seaward side of the system is unable to effectively drain. Flooding can also result from the rising water table in the region. During rain events, the rain saturates the ground as the water table rises, as a result, retention areas within Delray Beach will have less capacity to hold runoff.

Areas impacted by King Tides and the rainy season include:

-  Marina Way,
-  Veteran's Park, low lying areas on either side of the Intracoastal, and
-  Marina Historic District.

Source: Delray Beach Rising Waters Task Force and ESA Associates, *Elevating the Discussion of Rising Waters*, 2017.

As storm events strengthen, and the average temperatures in the Atlantic Ocean become warmer, the magnitude of storm surge is predicted to increase. Storm surge will largely impact the barrier island areas of the city and will likely cause mainland systems to become inundated.

Saltwater intrusion of the Biscayne aquifer is closely monitored throughout the region. As sea levels rise and freshwater is pulled from the aquifer, the head of pressure that keeps the saltwater at bay may become compromised. It is important for Delray Beach to continue to balance the demand and supply of drinking water for the community. As mentioned previously, to avoid saltwater intrusion the City of Delray Beach constructed six western wellfields and withdrawals from eastern wellfield wells are restricted and operated on a daily rotation. Palm Beach County's 2015 Capital Improvement Plan suggests \$210 million should be spent by 2020 on the southern portion of the county focusing on water and wastewater infrastructure.

Delray Beach will have the opportunity to build back better in ways which mitigate and adapt to climate change impacts. When new developments and redevelopment projects are proposed within the Planning Area, the City can utilize best practice mitigation strategies to reduce flood risks and increase resiliency.

Delray Beach shall continue to work with the SFWMD, the Southeast Regional Climate Change Compact, the Southeast Palm Beach County Micro-Regional Group, and the Lake Worth Drainage District to address these future hydrological challenges. A few key strategies include: reduce and avoid development in flood prone areas, strengthen building requirements for new buildings and infrastructure, increasing the base-flood elevation of structures, reduction of impervious surfaces, and informational multi-lingual outreach to educate residents.



ADAPTING TO SEA LEVEL RISE WITH THE SOUTHEAST REGIONAL CLIMATE CHANGE COMPACT

In 2010, Southeast Florida Regional Climate Compact (the "Compact") was formed by Broward, Miami-Dade, Monroe, and Palm Beach Counties to establish unified climate change mitigation and adaptation strategies across the four counties. In support of the Southeast Florida Regional Climate Compact and the Regional Climate Action Plan, Delray Beach signed onto the Mayor's Climate Action Pledge in January 2014.

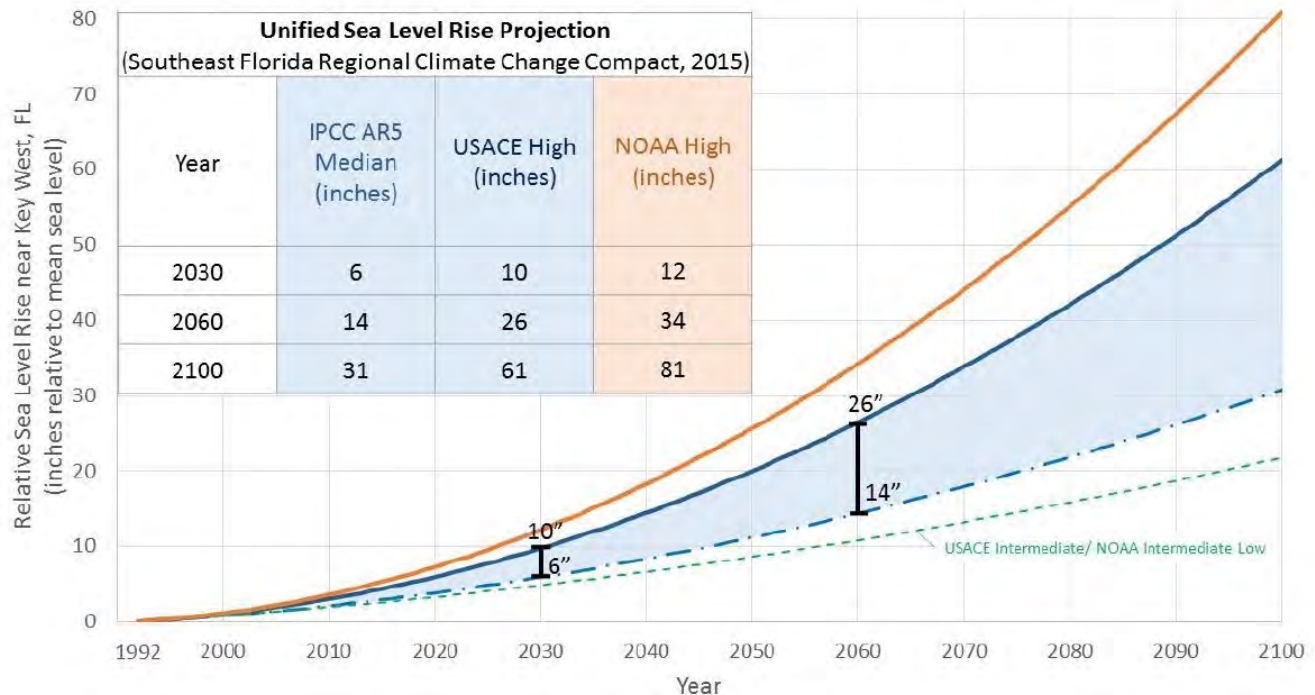
The Compact created the Regional Climate Action Plan in 2012, which outlines recommendations to advance climate adaption and mitigation techniques throughout Southeast Florida. The Regional Climate Action Plan ("RCAP") was updated in 2017, to RCAP version 2.0 and includes three new goal areas (regional economic resilience, social equity, and public health). RCAP provides a framework for local and regional implementation of resiliency strategies.

The Compact developed a baseline range of sea level rise projections as a basis for developing risk informed adaptation strategies. The Unified Sea Level Rise Projection was updated in 2015, and incorporates newly observed and published sea

level rise data into one coherent model for the region. The 2015 *Unified Sea Level Rise Projection* projects sea level rise of 6 to 10 inches by 2030, and 14 to 26 inches by 2060, and 31 to 61 inches by 2100.

Sea level rise projections for South Florida are based on historic tidal information from the following sources: (1) tidal gauge in Key West, and in dependent sea level rise models by the (2) United States Army Corps of Engineers, (3) the National Oceanic and Atmospheric Administration, (4) Intergovernmental Panel on the Climate Change, (5) the World Meteorological Organization.

Planning for sea level rise demands planning for variable conditions. The Compact has been and will continue to be instrumental in planning for future sea level rise projections and climate mitigation strategies in the region. The City of Delray Beach should continue to participate in the Compact as a City-member, by pursuing Delray Beach specific scientific data, projections, and strategies.





Southeast Palm Beach County Micro-Regional Group

The Southeast Palm Beach County Micro-Regional Group, also known as the “inlet-to-inlet collaborative” originated in 2017, and is focused on addressing environmental and sustainability issues from the inter-jurisdictional perspective of the municipalities that share the Intracoastal waterway from Boca Raton to Boynton Beach.

Delray Beach is a founding member and the Collaborative includes: Boca Raton, Highland Beach, and Boynton Beach. In the future this partnership will be used as a vehicle to implement the Southeast Regional Climate Change Compact’s Regional Climate Action Plan 2.0 and develop micro-regional solutions related to climate change.

National Flood Insurance Program And Flood Prone Areas

Flood zones identified by the Federal Emergency Management Agency (FEMA) are identified on Map AD-15 (FEMA Flood Zones). The FEMA flood zone categories are described in the Table CSR-H.

Delray Beach has adopted and enforced floodplain management ordinances to reduce future flood damage. National Flood Insurance Program rates depend on flood maps created by the National Flood Insurance Program. These maps are periodically updated, new maps for Palm Beach County went into effect March 2017. This is the first map revision since the 1980s.

Most of the area east of the Intracoastal Waterway is Zone AE, and the areas between the Intracoastal Waterway and I-95 are predominately Zone X, with areas of Zone AE and X500. Specific flood zone boundaries are identified on FIRM Community Panel Number 12099C0979D, effective 10/05/2017. The City has a flood damage protection program which is certified by FEMA.

National Flood Insurance Program flood maps are based off of historic flooding data and do not incorporate expected changing ecological conditions such as sea level rise, increase water table heights, and participation variability. Therefore, the National Flood Insurance Program maps are not adequate for planning future

economic development or City capital improvement expenditures that may be necessitated by level rise impacts.

The Community Rating System is a voluntary program for National Flood Insurance Program

Table CSR-H Federal Emergency Management Agency Flood Zone Descriptions	
Zone	Description
AE	Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
VE	Areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
X	Areas of 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance (base flood) sheet flow flooding with average depths of less than 1 foot, areas of base flood stream flooding with a contributing drainage area of less than 1 square mile or areas protected from the base flood by levees. No BFEs or depths are shown in this zone and insurance purchase is not required, and; Areas outside the 0.2-percent-annual-chance floodplain. No BFEs or depths are shown in this zone, and insurance purchase is not required.
X500	Same as Zone X, however this zone is between the 100 and 500-year flood zone.
Source: Federal Emergency Management Agency (FEMA)	

participating communities. Delray Beach has



CONSERVATION, SUSTAINABILITY, AND RESILIENCY

received a level 8 Community Rating Score. Federal Emergency Management Agency, *Community Rating System Communities and their Classes*, 2017.

The Community Rating System includes 10 classes, with Class 1 being the highest. For Community Rating System participating communities, flood insurance premium rates are discounted in increments of 5% [i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount (Class 10 is for non-participating Cities which receive no discount)].

Delray Beach residents currently receive 10% premium discount for the City's participation in floodplain management Community Rating System activities. The City could further improve its score by pursuing climate, future conditions, and sea level rise activities within the Community Rating Manual. There are at least ten different areas within the Community Rating System where credits can be gained for efforts such as a citywide vulnerability assessment, or accounting for sea level rise in stormwater master planning. Improving the rating through these activities would provide greater insurance discounts and an added incentive for residents to purchasing flood insurance.

Similar to the Southeast Regional Climate Change Compact's sea level rise projections, the Community Rating System has adopted the National Oceanic Atmospheric Administration Intermediate-High projection as its minimum sea level rise standard. National Flood Insurance Program, *Community Rating System, Coordinator's Manual*, FIA- 15/2017.

VULNERABILITY ASSESSMENT

Vulnerability assessments can be used to integrate the topography and critical assets of Delray Beach with sea level rise scenarios, increased water table heights, and storm surge projections. A vulnerability assessment is used to identify and assess critical City controlled infrastructure, systems, and identify the vulnerability of areas or segments of the community in order to properly plan for the life of structures, improvements, and upgrades.

Climate change impacts will be felt throughout the Delray Beach Planning Area and not just along the coast or Intracoastal Waterway. Delray Beach would benefit from a citywide vulnerability assessment that identifies City owned buildings, water and wastewater treatment plants, pumping stations, stormwater systems, roads, railways, bridges, transportation infrastructure, power generating facilities and transmission lines, at-risk populations, hospitals, historic sites, and designated Palm Beach County Emergency Shelters.



It is imperative for the City to obtain and track data pertaining to the vulnerability of City assets, roads, and critical facilities, in order to better plan capital improvement projects and define supporting policies for highly vulnerable areas within the Delray Beach Planning Area.

The City's 2018 Stormwater Management Master Plan Update includes assumptions for sea level rise based on 30-year and 75-year projections identified in the City of Delray Beach Intracoastal Waterway Water Level & Infrastructure Vulnerability Study, conducted in 2018. The Stormwater Management Master Plan Update identifies stormwater management challenges due to impacts of sea level rise and localized flooding. These issues coupled with a rising groundwater table will impact primary and secondary drainage systems, ultimately reducing the capacity of these systems which can result in flooding of street, buildings and natural systems.



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The Stormwater Management Master Plan Update will provide current data on elevations of structures and their projected future impact which provides the City with additional tools for evaluating future projects. The goal of the Stormwater Management Master Plan Update is to create a plan to address water resource issues and problems, including but not limited to, drainage problems, street flooding, tidal flooding, inadequate infrastructure, stormwater quality and recharge as well as other stormwater related issues or problems. The Update also evaluates the adequacy and condition of the drainage facilities, determines the level of service for flood protection for the city's sub-watersheds and identifies solutions. The Update will address the current and future needs of the city based on growth and climatological changes that have and will continue to impact the City's stormwater management system.

SHORELINE PROTECTION, SEAWALL RESTORATION, AND LIVING SHORELINES

The beach and dune system are Delray Beach's first line of defense against storm surge and waves. The dune system provides a rich coastal environment full of natural resources. The beach is heavily used for recreational activities. Delray Beach has 2.8 miles of oceanfront shoreline, all of which are deemed critically eroded by the state. The beach is 100% accessible and 51% of the frontage is contained within two the Municipal Beach and Atlantic Dunes Park.

Coastal dunes stabilize the beach and provide important storm protection. The sandy dune provides habitat for over two hundred plant and animal species. The City recognizes the importance of exotic species removal, the protection of the beach dunes as resiliency features, and as a natural resource which must be preserved.

The Florida DEP maintains the Coastal Construction Control Line, a regulatory program to protect

Quick Fact

In 2018, the City added two feet to the seawall protecting Veteran's Park to provide flood protection.

Florida's beaches and dunes while ensuring reasonable enjoyment of private property. The program minimizes new man-made structures proposed beyond the Coastal Construction Control Line.

Erosion, coastal development, and the rising sea levels can impact the ability of waterfront infrastructure to rebound after storm impacts. The City's response to erosion should utilize a holistic strategy that will ensure a resilient coastline, shoreline reconstruction, and beach management.

The City should continue to work with the Palm Beach County Department of Environmental Resource Management to coordinate the protection and management of Lake Ida, the Municipal Beach, shared natural areas, and shorelines.



The City should also continue to coordinate with the Palm Beach County Department of Environmental Resource Management, as well as State and Federal agencies on beach nourishment projects and implementation of the Palm Beach County Shoreline Protection Plan. To date Delray Beach has participated in eight nourishment projects since the initial nourishment in 1973. Periodic nourishment is provided every five years, and occasional storm damage repair projects are used as a response to losses from the hurricane season. For detailed information See COASTAL MANAGEMENT ELEMENT.



The City of Delray Beach Intracoastal Waterway Water Level & Infrastructure Vulnerability Study, conducted in 2018, to assess existing seawalls and outfalls along the intracoastal waterway. The assessment included a survey of current conditions. Backflow devices have been installed on select outfalls and future updates have been identified and will be implemented by the Public Works Department.

The Intracoastal Waterway Level & Infrastructure Vulnerability Study inventories current conditions and develops recommendations to reduce the risks of high tide flooding for both public and private properties. Sea level projections from the Southeast Florida Regional Climate Compact served as the basis for the Study's identification of vulnerable areas. Target elevations are identified for future sea wall design standards. Case studies are summarized for implementation of seawall retrofitting programs.

Adaptation techniques promoted by the Southeast Regional Climate Change Compact include evaluating sea walls and other critical shoreline infrastructure present within the community and planning for updates using best available climate change data. The City may pursue updating its current sea wall criteria for existing or newly constructed seawalls, as well as, policy relating to living shorelines.

A "living shoreline" is a management practice that provides erosion control benefits; protects, restores, or enhances natural shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand, and other structural organic materials. National Oceanic and Atmospheric Administration, *A Guide to National Shoreline Data and Terms*, 2016. Living shoreline projects incorporate a variety of materials such as wetland plants, sand, wood, oyster shell, coir fiber logs, and native rocks. Living shorelines can be a great tool to armor the shoreline while stabilizing natural coastal habitats. Living shorelines cannot be used in every location and have proven to be most useful in natural areas where there is not already a "hard" sea wall in place. Living sea walls are considered restoration activities and not a technique for mitigation.

SECONDARY IMPACTS OF CLIMATE CHANGE

Climate change impacts causing flooding throughout Delray Beach also have the capacity to cause vector-borne diseases or increased blue-green algae blooms. Stagnant water or shallow puddles that fail to drain are the ideal environment for mosquitos that can spread water-borne illnesses and viral diseases, like the Zika Virus.

Stormwater run-off from intense storms can carry fertilizers into drainage areas and canals. Warm weather mixed with the slow-moving character of the canals or lakes creates favorable conditions for algae growth. Algae-blooms can be harmful to the natural ecological systems, particularly within Delray Beach, and can impact human health through emitted toxins.

Green-blue algae blooms are expected to increase with climate change due to high volume precipitation events and warmer weather. The City could monitor and consider such impacts during policy development and adaptation planning.





Heat Island Effect

The “heat island effect” refers to earth’s altered surface climate caused by commonly used building materials such as concrete and asphalt, which absorb the sun’s energy and releases heat. During the hot summer months, urbanized areas experience higher temperatures than rural communities because built structures and surfaces have replaced the natural vegetated landscape. The built environment takes time to cool down once the sun sets.

The United States EPA began studying the heat island effect in 1998, in the Urban Heat Island Pilot Project. The project concluded the hottest spots within a built environment are often large rooftops and the coolest areas were those covered with vegetation. There is significant potential to address the heat island affect with mitigation strategies focused on roofs, improving the City’s tree canopy coverage, and preserving existing greenspaces.

The heat island effect has negative consequences such as:

- 🌍 Increased energy consumption required for air-conditioned buildings
- 🌍 Increased air pollution
- 🌍 Negative health impacts for the public population. Those most susceptible to heat island include pregnant woman, young children, the elderly, people who work outdoors, and people with certain preexisting conditions.
- 🌍 Increased stress on citywide natural ecosystems

- 🌍 Increased water consumption
- 🌍 Economic impact to local tourism

Communities across the nation are taking actions to reduce urban heat islands using five strategies: (1) increasing tree and vegetative cover, (2) installing green roofs, (3) installing reflective roofs, (4) using cool pavement, and (5) utilizing smart growth practices that constrain building footprint and parking spaces. United States EPA, *Heat Island Colling Strategies*.

“Green roofs” refer to roofs that have been covered with plants or host a garden. Green roofs can be expensive, but unlike reflective roofs, green roofs have the added benefit of managing stormwater runoff, which can prove useful in the rainy season in low lying areas.

Trees and plants cool the environment and are the most useful mitigation strategy for the heat island effect. The City of Delray Beach would benefit from a tree canopy analysis that would determine the number of trees within the community providing shade when viewed from above. The City can then adopt specific goals for tree canopy cover to help reduce the heat island effect and enhance the built environment.

Reflective roofs are a way to conserve energy. Specifically, a “reflective roof” or a “cool roof” is one that has been designed to reflect more sunlight and absorb less heat than a standard roof. Reflective roofs utilize some type of paint, sheet covering, or highly reflective tiles or shingles. Reflective roofs and green roofs can provide energy savings, improve indoor comfort, reduce local air temperatures, and reduce greenhouse gas emissions associated with energy consumption.

“Cool Pavement” refers to solar reflective pavements that stay cooler in the sun than traditional pavements. Like conventional dark roofs, dark pavements absorb 80-95% of sunlight, which directly warms the local air and radiates heat into the atmosphere. Cool pavement techniques are currently utilized in California, and related benefits include energy savings, emission reductions, and increased comfort and health.



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By conserving natural areas within the Delray Beach Planning Area and promoting cool or green roofs in building design, the City will protect human health, conserve energy, and preserve the natural environment. All new development within the Central Business District is required to use reflective roofing or rooftop plantings in order to lower the temperature of local atmosphere in the downtown area. Due to the built character of the city, strategies to reduce the heat island effect should be used in future capital improvement projects and integrated into existing development plans.

CONSERVATION, SUSTAINABILITY, AND RESILIENCY PUBLIC OUTREACH

The conservation, sustainability, and resiliency, of Delray Beach depends on the widespread understanding of the critical relationship between resource use and environmental degradation. Public involvement is the foundation for a sustainable democracy. Delray Beach's greenhouse gas emission largely result from community activities; thus, it is imperative to encourage community buy-in to support Delray Beach's conservation, sustainability, and resiliency goals. Delray Beach can create opportunities for individuals and institutions to design, develop, and apply sustainability and resiliency practices into their lives and operations.

Information about conservation, sustainability, and resiliency can be made readily available in various formats to empower residents with knowledge regarding energy conservation, renewable energy opportunities, environmental conservation, and the steps Delray Beach's government has taken to green the local community.

Delray Beach sustainability and resiliency civic engagement will be inclusive of all members of the community, particularly neighborhoods and groups of individuals struggling with economic stability or vulnerable populations with less access to vital necessities. Public outreach strategies can include identification of socially vulnerable populations at risk from aging infrastructure or lack of economic capacity and develop strategies that are individualized to fit the needs of those areas.

In 2017, as part of the City's effort to educate residents about climate vulnerability and

adaption, the Delray Beach Office of Sustainability organized the 2nd Annual King Tide presentation on green and gray shoreline strategies. Delray Beach Office of Sustainability can maintain and enhance these public outreach efforts. The City can engage in community-wide dialogue regarding flooding, sea level rise, weather-related events, and emergency management to support community-wide preparedness for climate change impacts.

In 1998, the Sandoway Discover Center opened in Delray Beach. The Sandoway Discovery Center is a coastal ecosystems and marine life center, that is open to the public. The Center presents educational exhibits and programs for locals, tourists, and visitors of all ages. The Center currently hosts field trips and offers educational outreach programs related to sea level rise, climate change, coral reefs, amphibians and birds, insects, plants and seeds, sea turtles, and reptiles. The Center represents early beach-front living, the lawn is thick with natural local beach dune vegetation.



The Sandoway House Nature Center is a historic home built in 1936, where one can experience Delray's rich history through a self-guided tour. Palm Beach County owns the property and leases it the City of Delray Beach, who in turn, subleases the property to the Friends of Sandoway Nature Center, inc. The City could coordinate with the Friends of Sandoway House to create and coordinate public education programs.

As part of community outreach the City can develop a youth-component to engage young



CONSERVATION, SUSTAINABILITY, AND RESILIENCY

people in learning about conservation, sustainability, and resiliency, and to provide a forum for sharing their ideas about improving their environment.

The Office of Sustainability and the City's Education Coordinator have already begun reaching out to Atlantic High School, Carver Middle School, and several Elementary Schools to enrich their curriculum with sustainability concepts and provide learning opportunities for the students. These activities should continue. Delray Beach would benefit from developing long term strategic partnerships with institutions of higher learning such as Florida Atlantic University, Digital Media Arts College, Keiser University, Palm Beach Atlantic University, Nova Southeastern, Lynn University, and Palm Beach State College. Academic partnerships can yield the City a wealth of resources. Students, administration, and professors can get involved with Delray Beach's sustainability and resiliency goals and assist with implementation.

SUSTAINABILITY AND CLIMATE ACTION PLAN

The purpose of creating a Delray Beach Sustainability and Climate Action Plan is to link the status quo of the City with economic health, sustainability strategies, resiliency techniques, and community support. By integrating efforts into a plan, improving the sustainability and resiliency of Delray Beach will become a transparent process allowing for dialogue between the City, community members, and business stakeholders.

Methods for promoting conservation, sustainability, and resiliency in the community should range from passive informational strategies, to active involvement with targeted community groups.

Delray Beach can foster stakeholder partnerships with the public and private sectors through informational programs, public outreach, and other initiatives. To advance sustainability goals, the City should develop a Sustainability and Climate Action Plan that benchmarks current conditions, identifies opportunities, and measures successes.

RECOMMENDATIONS

The Conservation, Resiliency and Sustainability Element goals, objectives, policies, performance measures, and strategies reflect the following needs and recommendations suggested by the community:

The City recognizes that collecting data related to air quality may be outside of the purview of City operations and regulatory authority, but there is an opportunity with monitoring and tracking the City's greenhouse gas emissions. Such inventorying of the City's fuel and energy use support multiple benefits such as reducing operating costs as well as reducing transportation-related greenhouse gas emissions.

Protection of Air Resource Recommendations:

- Develop a greenhouse gas inventory to better link transportation and air quality improvements
- Implement City operations and assets in a manner that reduces greenhouse gas emissions, fuel use and saves the City in operating costs over time.
- Use greenhouse gas inventory to develop additional policies that reduce the City's largest sources of emissions at the City operations and community levels.

The City already has a proactive utility and programming aimed at improving water quality and water conservation for the benefit of the resource. Continuing to adapt those policies will meet growing populations' needs while protecting water quality.

The City's highest priorities should be on the development of new water supply sources, maintaining and increase water conservation, expanding the reclaimed water system, the use of landscaping, sound development principles, and elimination of septic systems.



CONSERVATION, SUSTAINABILITY, AND RESILIENCY

Conserve and Protection Water Resources Recommendations:

- 🌱 Improve data collection to identify and reduce water quality impacts to improve water resources for recreation, swimming and environmental benefits.
- 🌱 Continue to monitor for water resource indicators that may start to reflect the impacts of climate change such as increase chlorides in wells.
- 🌱 Continue aggressive water conservation efforts and development of new regional water supply resources.
- 🌱 Continue to partner on water quality, monitoring and water resource improvement for important water bodies such as Lake Ida.

Even though there are no extractive industries related to mineral or soils, erosion of beaches and shorelines may be an increasing problem in the future for Delray Beach. The City must continue to promote the conversion of older septic systems to centralized service.

Conserve and Protect Minerals and Soils Recommendations:

- 🌱 Continue converting septic systems to centralized wastewater as part of the City's infrastructure programming.
- 🌱 Utilize strong principles of streetscaping and shoreline protection to protect mineral and soil resources.

While the City is a predominantly built and will grow largely through redevelopment, opportunities still remain to protect existing habit and species. A continued emphasis on participation in data collection is needed to share information related to sea turtles (and nesting), natural areas that may be owned or maintained by the City or County and other important natural systems such as wetlands. Enforcement of existing policies to not allow such habitats to be impacted will be critical.

Protect Land for the Benefit of Habitat and Species Recommendations:

- 🌱 Promote and enforce policies that manage and eliminate exotic vegetation and species and focus on protecting and increasing native habitats and shorelines.
- 🌱 Continue to protect critically designated conservation, recreation and open space properties for the benefit of the habitat and species that rely upon them.
- 🌱 Develop funds to maintain specially designed properties to keep them in a natural state and avoid habitat transitions or exotic infestation.
- 🌱 Protect key wetlands habitat and continue to require wetlands preservation and enhancement for public and private lands.
- 🌱 Regional collaboration with the County or other municipalities shall continue to be a focus to protect extra-jurisdictional natural resources.

More and more local governments are recognizing the relationships between energy use as a mitigation strategy for addressing climate change. Generally, these policies should begin with the City leading by example in terms of increasing the energy efficiency and renewable energy opportunities within its own facilities and operations.

Promote Energy Efficiency and Diversify the Energy Mix Recommendations:

- 🌱 Energy efficiency and renewable energy priorities for the City in terms of facilitating more projects on City infrastructure, assets and buildings as well as private property installations.
- 🌱 Commit to building City assets to the most energy efficient standards possible to save costs on future asset operations.

A key component of sustainable waste management, urban agriculture and food and food waste programming is education and outreach to the community coupled with



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partnerships for the key influencers of waste management including the business community and the actual waste hauler. The City has already launched numerous sustainability initiatives related to recycling and materials management. Because the business community is a larger producer of waste, it will be important to work with them to increase beneficial reuse and recycling of all types of materials. The City should seek opportunities to enhance these opportunities through building stronger relationships with the business community, Chamber of Commerce and the City's contracted waste hauler.

Support Sustainable City Operations and Practices that Increase the Triple Bottom Line Recommendations:

- 🌱 Create a baseline of existing sustainability practices and identify opportunities to improve those through development of a Sustainability and Climate Plan.
- 🌱 Outreach and education opportunities are critical for residents and business owners to see sustainability initiatives in practice to improve the cultural identification with green initiatives.
- 🌱 Increase facilitating sustainability strategies that will promote green businesses and the green economy.

The City has already been developing recommendations on sustainable practices for quite some time. The challenge has been that there is currently no cohesive planning document inventorying the sustainable practices the City already undertakes in terms of sustainability and climate that integrates across the city for implementation. The City should utilize the infrastructure it has already created through the Green Implementation Advancement Board and expand its effort into a framework for implementation. By assessing the effectiveness of current work to date, and adding an actual strategy that incorporates the principles of the triple bottom line, the planning process can be equitably implemented and focus on economic, social and environmental factors together

Support Sustainable Waste Management, Urban Agriculture and Food Programs Recommendations:

- 🌱 Water management programs in partnership with the City's waste hauler and the County's Solid Waste Authority should focus on more innovation in recycling and repurposing materials.
- 🌱 Engagement of commercial businesses, particularly the restaurant industry, should be a priority to increase opportunities for composting and recycling.
- 🌱 Education and outreach to residents and business owners is an important goal to improve recycling, composting and increasing urban agriculture.
- 🌱 Facilitate opportunities for residents to participate in community gardens and individual urban agriculture.

Community resiliency will continue to, and increasingly, impact Delray Beach in the future due to the impacts of climate change. The City has already begun to assess infrastructure impacts and proactively begun to incorporate sea level rise into assessments related to seawalls and stormwater. But the work must continue and become an ongoing philosophy in terms of basis for current and future planning and infrastructure decisions.



Increased Resilience Recommendations:

- Invest in accurate data to make informed planning decisions about future flood risk.
- Make climate adaptation and sea level planning a cornerstone of all planning efforts for infrastructure, habitat and development.
- Harmonizing current efforts, such as seawall vulnerability and stormwater management planning, should serve as a foundation for creation of a City Sustainability and Climate Plan.
- Green infrastructure projects should be increased to passively manage precipitation, flooding and water resource recovery.
- Reduce vulnerability must be a key goal of capital planning projects.
- Continue City partnerships and involvement in regional and micro-regional planning efforts to exchange information and learn about successful climate planning case studies for projects and programs.

Emergency Preparedness Recommendations:

- Emergency planning shall be coordinated among departments citywide and in conjunction with County efforts.
- The City must calibrate emergency management planning with future flood risk and capital improvements shall consider these impacts.
- Education and outreach regarding individual preparedness and business continuity are critical to reducing recovery intervals and the City shall link such efforts with its floodplain management programming.

The City must actively link and integrate infrastructure planning, emergency management and the future impacts of climate and sea level rise to become a more resilient community. The City already has strong emergency planning approaches for hurricane evacuation that will only be exacerbated by sea level rise and impacted infrastructure. Linking project development, such as through the Local Mitigation Strategy. It is through these efforts that the City must "harden" its infrastructure and assets and support residents' and business' efforts to do the same





NEIGHBORHOODS, DISTRICTS, AND CORRIDORS



DATA, INVENTORY, AND ANALYSIS



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

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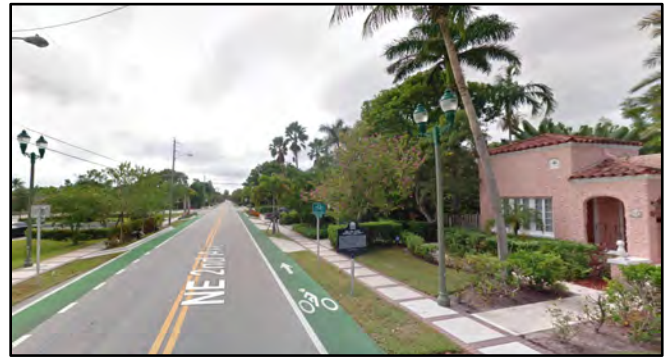
NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

INTRODUCTION

The Neighborhoods, Districts, and Corridors Element, formerly known as the Future Land Use Element, recognizes that Delray Beach is made up of a variety of interconnected, distinctive and unique neighborhoods, districts, and corridors. Together, they are the structure that forms identifiable areas of the community.

Neighborhoods are predominantly residential areas with varying levels of intensity and use that accommodate many activities of daily life. Delray Beach's eastern neighborhoods accommodate a wider mix of uses within the neighborhoods than the western neighborhoods, which rely on corridors for access to shopping and workplaces. Districts are areas that emphasize a specific use, have a unique land use pattern, or specialized plan. Corridors are both the connectors and the boundaries of neighborhoods and districts; they include thoroughfares, rail lines, and greenways. Delray Beach is linked both internally and to the region by its corridors.

The Neighborhoods, Districts and Corridors Element provides the land use principles and standards to guide development and redevelopment, to reinforce the character of existing neighborhoods, to revitalize blighted areas, and to accommodate growth in the form envisioned by Delray Beach residents and stakeholders.







The NE 2nd Avenue corridor runs through the Del-Ida Park Historic District; the Del-Ida Park neighborhood was established by plat in 1923.

POPULATION DATA

In the 2000 US Census, 60,020 residents were counted in Delray Beach. Between 2000 and 2010, population growth was nominal. At the last US Census in 2010, 60,522 residents were accounted for within the city. Since 2010, Delray Beach's population has increased at a more significant rate and is estimated to be 68,749 residents, a gain of over 8,000 new residents in more than 2,500 new households.

As illustrated in Table NDC-A, Delray Beach's share of Palm Beach County's population has declined slightly over the past 16 years—from 5.3% in 2000 to 4.5% in 2017—as other areas of the county have exhibited more significant population growth.

Quick Facts:

-  60,522 residents in 2010 Census
-  68,749 residents (July 2017 estimate)
-  48.4 years is the median age
-  \$83,600 Average Household Income

West Atlantic Avenue
The Set Downtown Osceola Park
I-95 NEIGHBORHOODS Lake Ida
Pineapple Grove Way
Banker's Row North Federal Highway
Military Trail DISTRICTS Swinton Avenue
Linton Boulevard South Federal Highway
Wallace Drive Southwest Neighborhood
East Atlantic Avenue Historic Districts
South Ridge CORRIDORS The Beach
Congress Avenue Four Corners
NE 2nd Avenue—Seacrest Boulevard
NW/SW 5th Avenue

In comparison to Florida as a whole, Delray Beach has a younger population with a median age of 48.4 years, which is forecast to increase to 49.4 years by 2022. A generally affluent community, the average household incomes were \$83,600 per year in 2017. Fully 26% of households have annual incomes greater than \$100,000 per year. Average household incomes are forecast to increase by 2.6% per year over the next five years, to more than



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

\$95,000 by 2022, but are forecast to remain slightly below their counterparts across Palm Beach County, which is forecast to be more than \$96,900 by 2022.

TABLE I
POPULATION GROWTH* - DELRAY BEACH, FLORIDA
1920 - 1960

	Population	Increase	Percent of Increase
1920	1051		
1930	2333	1282	122.0
1940	3737	1404	49.0
1950	6312	2575	69.0
1955	8337	2025	32.0
1960	11939	3602	43.0 (5 year gain)

*U. S. Census Reports

The Delray Beach Comprehensive Plan from 1961 shows the rapid population growth from 1920 - 1960.

TABLE NDC-A
Regional Population Trends, 2000—2016

	2000	% of County	2010	% of County	April 2016	% of County	Change Amount	2010-2016 CAGR
Palm Beach County	1,131,184		1,320,134		1,391,741		71,607	0.88%
Delray Beach	60,020	5.30%	60,522	4.60%	63,972	4.60%	3,450	0.90%
Boca Raton	74,764	6.60%	84,392	6.40%	88,275	6.30%	3,883	0.80%
Boynton Beach	60,389	5.30%	68,217	5.20%	73,163	5.30%	4,946	1.20%

CAGR=Compound Annual Growth Rate.

Source: U.S. Census Bureau; University of Florida, Bureau of Business & Economic Research; ESRI Business Analyst; WTL+a, July 2017

POPULATION PROJECTIONS

The plan uses data and projections from multiple sources to analyze the population growth trends through 2040 (See Table NDC-B). It is important to note that at the time this plan was issued, the population projections in the 2018 Lower East Coast Water Supply Plan Update (LECWSP) provided the best data source available and are the official population projection for the plan.

At the time this plan was issued, the The LECWSP has the most aggressive population projection, anticipating 81,874 by 2040. The projection includes approximately 1,000 residents in the Town of Gulf Stream, to which the City supplies potable water, as well as the unincorporated areas located within the City's Planning Area. The City is in the process of updating its water supply facilities work plan, which will further refine these projections, with adoption planned for 2020 2021. The population projections developed as part of the 2021 water supply plan are included in Table NDC-B. These projections are similar to the LECWSP, but are more aggressive in future years due the inclusion of water demands for future annexed areas. Since these projections also include the residents of the Town of Gulfstream and Unincorporated Palm Beach County, the less

aggressive LECWSP will continue to be used as the official population projection for the plan.

The Palm Beach County Population Allocation model is based on data from the 2010 US Census; the 2014 population projections from Office of Economic and Demographic Research; land use density changes, approved and expired residential projects, annexations, and 2014 municipal population estimates. The Palm Beach County Population Allocation is used both in both the Mobility and Housing Elements to provide local-level data that is detailed for the specific analyses and trends. For example, data from the Shimberg Center for Housing Studies is part of the housing demand analysis in the Housing Element due to its focus on housing characteristics. Table NDC-B Delray Beach Population Projections compares the projections from various sources.

It is important to note that the most aggressive population projection is the The 2018 Lower East Coast Water Supply Plan Update, which projects 81,874 by 2040 and is the population projection used for the Plan. This estimate anticipates an increase of approximately 13,125 people within the planning period from the current US Census



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estimate of 68,749 (July, 2017). Using the estimated household size of 2.4 people per household (US Census, 2013-2017), the City can anticipate needing approximately 5,469 additional residential units under the high growth estimate.

The City experiences seasonal population fluctuations. There are 6,993 vacant housing units, of which 3,827 are identified as “For seasonal, recreational, or occasional use” (U.S. Census Bureau, 2010). 760 units are identified as “Vacant – Current residence elsewhere” (U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates).

TABLE NDC-B Delray Beach Population Projections						
Year	US Census	PBC	LECWSP	Shimberg	BEBR	2015 2021 WSP
2010	60,522				60,522	
2015	68,749		67,272		63,175	64,054
2020	69,283	67,643	70,520	65,493		67,573 <u>71,564</u>
2025	71,576	70,519	74,188	67,184		70,441 <u>74,891</u>
2030	73,870	73,433	77,079	68,578		73,349 <u>78,374</u>
2035		76,054	79,597	70,187		75,964
2040			81,874	71,433		78,243 <u>83,249</u>
PBC = Palm Beach County Population Allocation Model; LECSWP = 2018 Lower East Coast Water Supply Plan Update (includes 1,000+ residents in the Town of Gulf Stream); Shimberg = Shimberg Center for Urban Studies; BEBR = Bureau of Economics and Business Research; 2015 2021 WSP = City of Delray Beach 10-Year Water Supply Facilities Work Plan (Work Plan), prepared by Kimley Horn and Associates, Inc., dated <u>May 2021</u> February 2015 . (Includes 2,200+ residents in Town of Golf Stream and Unincorporated Palm Beach County).						

ACCOMMODATING GROWTH

The Planning Area contains approximately 17.4 square miles, of which approximately 1 square mile is within Palm Beach County’s jurisdiction. While 642.55 acres of unincorporated land exists within the planning area and is anticipated for eventual annexation into the municipal boundary, much of this land, like land already located within Delray Beach, is developed and will not necessarily generate a significant number of new units. The era of westward expansion, development of agricultural areas, and settlement on greenfield land is over for Delray Beach. In the next 30 years, Delray Beach will grow mainly through infill, adaptive reuse, and redevelopment.

Map DIA-6 (Potential Residential Units) illustrates potential locations for new residential units within the current municipal boundaries. This map identifies vacant parcels that have a residential or mixed-use land use designation and provides an estimated number of potential units.

It is important to note that while the other analyses in this plan measure impact or future demand on services (like potable water supply) with the assumption of the highest intensity or density of the land, the potential number of units estimated for these parcels was measured conservatively, using the lower density in the range permitted by the land use designation. It is the City’s practice to reserve the highest density allowed in the land use designation for incentive programs focused on



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specific community benefits, such as the provision of workforce housing units, as stipulated in the land development regulations.

For example, the Commercial Core land use designation allows up to 100 du/acres; however, generally, 30 du/acres is currently the maximum permitted under the implementing zoning, without using an incentive program. This analysis assumed the base density for two reasons: to identify a conservative scenario for meeting future housing

needs and to determine whether incentive programs will continue to be needed.

As depicted in Table-NDC-C, approximately 3,850 residential units can be accommodated on vacant parcels under the current land use designations within the municipal boundary. The same methodology was used for the potential annexation areas (Map AD-23 - Annexation Areas). The vacant parcels yield approximately 95 units under the Advisory Land Use.

TABLE NDC-C Potential Residential Units in Delray Beach			
Land Use Designation	Acres	Tested Density	Potential Units
Low Density – 1 to 5 du/ac	79.83	5 du/ac	399
Medium Density – 5 to 24 du/ac	27.68	12 du/ac	332
Commercial Core – 12 to 100 du/ac	45.52	30 du/ac	1,275
General Commercial – 12 to 30 du/ac	29.05	30 du/ac	871
Congress Mixed Use – 40 to 50 du/ac	17.27	40 du/ac	691
Transitional – 18 du/ac	15.59	18 du/ac	281
Total	211.95		3,850 Units

The maps also identify parcels that are considered “underutilized”. Underutilized parcels have a land value that exceeds the improvement value on the site by more than 50%. This methodology indicates when the potential redevelopment of the land is worth more than the value with current structure(s) on the site. This condition could result from the structural age or condition of the building(s) or from a land use designation with a higher density or intensity than the existing development.

TABLE NDC-D Potential Residential Units in the Delray Beach Planning Area	
Area	Units
Vacant Parcels in the City	3,850
Vacant Parcels in Annexation Area	95
Underutilized Parcels in Annexation Area	260
Total	4,205

Since many of these areas will annex because of the need for water service to serve redevelopment, an analysis of the potential residential unit yield was conducted for the

underutilized parcels in the annexation area. This yields potentially 260 new units. The total potential is 4,205 units on likely development sites (Table NDC-D).

Outside of the annexation areas, many underutilized parcels are located within mixed-use districts. Mixed-use land use designations have many benefits, including a flexible environment for investment, facilitating transportation trip capture by collocating uses, providing the foundation for transit-oriented development, and, (when executed with a high degree of design) contributing to the quality of life for residents and surrounding areas. The challenge moving forward is that mixed-use land may be needed for both housing and commercial development as Delray Beach grows to meet both the city’s housing needs and economic development goals.



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Incentive programs continue to be needed to:

- Close the gap of approximately 1,200 units between projected need and potential units on vacant land;
- Encourage transit-oriented development patterns;
- Provide housing affordable for all household incomes; and,
- Attract investment to areas of the city in need of revitalization.

Growth is also accommodated by commercial uses that serve the residential population through the provision of goods and services that meet daily needs and provide workplaces to grow the city's economy. Commercial uses are accommodated by mixed-use and industrial land use designations. Economic and land use policies continue to protect Commerce land from re-designation to ensure industrial businesses will remain within Delray Beach.

Underutilized parcels have a land value that exceeds the value of improvements on the site by more than 50%.

As Delray Beach grows, development and redevelopment must not only provide for compatibility within the city limits, but with the adjacent land uses of the neighboring municipalities (see Map AD-1 – Planning Area). Delray Beach's neighbors include the Town of Highland Beach, City of Boca Raton, Palm Beach County, City of Boynton Beach, and the Town of Gulfstream. The City of Delray Beach and its neighboring municipalities work together when a request that impacts the land use designation or a new development of adjoining land is submitted for review.









This sign along Federal Highway welcomes those traveling north into Boynton Beach from Delray Beach.

EXISTING LAND USE

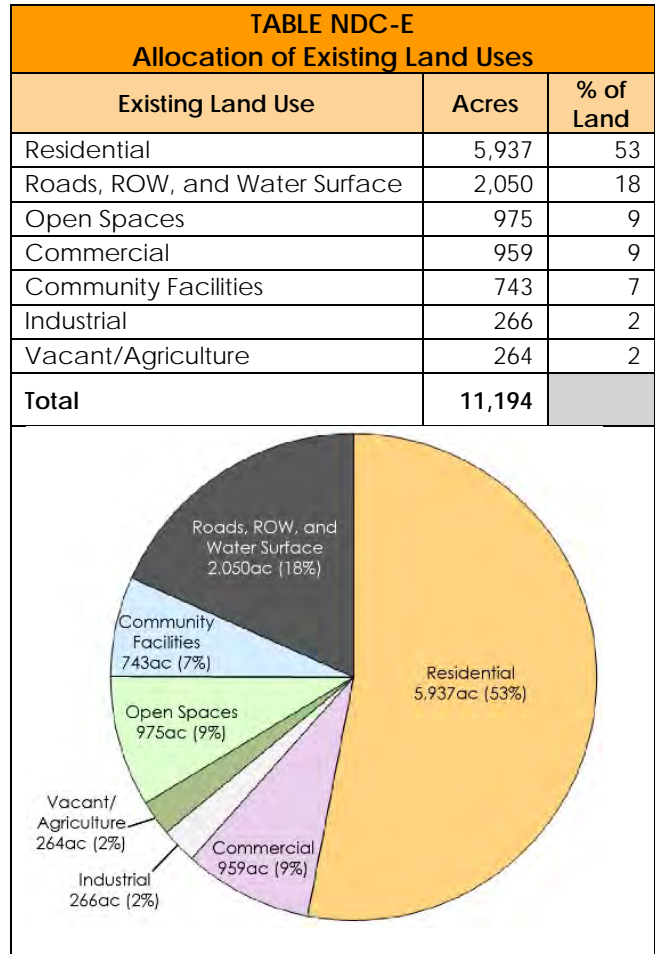


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An analysis of the existing land uses in Delray Beach indicates the settlement pattern is largely comprised of residential neighborhoods. The available data from Palm Beach County provides information on existing development using the following use categories:

-  Residential
-  Commercial
-  Industrial
-  Vacant/Agriculture, Recreation
-  Education and Public Facilities,
-  Roadways and water rights-of-way

Mixed use development is accounted for under the commercial allocation. The existing use of the land throughout the Delray Beach planning area shows a predominantly residential community, with open space, recreation, conservation, served by commercial uses located along main corridors or in nodes at major intersections.





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LAND USE DESIGNATIONS

The Land Use Map (Map AD-2), formerly known as the Future Land Use Map, identifies the land use designations for all properties within the defined Planning Area for the planning horizon of 2019 through 2040. The land use categories have a variety of densities and intensities that are strategically applied to accommodate for the diverse and different neighborhoods, districts, and corridors in Delray Beach.

The distribution of land use designations throughout the Delray Beach planning area illustrates that a large majority of the land designated for residential use is located west of Interstate-95, served by nodes of commercial or mixed use development along Military Trail and Congress Avenue.

Residential Land Use Designations

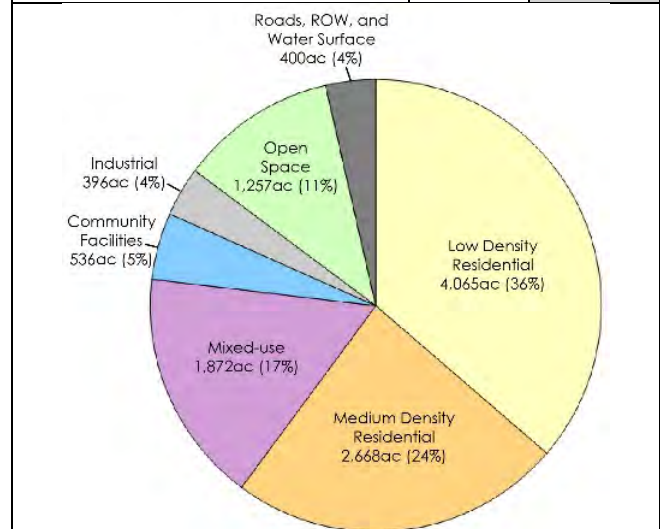
The Low Density Residential and Medium Density Residential land use designations are utilized to maintain and enhance Delray Beach's established neighborhood characteristics, while supporting new and revitalized housing that compliments the desired development pattern and intensity. These two residential land use designations, which consist of 60% of the land area within the Delray Beach municipal city limits, are applied based on existing development patterns and lot sizes in the surrounding neighborhood.

Based on the amount of land with residential land use designations, that is likely to infill, up to 731 additional residential units are possible (see Map DIA-6 - Potential Residential Units). Land in the Low Density Residential land use designation has the potential to accommodate 399 units, while land with the Medium Density Residential land use designation could accommodate 332 potential units.

Low-Density (LD) Land Use

The purpose and intent of the Low Density Residential land use designation is to create and maintain low density residential neighborhoods by limiting the development intensity to five dwelling units per acre. Therefore, the Low Density Residential land use designation is primarily reserved for detached, single family residential housing development, while providing for a mix of residential housing types under a planned

TABLE NDC-F Allocation of Land Use Designations		
Existing Land Use	Acres	% of Land
Low Density Residential	4,065	36
Medium Density Residential	2,668	24
Mixed-use	1,872	17
Open Space	1,257	11
Community Facilities	536	5
Industrial	396	4
Roads, ROW, and Water Surfaces	400	4
Total	11,194	



residential zoning district. The Low Density Residential land use designation also accommodates non-commercial, neighborhood-oriented facilities, such as community clubhouses, neighborhood amenities, and places of worship.



Aerial view of the Northwest neighborhood where a number of



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Community Facilities are located including Pompey Park, many places of worship and SD Spady Elementary School.

Medium-Density (LD) Land Use






The purpose of the Medium Density Residential land use designation is to create and maintain residential neighborhoods that have a wide range of housing types with associated neighborhood amenities. The Medium Density Residential land use designation is primarily reserved for housing types, including but not limited to attached and detached single-family and multi-family housing. Generally, the implementing zoning districts have a density of at least five and up to 12 units per acre. In areas that have adopted redevelopment plans or are part of incentive programs, like the Workforce Housing Overlay, density can be increased up to 24 dwelling units per acre. The City has successfully utilized density incentives to encourage private sector investment to build workforce units. In addition to the provision of a variety of housing types, the Medium Density Residential land use designation also accommodates non-commercial, neighborhood-oriented facilities, such as community clubhouses, neighborhood amenities, and places of worship.



CODA Townhomes at the southeast corner of SW 2nd Avenue and SW 1st Street contain four workforce housing units as a result of a partnership between the Delray Beach Community Land Trust and the Delray Beach Community Redevelopment Agency.

Mixed-Use Land Use Designations

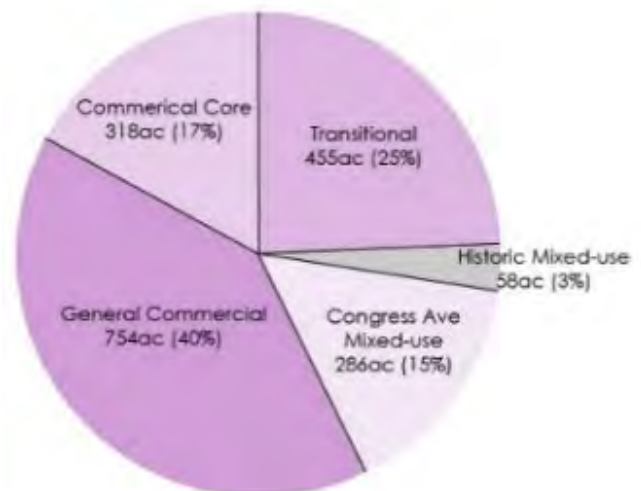
The mixed-use land use designations consist of:

-  Commercial Core;
-  General Commercial;
-  Transitional;
-  Congress Avenue Mixed-use; and,
-  Historic Mixed-use.

A wide range of commercial and residential housing opportunities throughout the city's diverse neighborhoods, districts, and corridors are accommodated by the mixed-use land use designations. The development patterns within mixed-use land use designations should encourage pedestrian and bicycle activity, stimulate public transit ridership, and create a park-once environment. The maximum density and intensity offered through incentive programs should encourage adaptive re-use, development, and redevelopment that advances strategic, policy-driven goals, such as diverse residential housing opportunities, sustainable building practices, historic preservation, public parking, civic open space, or economic development strategies.

The mixed-use land use designations consist of 10% of the land area within the Delray Beach municipal city limits. The advisory land use designations for the annexation areas will add an additional 56.19 acres of land with a mixed-use land use designation.

Within the mixed-use land use designations, the General Commercial designation is the largest with 40% of the category, while the Historic Mixed-Use land use designation is the smallest with just 3% of the mixed-use land use category. Figure NDC-A shows how each of the mixed-use land designation area divided throughout the city.





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Commercial Core (CC) Land Use

The Commercial Core land use designation is applied to stimulate Delray Beach's vitality and economic growth while simultaneously enhancing and preserving the cultural and historic downtown area. The City has successfully achieved this purpose through adopted form-based code techniques, which encourage adaptive-reuse, development, and redevelopment that preserves the downtown's historic moderate scale while promoting a balanced mix of uses to help the area continue to evolve into a traditional, self-sufficient downtown.

The intensity and density for the Commercial Core land use designation is a maximum floor area ratio of 2.5 with density allowed in a range of 12 to 30 units per acre, depending upon the location. Higher density, up to a maximum of 100 dwelling units per acre is reserved for specific incentive programs; at this time, the City is not offering density over 30 du/ac.

The previous comprehensive plan had a maximum floor area ratio of 3.0 in the Commercial Core land use designation, prior to the reduction to 2.5 during the plan update process. Areas designated Commercial Core are largely built-out and are growing through redevelopment. A reduction in floor area ratio from 3.0 to 2.5 would decrease the development potential by no more than 16.7%, as many projects historically have not maximized the allowable floor area ratio. This FAR reduction decreases the potential impact on public facilities."

District is the zoning district that mainly implements the Commercial Core land use. The Central Business District has four sub-districts that are customized to respond to differing characteristics within the downtown area:

-  Central Core
-  Beach
-  West Atlantic Neighborhood
-  Railroad Corridor

The Central Core Sub-district strives to provide development that preserves the downtown's historic moderate scale, while promoting a balanced mix of uses that will help the area evolve

into a traditional, self-sufficient downtown. Residential development is permitted at higher densities in this area than any other part of Delray Beach as a means of fostering compact, pedestrian oriented growth that will support downtown businesses.



City Walk, located on Pineapple Grove Way within the Central Core Sub-district, is a mixed-use development completed in 2006; three stories of residential units sit atop the ground floor of a mix of commercial uses.

The Beach Sub-district, located east of the Intracoastal Waterway along and adjacent to East Atlantic Avenue, strives to preserve and enhance the character of the commercial area, the public condition of the beach, and the natural environment. Residential development is strictly limited to 12 du/ac and increases, including those from incentive programs, are not permitted as the sub-district is within the Coastal High Hazard Area. All increases in land use intensity are not permitted as a life-safety measure to maintain evacuation speed and to limit potential property losses.

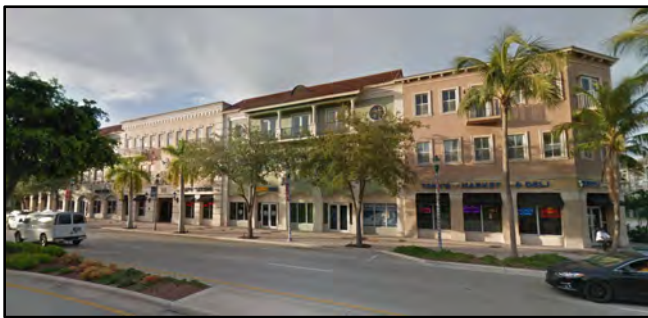




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This circa 1954 building at 1100 East Atlantic Avenue remains indicative of the original scale and character within the Beach Sub-district.

The West Atlantic Neighborhood Sub-district provides for development that emphasizes the preservation and enhancement of the existing neighborhood, while promoting a pedestrian friendly commercial area along West Atlantic Avenue. Development is encouraged to contain a mix of residential, commercial and civic functions. The density is lower in this area to ensure compatibility with the adjacent residential neighborhoods, however, a density bonus up to 18 du/ac is currently offered to encourage workforce housing. Businesses that are oriented toward serving the local neighborhood, as opposed to the city as a whole, are encouraged.



Atlantic Grove, located on West Atlantic Avenue from SW 3rd Avenue to SW 5th Avenue, is a mixed-use development containing a variety of commercial businesses on the ground floor, offices on the second floor, and residential units on the third floor.

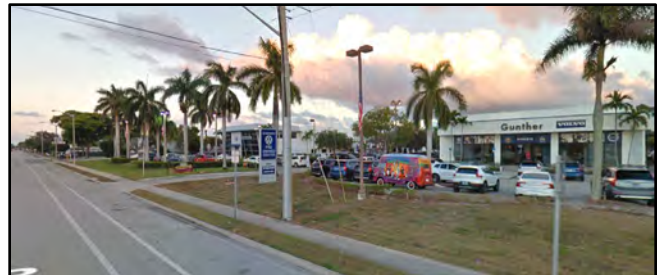
The Railroad Corridor Sub-district allows for development of light industrial type uses on properties that are in the downtown area, but are in close proximity to the FEC railroad. This sub-district recognizes the long-standing light industrial character of this railroad corridor, while providing for additional uses to enhance the economic growth of the downtown.



The Railroad Sub-district extends along SE 2nd Avenue within the Osceola Park neighborhood, and is home to many small, local businesses.

General Commercial (GC) Land Use

The General Commercial land use designation accommodates a wide range of non-residential and mixed-use development and limited stand-alone residential development along major corridors and within certain districts. Light industrial type uses are accommodated on certain parcels with a General Commercial land use designation. This is also the only designation that accommodates the Automotive Commercial zoning district.



The North Federal Highway corridor contains a variety of small, local and corporate auto dealerships among many commercial properties.

The intensity and density for the General Commercial land use designation is a maximum floor area ratio of 3.0 and a maximum density of 30 dwelling units per acre. However, there are current restrictions on the prescribed density and required use mix in the implementing zoning districts. This should be re-evaluated to provide for desirable and appropriate amounts and locations of mixed use developments with residential uses.

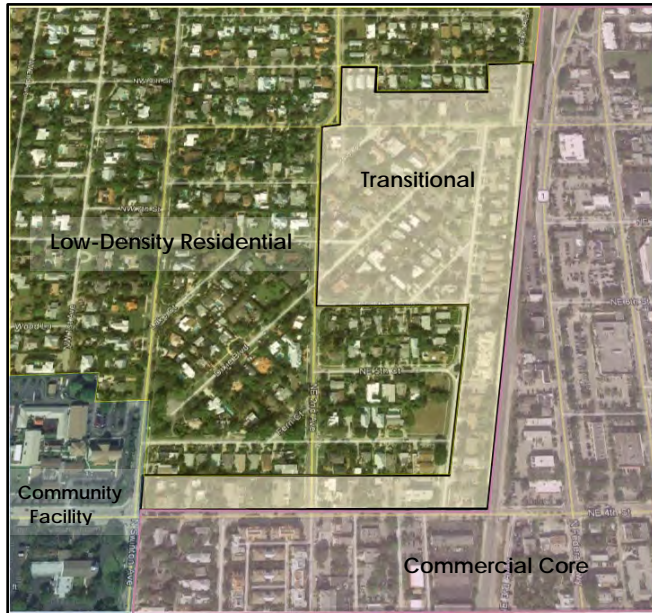
Transitional (TRN) Land Use

The Transitional land use designation allows a wide range of residential and low intensity



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nonresidential uses to address varied community needs, unique development patterns, and/or distinctive uses. The Transitional land use designation is appropriate for properties located between two or more land use designations with differing building scale, uses, or levels of intensity to create development patterns that are compatible with the specific, unique surrounding conditions.



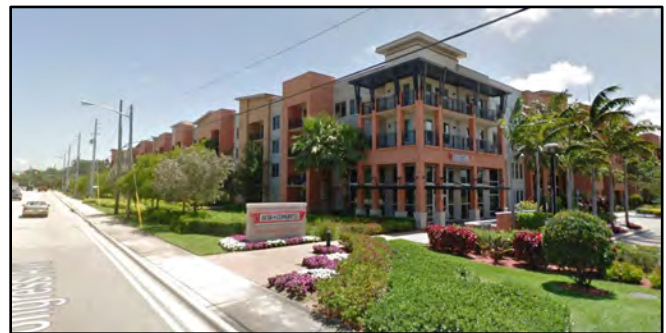
Properties with a Transitional land use designation (center) are located between the Del-Ida Park Historic District to the west and the more intense downtown area to the east (highlighted in pink). The Transitional land use provides a compatible transition between the low density neighborhood and more intense Commercial Core redevelopment by allowing for adaptive reuse.

Daily shopping and service needs of adjacent residential neighborhoods can be provided by utilizing the Neighborhood Commercial zoning designation for properties with a Transitional land use designation. Therefore, the intensity and density for the Transitional land use designation is limited to a maximum floor area ratio of 1.0 and a maximum density of 12 dwelling units per acre to provide an appropriate scale and essential transition between areas with different land uses or levels of intensity.

Congress Avenue Mixed Use (CMU) Land Use

The Congress Avenue Mixed Use land use designation accommodates a variety of commercial, office, and residential uses that

provide development intensities intended to spur economic growth, provide incentives for transit oriented development, and create multimodal development patterns along the Congress Avenue corridor, south of West Atlantic Avenue. Transit-oriented development is encouraged for properties in close proximity to the Delray Beach Tri-Rail Station through the provision of incentives in the land development regulations, such as higher residential densities. The intensity and density for the Congress Avenue Mixed Use land use designation is a maximum floor area ratio of 2.5 and a maximum density up to 50 dwelling units per acre to encourage a mix of uses and assist in the transformation of the Congress Avenue corridor as a destination.



Alta Congress, located along South Congress Avenue in close proximity to the Delray Beach Tri-Rail station, consists of a 369-unit luxury apartment complex that includes 90 workforce housing units.

The previous floor area ratio for the Congress Mixed Use land use designation was limited to a 2.0 for residential, and a 1.0 for commercial. The plan was not clear if the FAR allowances could be combined into a total of 3.0. Given the desire for more intense, but controlled development in the form of transit-oriented development along Congress Avenue, the floor area ratio has been clearly stated as combined/increased to a total of 2.5 for all development. The permitted height in the Land Development Regulations for this area is the highest in the city at 85 feet, which also complements and supports the increased floor area ratio.

It is also important to note that the transportation analysis provided in the Mobility Element indicates that Congress Avenue in this area will have excess vehicular capacity through the year 2040.



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Therefore, using this land use designation to attract residential and commercial investment to this corridor from Military Trail or Federal Highway provides multiple benefits, for both economic and transportation goals.

Within the Congress Avenue corridor, there is one designated Regional Activity Center, which is the only one located within the municipal limits of Delray Beach. The Congress Village Regional Activity Center overlay is established to encourage new development at an appropriate intensity and density on the 42.749 acre site previously occupied by the Office Depot headquarters. The site, which is located on the west side of South Congress Avenue, south of Old Germantown Road, is allowed a maximum development program of 600,000 square feet of office use, 400,000 square feet of commercial uses, 350 hotel units and 2,000 residential units.

Much of the area designated as Congress Avenue Mixed Use is already built out and growing through redevelopment. A reduction in floor area ratio from a combined 3.0 to 2.5 would decrease the development potential by no more than 16.7%, as many projects historically have not maximized the allowable floor area ratio. This FAR reduction decreases the potential impact on public facilities.

Historic Mixed Use (HMU) Land Use

The Historic Mixed Use land use designation is applied to encourage the preservation and adaptive reuse of historic structures while maintaining and enhancing the historic, pedestrian scale and character. The land use designation is applied to properties located within the Old School Square Historic District. The Historic Mixed Use land use designation provides for a mix of residential, commercial, and arts-based uses. As a means of maintaining the historically balanced mix of residential and nonresidential uses, planning tools can be utilized to encourage the maintenance of residential use, such as incentives in the Land Development Regulations for maintaining existing residential units, including live-work units, and/or providing incentives for residential and non-residential developments.

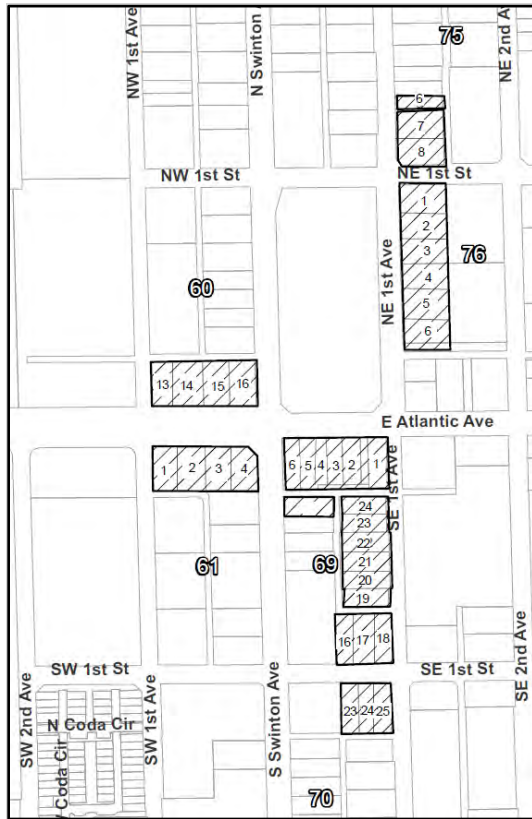


The circa 1924 historic structure at 102 NE 1st Avenue within the Old School Square Historic District, is an example of a successful adaptive reuse from single-family residential to office.

The intensity and density for the Historic Mixed Use land use designation is limited to a maximum floor area ratio of 1.0, and a density up to 10 dwelling units per acre. The land use is mostly implemented though the Old School Square Historic Arts District (OSSHAD); however, an overlay is also utilized for properties located along the historic main streets of Atlantic Avenue and Swinton Avenue. The intent of the overlay is to support adaptive reuse of historic structures and achieve compatible infill development in a pattern and scale consistent with Delray Beach's historic commercial main streets. The overlay allows the principal and accessory uses from the Central Business District zoning to be established on the designated properties. The overlay also allows the designated properties to utilize the development standards and architectural guidelines of the Central Business District; however, it is important to note, the overlay does not change the land use designation, and the properties are still limited to the floor area ratio and density maximums for Historic Mixed Use.



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The hatched properties have the Historic Mixed Use land use designation with the Central Business District overlay zoning.

Industrial Land Use Designations

The Industrial land use designations of Industrial and Commerce are applied to those areas where industrial type uses, such as fabrication and assembly of goods, warehousing, and vehicle repair, are the primary economic strategy for the district. While Delray Beach is not known as an industrial hub, many sites located along Congress Avenue and along or adjacent to Linton Boulevard take advantage of the nearby railway and highway access in the area. Accommodation of these industrial-type uses is essential to the local economy as they help to support and grow the local job base. Based on established development patterns, the intensity for development on land with an Industrial land use designation is deemed appropriate at a maximum floor area ratio of 0.60.

Only 2% of land area within the Delray Beach municipal city limit has the Industrial land use designation. The advisory land use designations for the annexation areas will not add any land for industrial-type development. Therefore,

amendments to the land use map that reduce the amount of land with an Industrial land use designation are discouraged for long term economic prosperity.



A glimpse of an industrial section from Interstate-95; industrial uses are typically located in proximity to interstates and highways for ease of access both for distribution and customers.

Industrial (I) Land Use

The Industrial land use designation accommodates manufacturing, fabrication, assembly, and warehousing uses on properties where such uses currently exist, and in areas identified as appropriate to continue or expand industrial-based uses. As a means of ensuring the perpetual accommodation of industrial uses, residential and general commercial uses are prohibited on properties with an Industrial land use designation.

Commerce (CMR) Land Use

The Commerce land use designation is located along or adjacent to the North Congress Avenue corridor, north of West Atlantic Avenue. While categorized as an Industrial-type land use designation, the Commerce land use designation accommodates a mix of industrial, service, and commercial uses. Residential uses are also allowed on a limited basis and require the inclusion of workforce housing.

Congress Avenue is classified as a major arterial roadway that connects Delray Beach to Boynton Beach to the north and Boca Raton to the south. An analysis is needed to determine if the Commerce and Congress Mixed Use land use designations should be combined into a single land use designation. The intent of the single land use designation would be to establish a cohesive and unified streetscape aesthetic while



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accommodating a balanced mix of commercial, industrial, office, and residential uses.



The Congress Commerce Center at the southeast corner of North Congress Avenue and Lake Ida Road provides a balanced variety of businesses with limited retail-based opportunities.

Open Space Land Use Designations

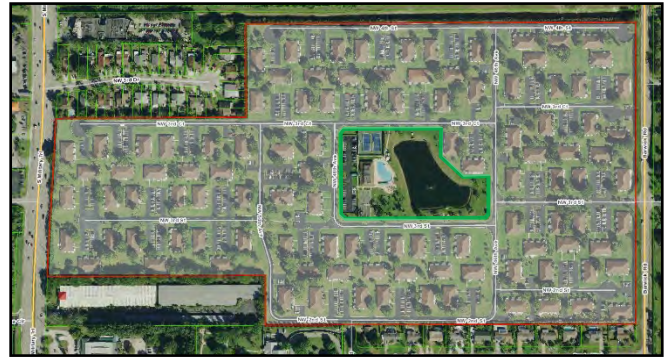
The Open Space and Conservation land use designations are intended to protect and preserve open and natural areas that serve to benefit the public. The provision of recreational opportunities is also an important aspect of these land use designations.

The Open Space and Conservation land use designations comprise 9% of the land area within the Delray Beach municipal city limits (see Map AD-1). The current advisory land use designations for the annexation areas will not add any open space or conservation lands. However, new development could apply these designations to community amenities and recreational areas.

Open Space (OS) Land Use

The Open Space land use designation is predominantly utilized for canals, waterways, beaches, shores, estuarine systems, golf courses, private common areas within planned developments, and undevelopable parcels. The Open Space land use designation is also utilized for public recreational areas, including those sites with associated indoor facilities open space areas, and some areas intended to remain as natural habitats, even if not currently limited with a Conservation land use designation. The Open Space land use designation is implemented mostly by the Open Space or Open Space Recreational zoning

districts, although the City has assigned some parcels Conservation zoning as well. The Open Space land use designation is also implemented by residential zoning districts with the area limited to the provision of amenities for residential development.



The community amenities for High Point of Delray is a good example of the Open Space land use designation implementation by a residential zoning district.

The development intensity for the open space land use designation is 0.10 and is intended to provide for ancillary structures such as maintenance, storage, or public restrooms. The floor area ratio for the Open Space land use designation was 0.50 in the previous plan; however, an analysis of the twenty-three parcels with an Open Space land use designation indicated that the floor area ratio for all parcels was below 0.10. Therefore, the floor area ratio has been reduced accordingly.

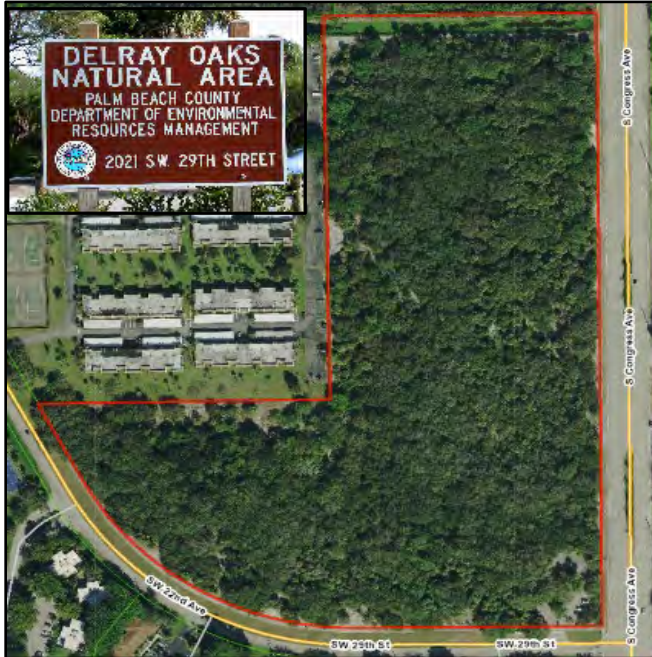
Conservation (CON) Land Use

The Conservation land use designation is limited to recreation, open space, and conservation uses. However, those properties identified in the Conservation Element as land to be preserved, may only be developed in accordance with the Conservation Element. Given that land reserved for conservation is predominantly for public purpose, those properties with a Conservation land use designation should be required to be placed into public ownership or protected through a perpetual restrictive land covenant. Development on conservation land is limited to ancillary structures that support the needs of the conservation of land and do not have a negative impact on the property or environment. Therefore,



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the maximum intensity for properties with a Conservation land use designation is limited to a 0.01 floor area ratio.



Delray Oaks Natural Area, which is owned by Palm Beach County, is located in Delray Beach along South Congress Avenue. The Conservation land use designation protects remaining natural areas within the city.

Community Facility Land Use Designation

The Community Facility land use designation accommodates a full range of local or regional community based uses primarily intended to serve the public. Those community based uses include current and future school sites, public buildings, public facilities, and buildings that serve the community and are not commercial in nature, such as places of worship. The maximum intensity for development on land with a Community Facility land use designation is a 1.0 floor area ratio.



Pompey Park, located within the northwest neighborhood, is a community facility that provides diverse recreational opportunities for residents of all ages.

Agricultural Land Use Designation

Given that 98.9% of the land within the Delray Beach Planning Area has been developed, the Agricultural land use designation is not applied to any parcels on the Land Use Map. The long-term continuance of existing agricultural operations is unlikely from an economic perspective and is not compatible with the urbanization that has occurred. The Agricultural land use designation, which is implemented by the Agricultural zoning district, has a maximum intensity for development at a 0.15 floor area ratio.



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ANNEXATION AREAS

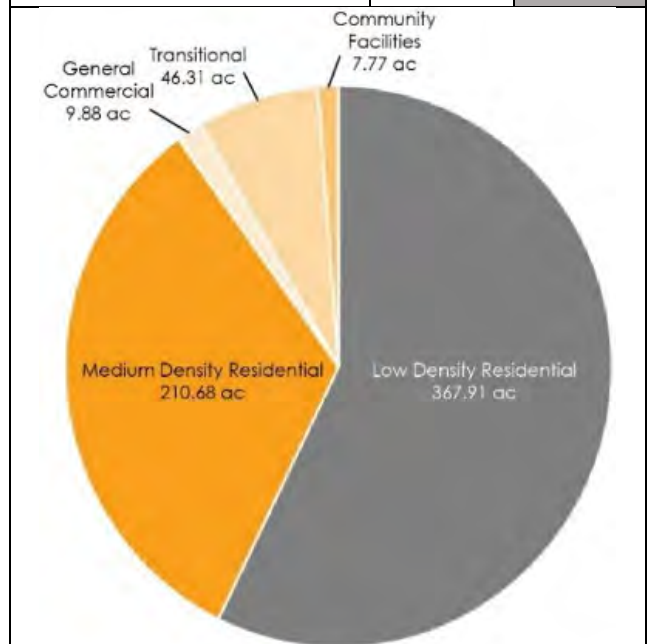
The Charter for the City of Delray Beach established the "Greater Delray Beach Area". The area exceeded the municipal boundaries and provided that the City could annex properties within it (i.e. a "reserve annexation area"). Since the Charter was adopted, the City has enacted numerous annexations. Through 1987, these annexations had mostly been voluntary and were usually associated with proposed development seeking municipally provided services (water, sewer, fire, police, street maintenance, etc.). That annexation process led to the creation of numerous County islands or "enclaves". Following enactment of special legislation entitled the "Delray Beach Enclave Annexation Act", the City in 1988 unilaterally annexed approximately 1,300 parcels located within 68 enclaves which comprised 834 acres and a population of approximately 3,100 individuals.

Upon adoption of the 1989 Comprehensive Plan, the City's "reserve annexation area" was replaced by the boundaries of its "Official Planning Area". The Official Planning Area is the area for which most calculations and projections in this Plan are predicated upon. It is also considered the City's ultimate boundaries. The Planning Area is specifically delineated on Map AD-1, as well as most maps contained in this Element.

The current Planning Area for Delray Beach includes 642.55 acres of unincorporated land (See Map AD-23 - Annexation Areas). These areas have a mix of advisory land uses including Low Density Residential, Medium Density Residential, General Commercial, Transitional, and Community Facilities. The advisory land use is the City's intended density and intensity for the land; assigning another land use requires a determination of need from the same findings any other Land Use Map amendment requires.

TABLE NDC-G
Advisory Land Use Designations for Annexation Areas

Existing Land Use	Acres	% of Land
Low Density Residential	367.91	57%
Medium Density Residential	210.68	33%
Transitional	46.31	7%
General Commercial	9.88	1.5%
Community Facilities	7.77	1.2%
Total	642.55	



Country Club Acres, located off of South Military Trail, is a single-family neighborhood with approximately five-hundred parcels. The 158 acre neighborhood is located within the City's Future Annexation Area.



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The City has a program for annexation of the areas identified on Map AD-23 (Annexation Areas). The program includes the preparation of an "urban services annexation report" as required by Florida Statutes, for each of the remaining designated annexation areas. Additionally, the City must work with Palm Beach County to address the annexation of improved property that lacks adequate sewer, water, street, and/or drainage facilities pursuant to the Palm Beach County Annexation Incentive Program, and recommend whether annexation should be pursued and, if so, the means by which annexation should occur.

The program also requires that the City accommodate individual voluntary annexations as the opportunities arise; most annexations are anticipated to result from voluntary annexations.

Any future development or redevelopment of these areas will likely pursue annexation to receive water service, which is necessary to serve any densification or increased intensity on the properties. Prior to obtaining water service, annexation or an agreement to annex when conditions are appropriate, is a prerequisite.

Concurrency findings are required for all land to be annexed with respect to water facilities, sewer facilities, public schools, streets, drainage, and other facilities (See Table NDC-H). This analysis is necessary to ensure public facilities are in place to adequately serve the area without negatively impacting both existing and future residents.

TABLE NDC-H
Concurrency Findings

Findings for:	Shall mean that:
water facilities	direct connection to a functioning municipal system is made.
sewer facilities	direct connection to a functioning municipal system is made; or, where such facilities are not reasonably accessible, connection to a septic system.
public schools	the improvement is in place or construction appropriations are specified within the first three years of the most recently approved School District Improvement Schedule, as reflected in Table SD-CIP of the Capital Facilities Element.
streets, drainage, and other facilities	the improvement is in place prior to issuance of the occupancy permit; or, the improvement is bonded, as a part of the subdivision improvements agreement or similar instrument, and there is a schedule of completion in the bonding agreement; or, the improvement is a part of a governmental capital improvement budget; it has been designed; and a contract for installation has been solicited.

AVAILABILITY OF SERVICES

Potable Water Supply

The City's adopted 10-Year Water Supply Facilities Work Plan, prepared by Kimley Horn and Associates, Inc., dated February-May 2015/2021, is in the process of being updated, and adopted. The updated plan will provide includes new population projections and incorporates the 2018 Lower East Coast Water Supply Plan Update; anticipated completion and adoption is within 2020.

Based upon the 2018 Lower East Coast Water Supply Plan Update, the demand for water in 2040 for the projected 2040 population of 81,874 will require 18.75 MGD Average Daily Flow (ADF). The City's current SFWMD Water Use Permit (No. 50-00177-W) has an annual groundwater allocation of 19.10 MGD ADF, which exceeds the current demand and meets the future projects projections. The City's existing water treatment plant system is capable of producing 26.0 MGD Maximum Daily Flow (MDF). It should also be noted that the population projections in the plan are



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

higher than other sources indicate. In addition, the planned expansion of the reclaimed water system will provide alternative water supply for irrigation, lessening the demand on the potable water system. More than 1,000 domestic wells still exist within the service area, predominantly used for irrigation.

Sewer Facilities

The design capacity of the City of Delray Beach's and the City of Boynton Beach's City's sewer/wastewater treatment plant system is 24 MGD, which has a planned expansion to 30 MGD. The current demand flow as of July 2021 is 17.16 MGD for the entire facility and 7 MGD for the City of Delray Beach's share. This indicates that the facility has the capacity to absorb the projected almost 20% population increase during the planning period.

Solid Waste

No solid waste disposal facilities exist within the Planning Area. The Palm Beach County Solid Waste Authority (SWA) has established a level of service standard of 9.54 pounds per person per day. Delray Beach has an estimated 2.74 pounds per capita per day need, which is well below the established level of service standard. This level of use indicates the landfill is anticipated to meet the City's capacity needs within the projected final depletion year use plans of the County and its municipalities. In addition to landfill capacity, the City is interested in expanding recycling and other sustainability efforts that will aid in the reduction of the demand per person per day.

Stormwater

The City's 2018 Stormwater Management Master Plan Update includes assumptions for sea level rise based on 30-year and 75-year projections identified in the City of Delray Beach Intracoastal Waterway Water Level & Infrastructure Vulnerability Study, conducted in 2018. The Stormwater Management Master Plan Update identifies stormwater management challenges due to impacts of sea level rise and localized flooding. These issues, coupled with a rising groundwater table, will impact primary and secondary drainage systems, ultimately reducing

the capacity of these systems. The required improvements are prioritized and programmed in the Capital Improvements Element. Ongoing discussion regarding seawall improvements based on a recently completed evaluation is anticipated to drive new standards for both public and private properties. Ultimately, the City will need to undertake a citywide climate change vulnerability assessment to develop a long term, focused approach to managing the impacts of climate change.

Mobility

Recognizing that growth through redevelopment and densification provides limited opportunity for new lane mileages, the City's direction in the planning period is to diversify viable modes of transportation within its boundaries through both capital improvements and land use strategies. The priority to meet transportation needs is the creation of a Mobility Plan, ultimately supported by a Mobility Fee, to retrofit existing streets, expand bike-ped facilities, and construct a new commuter rail station for the Tri-Rail Coastal Link and potentially the Brightline services.

Using conventional roadway level of service standards (County and regional standards for all but the State facilities, which use FDOT standards), deficiencies exist at the following roadway segments:

- 🚦 Military Trail from Flavor Pict Road to Clint Moore Road
- 🚦 Interstate 95 from West Atlantic Avenue to Peninsula Corporate Drive
- 🚦 Federal Highway from Linton Boulevard to Lindell Boulevard
- 🚦 Linton Boulevard from Old Dixie Highway to 10th Avenue SW
- 🚦 Lake Ida Road from North Swinton Avenue to Military Trail
- 🚦 SW 10th Avenue from Lindell Boulevard to Hidden Valley Boulevard.

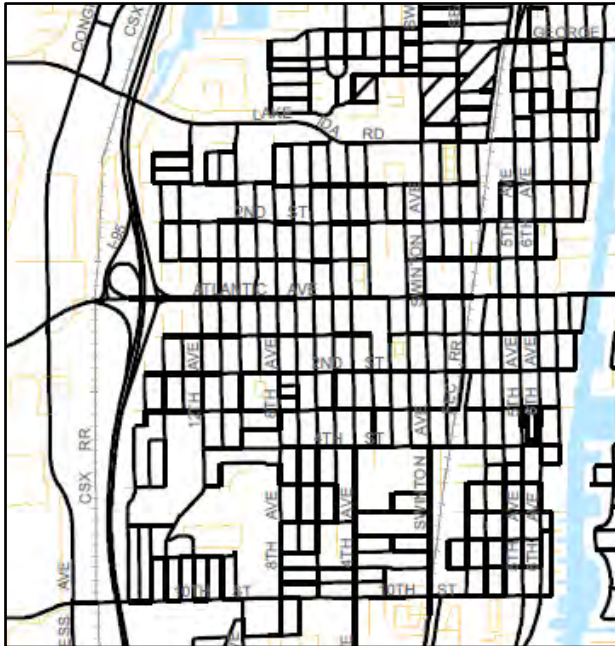
To aid in the revitalization of the downtown, the City has established a Transportation Concurrency



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

Exception Area (TCEA), which is depicted on Map AD-11 (TCEA Boundary). The TCEA provides an alternative to expanding roadway capacity through wider roads and higher speeds. Therefore,

growth will largely be accommodated through redevelopment, this strategy will continue to be an important tool.



The original grid network throughout the downtown area and surrounding neighborhoods remains largely intact (see Map DIA-10, Roadway Connectivity).

the TCEA designation is an essential tool to achieve the City's vision of maintaining the overall scale and character of the downtown as the "Village by the Sea." In addition, all major infrastructure systems are in place, including a grid network of streets providing convenient access to and from major arterials and the Interstate highway system. The TCEA is further described in the Data, Inventory, and Analysis of the Mobility Element.

REDEVELOPMENT AND NEIGHBORHOOD PLANS

The City has undertaken a focused, area-specific strategy to revitalizing aging or under-utilized areas using Neighborhood or Redevelopment Plans created with a high degree of resident and stakeholder involvement (See Map AD-22 - Neighborhood and Redevelopment Plan Areas). The transformation of the downtown during the last 20 years is a testimony to the power of developing a master plan in partnership with the public, and implementing the recommendations of the plan to achieve the vision defined by the plan. Since

TABLE NDC-I Adopted Neighborhood and Redevelopment Plans	
Plan	Year Adopted
Banker's Row: A program for Re-Use and Restoration	1991
West Atlantic Avenue Redevelopment Plan	1995
Silver Terrace Redevelopment Plan	1996
A Neighborhood Plan for 'Main Street' in the Grove	1998
Seacrest / Del-Ida Park Neighborhood Plan	1998
North Federal Highway Redevelopment Plan	1999
Southridge / SW 4 th Avenue Redevelopment Plan	1999
Lindell/Federal Highway Redevelopment Plan	2000
Downtown Delray Beach Master Plan	2002
Southwest Area Neighborhood Plan	2003
Wallace Drive Industrial Area Redevelopment Plan	2004
Osceola Park Redevelopment Plan	2004
South Federal Highway Redevelopment Plan	2012

The City will continue to facilitate and prepare neighborhood and redevelopment plans with a high degree of public participation and in collaboration with City departments, the Delray Beach Community Redevelopment Agency (if located within their boundaries), strategic partners, and neighborhood residents. Once a plan is adopted, specialized planning strategies will be determined to implement the vision of adopted Neighborhood and Redevelopment Plans. Table NDC-I lists the adopted plans, which are also illustrated in see Map AD-22 (Redevelopment Areas). These plans will continue



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

to be utilized to assist in the transformation of Delray Beach's neighborhoods, districts, and corridors.

In the update of the listed plans, or creation of any new plans, the City will continue to facilitate public participation through the creation of neighborhood, community, and stakeholder groups to provide balanced representation. The creation or update of a neighborhood or redevelopment plan will be prioritized for areas of the city that are in a historic district, presenting signs of deterioration, or raising concerns regarding the intrusion of incompatible uses or development patterns.

Plan recommendations will be based on the need, desirability, and level of support for enacting

specific planning strategies, such as the creation of a historic or other special purpose district, introduction of new uses or housing types, inclusion of streetscape or landscape design guidelines, or amendment of land use designations. Requests to change residential land use or zoning designations to designations other than Community Facilities or Open Space land use designations or zoning categories will not be supported unless the proposed changes implement an adopted neighborhood or redevelopment plan. To ensure the implementation of an adopted Plan's vision and recommendations, any required land use or zoning designation changes, amendments to the Land Development Regulations, creation of design guidelines, etc. will be adopted within two years of the adoption of a new or updated Neighborhood or Redevelopment Plan.

RECOMMENDATIONS

Land Use

Goal 1, Land Use, focuses on the enhancement of the quality and character of Delray Beach's neighborhoods, districts, and corridors to create a sustainable community in which to live, work, play and grow. The needs and recommendations inform policies that focus on establishing compatibility among land uses with appropriate transitions in scale, intensity, and development pattern through the application of appropriate land use designations and their associated intensities and densities. The identified needs and

recommendations, which are discussed within each land use designation category, will guide the implementing zoning districts for each land use designation to provide adaptive reuse, redevelopment, and development that is compatible, appropriate, and meet the intent of each land use designation.

Quality of Life and Urban Form

Goal 2, Quality of Life and Urban Form, focuses on providing a high quality of life for all residents through the transformation of underutilized and blighted areas into attractive and thriving neighborhoods, districts, and corridors. The objectives and policies are organized from east to west, and reflect the needs and recommendations for each area of the City: the barrier island, the downtown and surrounding neighborhoods, and the area located west of Interstate-95, which is comprised largely of residential neighborhoods and commercial corridors.

The policies guide specific uses and issues, such as accommodating automotive dealers, encouraging transit-oriented development, and

Recommendations, Land Use:

- 🌱 Provide incentives for adaptive reuse of structures eligible for historic designation.
- 🌱 Provide incentives to encourage transit-oriented development.
- 🌱 Re-evaluate implementing zoning districts for land with a General Commercial land use designation to provide for desirable and appropriate amounts and locations of mixed use developments with residential uses.
- 🌱 Analyze the feasibility of combining the Commerce and Congress Avenue Mixed Use land use designations.



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

improving Delray Beach's corridors, which reflects their importance in improving quality of life and urban form throughout the City. The policies relevant to automotive dealerships are carried forward from the current Comprehensive Plan, which specify the limited locations where they can be located. Given market changes and industry advancements, future consideration may be given to permitting automotive dealerships west of Interstate-95 along the Congress Avenue corridor with specified limitations.

Goal 2 also provides the planning strategies the City uses to improve Delray Beach's neighborhoods, districts, and corridors. The City has realized successful transformations of distressed or declining areas using focused neighborhood planning activities with a high degree of resident involvement. The transformation of the downtown area during the last 20 years is a testimony of the power of developing a master plan in collaboration with residents and stakeholders, then using land use and land development regulations and capital improvements to revitalize an area.

Goal 2 identifies the process for prioritizing areas for new or updated plans, as well as the adopted neighborhood and redevelopment plans the City uses to guide redevelopment decisions and improvements. Many of the current plans need to be updated based on an analysis of the plan's vision, particularly if a significant amount of improvements has occurred either within or adjacent to the plan area. Additional areas are identified that should have a redevelopment plan created to establish a specific vision. Given the

Recommendations, Innovative Housing Strategies:

- Identify where greater housing choices, more affordable housing, and innovative housing types are appropriate.
- Establish criteria for the provision of accessory units when not included in a density calculation.
- Create and promote incentives for workforce housing programs.

amount of needs and recommendations identified

for Goal 2, the list is organized by topic or geographical location.

Recommendations, Development on the Barrier Island:

- Update the Land Development Regulations with respect to maintain the character of and increase the resiliency within the Coastal Planning Area.
- Study a Transfer of Development Rights program to direct density and development away from the Coastal Planning Area.

Recommendations, Downtown and Eastern Neighborhoods:

- Retain alleys and maintain the street network.
- Provide incentives to encourage adaptive reuse within mixed-use and commercial land use designations.
- Provide incentives that encourage the long-term viability, adaptive reuse, and redevelopment of small properties located within mixed-use and commercial land use designations.

Recommendations, Western Neighborhoods (West of Interstate-95):

- Enhance and augment the street, sidewalk, and bicycle network west of Interstate-95.
- Improve recreational opportunities west of Interstate-95.
- Create incentives to encourage the redevelopment of strip commercial centers to mixed-use, multi-modal environments.



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

Recommendations, Promote Transit-Oriented Development:

- Create incentives to provide transit-oriented workforce housing.
- Create an infill/redevelopment plan for the station area surrounding the Delray Beach Tri-Rail Station.
- Develop plans and provide site improvements for the Tri-Rail Coastal Link Station downtown.

Recommendations, Improve City Corridors:

- Utilize creative strategies to improve the view shed of Delray Beach from the FEC and CSX Railways, and Interstate-95.
- Create a greenway along the CSX Railway.

Recommendations, Planning of Neighborhoods, Districts, and Corridors:

- Prepare and update redevelopment and neighborhood plans; implement recommendations within two years of adoption.
- Prioritize public participation in the creation or update of neighborhood and redevelopment plans.
- Prioritize areas based on specific criteria for the creation or update of neighborhood and redevelopment plans.
- Re-evaluate the vision of current plans, in order of adoption or last update, to identify any impacting conditions or factors.
- Identify areas where new plans are needed to realize the City's vision.

Smart Growth

The needs and recommendations of Goal 3, Smart Growth, concern the provision of efficient, cost effective urban services to discourage sprawling settlement patterns, the establishment of a consistent review procedures for land use changes, and the ongoing streamlining and refinement of predictable land development regulations that realize the vision of the City.

Recommendations, Smart Growth:

- Require Concurrency criteria.
- Maintain coordination with Strategic Partners for new development.
- Discourage urban sprawl.
- Continue to provide services to properties within the City's Planning Area.
- Continue to provide a process for the annexation of properties within the City's Planning Area.
- Consistently evaluate amendments to the Land Use Map.
- Evaluate the Land Development Regulations to address recommended incentives and concepts identified throughout the Always Delray Comprehensive Plan.
- Conduct a thorough review of the Land Development Regulations to address inconsistent terminology and redundancy.



NEIGHBORHOODS, DISTRICTS, AND CORRIDORS ELEMENT

APPENDIX NDC - A

IMPLEMENTING ZONING DISTRICTS	
District Name	Acronym
Agriculture	A
Automotive Commercial	AC
Central Business District	CBD
Community Facilities	CF
Conservation	CD
General Commercial	GC
Industrial	I
Light Industrial	LI
Low Density Residential	RL
Medium Density Residential	RM
Mixed Industrial and Commercial District	MIC
Mixed Residential, Office, and Commercial	MROC
Mobile Home	MH
Neighborhood Commercial	NC
Old School Square Historic Arts District	OSSHAD
Open Space	OS
Open Space and Recreation	OSR
Planned Commerce Center District	PCC
Planned Commercial	PC
Planned Office Center	POC
Planned Residential Development	PRD
Professional and Office District	POD
Residential Office	RO
Resort/Tourism	RT
Rural Residential	RR
Single-Family Residential	R-1
Special Activities District	SAD



PUBLIC FACILITIES & SERVICES

LIVE



WORK



PLAY



GROW



DATA, INVENTORY, AND ANALYSIS



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PUBLIC FACILITIES AND SERVICES

INTRODUCTION

The purpose and objective of the Public Facilities Element is to provide cost effective total life cycle management of the City of Delray Beach's public infrastructure and key essential services to enhance sustainability and the health, safety and welfare of residents, businesses and visitors.

The City maintains extensive public infrastructure and facilities. Storm drainage systems, water treatment and transmission systems, wastewater (sanitary sewer) collection and pumping systems, City-owned buildings, landscaping, streets, trees, sidewalks, signs, parks, public parking, and street lamps are all maintained by the City. This infrastructure provides property owners, residents and visitors to the city with a high quality of life

The Public Facilities Element summarizes items of significance in the City's sanitary sewer, reclaimed water, potable water, solid waste, stormwater management system, transportation system, and public facilities. The following summaries have been prepared to facilitate review of the requirements of Florida Statutes (F.S.) 163.3177 and guide the City of Delray Beach in the creation of Goals, Objectives, and Policies to govern the provision of public facilities and services. The text of the Element is a summary of the complete inventory, analysis, and recommendations which are contained in the technical source documents. As a summary, only significant items are highlighted. The source documents should be referred to for more information.





PUBLIC FACILITIES AND SERVICES

INVENTORY & ANALYSIS

General Government Facilities

The City has 113 public facilities. An inventory of the major buildings and facilities owned by the City is provided in Table PFE-A:

Table PFE-A General Government Facilities			
Location Name	Street Address	Occupancy Description	Year Built
GENERAL GOVERNMENT BUILDINGS/FACILITIES			
City Hall Complex	100 NW 1st Avenue	City Hall Building	1961
City Attorney Building	200 NW 1st Avenue	City Attorney Building	1959
Employee Health & Wellness Center	525 NE 3rd Avenue	Employee Health & Wellness Center	
Swinton Operations Center	434 S Swinton Avenue	Public Works: Facilities, Parking, Fleet Maintenance, Stormwater, and Engineering; Utilities, including the water treatment plant and elevated storage tank.	1950s; added onto in 1980s; New Construction in 2007
Federspiel Garage Building	22 SE 1st Avenue	Parking Garage	2007
Old School Square Garage Building	95 NE 1st Street	Parking Garage	2007
Public Library	100 Atlantic Avenue	Public Library	2005
PUBLIC SAFETY FACILITIES			
Fire Rescue Headquarters Building: Fire Station HQ	501 W Atlantic Avenue	Fire Rescue Headquarters Building: Fire Station HQ	1993
Fire Station #2 Building	35 Andrews Avenue	Fire Station #2 Building	1991
Fire Station #3 Building	651 Linton Boulevard	Fire Station #3 Building	1971
Fire Station #4 Building	4321 Lake Ida Road	Fire Station #4 Building	2008
Fire Station #5 Building	4000 Old Germantown Road	Fire Station #5 Building	1993
K-9 Police Obstacle Course	1025 Mission Hill Road	K-9 Police Obstacle Course	
Ocean Rescue HQ Building: Anchor Park	340 South Ocean Boulevard	Ocean Rescue Headquarters and Equipment Storage	1950
Police Headquarters Building	300 W Atlantic Avenue	Police Headquarters Building	1987
Police Substation (Lessee)	1570 S Federal Highway	Police Substation (Lessee)	
Seacrest Training Center	2350 N Seacrest Boulevard	Seacrest Training Center (Lessee)	2002



PUBLIC FACILITIES AND SERVICES

Table PFE-A General Government Facilities			
Location Name	Street Address	Occupancy Description	Year Built
HISTORIC/CIVIC BUILDINGS			
1926 Historic Bungalow House (Lessor)	3 NE 1st Street	1926 Historic Bungalow House (Lessor)	1926
1931 Cason Cottage (Lessor)	5 NE 1st Street	1931 Cason Cottage (Lessor) Historic Cottage	1931
American Legion Post (Lessor)	196 NW 8 Avenue	American Legion Post (Lessor)	1966
Boy Scouts Building/Mike Macheck Boy Scout Park	405 Lake Ida Road	Equipment/Electrical	1962
Hunt House & Archive Bunker (Lessor)	111 NE Swinton Avenue	Hunt House & Archive Bunker (Lessor)	1931
Mae Volen Senior Center (Lessor)	850 N Congress	Mae Volen Senior Center	1997
Monterey House / Judge Knott Center (Lessor)	20 N Swinton Avenue	Monterey House / Judge Knott Center (Lessor)	1935
Munnings Cottage Building	154 NW 5 Avenue	Munnings Cottage Building (Lessor)	1931
Railroad Depot Building	80 Depot Avenue	Railroad Depot Building	1926
Spady House Museum	170 NW 5th Avenue	Spady House Museum	1924
RECREATION AND OPEN SPACE FACILITIES			
Playground	405 Lake Ida Road	Public Playground	
Amphitheater	SW 5 Ave & Atlantic	Public Amphitheater	
Family Recreation & Fitness Center Playground	850 N Congress	Multi-Play Structure	
Mike Macheck Boy Scout Park	405 Lake Ida Road	Pavilion and Restrooms Building	1993
Teen Center/Woman's Club Building	505 SE 5th Avenue	Teen Center/Woman's Club Building	1949
Skate Park: Teen Center/Woman's	505 SE 5th Avenue	Skate Park: Teen Center/Woman's	
Old School Square Crest Theater	51 N Swinton Avenue	Theater	1925
Old School Square Cornell Museum Building	51 N Swinton Avenue	Museum	1913
Old School Square Pavilion/Amphitheater Building	51 N Swinton Avenue	Pavilion/Amphitheater	2002
Old School Square Loggia	51 N Swinton Avenue	Loggia (West)	1925



PUBLIC FACILITIES AND SERVICES

Table PFE-A General Government Facilities			
Location Name	Street Address	Occupancy Description	Year Built
Old School Square - Gymnasium Building	51 N Swinton Avenue	Gymnasium	1925
Neighborhood Resource Center	141 SW 12th Avenue	Neighborhood Resource Center	1967
Visitor Information Center Building & Sarah Gleason Park	2 S Ocean Avenue	Visitor Information Center Building & Sarah Gleason Park	1979
Community Center/Gym Building	50 NW 1st Avenue	Community Center/Gym Building	1961
Administration/Parks Maintenance	320 SW 4th Street	Administration/Garage Building: Parks Maintenance	1982
Atlantic Dunes Park	1605 South Ocean Boulevard	Public Park Facility	
Barwick Park	4321 Lake Ida Road	Public Park Facility	
Bexley Park	1400 W Bexley Park Drive	Public Park Facility	2008
Catherine Strong Park	1500 SW 6th Street	Public Park Facility	2006
Currie Commons Park	750 SE 2nd Avenue	Public Park Facility	1980
Eagle Park Picnic Facility	55 Coral Trace Boulevard	Public Park Facility	
Knowles Park	1001 S Federal Highway	Public Park Facility/Boat Ramp	
Lake View Park	1100 Lake Drive	Public Park Facility/Boat Ramp	2006
Mangrove Park	1211 S Federal Highway	Public Park Facility/Boat Ramp	
Miller Park/Little Fenway	1905 SW 4th Avenue	Public Park Facility	
Merritt Park	320 SW 4th Street	Public Park Facility	1970
Orchard View Park	4060 Old Germantown Road	Public Park Facility	
Pine Grove Park	400 SW 10th Street	Public Park Facility	
Pompey Park	1101 NW 2nd Street	Admin/Gymnasium Building: Pompey Park	1978
Veterans Park	802 NE 1st Street	Public Park and Community Center	1966
Playground	2800 Albatross Road	Public Playground	
Beach Pavilion (Main)/Observation Ramp	Atlantic & Ocean	Public Beach Facility	
DB Municipal Golf Club	2200 Highland Avenue	Public Golf Course/Club House	1996
Lakeview Golf Course	2000 Dover Road	Public Golf Course	1973
Delray Beach Tennis Center Complex	201 W Atlantic Avenue	Public Tennis Center/Stadium	1993



Table PFE-A General Government Facilities			
Location Name	Street Address	Occupancy Description	Year Built
Seacrest/Hilltopper Soccer Complex	2505 Seacrest Boulevard	Pavilion/Restrooms/Concession	2008
Delray Beach Memorial Gardens Municipal Cemetery	700 SW 8th Avenue	Municipal Cemetery & Mausoleum	1988
Delray Beach City Marina	159 Marina Way	Public marina	

Wastewater Collection & Treatment Facilities

The South Central Regional Wastewater Treatment Facility is located in Delray Beach. Delray Beach and Boynton Beach established the South Central Regional Wastewater Treatment Plant and Disposal Board in 1974 as an independent special district through an interlocal agreement to treat wastewater. The City Commissions of both cities serve as the governing board and daily operations of the facility are overseen by a plant manager, who reports to the Board. Coordination is facilitated through an "Operating Committee" comprised of the plant manager and a representative of each of the cities, typically the utilities department director. The Operating Committee engages each city with the plant manager in operation of the facility, its budget and resources. The City is responsible for the wastewater collection and transmission system within the service area shown on Map DIA-36 (Utility Service Area).

The utilities service area includes the City's Planning Area plus additional areas that are provided service through contract, including the Town of Highland Beach and several single and multi-family connections in the Town of Gulf Stream. The service area encompasses approximately 18 square miles.

The wastewater collection system consists of approximately 434 225 miles of gravity mains and 47 miles of force mains interconnected to 129 lift stations. Fewer than 100 septic systems remain within the service area. The wastewater treatment facility was constructed in 1979, with a programmed life of 50 years (2029). With the completion of the Palm Beach County Solid Waste Authority biosolids pelletization facility, which dries and processes sludge for use in

fertilizer, land spreading of sludge has been eliminated.

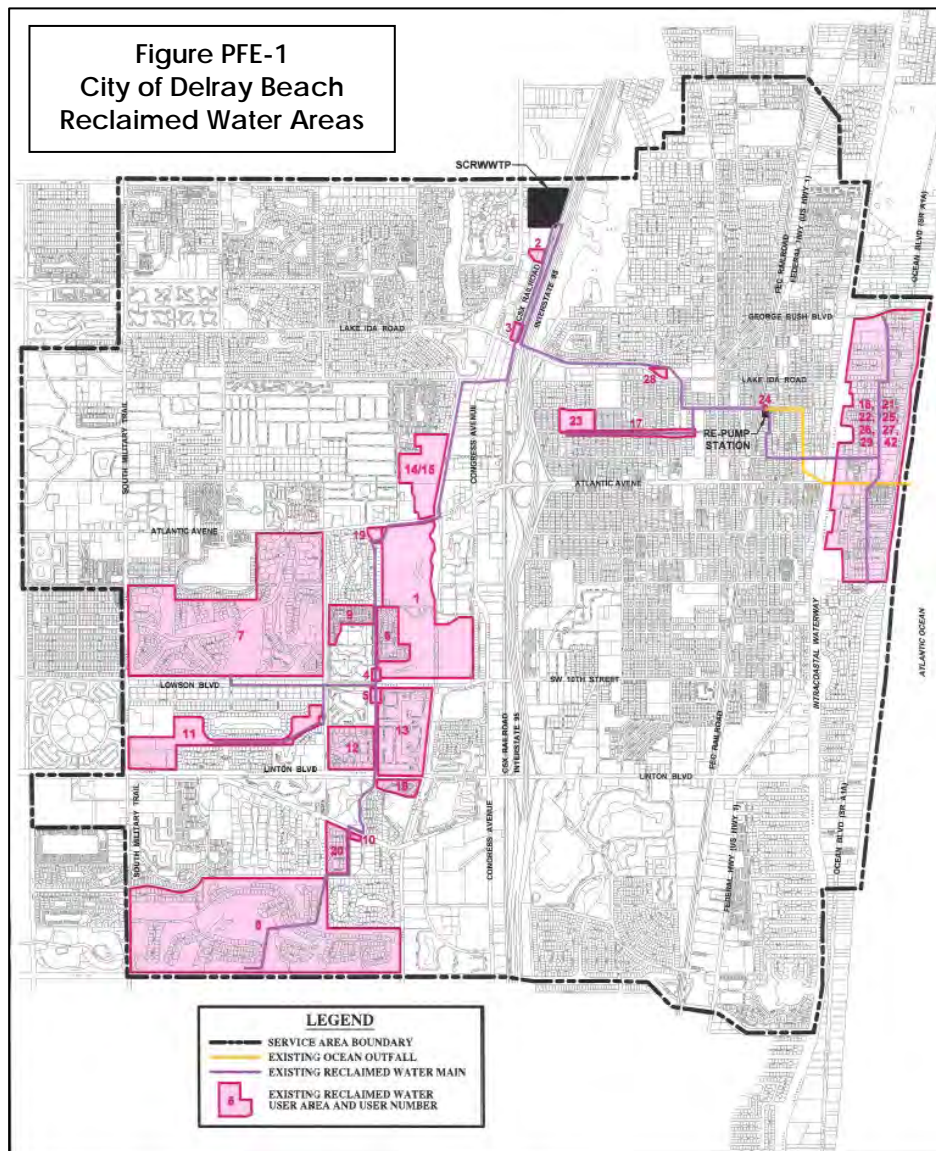
The design capacity of the South Central Regional Wastewater Treatment Facility for secondary treatment capacity is 24 million gallons per day (MGD) but will be expanded to 30 MGD as a part of a \$15 million bank loan for aeration improvements, plant expansion, and other improvements included in the five year capital improvement plan. The plant is capable of producing up to 24 MGD of reuse quality water design capacity for tertiary treatment is 10 MGD, which is specifically for reclaimed water use and has 8 MGD of reuse storage tank capacity.

Table PFE-B City of Delray Beach Sewer Capacity / Demand Analysis (Includes Service to the City of Highland Beach and Boynton Beach)	
CAPACITY	AVERAGE FLOW
24 MGD	47-16 MGD
Source: South Central Regional Wastewater Treatment & Disposal Board (July 2021)	

Using reclaimed water for irrigation helps shave peak potable water irrigation demands, which helps preserve limited potable water resources. City reclaimed water customers average about 2.5 million gallons per day (MGD) of irrigation use with an anticipated expansion of the system to about 3.8 MGD by



Figure PFE-1
City of Delray Beach
Reclaimed Water Areas



2025 to meet the Leah Schad Ocean Outfall Legislation Ocean Outfall Law requirements. The 2003 2016 reclaimed water master plan update identified 15-16 reclaimed water service areas and recommended developing and expanding the system based on proximity to the SCRWWTP and the highest irrigation use. There are currently 600570 metered connections to the reclaimed water system, primarily on the barrier island, with the biggest users consisting of the golf courses and homeowner associations. The City is in the process of expanding the reclaimed water distribution system by adding at least an additional 50 customers. As the major

reclaimed water trunk lines are installed, the City connects customers whenever physically possible along a corridor route. When the reclaimed system is complete, it is estimated that it will offset as much as 4.7 3.93 MGD of potable water, reducing irrigation withdrawals from the Surficial aquifer, shaving peak demands often caused by irrigation, and deferring capital costs required to develop expensive alternative water supplies for potable water use. The City's reclaimed water system, along with other conservation measures, has helped stabilize the average water use to approximately 14.5 14.9 MGD, despite growth.



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Between 2003 and 2016, the City installed \$8.7 million of reclaimed water system infrastructure, installed in eight phases. The reclaimed water system has a re-pump station adequate to serve the barrier island and future infrastructure in the south-east service area, as well as approximately 20 miles of transmission and distribution pipes, ranging from four to 36 inches. The current reclaimed water capacity is 3.0 MGD, and the average daily flow is 2.29 MGD. The City intends to expand the reclaimed water system to comply with the South Florida Water Management District (SFWMD) water use permit and FDEP Ocean Outfall Legislation.

Potable Water & Groundwater Recharge Facilities

Potable water treatment is provided by the City of Delray Beach at the water treatment plant through conventional treatment processes and a lime softening system. The geographic service area coincides with the Planning Area plus service provided to the Town of Gulf Stream for 0.80 MGD, through contract as a bulk customer. The service area encompasses approximately 18 square miles, as shown on Map DIA-36 (Utility Service Area).

The City of Delray Beach 10-Year Water Supply Facilities Work Plan (Work Plan), prepared by Kimley Horn and Associates, Inc., dated February 2015-May 2021, is in the process of

being updated and will reflect new demand and population projections, as well as the 2018 Lower East Coast Water Supply Plan Update. Completion, including adoption into the comprehensive plan, is anticipated in 2020/2021. A comparison of the 2015-2021 City water supply plan and the latest data from the LECWSP is provided in Table PFE-C.

The lime softening water treatment plant, as noted within the 2015-2021 10-Year Water Supply Facilities Work Plan required by the SFWMD issued water use permit, is rated at 26 MGD by the Florida Department of Environmental Protection (FDEP). The City maintains a National Environmental Laboratory Accreditation Conference (NELAC) state certified laboratory, the primary responsibility of which is monitoring potable water quality. EPA Stage 2 Standards for disinfection by-

Table PFE-D Projected Potable Water Supply Demand (Includes Service to Town of Gulf Stream)				
CAPACITY (MGD)	Existing 2016	2025	2030	2040
26	15.41	16.02 +15	17.65 +68	18.75 +17.24
Source: 2018-2021 Lower East Coast Water Supply Plan Update; includes Town of Gulf Stream)				

TABLE PFE-C Water Supply Plan Population Projections						
	2015	2020	2025	2030	2035	2040
2015-2021 WSP						
City of Delray Beach	64,054	67,573	70,441	73,349	75,964	78,243
Town of Gulf Stream	1,097	1,106	1,126	1,158	1,196	1,232
Unincorporated Palm Beach County / Future Annexation Areas	1,506	1,578	1,675	2,756	2,862	2,947
Total 2015-2021 WSP	66,658	70,257	73,242	77,263	80,022	82,422
LECWSP						
Total LECWSP	*67,272	70,520		77,079		81,874
* Years 2030 and 2040 include the population for areas to be annexed in the future and are currently not receiving water service from the City. The 2015 population is not provided in the LECWSP.						
LECWSP = 2018 Lower East Coast Water Supply Plan Update (includes 1,000+ residents in the Town of Gulf Stream); 2015-2021 WSP = City of Delray Beach 10-Year Water Supply Facilities Work Plan (Work Plan), prepared by Kimley Horn and Associates, Inc., dated February 2015-May 2021						

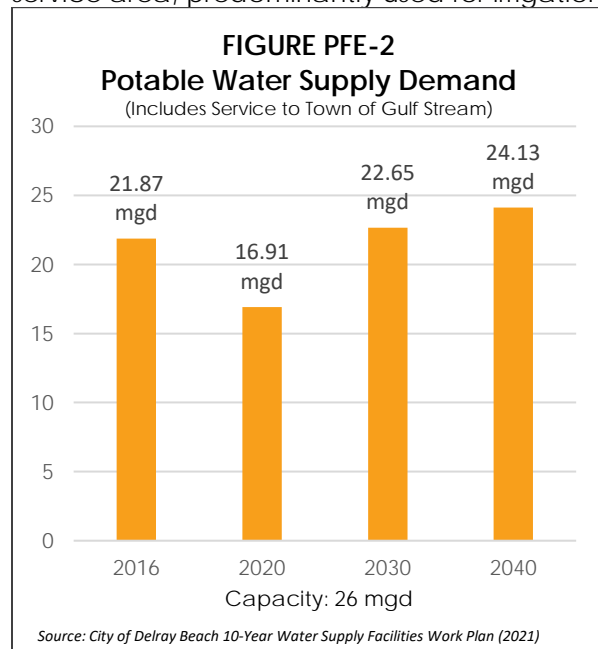


products are being met through the use of supplemental chemical treatment.

Although demand is anticipated to increase, the City has adequate capacity to accommodate the projected increase in demand through the improvements set forth in the adopted water supply facility work plan.

The water distribution system includes 431 miles of water mains ranging from 2 inch to 24 inch diameter, 2,670 fire hydrants, transfer pumps, and storage facilities with a capacity of 8.5 mg.

The City currently withdraws groundwater from 30 active surficial aquifer wells in four wellfields and one (1) Floridan aquifer well for subsequent treatment and distribution to its service area. The City's current SFWMD Water **Use** Permit No. 50-00177-W was issued on December 20, 2010 and expires on December 20, 2030. Under this permit, the annual groundwater allocation shall not exceed 6,972 million gallons (MG) (19.10 MGD) and the maximum monthly allocation shall not exceed 654 MG (21.8 MGD). In addition, there are more than 1,000 domestic wells within the service area, predominantly used for irrigation.



No major groundwater recharge areas are located within the Planning Area, although the entire region east of the Conservation Area is identified as a prime aquifer recharge area by

the U.S. Geological Survey and the Palm Beach County Comprehensive Plan.

Solid Waste Management

The Solid Waste Authority of Palm Beach County is responsible for the ultimate disposal of solid waste in the region. The City is responsible for collection of solid waste within the city limits through a franchise contract with a private firm.

The Solid Waste Authority's solid waste management system consists of a landfill, a 2,000 ton per day waste-to-energy facility, a 3,000 ton per day mass burn waste-to-energy plant, a recovered materials processing facility, a biosolids pelletization facility, a vegetative waste processing operation, household hazardous collection facilities, and six transfer stations.

Solid waste is collected by the City's contractor and is transported to the regional facility located near West Palm Beach. Solid waste can also be taken to a transfer station, located on S.W. 4th Avenue just south of Linton Boulevard, which has a capacity of 1,000 tons per day. In 2006, the Southwest County Transfer Station was established to provide an additional 2,400 tons per day of capacity, to alleviate capacity shortages at the South County and Central County facilities.

The North County Regional Solid Waste Disposal Facility, operated by the SWA, is the ultimate disposal site. This facility occupies 334 acres and consists of a Class 1 (garbage and incinerator residue) and a Class 3 (trash) landfill. The landfill, at its established level of service standard of 7.02 pounds per person per day, has sufficient capacity to serve until the year 2049. In addition to the landfill, the facility provides recycling and waste-to-energy incineration. As of September 30, 2016, the Solid Waste Authority North County Landfill had an estimated 25,303,180 cubic yards of landfill capacity remaining. The second waste to energy facility which began operation in 2015 will significantly extend the useful life of the landfill.



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Despite the recycling and incineration programs, the landfill is anticipated to reach final depletion by 2047. According to the 2017 Landfill Depletion Model report, the Solid Waste Authority's integrated solid waste management system is designed to minimize the reliance on landfilling in an environmentally responsible and cost-effective manner. While Solid Waste Authority's combustion, recycling and recovery efforts have and will continue to significantly extend the life of the landfill, it is unreasonable to expect, given current technology, that landfill disposal can be completely avoided. Landfills, unlike other forms of infrastructure, are a depletable resource. The purpose of the Landfill Depletion Model is to forecast the estimated life of Solid Waste Authority's landfill in order to assist facilities planning decisions and to assess the impact of alternatives on landfill life. As a planning tool, the model is useful in identifying the point or points in time at which a decision is required in order to ensure the availability of disposal capacity.

The total residential tonnage added to the landfill from the City of Delray Beach in 2016 was 32,569.8 tons.

The City provides a residential recycling program that began in 1990. The program includes curbside residential recycling for single family and multi-family homes. The program accounted for a reduction to the waste stream of 3,024.83 residential tons in 2016. This represents a reduction of 8.26% in the residential waste stream, which provides a 12.83% reduction from 2008 tonnage.

With an estimated 2016 population of 65,044 (American Community Survey), Delray Beach has an estimated 2.74 pounds per capita per day need, which is well below the established level of service standard of 9.54 pounds per capita per day. This level of use indicates the landfill is anticipated to meet the City's capacity needs within the projected final depletion year.

Table PFE-E shows the residential solid waste and recycling tonnage for Delray Beach between 2008 and 2016.

Table PFE-F City of Delray Beach Residential Solid Waste & Recycling Annual Tonnage Report Summary 2008 -2016					
Year	Garbage (tons)	Recycle (tons)	Vegetation (tons)	Bulk (tons)	Total Annual Tonnage
2016	16,509.9	3,024.8	1,626.2	14,793.7	35,954.6
2015	16,065.8	2,963.4	1,813.8	13,137.4	33,980.4
2014	18,738.3	4,267.4	853.6	15,800.6	39,659.9
2013	19,807.1	4,356.6	748.7	16,072.0	40,984.4
2012	19,285.0	4,057.6	728.0	16,300.1	40,370.7
2011	18,555.7	4,186.1	1,592.0	14,161.3	38,495.1
2010	18,235.5	4,419.5	1,515.5	13,765.2	37,935.7
2009	18,609.8	4,503.4	1,834.7	13,051.7	37,999.6
2008	19,630.7	5,216.3	2,053.7	13,742.9	40,643.6
Source: City of Delray Beach / Southern Waste Systems					



Stormwater Management

Responsibility for stormwater management in the city is divided among a hierarchy of state and regional agencies, the City, and landowners, as follows:

Table PFE-F Stormwater Management Agencies	
AGENCY	RESPONSIBILITY
South Florida Water Management District	Major canals and structures; permitting
Lake Worth Drainage District	Lateral and equalizer canals and minor structures
City of Delray Beach/Palm Beach County	Public stormwater collection system
Land Owners and Homeowners Associations	On-site storm sewers and retention areas

Stormwater is managed through a combination of interconnected SFWMD canals and natural waterways, local drainage districts, County and City government facilities, and community and neighborhood drainage systems.

South Florida Water Management District

Congress authorized the Central and Southern Florida Project in 1948 to control flood and drought. The district is operated and maintained by the South Florida Water Management District, whose predecessor the Central and Southern Florida Flood Control District, was established in 1949.

Florida is divided into five water management districts—the City of Delray Beach is located within the South Florida Water Management District. The South Florida Water Management District is a regional governmental agency that manages the water resources in the 16 counties from Orlando to the Florida Keys, and serves a population of 8.1 million residents. SFWMD is the oldest and largest of the state's five water management districts. The agency is responsible for managing and protecting

South Florida water resources by balancing and improving flood control, water supply, water quality and natural systems.

The restoration of the Everglades is a key regional project – the largest environmental restoration project in the United States. Lake Okeechobee and its watershed are another important focus of the SFWMD. The District is working to improve it, the Kissimmee River and its floodplain, and South Florida's coastal estuaries.

Stormwater is managed by SFWMD through a system of canals and natural waterways that work in connection with community and neighborhood systems.

Lake Worth Drainage District

The Lake Work Drainage District was created in 1915 under Chapter 6458 of the 1913 General Drainage Laws of Florida. Currently, the District operates as an independent special district under Chapter 2009-258, Laws of Florida, and under F.S. 189 and 298

The Lake Work Drainage District was created to

- Reclaim, drain, and irrigate the lands within its boundary.
- Provide water control and water supply.
- Protect the lands within its boundary from the effects of water by means of the construction and maintenance of canals, ditches, levees, dikes, pumping stations and other works.
- Provide improvements for the purpose of making the area habitable for both settlement and agriculture.

The Lake Work Drainage District protects the 700,000 residents in its service area from flooding by maintaining approximately 500 miles of canals and their rights-of-way, 20 major water control structures and several minor structures. This system is also operated to provide ground water recharge to prevent saltwater intrusion for numerous municipal water utilities.



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The Lake Work Drainage District encompasses roughly 200 square miles in southeastern Palm Beach County, generally bordered on the west by the Arthur R. Marshall Loxahatchee National Wildlife Refuge, on the east by 1-95, on the north by Okeechobee Boulevard and on the south by the Hillsboro canal. There are 13 municipalities entirely or partially within the boundary of the Lake Work Drainage District. The western half of the City of Delray Beach is within the LWDD boundaries.

The responsibilities of the Lake Work Drainage District include:

- 🌸 Permitting of construction projects that discharge into LWDD canals.
- 🌸 Aquatic weed control program utilizing EPA & DEP approved herbicides.
- 🌸 Daily inspections of 20 major water control structures and weekly inspection of minor water control structures.
- 🌸 Daily recording of rainfall at multiple locations throughout the LWDD.
- 🌸 Daily monitoring of surface water elevations at multiple locations.
- 🌸 Water quality monitoring.
- 🌸 Mowing of canal banks and berms.
- 🌸 Removal of encroachments within canal rights-of-way.
- 🌸 Community outreach and educational programs.

Palm Beach County

The City of Delray Beach is part of the Palm Beach County Stormwater Management Program (SWMP), to maintain compliance with the Environmental Protection Agency (EPA) Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES). NPDES is a federal program to eliminate stormwater pollutant discharge to "receiving waters." Palm Beach County applies for NPDES permitting for 40 governmental units within the County – including the City of Delray Beach – to the Florida Department of Environmental Protection (FDEP) through the lead permittee,

the Northern Palm Beach County Improvement District (NPBCID). The City is responsible for monitoring and assessment of pollutants discharged into water bodies, with discharges not to exceed the Total Maximum Daily Loads (TMDLs). All stormwater management and monitoring is subject to the NPDES requirements. MS4 permit (FLS000015-004) is scheduled to expire in 2021.

City of Delray Beach

Currently, the City maintains 3,000 stormwater inlets and over 26 miles of storm drainage pipes. The City established the SFWMD Level of Service Standards for drainage as the City's standard in the Goal's, Objectives, and Policies

Table PFE-G Level of Service Design Standards			
Level of Service Standard	Design Standard for Roadways	Impacts	
		General Conditions	Accessibility
A	10-year, 24-hour	Possible minor ponding	Roads are accessible
B	5-year, 24-hour	Possible minor ponding	Roads are accessible
C	3-year, 24-hour	Possible minor ponding	Roads are accessible
D	< 3-year, 24-hour	Portions of area have ponding with moderate duration < 12 hours	General inconvenience
E	< 3-year, 24-hour	Ponding with relatively long duration > 12 hours	Sections of roadways are not accessible and general inconvenience
F	< 3-year, 24-hour	Ponding with relatively long duration > 12 hours and structural damage	Sections of roadways are not accessible and general inconvenience
Source: 2000 Stormwater Master Plan for the City of Delray Beach by Kimley-Horn			

As described in the 2000 Stormwater Plan, these Level of Service standards are applied to



PUBLIC FACILITIES AND SERVICES

city drainage in the following manner (City of Delray Beach 2000 Stormwater Master Plan Update, Kimley Horn and Associates, Inc):

- All SFWMD permitted projects were assigned a Level of Service Standard A, B or C depending on the storm event used for design of the roadways within each permitted project. If the permit did not specify the roadway design standard, a Level of Service Standard C was assumed.
- All FDOT or Palm Beach County roadways (excluding 1-95 which was designed for greater than a 10-year, 24-hour storm event) were assigned a Level of Service Standard C (per FOOT and Palm Beach County standards) unless drainage problems have been identified.
- All undeveloped areas were assigned a Level of Service Standard C based on the assumption that as these areas are developed minimum standards will be met.
- All developed areas within the city with existing storm sewer systems were assigned a Level of Service Standard C. This assumes that the City has previously reviewed plans for these systems and minimum standard criteria have been met. Note some of these areas may contain isolated problems areas which, based on the available data, were thought to be attributed to localized irregularities and/or maintenance problems.
- All developed areas within the city without drainage systems, or with drainage systems that were determined to be inadequate but where significant drainage problems have not been identified, were assigned a Level of Service Standard D. Note these areas may contribute to drainage problems elsewhere.
- All developed areas within the city without drainage systems, or with drainage systems that were determined to be inadequate where significant drainage problems have been identified, were assigned a Level of Service Standard E.
- All developed areas where structural damage due to flooding has been

identified by City Staff were assigned a Level of Service Standard F. (Often structural damage due to flooding occurs when buildings have a floor elevation that is below the road.)

The City is in the process of a Stormwater Management Master Plan Update that will include assumptions for sea level rise based on 30-year and 75-year projections identified in the City of Delray Beach Intracoastal Waterway Water Level & Infrastructure Vulnerability Study, conducted in 2018. The Stormwater Management Master Plan Update will identify stormwater management challenges due to impacts of sea level rise and localized flooding. These issues coupled with a rising groundwater table will impact primary and secondary drainage systems, ultimately reducing the capacity of these systems which can result in flooding of street, buildings and natural systems.

The Stormwater Management Master Plan Update will provide current data on elevations of structures and their projected future impact which provides the City with additional tools for evaluating future projects. The goal of the Stormwater Management Master Plan Update is to create a plan to address water resource issues and problems, including but not limited to, drainage problems, street flooding, tidal flooding, inadequate infrastructure, stormwater quality and recharge as well as other stormwater related issues or problems. The Update also evaluates the adequacy and condition of the drainage facilities, determines the level of service for flood protection for the city's sub-watersheds and identifies solutions. The Update will address the current and future needs of the city based on growth and climatological changes that have and will continue to impact the City's stormwater management system.

Transportation Network

A well-maintained transportation system is a component of public facilities, which is crucial to sustaining a high quality of life. The City has 275 (centerline) miles of streets, and 250 miles of sidewalks. Street infrastructure includes parking meters, street lights, signs, and



pavement markings. The transportation system includes bike lanes, the trolley, a pending bike share program, and planned Tri-Rail Coastal Link station.

In 2016, the City adopted a Complete Streets Policy, which is modeled on the best practices recommended by Smart Growth America, which redirects street planning to focus on the needs of all users, rather than prioritize drivers. This policy will be adhered to in future street improvements, which will help identify and prioritize bicycle and pedestrian infrastructure needs.

The Mobility Element and Capital Improvements Element provide a full inventory of the transportation facilities, needs, and planned improvements.

RECOMMENDATIONS

The needs and recommendations are based on both public input and subject matter feedback. As part of the Always Delray Comprehensive Plan update process, the City conducted a public workshop on May 20, 2017, to discuss Public Facilities and other Grow Elements.

Needs Identified by Public Input

Workshop participants identified short, mid, and long-range goals for public facilities improvements, as follows:

Focus on Now

- Expansion of reclaimed water facilities to reduce ocean discharge
- Improved way-finding signs
- Reduce nuisance street flooding

Focus on Soon

- Beautification projects for roads and public spaces
- Street lighting for public safety
- Improved surveillance capabilities
- New water treatment plant**

Focus on Later

- A living shoreline
- Sea walls
- Sidewalks
- Street lights

Additional needs were identified in the following areas as a result of inventory and analysis of existing public facilities and services. Since the City has completed all critical improvements to the system, the identified needs can be categorized as

- 1) initiatives to maintain or improve existing infrastructure,
- 2) initiatives to enhance quality of life, and
- 3) sustainability initiatives.

Public Building Improvements

The City is undertaking a major initiative to refurbish and remodel buildings and facilities to become more energy efficient, sustainable, and resilient. A needs assessment is also underway to help plan for long term short needs.

Public Building Recommendations:

- Continue to support public WiFi and explore its expansion as public infrastructure.
- Explore the feasibility of solar panels on public buildings.
- Work with the Delray Beach CRA to assess the need for new parking facilities and plan for their location.
- Upgrade City Hall and other public facilities for both emergency preparedness as well as for future resilience to sea level rise.

Wastewater Improvements

Ongoing improvements are needed to force mains, sewer mains, lift stations, and other plant facilities, including the reclaimed water system. Significant expansion of the reclaimed water system is planned to meet environmental goals, protect wellfields from saltwater intrusion, recharge aquifers, and conserve resources.

These needs have been identified in the capital budget to accommodate ongoing demand and regulations. Infiltration into the collection system by rainwater and high groundwater levels could impact future



capital expansion facility costs. This problem has been significantly reduced in recent years with the repair and reconstruction of the collection system citywide. An on-going program to reduce infiltration/inflow is a cost-effective method of reducing the need for treatment facility expansion and requires on-going capital investment.

Wastewater Improvements Recommendations:

- Continue to expand the reclaimed water system to increase the amount of water that is reused.

Potable Water Improvements

The City of Delray Beach must update the water supply facilities work plan in 2020-2021. The plan will identify both water supply sources and necessary improvements. Ongoing improvements are needed to water mains, water meters, raw water wells, and other plant facilities. These needs are identified in the capital budget to accommodate ongoing demand and regulations. Long term potable water planning has to focus on identifying continuing to lower water use through conservation efforts, identifying and implementing new treatment technologies to supplement the existing lime treatment plant, maximizing use of existing raw water supply and identifying options for additional water supply if needed. additional, alternative water supplies and additional treatment process.

Potable Water Improvements Recommendations:

- Identify and develop alternative water supplies and treatment processes.
- Continue to lower water use through conservation efforts.
- Identify and implement new treatment technologies to supplement the existing lime treatment plant.
- Maximize use of existing raw water supply.

Solid Waste Improvements

Although the landfill has adequate capacity to accommodate the solid waste generated by the city, the City could increase the amount of waste that is recycled.

Solid Waste Improvements Recommendations:

- Increase involvement in recycling programs by expanding both participation and the number of permitted recyclable items.

Stormwater Improvements

Local and citywide drainage deficiencies are identified in the Stormwater Master Plan and funded by the Stormwater Utility Fee. An update to the plan is underway. As a part of this process, the City has identified drainage deficiencies throughout the city. Projects identified include seawall overtopping along the Intracoastal Waterway to prevent flooding from high and king tides, miscellaneous projects to remedy street flooding, and projects to repair swale degradation. Increased flooding from sea level rise is a growing stormwater concern for the City. Upon completion of the Stormwater Master Plan Update, the Public Facilities Element will be updated to reflect new information.

Stormwater Improvements Recommendations:

- Update level of service standards and project priorities based upon the 2018 Stormwater Master Plan
- Establish a program for the repair, replacement, and maintenance of seawalls based upon the Intracoastal Waterway Water level & Infrastructure Vulnerability Study.

Emergency Preparedness






In 2017, Hurricane Irma hit Delray Beach with Category 1 strength winds, highlighting vulnerabilities within the city, particularly to the wastewater collection system which lost power to 70% of its pumping stations. To prevent disruption of service during a natural or manmade catastrophic event, the City now



has approximately 75 generators, of which 52 are portable and the remainder fixed. The portable generators are primarily for the 130 wastewater lift stations, 7 stormwater pumping stations and 30 raw water potable wells.

Emergency Preparedness






Recommendations and Actions:

-  A Continuity of Operations Plan (COOP) has been developed and should be regularly updated and maintained
-  Develop a plan for post disaster recovery for all hazards.
-  A \$13 M project to add a third floor to Fire Station 113 to serve as the City's emergency operations center (EOC).
-  Develop strategies to prevent street flooding and ponding on critical streets.
-  Upgrade IT infrastructure to facilitate post-disaster recovery.



With the adoption of the Complete Streets policy, the City will continue to prioritize transportation infrastructure improvements that provide for pedestrian and bicycle mobility. The City has recently completed several bike lane installations and has more projects scheduled in the capital improvements program. Ultimately, a bicycle master plan will be needed to establish priority links. New long-term needs include a station for the planned Tri-Rail Coastal Link station in downtown.

Transportation Recommendations:

-  Implement a Safe Routes to Schools program, including evaluating existing conditions, mapping routes to school, identifying needed improvements, and prioritization of the identified improvements.
-  Analyze bicycle and pedestrian infrastructure needs along routes to major destinations, such as parks, the downtown district, schools, and employment centers, and prioritize multimodal improvements.
-  Increase the percentage of tree coverage throughout the city to aesthetically improve areas and provide a shaded environment for pedestrians. To measure success in this area, the City should develop benchmarks for tree coverage on public streets and public land.
-  Plan for the design and construction of the Tri-Rail Coastal Link Station.
-  Prioritize multi-modal improvements needed in the Tri-Rail station area to facilitate access and support the long-term viability of commuter train service.

