

DRAINAGE AND FLOODING

REGULATORY FRAMEWORK AND STRENGTHS, WEAKNESSES AND OPPORTUNITIES



ONE CITY. ONE JACKSONVILLE.

On August 1, 2017 the LUZ Committee discussed development related flooding issues throughout the City and requested that the Planning and Development Department provide information regarding related comprehensive plan policies and land development regulations. The Committee also requested feedback on the effectiveness of implementing these policies and regulations and for suggestions to improve the current system.

This document provides a breakdown of the following information:

1. Regulatory Background;
2. Responsibilities for drainage design and permitting;
3. Summary of requirements for drainage design and permitting from the Land Development Procedure Manual (LDPM), Section 4.0;
4. Drainage and floodplain policies from the 2030 Comprehensive Plan; and
5. An assessment of the strengths, weaknesses and opportunities related to drainage design and permitting.

Table of Contents

REGULATORY BACKGROUND	5
RESPONSIBILITIES FOR DRAINAGE DESIGN AND PERMITTING	6
<i>Engineering Professional Responsibilities</i>	6
<i>Development Services Division Responsibilities</i>	6
<i>SJRWMD Responsibilities</i>	7
LAND DEVELOPMENT PROCEDURE MANUAL SECTION 4.0 – DEVELOPMENT DRAINAGE REQUIREMENTS	7
General Requirements	7
<i>Developers Responsibility</i>	7
<i>Erosion and Sediment Control</i>	7
Drainage Information Required	7
<i>Master Drainage Map</i>	7
<i>Lot Grading</i>	8
<i>Lot Filling</i>	8
<i>Soil Investigation Requirements</i>	8
<i>Obstruction of Drainage</i>	8
<i>Flood Zone and Flood-Prone Areas</i>	8
<i>Downstream Improvements</i>	9
ADJACENT PROPERTY	9
<i>Downstream Owner</i>	9
<i>Upland Owner</i>	9
DRAINAGE AT PROPERTY ENTRANCES	9
DEPENDENCE ON FUTURE DEVELOPMENT	9
OWNERSHIP OF STORMWATER MANAGEMENT FACILITIES	9
HOLD HARMLESS AGREEMENT	9
2030 COMPREHENSIVE PLAN GOALS, OBJECTIVES AND POLICIES RELATED TO FLOODPLAINS AND DRAINAGE	10
<i>Capital Improvements Element</i>	10
<i>Conservation/Coastal Management Element</i>	11
<i>Future Land Use Element</i>	17

Infrastructure Element - Drainage Sub-Element 18

STRENGTHS, WEAKNESSES AND OPPORTUNITIES 20

Strengths 20

Weaknesses 20

Opportunities 21

REGULATORY BACKGROUND

The Land Development Procedure Manual (LDPM) contains a comprehensive and detailed list of design standards, methodologies and formulas required to achieve compliance with stormwater drainage and floodplain ordinances. The developer responsibility is that all stormwater runoff in a development must be disposed of in a manner which will not cause damage to upstream or downstream property owners, and developers are under a pre/post development discharge restriction. The drainage system may include engineering solutions such as lot filling and grading, ditches and swales, piping, storm drains, roadway gutters and stormwater retention ponds. The City has also identified drainage basins throughout the City with known ongoing drainage problems. These areas are referred to as restricted basins and the LDPM includes additional requirements for development within these basins.

Ordinance 2013-310-E adopted The Floodplain Management Ordinance as Chapter 652 of the Municipal Code. The intent of Chapter 652 is to establish minimum requirements to safeguard the public health, safety and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas.

The Floodplain Management Ordinance is based on design standards to manage what is commonly referred to as the “100-year flood” or the “1-percent-annual chance flood.” Chapter 652 applies to all development that is wholly within or partially within any flood hazard area and Adjusted Special Flood Hazard Area (SFHA), including but not limited to the subdivision of land; filling, grading, and other site improvements and utility installations; construction, alteration, remodeling, enlargement, improvement, replacement, repair, relocation or demolition of buildings, structures, and facilities that are exempt from the Florida Building Code; placement, installation, or replacement of manufactured homes and manufactured buildings; installation or replacement of tanks; placement of recreational vehicles; installation of swimming pools; and any other development.

Flood hazard areas are established based on the Flood Insurance Study for the City of Jacksonville, dated June 3, 2013, the Flood Insurance Rate Maps (FIRM), and with the supporting data and flood hazard areas included in the Master Stormwater Management Plan (MSMP).

The Concurrency and Mobility System, which is implemented through Chapter 655, includes a drainage review component. Drainage level of service standards and methodologies applied under Chapter 655 are compatible with the LDPM.

The 2030 Comprehensive Plan includes a series of policies in the Capital Improvements Element, Conservation/Coastal Management Element, Future Land Use Element and Infrastructure Element related to drainage and floodplains. These policies provide for specific courses of action to guide day-to-day decision making and direct actions to be taken by the City to implement the Plan through more detailed land development regulations such as Chapter 652 and the LDPM.

Ordinance 2017-627 is a pending text amendment to the Conservation/Coastal Management Element of the 2030 Comprehensive Plan that provides more detail regarding the manner in

which the City addresses coastal flooding issues, including the associated impacts of sea level rise.

RESPONSIBILITIES FOR DRAINAGE DESIGN AND PERMITTING

Engineering Professional Responsibilities

The engineering professional certifies that all of the contributing areas are accounted for; that the on-site collection system is designed for the proper flows; that stormwater ponds are designed for the storm events as indicated in LDPM Section 4.0; and that all conveyance methods (ditches and/or pipes), elevations, all calculations for the flow characteristics of stormwater (hydraulics component) are accounted for and documented. The engineering professional is also responsible for obtaining all permits from the City and the St. Johns River Water Management District (SJRWMD).

Drainage Plan Requirements:

- Identification of contributing areas and on-site water movement;
- Elevations and slope of subject property and surrounding property;
- Soil investigations to determine seasonal high water level;
- Existing and proposed stormwater systems (piping for conveyance, and stormwater ponds, ditches, structures and discharge piping);
- Pre/post discharge analysis that demonstrates that pre/post discharge locations and amounts are the same as before alteration and where applicable compliance with restricted basin requirements; and
- Engineering Solutions – fill, grading, ditches, stormwater connection, and ponds.

Development Services Division Responsibilities

Development Services Division staff are responsible for verifying that design areas and piping systems are adequate based on the information, analysis and designs supplied by the engineering professional. Acceptable design methods and equations are specified in Section 4.0 of the LDPM.

Development Services Division staff only walks the final inspection unless the developer opts to utilize a private inspector hired by the developer. Private inspectors are authorized by Section 553.791, F.S.

Development Services Division Staff is also responsible for evaluating concurrency applications for drainage capacity in compliance with the level of service standards and methodologies and criteria as set for the in the Concurrency and Mobility Management System Handbook. Under concurrency new developments are required to ensure that development runoff to the existing drainage system does not exceed the pre-developed discharge volume and/or rate to prevent compromising the current system. When connection to the City drainage system or an extension thereof is needed, the facilities must be analyzed and found to have sufficient capacity to serve the development along with any contributing off-site drainage. Where such facilities are not adequate, the development may be required to improve the downstream system. Additionally, new developments must be supported by information demonstrating that

the existing drainage system will not be adversely impacted by the proposed work. Development in flood prone areas requires a 1 to 1 compensation.

SJRWMD Responsibilities

The SJRWMD role is focused on water quality while the City's role is focused on attenuation for stormwater events. Despite these different roles the SJRWMD stormwater size and design specifications overlap with the City's drainage requirements with the exception of areas within restricted basins.

LAND DEVELOPMENT PROCEDURE MANUAL SECTION 4.0 – DEVELOPMENT DRAINAGE REQUIREMENTS

Section 4.0 of the Land Development Procedure Manual (LDPM) provides a comprehensive guide to development regulations addressing drainage requirements and development within floodplains. Below is a summary of the LDPM regulations.

General Requirements

Developers Responsibility

- Storm runoff in a development must be disposed of in a manner which will not cause damage to upstream or downstream property owners.
- The developer shall respect the rights of adjacent property owners with regard to overloading the stream or creating an excessive rise in water level in the receiving body of water.
- Development must maintain pre/post development discharge levels.
- All new developments shall provide for stormwater treatment. Treatment volume shall be based on current St. Johns River Water Management District (SJRWMD) rules or the Master Stormwater Management Plan (MSWMP) special basin criteria to achieve pollution loading targets.
- Additional requirements apply to developments located within restricted drainage basins.

Erosion and Sediment Control

- Erosion during and immediately after construction is a major contributor to the siltation of drainage ways, wetlands, and tributaries, and is a major factor in the degradation of water quality.
- An erosion control plan for all land-disturbing activities must be submitted for approval.
 - The plan must fit the particulate topography, soils, drainage patterns, and natural vegetation of the site and prevent off-site damage.

Drainage Information Required

Master Drainage Map

- The registered professional shall include in the site development plans a Master Drainage Map showing all existing and proposed features.
- The following are some of the features to be included on the drainage map:
 - Drainage Area
 - High water data on existing structures upstream and downstream from the development.

- Notes pertaining to existing standing water, areas of heavy seepage, or springs.
- Limits of construction.
- Existing ground contours drawn to a 1 foot interval.
- Existing drainage channels and structures with their size, elevations, and slopes.
- Proposed drainage channels and structures with their size, elevations, and slopes.
- Land use with the appropriate soil type.
- Elevations and slope of surrounding property in sufficient detail to determine direction of flow.
- The 100-year flood plain or flood-prone areas.

Lot Grading

- The registered professional shall include in the site development plans a Lot Grading Plan including the following:
 - Elevation of each lot corner proposed.
 - Centerline pavement elevations (nearest 0.1 feet) in front of approximately every other lot corner and centerline intersections and center of cul-de-sacs.
 - Proposed sidewalk location.

Lot Filling

- Sets out design standards for setbacks from property lines and swales/piped and yard drain systems

Soil Investigation Requirements

- A soil investigation report shall be submitted with the site development plans and shall include:
 - Test borings showing existing water table and estimated water table during periods of normal rainfall and without drainage improvements that may lower the groundwater.

Obstruction of Drainage

No obstruction to existing drainage will be permitted unless approved by the City Engineer. This includes flow in streams or ditches, overland flow, underground flow, flow in pipes, or flow in flood plains.

Flood Zone and Flood-Prone Areas

Flood Zones

- Any site (including residential lots) adjacent to a stream or river must be evaluated to assure that no blockage occurs in the flood plain.
- In the event a 100-year flood zone, as shown on current FIRM MAPS or delineated by the best available data, is to be filled, 1) adequate storage area must be provided to hold the same quantity of water that the flood area did prior to filling; 2) certain channel and improvements downstream must be made to compensate for any storage denial; or 3) a combination of No. 1 and 2 unless otherwise approved by the City Engineer.
- Flood-Prone Areas

- Adequate drainage must be provided to accommodate storm water if flood-prone areas are filled. This could be in the form of alternate water storage areas, improvements, or combination of these or other basin changes.

Downstream Improvements

The Public Works Department shall require that drainage systems downstream of a proposed development have the capacity or hydraulic gradient to accept the proposed developments discharge, or that the proposed development improves the downstream drainage system. Accordingly, the City Engineer may require the developer to analyze the downstream drainage system.

ADJACENT PROPERTY

Downstream Owner

Increased concentrated storm water runoff shall not be directed onto adjacent property without the written consent of that property owner.

Upland Owner

All water must be accepted from all upland owners. Such water must be accepted according to then present land conditions. When the development constructs a drainage system to accept the private offsite upstream drainage, unless accepted by the City as part of a master plan, the property owner, the Homeowners Association or other acceptable entities as approved by the City Engineer, shall maintain the system.

DRAINAGE AT PROPERTY ENTRANCES

All driveway entrances and exits to private property must be graded so as to prevent water entering from public streets.

DEPENDENCE ON FUTURE DEVELOPMENT

When development is accomplished in phases, each individual unit constructed must provide the drainage improvements necessary for that unit.

OWNERSHIP OF STORMWATER MANAGEMENT FACILITIES

All stormwater management facilities are to be owned and maintained by either the surrounding property owners or another group as approved by the City.

HOLD HARMLESS AGREEMENT

A "hold harmless" agreement must be executed and approved by the City General Counsel's office which will relieve the City of any responsibility for maintaining the stormwater management facility and of any liability for any damage caused by flooding from the storm water management facility, including but not limited to blockage, dam failure, and excess flow; drowning; or any other personal damages. The agreement shall be shown on the final plat.

2030 COMPREHENSIVE PLAN GOALS, OBJECTIVES AND POLICIES **RELATED TO FLOODPLAINS AND DRAINAGE**

Capital Improvements Element

Policy 1.1.5

The City shall implement a Concurrency Management System that addresses schools, potable water, sanitary sewer, solid waste, drainage, and parks and recreation. The City is removing transportation concurrency requirements and replacing the transportation concurrency system with a Mobility Fee System that addresses roadways, mass transit, and transportation facilities in general.

PUBLIC FACILITY LEVEL OF SERVICE STANDARDS

DRAINAGE

These Levels of Service shall define the depth of flooding allowed within and adjacent to the street rights-of-way as stated below and shall be based on a 5-year design storm.

LOS A - For new systems: Hydraulic gradeline at or below inlet grate: lowest roadway grade elevation at or above the 25-year design high-water elevation for the stormwater management facility.

LOS B - For retrofitting an existing system: Flooding of streets and some yard areas but contained within the right-of-way.

LOS C - For existing system: Flooding up to the finished floor elevation of structures.

Policy 1.2.15

The City's Land Development Regulations shall include standards and criteria for drainage and stormwater management in all types of development based on Level of Service standards established in the 2030 Comprehensive Plan.

Concurrency Management System

The City has adopted a Concurrency Management System as part of its Land Development Regulations. The Concurrency Management System ensures, prior to the issuance of a development order and development permit, that the adopted Level of Service standards for schools, potable water, sanitary sewer, solid waste, drainage, and parks and recreation will be maintained and that public facilities and services needed to support development are available concurrent with the impacts of development.

The City shall require concurrency tests for local development orders and local development permits to be conducted by each agency or department having responsibility for the impacted facility(s) prior to the consideration of such local development orders or local development permits, which shall include data concerning proposed densities and intensities, according to the following guidelines:

1. Each affected agency or department shall develop customized concurrency testing procedures and mechanisms that assess the capacity demands of a proposed development upon its particular facility(s);
2. Each affected agency or department shall communicate the results of its customized concurrency test via the computer software program developed by the City's Central Services Computer Systems Division.

The computer software program developed by the Information Technologies Department shall be called the Automated Concurrency Management System Data Base. The Automated Concurrency Management System Data Base and each affected agency or department shall monitor changes in the capacities of affected public facilities over time and changes in the Levels of Service provided for affected public facilities over time.

All local development orders and local development permits approved by the City shall be accompanied by an approved Concurrency Management Reservation Certificate (CRC) for that specific project, certifying that it has passed mandated concurrency tests.

Capacity for all local development orders and local development permits holding approved Concurrency Reservation Certificates shall be reserved in the affected public facilities for the life of its associated and approved local development order or local development permit.

Conservation/Coastal Management Element

Text changes pending pursuant to Ordinance 2017-627 are included and differentiated by underline formatting.

Objective 2.7 The City shall protect the hydrological and ecological benefits of flood plain areas, such as water quality, fish and wildlife habitat, and prevention of downstream flooding.

Policy 2.7.1

The City shall continue to define the surface hydrology of the area to determine flood plain vulnerability and sensitivity, and will determine appropriate protection measures.

Policy 2.7.2

A land acquisition program for appropriate flood plain areas to be purchased shall continue to be included in the City's Special Management Areas Program, with funding provided through The Preservation Project Jacksonville.

Policy 2.7.3

The City shall protect appropriate floodplain areas for the public benefit and restore degraded floodplain areas by:

- A. Land acquisition or conservation easement acquisition;
- B. Regulation, including setbacks, buffer zones, designated wildlife corridors, low density zoning, performance standards and open space requirements; and
- C. Incentives, including tax benefits and transfer of development rights.

Policy 7.3.2

The City shall continue to participate in the National Flood Insurance Program.

Policy 7.4.2

Upon adoption of the 2030 Comprehensive Plan, all land development applications within the Coastal High Hazard Area (CHHA) shall be reviewed by the Planning and Development Department, Emergency Preparedness Division and Public Works Department for verification of consistency with the goals, objectives and policies of the 2030 Comprehensive Plan and all Land Development Regulations, including but not limited to, pertinent sections of the National Flood Insurance Program and all applicable flood control regulations.

GOAL 11

To ensure that development and redevelopment within the Coastal Area is compatible with the Coastal Area's natural character and that flood risk is managed through principals, strategies and engineering solutions.

* * *

Objective 11.3

The City shall implement development and redevelopment principles, strategies and engineering solutions to reduce or eliminate flood risk in coastal areas when opportunities arise.

Policy 11.3.1

The City shall protect coastal areas for the public benefit and restore degraded floodplain areas by methods such as land acquisition or conservation easement acquisition; regulation, including setbacks, buffer zones, designated wildlife corridors; low density zoning, performance standards and open space requirements and through engineering solutions adopted in the floodplain management ordinance and the Florida Building Code.(CCME 2.7.3)

Policy 11.3.2

Utilizing such programs as the Flood Mitigation Assistance Program (FMAP), Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL), the City will continue to work with the State of Florida Division of Emergency Management (DEM), the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP) to mitigate flooding hazards through the acquisition, elevation or relocation mitigation alternatives (Local Mitigation Strategy).

Policy 11.3.3

The City will create and maintain data and information to support redevelopment efforts which will include the following inventories: non-conforming land uses, vacant lands, high hazard areas, potential property acquisition/reuse, critical priority redevelopment areas and industrial preservation areas (Post Disaster Redevelopment Plan).

Policy 11.3.4

The City will develop and support public and private projects and programs to retrofit, relocate or acquire properties susceptible to repetitive flooding.

Policy 11.3.5

The City shall meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22 in order to reduce flood losses and achieve flood insurance premium discounts for residents. (Ordinance Code, § 652.103(h))

Policy 11.3.6

The City will continue to participate in the National Flood Insurance Program (NFIP) and will make all reasonable efforts to maintain a Community Rating System score of 6 or higher.

Policy 11.3.7

The City's Emergency Preparedness Division shall maintain a Local Mitigation Strategy which will be reviewed and updated annually in accordance with state and federal requirements to remain eligible for pre- and post-disaster funding assistance.

Policy 11.3.8

The City shall minimize public and private losses due to flooding by implementing the following regulations:

- A. Requiring the use of appropriate construction practices in order to prevent or minimize future flood damage and managing development practices which may increase flood damage or erosion potential through implementation of the floodplain management ordinance. (Ordinance Code, § 652.103(b and c))
- B. Designating a Floodplain Administrator to enforce the provisions of Chapter 652, Ordinance Code, the City's floodplain management ordinance.

Policy 11.3.9

The City has adopted and shall maintain a floodplain management ordinance that establishes engineering requirements to safeguard the public health, safety, and general welfare and minimizes public and private losses due to flooding through regulation and development of flood hazard areas. The ordinance shall include development and redevelopment regulations that:

- (a) Minimize unnecessary disruption of commerce, access and public service during times of flooding;
- (b) Require the use of construction practices that will prevent or minimize future flood damage;
- (c) Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential;
- (d) Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain;
- (e) Minimize damage to public and private facilities and utilities;
- (f) Help maintain a stable tax base by providing for the sound use and development of flood hazard areas;
- (g) Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and

- (h) Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22.

Policy 11.3.10

Engineering solutions shall be included in the floodplain management ordinance and shall apply to all development that is wholly within or partially within any flood hazard area, including but not limited to the subdivision of land; filling, grading, and other site improvements and utility installations; construction, alteration, remodeling, enlargement, improvement, replacement, repair, relocation or demolition of buildings and structures; placement, installation, or replacement of manufactured homes and manufactured buildings; installation or replacement of tanks; placement of recreational vehicles; installation of swimming pools; and any other development.

Policy 11.3.11

The Floodplain Administrator shall review permit applications and engineering plans to determine whether proposed development sites will be reasonably safe from flooding. If a proposed development is in a flood hazard area, all site development activities, (including grading, filing, utility installation and drainage modification), all new construction and substantial improvements shall be designed and constructed with engineering methods, practices and materials to minimize flood damage and that are in accordance with city Floodplain Management Ordinance.

Policy 11.3.12

The Federal Emergency Management Agency (FEMA) Flood Insurance Study for the City of Jacksonville, Duval County, Florida and Incorporated Areas and the accompanying Flood Insurance Rate Maps (FIRM), and all subsequent amendments and revisions to such maps, shall be adopted by reference as a part of the floodplain management ordinance and shall serve as the minimum basis for establishing flood hazard areas, along with the supporting data and flood hazard areas included in the Master Stormwater Management Plan. Flood zones shall also be depicted on Future Land Use Element Map L-4.

The flood hazard areas and base flood elevations contained in the Flood Insurance Study and shown on Flood Insurance Rate Maps (FIRM) and the requirements of Title 44 Code of Federal Regulations, Sections 59 and 60 may be revised by the Federal Emergency Management Agency, requiring revision to the floodplain management regulations to remain eligible for participation in the National Flood Insurance Program

Policy 11.3.13

All public utilities and facilities such as sewer, gas, electric, communications, and water systems are to be located and constructed to minimize or eliminate flood damage. All new and replacement sanitary sewage facilities, private sewage treatment plants (including all pumping stations and collector systems), and on-site waste disposal systems shall be designed in accordance with the standards for onsite sewage treatment and disposal systems in Chapter 64E-6, F.A.C. and ASCE 24 Chapter 7 to minimize or eliminate infiltration of floodwaters into the facilities and discharge from the facilities into flood waters, and impairment of the facilities and systems. All new and replacement water supply facilities shall be designed in accordance with the water well

construction standards in Rule 62-532.500, F.A.C. and ASCE 24 Chapter 7 to minimize or eliminate infiltration of floodwaters into the systems.

Policy 11.3.14

No development, including but not limited to site improvements, and land disturbing activity involving fill or regrading, shall be authorized in the regulatory floodway unless the floodway encroachment analysis required in the Floodplain Management Ordinance demonstrates that the proposed development or land disturbing activity will not result in any increase in the base flood elevation.

Policy 11.3.15

Development within flood hazard areas shall be required to include vulnerability reductions measures such as additional hardening, higher floor elevations or incorporation of natural infrastructure for increase resilience.

Policy 11.3.16

The City shall continue to implement the Florida Building code and land development regulations to enhance flood mitigation measures in vulnerable areas to reduce future risks associated with high tide events, storm surge, flash floods, stormwater runoff, and the related impacts of sea level rise.

Policy 11.6.17

The City's Land Development Regulations shall include standards and criteria for drainage and stormwater management in all types of development based on Level of Service Standards established in the 2030 Comprehensive Plan. (FLUE Policy 1.2.15)

Policy 11.3.18

The City shall require all development within the 100 year flood plain to be in strict conformance with all applicable federal, State, regional and local development regulations. (FLUE Policy 1.4.4)

Objective 11.4 The City of Jacksonville shall be consistent with, or more stringent than, the flood resistant construction requirements of the Florida Building Code (FBC) and applicable flood plain management regulations (44 C.F.R. part 60). Construction activities seaward of the coastal construction control lines shall be consistent with Chapter 161, Florida Statutes.

Policy 11.4.1

The Floodplain Management Ordinance (*Ordinance Code*, Chapter 652) shall be administered and enforced in conjunction with the Florida Building Code and shall be consistent with the requirements of the Federal Emergency Management Agency (FEMA) and Title 44 Code of Federal Regulations. Additionally, floodplain development permits or approvals shall be issued pursuant to Chapter 652 for any development activities not subject to the requirements of the Florida Building Code. (*Ordinance Code*, § 652.402)

Policy 11.4.2

Limit new construction to areas landward of the primary dune line, except as provided for by Florida's Coastal Construction Control Line regulation pursuant to Chapter 161, F.S. Prohibit the use of non-emergency or maintenance vehicles on the City's primary dune

system except as provided pursuant to an approved beach management plan. (FLUE Policy 1.5.8)

Policy 11.4.3

If extending, in whole or in part, seaward of the coastal construction control line and also located, in whole or in part, in a flood hazard area:

A. Buildings and structures shall be designed and constructed to comply with the more restrictive applicable requirements of the Florida Building Code, Building Section 3109 and Section 1612 or Florida Building Code, Residential Section R322.

B. Minor structures and non-habitable major structures as defined in F.S. § 161.54, shall be designed and constructed to comply with the intent and applicable provisions of this Chapter and ASCE 24. (Ordinance Code, § 652.1004)

Objective 11.5

The City has established an Adaptation Action Area (AAA) and shall consider appropriate responses to address current and future risks related to the associated impacts of sea-level-rise.

Policy 11.5.1

The City of Jacksonville shall recognize the Coastal High Hazard Area (CHHA) identified in Map C-18 as also encompassing the Adaptation Action Area (AAA) for those low-lying coastal zones that may experience coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. (§163.3177(6)(g)(10), F.S.) Land within the AAA is subject to potential high tide inundation under a horizon 2060 two foot sea level rise scenario.

Policy 11.5.2

The City shall consider the implications of the AAA when reviewing changes to the use, intensity and density of land lying within the AAA.

Policy 11.5.3

The City shall recognize existing regulations, programs and policies that overlap with the AAA and that are currently in place to limit public investment and address appropriate development and redevelopment practices related to flooding. These regulations, programs and policies include but are not limited to the floodplain management ordinance, CHHA policies, the Local Mitigation Strategy and the Post Disaster Redevelopment Plan and shall only be applied in cases where such regulation would otherwise apply to a development or redevelopment project.

Policy 11.5.4

The City of Jacksonville shall create a working group to review existing programs and policies in relation to the AAA to determine the need and appropriate timing for additional and financially feasible responses to the effects of coastal flooding within the Adaptation Action Area. The working group shall be established within one year of the effective date of this policy.

Definitions

Flood hazard area. The greater of the following two areas:

- (a) The area within a floodplain subject to a one percent or greater chance of flooding in any year.
- (b) The area designated as a flood hazard area on the community's flood hazard map, or otherwise legally designated.

Flood Insurance Rate Map (FIRM). The official map of the community on which the Federal Emergency Management Agency (FEMA) has delineated both special flood hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study (FIS). The official report provided by the Federal Emergency Management Agency that contains the Flood Insurance Rate Map, the Flood Boundary and Floodway Map (if applicable), the water surface elevations of the base flood, and supporting technical data.

Floodway. The channel of a river or other riverine watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot.

Future Land Use Element

Policy 1.2.4

Through implementation of a Concurrency Management System that addresses schools, potable water, sanitary sewer, solid waste, drainage, and parks and recreation, and the Mobility Plan which addresses roadways, limit urban scale development to the Central Business District, Urban Priority Area, Urban Area, and Suburban Area as identified in the 2030 Comprehensive Plan, in order to minimize the cost of public facilities and service delivery, and to conserve open space.

Policy 1.2.15

The City's Land Development Regulations shall include standards and criteria for drainage and stormwater management in all types of development based on Level of Service standards established in the 2030 Comprehensive Plan.

Policy 1.4.4

The City shall require all development within the 100 year flood plain to be in strict conformance with all applicable federal, State, regional and local development regulations.

Policy 4.1.5

Continue enforcement of existing Land Development Regulations in the City, which are consistent with this plan, including:

- Zoning Code;
- Code of Subdivision Regulations;
- Flood Plain Regulations;
- Landscape and Tree Protection Regulations;
- Housing Safety Code;

Unsafe Buildings and Structures Code;
Community Redevelopment Programs; and
Building Code.

Policy 7.1.1

The Planning and Development Department shall consider the land use impact on the St. Johns River and its tributaries by reviewing the future land use designation and land development regulations of those properties that are contiguous with and immediately adjacent to a water body. The following concerns will be considered for those properties:

- Wetlands
- Impervious surface potential
- Coastal High Hazard Area (CHHA)
- Septic Tank Failure Areas
- Environmentally Sensitive Areas
- Flood zones
- Aquifer recharge zones
- Wellhead protection areas

Infrastructure Element - Drainage Sub-Element

Objective 1.2 The City has completed a Master Stormwater Management Plan (MSMP). The information in the plan will be utilized in the development of operational criteria for the drainage system. Through this process, the Public Works Department will analyze its existing stormwater management system and correct existing deficiencies by coordinating the increase in the capacity of the system, thereby encouraging infill development in the Urban Area. With completion of each phase of the MSMP, the City shall amend the 2030 Comprehensive Plan to include changes recommended in design standards and revise the Capital Improvements Element as necessary.

Policy 1.2.1

The City shall revise the 2030 Comprehensive Plan to implement the results of the MSMP.

Policy 1.2.2

Based on the recommendations in the MSMP, the City shall reassess projects for stormwater improvements in the Capital Improvements Element and annually revise the Five Year Capital Improvement Program accordingly.

Policy 1.2.3

The Subdivision Standards and Policy Advisory Committee shall revise the Land Development Procedures Manual to incorporate special basin criteria, recommended as part of the MSMP.

Policy 1.2.4

The City shall establish and continue to utilize the three Levels of Service (LOS) standards for drainage facilities. These Levels of Service (LOS) standards define the depth of flooding allowed within and adjacent to the street rights of way. The design storm, which shall be used, will be a 5-year design storm.

LOS A - for new systems: Hydraulic gradeline at or below inlet grate.

LOS B - for retrofitted new systems: Flooding of streets and some yard area.

LOS C - for existing systems: Flooding up to the structures.

Where:

Service Level A is the most advanced level of stormwater protection available and comprises the complete removal of stormwater from street surfaces during the design rainfall event. All stormwater is captured by the collection system and overland flow and street storage conditions are eliminated. Significant ponding does not occur and confined areas are drained without surcharge. This level of service obviates the health and safety concerns associated with minor flooding, eliminates transportation hazards and prevents vehicular flooding. The hydraulic grade line is generally at or below the inlet throat.

Service Level B is the next level of protection and comprises the prevention of significant levels of yard flooding but includes some flooding of street and yard areas. The sources of Level B flooding are overland flow of off-site stormwaters, surcharging of the stormwater collection system, or the ponding of confined waters. The impacts on residents in Level B service areas are primarily nuisance flooding problems related to temporary impassability of streets. The flooding of major roadways is limited to the outer lane areas but which does not prevent travel. There may be flooding of a limited duration along minor streets and flooding of yards is generally limited to 50% of the grassed area between street and structure. There is no flooding of structures. The hydraulic grade line is at or slightly above the inlet throat.

Service Level C is the minimum level of stormwater protection provided and comprises the prevention of flooding in structures or appurtenant components of residential, commercial or institutional structures. Sources of flooding in Level C situations are via overland flow, surcharging of the stormwater collection system, or ponding of confined waters. Flooding of major roadways precludes the use of outer traffic lanes while travel in inner lanes is possible but difficult. Flooding of minor streets precludes travel and flooding of front yards up to the front face of the structure, but no structure flooding is indicated based on a five year storm frequency. The hydraulic grade line is significantly above the inlet throat.

Policy 1.2.5

The Public Works Department shall ensure that developments will not affect the existing drainage facilities by requiring pre/post development discharge restrictions or providing an analysis on the existing drainage facility to prove no adverse impacts.

Policy 1.4.1

The City shall maintain a method for financing the operation and management of stormwater facilities. The funding shall be used to reduce existing flooding, improve water quality, and preserve or restore the values of the natural systems.

Objective 1.5 The City shall continue to protect existing streams, rivers, and floodways through its development review process to ensure that no harm is done to the natural drainage system.

Policy 1.5.1

The Public Works Department shall continue to review each proposed new development and determine if it may do harm to the natural drainage system.

Policy 1.5.2

The Public Works Department shall continue to deny permits to any new development that fills a flood plain without compensation for the fill by excavating an equal volume or improvement to the drainage system or a combination of both.

Objective 1.6 The City shall coordinate extension of its drainage facilities through new developments as part of its current permitting process.

Policy 1.6.1

The Public Works Department shall require that proposed development drainage facilities are adequate in capacity to serve the proposed development along with any contributing off-site drainage.

Policy 1.6.2

The Public Works Department shall continue to require that the drainage systems downstream of a proposed development have the capacity or hydraulic gradient to accept the proposed development's discharge, or that the proposed development improves the downstream drainage system.

STRENGTHS, WEAKNESSES AND OPPORTUNITIES

Strengths

- Engineering regulations work as intended when correctly designed, implemented and maintained to address drainage standards.
- 2030 Comprehensive Plan policies support the detailed development regulations in Chapter 652 and the LDPM.
- Pending Ordinance 2017-627 is a comprehensive plan text amendment that further supports the Floodplain Management Ordinance. The text amendment also establishes an Adaptation Action Area (AAA) that relates to a projected two foot sea level rise by 2060 and directs the City to establish a working group to consider the implications of sea level rise as well as appropriate responses.

Weaknesses

- Private inspection firms are hired by the developer and report directly to the developer. What can we do within the limits of private inspections?
- Drainage impacts to adjacent properties during development are not adequately addressed under the LPDM.
- There is a need for better regulations and inspections for infill development.
- Development Services Division staff only walks the final inspection if the developer has hired a private inspector.
- A lack of maintenance for private stormwater/flood control infrastructure (HOA dissolving).

Opportunities

- Regarding private inspectors, the Development Services Division could pre-approve a list of private inspectors. The inspectors would report directly to the Chief of Development Services rather than directly to the developer.
- Address drainage impacts to adjacent properties during construction by requiring the design engineer to include a Maintenance of Drainage Plan in the engineering plans. The Maintenance of Drainage Plan ensures that site alterations and development occur in a manner that does not subject adjacent property to temporary flooding impacts during development.
- Create a drainage maintenance inspection program with enforcement options.