

DRAINAGE SUBELEMENT

Sections:

9.3.1 [INTRODUCTION](#)

9.3.2 [GOALS, OBJECTIVES AND POLICIES](#)

ISSUE: [Adoption of a level of service standard for drainage \(Quantity\)](#)

ISSUE: [Rehab/Upgrade of Drainage Facilities](#)

ISSUE: [Maximum use of existing facilities](#)

ISSUE: [Protection of Natural Drainage Features](#)

ISSUE: [Protection and improvement of surface water quality](#)

9.3.1 INTRODUCTION

Drainage is the conveyance treatment and attenuation of water generated from storm events. Drainage systems are designed to safely and efficiently manage Stormwater to reduce the threat to human safety and property from flooding caused by Stormwater. The adequacy and efficiency of a drainage system depends upon many variables: system capacity, intensity and duration of a storm event, topography, soil permeability, and level of the water table. Drainage systems designed to accommodate Stormwater from a rainfall event of average intensity and duration may be unable to accommodate Stormwater generated by an exceptionally intense or long rainfall event. These variables, as well as physical limitations such as elevation and available land, and cost are considered in the planning of drainage systems.

St. Petersburg is located on a low peninsula, varying in elevation from 0 to 40 feet above the surrounding water bodies. In a rainfall event of exceptional intensity or duration, tide level may effectively prevent water from being conveyed into adjacent water bodies. Flooding and property damage may occur as a result.

The complexities of providing adequate drainage facilities in the City of St. Petersburg have increased in direct proportion to growth and development within the area. Engineering philosophies and practices once oriented toward removing the maximum amount of water off-site in the shortest period of time no longer provide adequate protection from flooding or allow any significant degree of water quality maintenance.

In 1977, the City's Engineering Department produced the Master Storm Drainage Plan. This report identified drainage basins and sub-basins needing Stormwater improvement projects. The Area Improvements Program (AIP) was developed within these basins to include some of the identified projects. In 1987, a 10-year update was made to the Master Storm Drainage Plan identifying completed projects, prioritizing old projects, and adding new projects. Because of growth and development of the City, there was an increasing need for storage and treatment of Stormwater runoff to reduce flooding and pollution. In 1989, the City adopted the Drainage Subelement to further address those issues.

By the date of the Evaluation and Appraisal Report (EAR), several major changes to the City's Stormwater management program had occurred. Most significant was the development of the 1994 Stormwater Management Master Plan (SMMP). The Stormwater Management Master Plan (SMMP) replaced the 1977 Master Stormwater Drainage Plan. The intent of this plan was to identify the drainage problems that existed within the City, characterize the areas that were prone to flooding, establish factors which caused the flooding and determine solutions to correct the flooding problems. The SMMP incorporated design standards for conveyance, and identified improvement projects needed to bring the City's system up to the SMMP level of service (LOS) standards. Initially 338 projects were identified (112 revised MSDP projects) totaling 545,600 feet in improvements estimated to cost \$345.40 million. Because of budget constraints, changes were made to the SMMP's level of service standards to make the Plan more cost feasible. The revised SMMP includes 85 projects estimated to cost an average of 6 million dollars per year for a 20 years implementation schedule. Changes to the Drainage Subelement Goals, Objectives and Policies are based on the revised SMMP standards and policies.

9.3.2 GOALS, OBJECTIVES AND POLICIES

GOAL-DRAINAGE (D):

The City of St. Petersburg shall provide an efficient and effective stormwater management system which protects, to the maximum extent practical, persons and property from flooding and surface waters from erosion and degradation of quality.

ISSUE: Adoption of a level of service standard for drainage (Quantity)

Drainage level of service identifies a minimum criterion for existing and future conditions of drainage facilities. A level of service standard is capacity relative to demand. Drainage capacity can be expressed as a "design storm" which specifies the duration and return frequency of a storm with an identified rainfall amount. The level of service standard is implemented by the City through review of drainage plans for new development and redevelopment.

Before the time of adoption, the adopted level of service standards for existing and new Stormwater systems was the existing capacity. Because of budget constraints, changes were made to the SMMP's level of service standards to make the Plan more cost feasible. The LOS for new systems is the capacity of the system to convey the runoff from a 10 year, 1 hour storm. Additional standards were used to analyze potential Stormwater conveyance projects.

OBJECTIVE D1:

The City shall adopt a level of service standard and ensure that new development and redevelopment as defined by applicable city, regional, state and federal regulations meets the level of service as adopted by the City. Drainage is currently regulated by City Code Chapter

16.311, which requires drainage plans reviewed by the City to meet a 10-year, 1-hour design storm standard. The adopted level of service shall consist of three parts:

1. Due to the back log of stormwater improvement needs and the time needed to implement improvements to the municipal drainage system, existing conditions will be adopted as the level of service.
2. Construction of new and improvements to existing surface water management systems require permits from SWFWMD, except for projects specifically exempt. As a condition of municipal development approval, new development and redevelopment within the City which requires a SWFWMD permit according to Rules 40-D-4 and 40-D-40 shall be required to obtain a SWFWMD permit and meet SWFWMD water quantity and quality design standards. Development which is exempt from SWFWMD permitting requirements shall be required to obtain a letter of exemption.
3. Construction of new and improvements to existing surface water management systems will be required to meet design standards outlined in the Drainage Ordinance, Chapter 16.314, St. Petersburg City Code; using a minimum design storm of 10 year return frequency, 1 hour duration, rainfall intensity curve Zone VI, Florida Department of Transportation. Improvements to the municipal drainage system will be designed to convey the runoff from a 10-year, 1-hour storm event.

Policies:

- D1.1 The level of service standard for drainage, as indicated in Objective D1, shall be adopted and shall be used to determine the availability of facility capacity.
- D1.2 The City of St. Petersburg will continue to update the prioritized municipal drainage improvement projects based on current EPA, DEP and SWFWMD requirements.
- D1.3 Existing municipal drainage facilities will be adequately maintained by the City's Engineering and Stormwater Department.
- D1.4 St. Petersburg will continue to undertake special studies of drainage areas with specific problems. Recommendations from such studies may influence review criteria and design storm requirements for drainage systems in those areas.
- D1.5 The City will coordinate updates of its Stormwater Management Master Plan with Pinellas County and neighboring governments in shared drainage basins.

ISSUE: Rehab/Upgrade of Drainage Facilities

As reported in the 1996 EAR, the City's drainage basins have been revised to include a few small areas formerly within Pinellas County's jurisdiction. Map 29 shows the general location of each of the 26 basins. The drainage basin characteristics such as size, primary land use, reported flooding sites, and outfall locations have not changed since adoption of this Subelement in 1989.

While the primary purpose of the SMMP is to determine the improvements needed to prevent flooding in the City, the investigations also included the determination of opportunities for water quality improvements. The SMMP identified available land for potential Stormwater treatment facilities; however, because of land cost and neighborhood disruption, the City is proposing to implement Alum Treatment Projects to address water quality.

OBJECTIVE D2:

As the City rehabilitates and upgrades drainage facilities, drainage projects will be identified in the Capital Improvements Element of the Comprehensive Plan and will be constructed in compliance with the adopted level of service standard.

Policies:

- D2.1 The projects will be undertaken in accordance with the schedule provided in the Capital Improvements Element of this plan.
- D2.2 The City will seek and consider the recommendations of regional, state and federal agencies and other City Departments in the design and construction of these projects.
- D2.3 The City will provide necessary protective measures to minimize conditions that would create adverse health and/or environmental impacts during construction of these projects.

OBJECTIVE D3:

The City of St. Petersburg commits to the cost-effective and timely implementation of the Stormwater Management Master Plan. The implementation and timing of specific projects are subject to available funding, community acceptance and regulatory constraints.

Policies:

- D3.1 The City will continue to implement the Stormwater utility fee as a dedicated source of funding for the Stormwater Management Master Plan.

- D3.2 The City of St. Petersburg will implement the Stormwater Management Master Plan and update the prioritized municipal drainage improvement projects based on current applicable regulations.
- D3.3 Priorities for specific project implementation are based on 1) prerequisite downstream improvements, 2) flooding nodes per basin, and 3) cost to implement versus area protected.
- D3.4 The City will pursue completion of the estimated 85 projects listed in the revised SMMP by December 31, 2025.

ISSUE: Maximum use of existing facilities

The City recognizes the need to minimize capital expenditures on new drainage facilities through routine maintenance and using existing facilities to their fullest potential. The operation and maintenance of the City's Stormwater management system is critical to its ability to collect, convey, treat, and discharge Stormwater runoff. The St. Petersburg Engineering and Stormwater Department presently maintains the culverts, open channels, lakes, and control and discharge structures of the 26 basin drainage system.

The St. Petersburg drainage system consists of over 13 miles of large open channels, 40 miles of small channels, 423 miles of closed conduits, 71 lakes with surface areas totaling approximately 700 acres, 26 Stormwater detention/treatment facilities, 4 Stormwater pump stations and over 1,400 known outfalls.

OBJECTIVE D4:

The City shall extend the useful life of existing drainage facilities through efficient and timely maintenance of those facilities according to the maintenance schedule established by the Engineering and Stormwater Department.

Policies:

- D4.1 The City will continue the Street Sweeping program and continue to pursue the most effective and efficient means to implement this program.
- D4.2 The City will continue perfecting the backflow prevention devices to replace the flap gates where Stormwater outfalls into surface waters.
- D4.3 The City will continue an ongoing maintenance program for lakes, creeks, canals and other Stormwater retention and conveyance features in a manner which protects the natural drainage features and adjacent natural resources.

ISSUE: Protection of Natural Drainage Features

The City has identified sensitive natural resources and designated these as environmental preservation areas on the Land Use Plan. These resources are inventoried in the Conservation Element of the Comprehensive Plan. Natural drainage features, such as natural lakes and creeks, are inventoried in the Drainage Sub-Element of the Comprehensive Plan. Natural drainage features such as mangrove areas, salt flats, undeveloped creeks and natural lakes provide aesthetic, recreational and Stormwater control benefits.

OBJECTIVE D5:

The City shall protect natural drainage features and sensitive environmental resources. The maintenance, upgrade and improvement of the municipal drainage system shall not encroach upon the environmentally sensitive areas designated by the City as “preservation”.

Policies:

- D5.1 All drainage improvement plans will continue to be reviewed by the Development Services Department for impacts upon preservation areas, mangroves and trees.
- D5.2 Drainage improvements requiring tree removal will continue to require appropriate permits.
- D5.3 Drainage improvements will utilize best management practices to reduce potential for adverse environmental impacts.
- D5.4 Coordination among local, regional, state and federal environmental regulation agencies will continue to be sought by St. Petersburg in relation to drainage improvements.
- D5.5 St. Petersburg will continue to seek permits from appropriate regional, state and federal agencies relating to dredge and fill, water quality, drainage system maintenance and other environmental issues.

ISSUE: Protection and improvement of surface water quality

The quality of Stormwater entering surface waters such as lakes and bays affects the water quality, and the recreational, biological and aesthetic value of the surface waters. The City recognizes Stormwater as a carrier of water-borne pollutants such as nutrients, oil, grease, debris, heavy metals and sediments. The City also recognizes the need to incorporate water quality control mechanisms in the design and construction of new drainage facilities and in the upgrade/rehabilitation of existing drainage facilities.

OBJECTIVE D6:

The City shall address protection and improvement of surface water quality by implementing the following: construction of new surface water management systems and improvements to existing systems will be designed to meet state surface water quality standards as identified in DEP Rule 17-25 by implementing standards and best management practices identified by SWFWMD and DEP.

Policies:

- D6.1 The City shall require redeveloped sites, other than single family lots up to a quadruplex that are not part of a larger common plan of development, to incorporate water quantity and quality controls, recognizing case by case limitations or payments in lieu of improvements. All sites are required to retrofit for water quality to the degree it is being redeveloped.
- D6.2 As a condition of municipal development approval, applicants shall be required to obtain a SWFWMD surface water management system permit or letter of exemption.
- D6.3 The City will implement the recommendations of the Lake Maggiore Environmental Assessment Plan through the Lake Maggiore Restoration Plan to the extent feasible by 2000.
- D6.4 The City shall continue to seek funding through SWFWMD Grants for the restoration of Lake Maggiore.
- D6.5 Existing municipal Stormwater detention and retention areas which are altered within drainage or area improvements will include, to the maximum extent practical, appropriate surface water quality control techniques such as those identified in the Drainage Sub-Element of the Comprehensive Plan.
- D6.6 The City shall implement the best management practices as called for in the 5-year NPDES permit. As required by the permit, the City must renew the permit six months before expiration.
- D6.7 The City shall continue to develop and implement a public education program to promote and facilitate public reporting of the presence of illicit discharges into the Stormwater systems and proper use, management and disposal of waste such as industrial and commercial wastes, used oil, household hazardous wastes, leaf litter, grass clippings, animal wastes, fertilizers, insecticides and herbicides.
- D6.8 The City will implement, to the maximum extent feasible, water quality improvements including, but not limited to, Alum Treatment projects.

- D6.9 The City will continue to implement the Street Sweeping program to reduce debris entering the municipal drainage system.

- D6.10 The City will continue to implement the Aquatic Plant Control program to maintain an appropriate balance of aquatic vegetation in city-controlled lakes.