

Appendix C

Public Facilities Analysis

C.1 Introduction

A detailed analysis of public facilities has been conducted utilizing the DSAP land use plan and associated development program to calculate maximum theoretical impacts. Impacts were analyzed for both short-term (5-yr) and long-term (build-out) conditions. For the purpose of calculating 5-yr impacts, a development program of 350 residential units and 120,000 square feet of non-residential uses were assumed. The full DSAP development program was assumed for estimation of impacts at build-out (2030).

Included in this analysis were the full range of public facilities as defined by 163.3164, Florida Statutes, including potable water, sanitary sewer, solid waste, drainage, schools and parks. Due to the detailed nature of transportation impact studies, an analysis of these facilities was handled separately. A full transportation impact analysis is contained in Appendix B.

It is important to note that each of the following analyses assumes that demand generated by the proposed DSAP is in addition to projected increase in demand generated by population growth which would have occurred regardless of the DSAP. In effect, these two projections overlap to an extent. It can be assumed that some portion of the already projected population increase will occur within the DSAP; therefore, the following impact analyses should be considered conservative and it may be presumed that actual impacts may less.

C.2 Potable Water

Nassau County is located within the St Johns River Water Management District (SJRWMD). Per the District's 2003 Water Supply Assessment, existing water supply sources and water supply development plans are considered reasonably adequate to meet Nassau County' projected needs while sustaining water quality and protecting wetland and aquatic systems; therefore, neither the County nor the DSAP area is within a priority water resource caution area (PWRCA). Given that the District's finding that adequate supplies exist to accommodate the area's projected needs, Nassau County has not been required to prepare a water supply plan (WSP)

or otherwise identify water resource development or water supply development projects to accommodate projected demand.

Jacksonville Electric Authority (JEA), a municipally owned utility, provides potable water service to the East Nassau Employment Center DSAP site. JEA’s potable water system is made up of 134 artesian wells, tapping the Floridian Aquifer. 35 water treatment plants treat and distribute this water to users through more than 4,000 miles of water main in multiple service districts. The East Nassau Employment Center DSAP is located within JEA’s District 7 – Nassau County Water Service Area. Currently, the District 7 water service area is served by four potable water treatment plants; Lofton Oaks, Otter Run, Nassau (Yulee) Regional, and West Nassau Regional. Combined, these plants form the Lofton Oaks Grid (see Figure C-2-1).

It should be noted that the North Planning Area is located immediately outside the northernmost boundary of JEA’s District 7 boundary for potable water service. Due to ENCPA policy limitations and planned densities within the North Planning Area, private wells are not feasible. There are two potential options for serving this area with potable water. First, the North Planning Area could be annexed into the JEA service area and the central water system could be extended down HWY 17. Second, an independent central potable water plant could be constructed for the North Planning Area. Operation of this facility could be assumed by JEA at a future date.

C.2.1 Potable Water – 5-yr Projections

Potable water demand for the proposed 5-yr development program was calculated utilizing Nassau County’s adopted level of service (LOS) for new development, as reported in the Nassau County 2030 Comprehensive Plan. The LOS for potable water service within Nassau County is 100 gallons per capita per day. This LOS is then multiplied by 2.32 persons per household to convert GPD/capita to GPD/household. For non-residential uses, the LOS requirements are based upon an Equivalent Residential Connection (ERC) to be calculated by the service provider, at the time of application. For the purposes of this study, an average value ERC of 0.1 gallons per day per square foot was applied to non-residential development. Using these values, Table C-2a estimates short term (5-yr) demand for potable water.

Table C-2a Estimated Potable Water Demand (5-Yr)

	Residential	Non-residential	Total Demand
DSAP (5-yr)	350 du	120,000 sq ft	0.09 MGD

Table C-2b provides projected available treatment capacity, current usage, 5-yr DSAP demand and resulting capacity.

Table C-2b Projected Potable Water Plant Capacity (5-Yr) (MGD)

Water Plant	Plant Capacity*	Current Usage*	DSAP Demand	Remaining Capacity
Lofton Oaks Grid	6.40	2.00	0.09	4.31

*Source: As reported by JEA Water System Planning Staff, March 2012

Adequate capacity exists at the available treatment facilities to accommodate the proposed 5-yr development program.

C.2.2 Potable Water – Build-out Projections

Tables C-2c estimates the East Nassau Employment Center’s potable water demand at build-out utilizing the same methodology as the 5-year development program.

Table C-2c Estimated Potable Water Demand (Build-out)

	Residential	Non-residential	Total Demand
DSAP (Build-out)	4,038 du	7,100,000 sq ft	1.65 MGD

Should the DSAP’s maximum development program be realized, total projected demand for potable water could be approximately 1.31 million gallons daily (MGD).

Table C-2d provides projected available treatment capacity, forecasted demand through 2035, DSAP demand at build-out and resulting capacity. Values reported consider the known plant capacity increase to the West Nassau facility, set to expand in 2014 from 1.4 MGD to 5 MGD.

Table C-2d Projected Potable Water Capacity (2035) (MGD)

Water Plant	Plant Capacity*	Projected Usage*	DSAP Demand	Remaining Capacity
Lofton Oaks Grid	10.2	5.00	1.65	3.55

*Source: As reported by JEA Water System Planning Staff, March 2012

Adequate capacity exists within the Lofton Oaks Grid to accommodate the proposed development program through 2035. It should be noted that the preceding calculations are based upon average daily flow. Maximum daily flow or “peak hour” flow requires approximately twice the average daily flow capacity. Although the 5-year DSAP demand may be accommodated under both average daily and maximum daily flow conditions, additional treatment capacity may be needed to accommodate maximum flow in the 2035 scenario.

C.2.3 Potable Water – Proposed Infrastructure Plan

A conceptual potable water plan was prepared based upon the projected Detailed Specific Area Plan (DSAP) land use program. The resulting utility infrastructure map is shown as Figure C-2-2, Water Infrastructure Map. The proposed water distribution system will connect to the existing potable water mains currently owned and operated by JEA.

C.3 Wastewater

JEA Service Area 7 is served by a single wastewater treatment plant, the Nassau Regional Sewer Treatment Facility (see Figure C-3-1). JEA is currently operating this facility at the permitted level of 1.55 MGD. Currently, average daily demand at this facility is 0.86 MGD. JEA has plans to expand the plant to 2.0 MGD in the year 2014, in preparation to meet the needs of future growth. Scheduled sewer improvements beyond 2014 are limited to force main construction, in conjunction with roadway improvements and future development needs.

As with potable water, it should be noted that the North DSAP is located immediately outside the northernmost boundary of JEA’s District 7 boundary for sewer service. Again, due to ENCPA policy limitations and planned densities within the North Planning Area, private septic systems are not feasible. For this reason, it is recommended that annexation of the North Planning Area into the JEA service district be sought; thereby, allowing the extension of the existing 8-inch sanitary forcemain which currently terminates at the intersection of HWY 17 and HWY 108.

C.3.1 Wastewater – 5-yr Projections

Wastewater demand for the proposed 5-yr development program was calculated utilizing Nassau County’s adopted level of service (LOS) for new development, as reported in the Nassau County 2030 Comprehensive Plan. The LOS for wastewater treatment service within Nassau County is 100 gallons per capita per day. This LOS is then multiplied by 2.32 persons per household to convert GPD/capita to GPD/household. For non-residential uses, the LOS requirements are based upon an Equivalent Residential Connection (ERC) to be calculated by the service provider, at the time of application. For the purposes of this study, an average value ERC of 0.1 gallons per day per square foot was applied to non-residential development. Using these values, Table C-3a estimates short term (5-yr) demand for wastewater treatment.

Table C-3a Estimated Wastewater Demand (5-Yr)

	Residential	Non-residential	Total Demand
5-YR DSAP	350 du	120,000 sq ft	0.09 MGD

Table C-3b provides projected available treatment capacity, current usage, 5-yr DSAP demand and resulting capacity.

Table C-3b Projected Wastewater Plant Capacity (5-Yr) (MGD)

Wastewater Plant	Plant Capacity*	Current Usage*	DSAP Demand	Remaining Capacity
Nassau Regional	2.00	0.86	0.09	1.0

*Source: As reported by JEA Water System Planning Staff, March 2012

Adequate capacity exists at the available treatment facilities to accommodate the proposed 5-yr development program.

C.3.2 Wastewater – Build-out Projections

Tables C-3c estimates the East Nassau Employment Center’s potable water demand at build-out utilizing the same methodology as the 5-year development program.

Table C-3c Estimated Wastewater Demand (Build-out)

	Residential	Non-residential	Total Demand
DSAP (Build-out)	4,038 du	7,100,000 sq ft	1.65 MGD

Should the DSAP’s maximum development program be realized, total projected demand for wastewater treatment would be approximately 1.31 million gallons daily (MGD).

Table C-3d provides projected available treatment capacity, forecasted demand through 2035, DSAP demand at build-out and resulting capacity.

Table C-3d JEA Wastewater Plant Availability (MGD) after Build-Out

Wastewater Plant	Plant Capacity*	Projected Usage*	DSAP Impact	Available Capacity
Nassau Regional	2.00	1.50	1.65	-1.15

*Source: As reported by JEA Water System Planning Staff, March 2012

At this time, adequate wastewater treatment capacity does not exist to accommodate the proposed DSAP development program at build-out. It is estimated that the Nassau Regional Sewer Treatment Facility would need to be expanded to 3.25 MGD over the next 20 years to accommodate both projected growth as well as the proposed DSAP development program.

C.3.2 Wastewater – Proposed Infrastructure Plan

Figure C-3-2, Wastewater Infrastructure Map, shows gravity sewer service area boundaries, represented by a circle (Radius = 2,000ft). Due to the isolated nature of many of the proposed development parcels, it is likely that sewage collection systems will not be connected through large gravity main networks. Limited by topography and geometry, small service areas will be most probable. Central to the service area boundary is a lift station/pump station. If development timing allows, manifold force main systems can be replaced with cascading sewer systems, allowing for less expensive pumping designs.

The final design of the conceptual wastewater Infrastructure must conform with, and be permitted through, the Florida Department of Environmental Protection Agency. The infrastructure design must be able to handle Average Day and Peak Day design flows. Gravity sewer systems must be design to operate within the range of allowable flow velocities. Pump stations with manifolding force mains must operate in the “all-on” condition and be able to perform a complete “pump-out.” All components of the wastewater collection system must comply with the standards established by JEA.

C.4 Solid Waste

Solid Waste service is provided to the region by Nassau County. Nassau County has an adopted solid waste Level of Service of 4.91 pounds per capita per day. Table C-4 provides an estimate of solid waste creation at build-out based upon the number of residential units and projected persons per household within the DSAP.

Table C-4a Estimated Solid Waste Demand at Build-out (lbs/capita/day)

Residential Units	Persons Per Household	Projected DSAP Population	LOS*	Total Demand (Tons per year)	Total Demand (lbs per day)
4,038	2.32	9,368	4.91	8,395	46,000

*Source: Nassau County 2030 Comprehensive Plan

Nassau County has agreements with Camden County Landfill Solid Waste Disposal Facility (Georgia) and with Chesser Island Road Landfill (Georgia). Both agreements signed in 2009 are for ten years with the option to renew for an additional five years.

Camden County Landfill Solid Waste Disposal Facility is located 30 miles northwest of the DSAP area. The Camden County Landfill will allow 450 tons per day. It currently receives 150 tons per day from Nassau County. The life expectancy is more than 15 years.

Owned by Waste Management of Georgia, Chesser Island Road Landfill (CIRL) is located 35 miles to the northwest of the DSAP area. CIRL disposes 810,000 tons per year, with a life expectancy of 27 years.

Table C-4b estimates the impact of the DSAP development program on the existing capacity of the Camden County and Chesser Island Road Landfills. The proposed DSAP contributes less than 23 tons per day to each landfill, at final build-out. The resulting additional annual tonnage reduces the estimated lifespan of the landfill by less than one tenth of a year.

Table C-4b Solid Waste Capacity

Provider	Current Annual Tonnage	Estimated Lifespan (yrs)	DSAP Annual Tonnage	New Lifespan (yrs)
Camden County	146,000	12	9,045/2	12
Chesser Island	810,000	27	9,045/2	27

In summary, no improvements to solid waste facilities have been determined to be necessary to accommodate the proposed DSAP development programs.

C.5 Stormwater

Stormwater management system improvements for this region of Nassau County may be developed as regional systems accounting, where possible, for multiple areas of improved development. Efforts may be made to design stormwater treatment and attenuation systems, (i.e. wet and dry ponds, swales, underground chambers, ex-filtration trenches, etc.) and supporting conveyance pipes and swales as systems.

Stormwater systems will be permitted in accordance with the St. John’s River Water Management District (SJRWMD) discharge design criteria. Since the proposed stormwater management system will meet the requirements set forth by SJRWMD and Nassau County, the quality of the storm water leaving the site will meet state water quality standards. The ultimate receiving waters will be the St. Mary’s River or the St. John’s River.

The interconnected wetland systems serve as the method for conveying the treated runoff to the river. In locations where the wetland systems will be severed by proposed roadways, storm drainage networks will be installed beneath the roadway to provide proper surface water flow between wetland areas.

Compared to the pre-existing condition, control structures within the designed ponds and conveyance systems will delay the release of excess stormwater, thereby allowing suspended solids, excess nutrients such as nitrogen and phosphorus, and other potential pollutants to be removed from the stormwater discharge. The proposed stormwater ponds will be designed at such a size in order to provide storage of stormwater run-off and limit post-development discharge from exceeding

pre-development discharge from the project. Lastly, the modeling techniques and design applications will comply with SJRWMD requirements and incorporate best management practices in the treatment ponds and conveyance systems.

C.6 Schools

In 2008, Nassau County adopted a school concurrency system consistent with state statute. The details of this system are outlined in both an Interlocal Agreement (ILA) with the School Board of Nassau County and Nassau County’s Comprehensive Plan’s Public School Facilities Element (PSFE). These documents identify procedures for determining available capacity, identifying deficiencies and implementing improvements.

For the purpose of determining existing and future capacity, the County was subdivided into eight (8) Concurrency Service Areas. These CSAs identify which schools may serve a proposed development project. The East Nassau Employment Center DSAP is located within both the Yulee North and Yulee South CSAs. These CSAs are currently served by Yulee Primary School, Yulee Elementary School, Yulee Middle School and Yulee High School.

Via the Comprehensive Plan’s PSFE, Nassau County has adopted a Level of Service (LOS) of 95% of the permanent Florida Inventory of School Houses (FISH) capacity for elementary schools and 100% for middle and high schools. For the purpose of estimating DSAP impacts, an analysis was completed for both the 5-yr (2016) and build-out conditions.

C.6.1 Schools – 5-yr Projections

Table C-6a estimates short-term or 5-yr student generation for the East Nassau Employment Center DSAP. Student generations rates for each school level were provided by Nassau County School Board Staff.

Table C-6a Estimated DSAP Student Generation (5-yr)

Residential Units	Student Generation Rates			Students by School Type		
	Elementary	Middle	High	Elementary	Middle	High
350	.25	.14	.16	88	49	56

**Source: 2012 student generation rates as provided by Nassau County School Board staff*

Table C-6b is an estimate of 5-yr capacity available at the public schools serving the DSAP. The 2011-2012 Nassau County School Board 5-year Facilities Work Program was used to determine permanent FISH capacity and projected enrollment per school. Available capacity was calculated by applying the adopted LOS to projected 2015/16 enrollment.

Table C-6b 5-yr School Capacity (Yulee CSA)

School	FISH Capacity	2015/16 Projected Enrollment	LOS	Available Capacity
Yulee Primary	778	802	95%	-63
Yulee Elementary	795	831	95%	-76
Yulee Middle	801	909	100%	-108
Yulee High	1,121	981	100%	140

**Source: 2011-12 Nassau County School Board 5-yr Facilities Work Program*

Per Table C-6b, 5-year deficits are projected at both the elementary and middle school levels. Per the Amended Interlocal Agreement for Public School Facility Planning (ILA), new capacity in place or under construction in the first three years of the Schools District’s Educational Facilities Plan may be added to the capacity shown in the respective CSA and utilization rates will be adjusted accordingly. At this time, 132 additional middle school student stations are planned and funded within the first three years of the 2011-2012 Educational Facilities Plan.

In addition to the inclusion of programmed improvements, the ILA allows for the use of additional capacity contained in adjacent CSAs. Per the County’s PSFE, CSAs contiguous to Yulee North and South include, North Central Nassau, South Central Nassau and Fernandina. At this time, no schools exist in the North Central Nassau or South Central Nassau; therefore, no additional capacity may be had from these areas. The Fernandina Beach CSA contains four (4) schools including, Emma Love Hardee Elementary, Southside Elementary, Fernandina Beach Middle and Fernandina Beach Senior High.

Table C-6c is an estimation of 5-yr capacity available within the Fernandina Beach CSA.

Table C-6c 5-yr School Capacity (Fernandina CSA)

School	FISH Capacity	2015/16 Projected Enrollment	LOS	Available Capacity
ELH Elem	710	541	95%	133
Southside Elem	723	581	95%	105
Fernandina Middle	715	606	100%	109
Fernandina High	1,129	791	100%	338

**Source: 2011-12 Nassau County School Board 5-yr Facilities Work Program*

It appears that adequate capacity exists within the adjacent Fernandina CSA to accommodate the projected impacts of the DSAP 5-year development program; therefore, no amendment to the Nassau County Capital Improvements Plan (CIP) or School Board’s Educational Facility Plan is needed at this time.

C.6.1 Schools – Build-out Projections

Table C-6d estimates long-term or build-out student generation for the East Nassau Employment Center DSAP.

Table C-6d Estimated DSAP Student Generation (build-out)

Residential Units	Student Generation Rates			Students by School Type		
	Elementary	Middle	High	Elementary	Middle	High
4,038	.25	.14	.16	1,010	565	646

**Source: 2012 student generation rates as provided by Nassau County School Board staff*

Build-out of the DSAP development program could result in the addition of 1,010 elementary school students, 565 middle school students and 646 high school students. Utilizing the school districts prototypical school sizes as outlined in the ILA, it can be assumed that the equivalent of 1.26 elementary schools, .47 middle schools and .43 high schools would be needed to accommodate the projected DSAP student generation at build-out. The School Board’s 2011-2012 Work Plan contains two new Yulee area elementary schools within the 10-year work plan. If built, these schools would address projected deficits at the existing Yulee area elementary schools and accommodate the projected DSAP student generation. Additional middle and high school improvements may need to be included in future School Board Work Plans to accommodate projected impacts at those levels.

C.7 Recreation and Open Space

Nassau County has adopted within its comprehensive plan a tiered recreation and open space level of service (LOS) standard based upon acreage per 1,000 residents. These LOS standards are summarized in Table C-7a.

Table C-7a Nassau County Recreation and Open Space LOS

Type	Service Radius	Minimum Size	Acres/1,000 Residents
Community Parks	1-2 Miles	10 Acres	3.35
Regional Parks - General	County-wide	30 Acres	10
Regional Parks – Beach Access	County-wide	Variable	.25
Regional Parks – Boat Facility	County-wide	Variable	.40

Source: Nassau County 2030 Comprehensive Plan

C.6.1 Recreation and Open Space – 5-yr Projections

Table C-7b estimates short-term or 5-yr recreation and open space demand for the East Nassau Employment Center DSAP. It assumes a standard 2.5 persons per

household (PPH) for the 350 residential units proposed in the 5-yr development program.

Table C-7b Estimated DSAP recreation and open space demand (5-yr)

Type	Projected 5-yr Population*	Acres/1,000 Residents	Projected 5-yr Demand
Community Parks	875	3.35	2.93
Regional Parks - General	875	10	8.75
Regional Parks – Beach Access	875	.25	0.22
Regional Parks – Boat Facility	875	.40	0.35

**350 dwelling units x 2.5 persons per household = 875 residents*

C.6.2 Recreation and Open Space – Build-out Projections

Table C-7c estimates long-term or build-out recreation and open space demand for the East Nassau Employment Center DSAP. As with the 5-yr projections, the build-out projections assume a standard 2.5 persons per household (PPH) for the 4,038 residential units proposed at build-out.

Table C-7c Estimated DSAP recreation and open space demand (build-out)

Type	Projected Buildout Population*	Acres/1,000 Residents	Projected Buildout Demand
Community Parks	10,095	3.35	33.82
Regional Parks - General	10,095	10	100.95
Regional Parks – Beach Access	10,095	.25	2.52
Regional Parks – Boat Facility	10,095	.40	4.04

**4,038 dwelling units x 2.5 persons per household = 10,095 residents*

Currently, Nassau County is deficient in all types of recreation and open space facilities. The proposed DSAP 5-yr and build-out programs are estimated to increase demand by approximately 12 acres and 141 acres, respectively. This demand is being met through the provision of significant open space and an extensive multi-use trail system.

The proposed DSAP land use plan includes approximately 1,700 acres of open space in the form of interconnected wetlands, surface waters and upland preserves forming a Conservation Habitat Network (CHN). This open space system is intended to serve both the residents and employees of the East Nassau Employment Center DSAP as well as the remainder of the County. The significant open space system provided by the DSAP is capable of not only accommodating DSAP impacts but also addressing a County wide deficiency in regional parks through 2030.

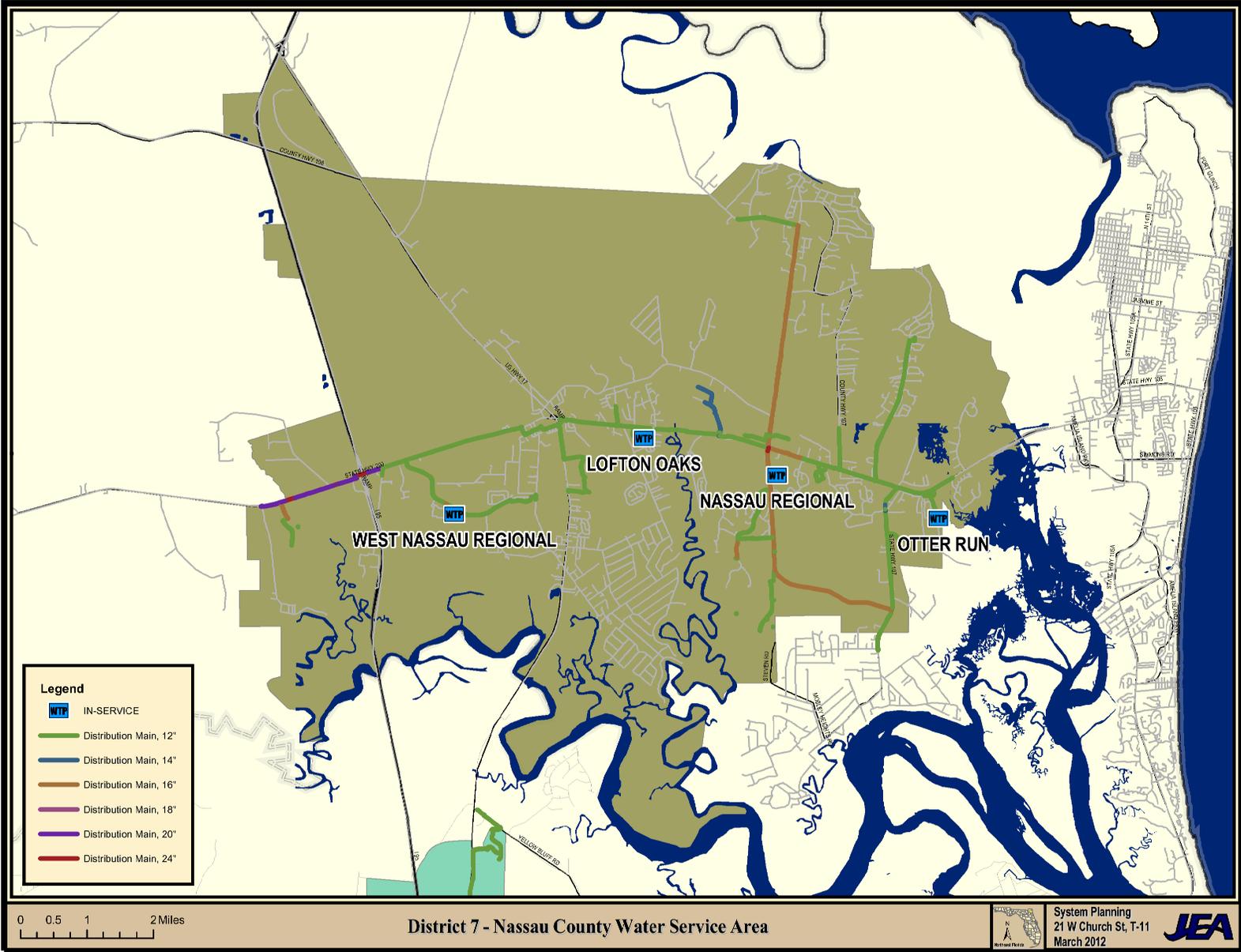
At build-out, the East Nassau Employment Center DSAP will contain over 20 miles of multi-use trails. Assuming an average width of twelve feet, this trail system would

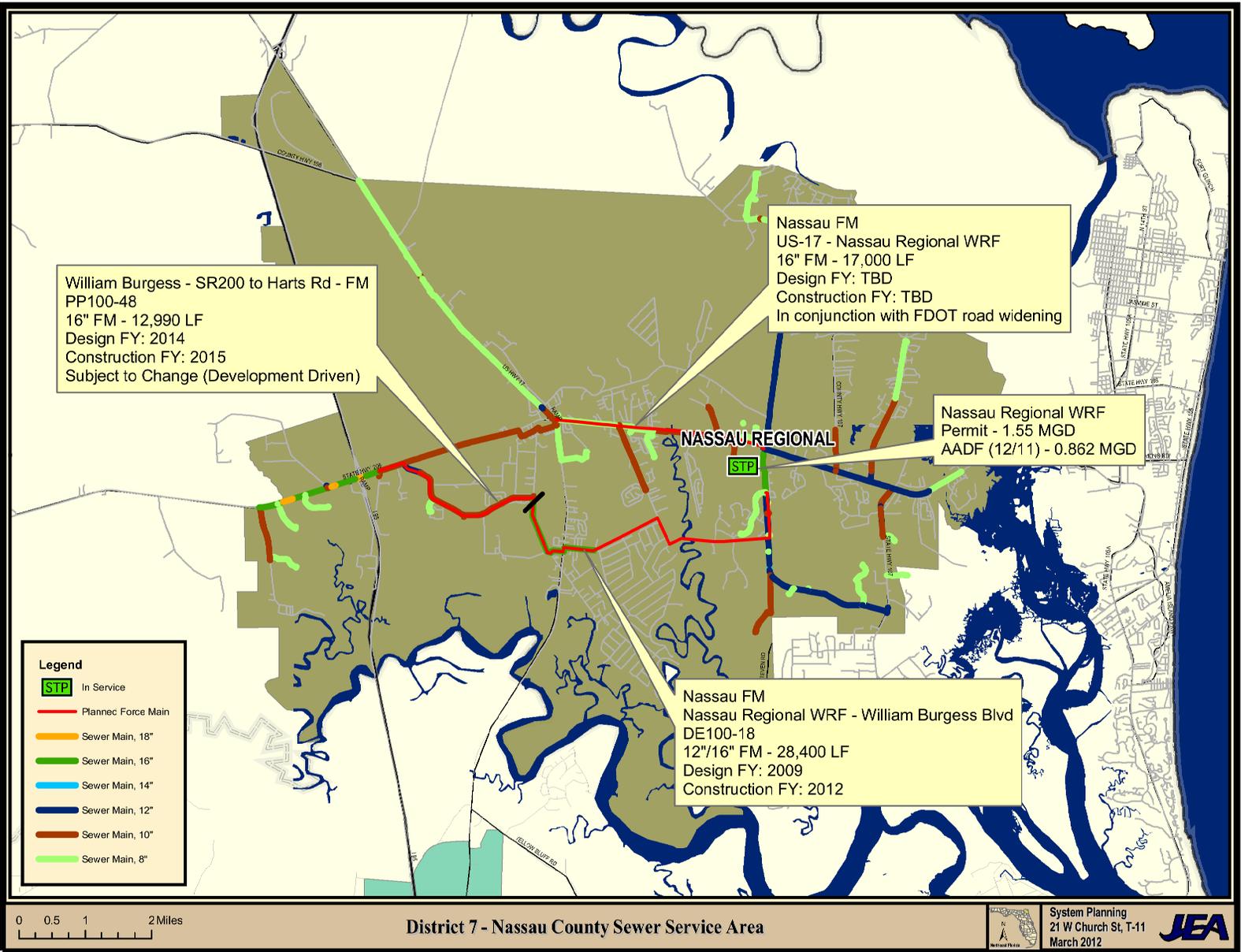
provide over 30 acres of recreational facilities and connect neighborhoods and employment centers to the extensive open space network.

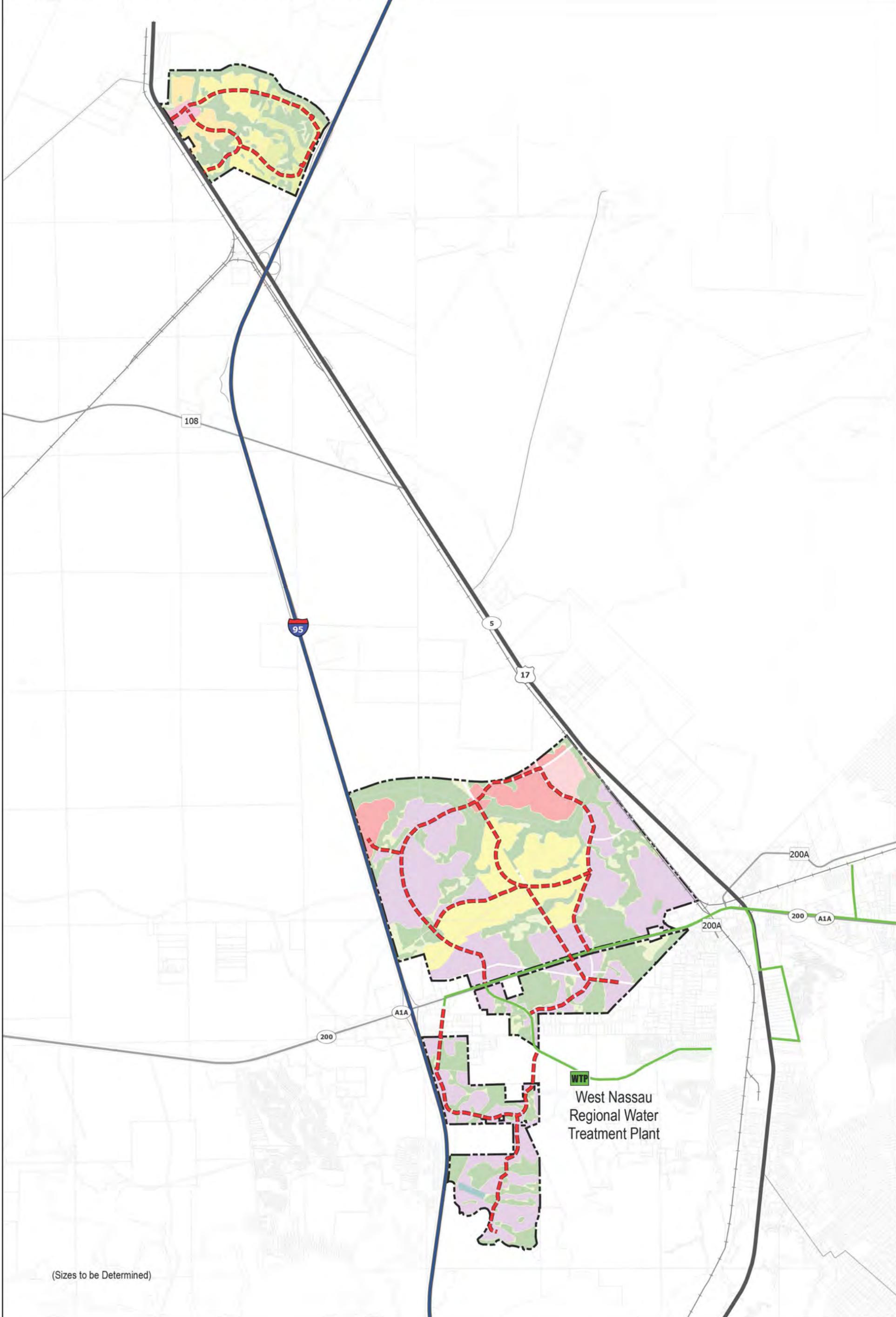
In addition to both the CHN and multi-use trail system, ENCPA policies require the inclusion of neighborhood parks, plazas and playfields. At build-out, these facilities are anticipated to exceed the projected demand created by the DSAP development program and assist significantly in addressing the County's overall deficiency in recreation and open space acreage.

C.7 Summary

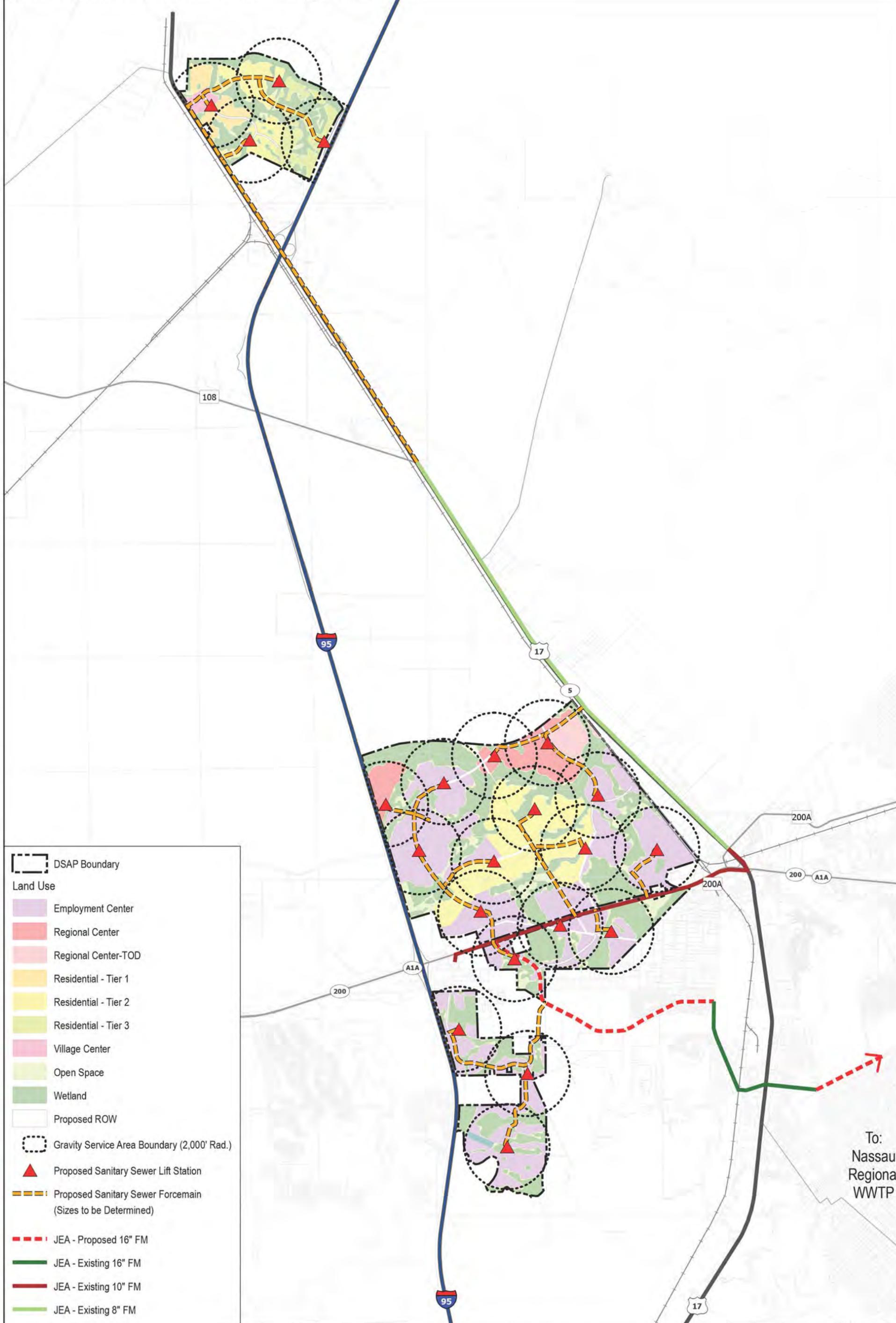
In conclusion, adequate potable water, sanitary sewer, solid waste, public school and recreational facilities exist to accommodate the proposed DSAP 5-yr development program. Future improvements may be necessary to accommodate the DSAP's projected wastewater and public school impacts at build-out.







(Sizes to be Determined)



- DSAP Boundary
- Land Use**
- Employment Center
- Regional Center
- Regional Center-TOD
- Residential - Tier 1
- Residential - Tier 2
- Residential - Tier 3
- Village Center
- Open Space
- Wetland
- Proposed ROW
- Gravity Service Area Boundary (2,000' Rad.)
- ▲ Proposed Sanitary Sewer Lift Station
- Proposed Sanitary Sewer Forcemain (Sizes to be Determined)
- JEA - Proposed 16" FM
- JEA - Existing 16" FM
- JEA - Existing 10" FM
- JEA - Existing 8" FM

To:
Nassau
Regional
WWTP