FUTURE LAND USE ELEMENT DATA INVENTORY AND ANALYSIS

A. POPULATION PROJECTIONS

The City of Fort Lauderdale receives population projections from the Broward County Planning and Development Management Department's Population Forecast and Allocation Model (PFAM). The Broward County Planning and Development Management Division PFAM 2017 update assigns the forecasted estimates from the University of Florida's Bureau of Economic and Business Research (BEBR), to Broward County's 2012 Traffic Analysis Zones (TAZ) and municipalities. PFAM is updated every three years to allocate the most recent countywide population estimate to each of the municipalities. This allocation is then modified for future years based on anticipated changes to development patterns. PFAM 2017 applies BEBR 2016 projections that reflect population estimates for 2015.

Per the PFAM projections, the City had an estimated 175,228 residents in 2015 and is projected to have 179,991 residents in 2020 which makes it the largest municipality in Broward County. Approximately 9.5% of Broward County's population resides in the City of Fort Lauderdale. The City has not experienced the exponential population growth of suburban communities in Broward County like Pembroke Pines and Miramar have in recent years. Current trends, however, indicate that more people are choosing to live in established urban centers like Fort Lauderdale due to convenience, quality of life, access to employment, social opportunities, and reduced automobile dependence. The following table shows the population projections for the City of Fort Lauderdale from 2010 to 2040.

Note: The population projections were updated in 2020 after transmittal of the elements to the state agencies that review Comprehensive Plans in order to reflect the population projections in the 10-Year Water Supply Facility Work Plan. The remainder of the data was prepared in 2016.

~~Fort Lauderdale's 2015 population of 175,123 residents makes it the largest municipality in Broward County, and the eighth largest city in the State of Florida. It is one of three principal cities in the South Florida Metropolitan Area, which had a population of 5,859,718 in 2015. With a total land area of 36.29 square miles, the City has an average population density of 4,825 persons per square mile. Table I.A.1. below indicates population trends in Fort Lauderdale since 1990, and projects population growth through 2040.~~

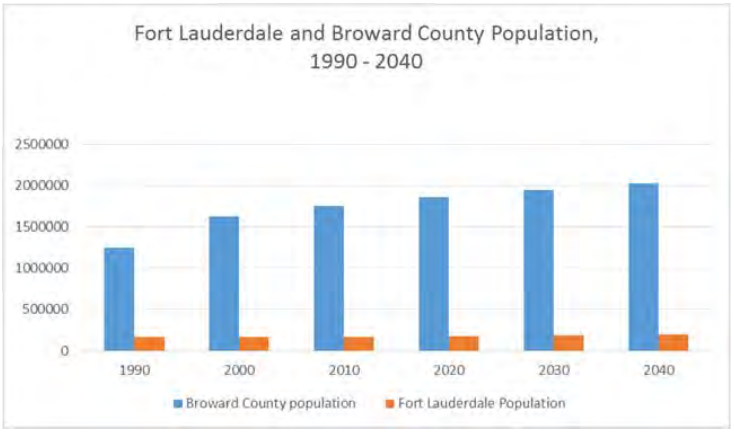
Table I.A.1. Historic and Projected Population Growth in Fort Lauderdale, 2010 - 2040

	2010	2015	2020	2025	2030	2035	2040
Fort Lauderdale	165,558	175,228	179,991	208,747	222,915	232,419	247,613
Broward County	1,748,128	1,827,005	1,894,285	1,990,171	2,051,056	2,110,602	2,199,813

Source: Broward County and Municipal Population Forecast Allocation Model (PFAM), 2017

~~Table I.A.1. Historic and Projected Population Growth in Fort Lauderdale, 1990 - 2040~~[1]

	~~1990~~	**~~2000~~**	**~~2010~~**	**~~2015~~**	**~~2020~~**	**~~2030~~**	**~~2040~~**
~~Fort Lauderdale~~	~~169,243~~	~~173,208~~	~~166,758~~	~~175,123~~	~~177,860~~	~~186,645~~	~~193,770~~
~~Broward County~~	~~1,255,531~~	~~1,623,018~~	~~1,748,066~~	~~1,827,367~~	~~1,855,922~~	~~1,947,695~~	~~2,020,947~~



[Graphic to be removed]

~~Approximately 9.6% of Broward County's population resides in the City of Fort Lauderdale. It should be noted that the City is largely built out and has not experienced the exponential population growth that newer suburban communities in Broward County like Pembroke Pines and Miramar have in recent years. Current trends, however, indicate that more people are choosing to live in established urban centers like Fort Lauderdale due to convenience, quality of life, access to employment, social opportunities, reduced automobile dependence, and myriad other reasons.~~

B. EXISTING LAND USE/VACANT LAND ANALYSIS

Fort Lauderdale encompasses approximately 36.29 square miles bounded by: the Atlantic Ocean to the east; Hollywood, Dania Beach, and Davie, and the Fort Lauderdale-Hollywood International Airport to the south; Plantation, Lauderhill, Lauderdale Lakes, and North Lauderdale, and unincorporated sections on Broward County to the west; Pompano Beach to the north; and Lauderdale-by-the-Sea and Sea Ranch Lakes to the northeast. The City's boundaries almost completely surround the municipalities of Wilton Manors and Oakland Park, which are located between the Middle River area to the south and the Cypress Creek area to the north.

Figure I.B.1. shows existing land uses in the City of Fort Lauderdale in 2016. These uses are detailed on Table I.B.1 below. As can be seen, residential and commercial/business uses represent a majority of the City's land uses, with commercial uses concentrated in the Downtown core and along major transportation corridors. The City industrial lands are generally concentrated along

~~1 Estimates of Population by County and City in Florida: April 1, 2015, Bureau of Economic and Business Research, University of Florida~~

the west side of Interstate 95, in the vicinity of Fort Lauderdale-Hollywood International Airport to the south, and in the Cypress Creek area in the north.

Table I.B.1. Existing Land Use in the City of Fort Lauderdale[12]

Land Use	Acres	Percent of Land Area
Residential	10,085	40%
Commercial	5,411	22%
Industrial	2,167	9%
Agricultural	3	<1%
Institutional	703	3%
Government	3,159	13%
Miscellaneous (i.e. some water, irrigation ditches)	3,413	14%
Mixed Use	89	<1%
Centrally Assessed (i.e. utility lines, railroad tracks)	101	<1%
TOTAL	**25,131**	**100%**

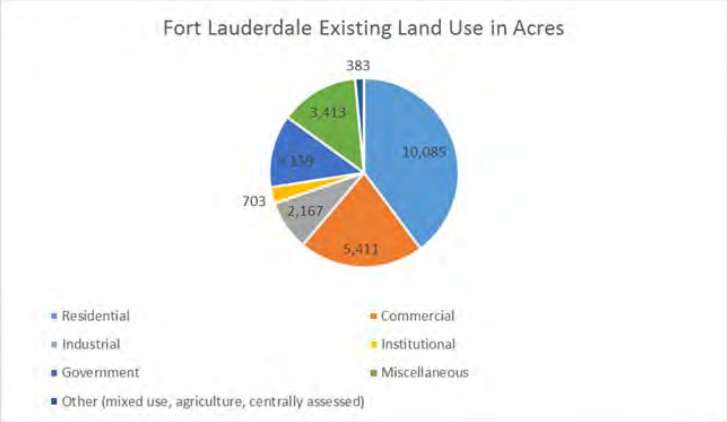


Figure I.B.2. shows the location of vacant and developable lands in the City of Fort Lauderdale, as well as their permitted uses based on underlying zoning and Future Land Use designations. As can be seen, Fort Lauderdale has a limited supply of vacant lands, comprising a total of 798 acres, representing approximately 3% of the City's total land area.

Table I.B.2. Vacant Land in the City of Fort Lauderdale[23]

Vacant Land Type	Acres
Vacant Commercial	155
Vacant Residential	594
Vacant Institutional	23
Vacant Industrial	26
Total	**798**

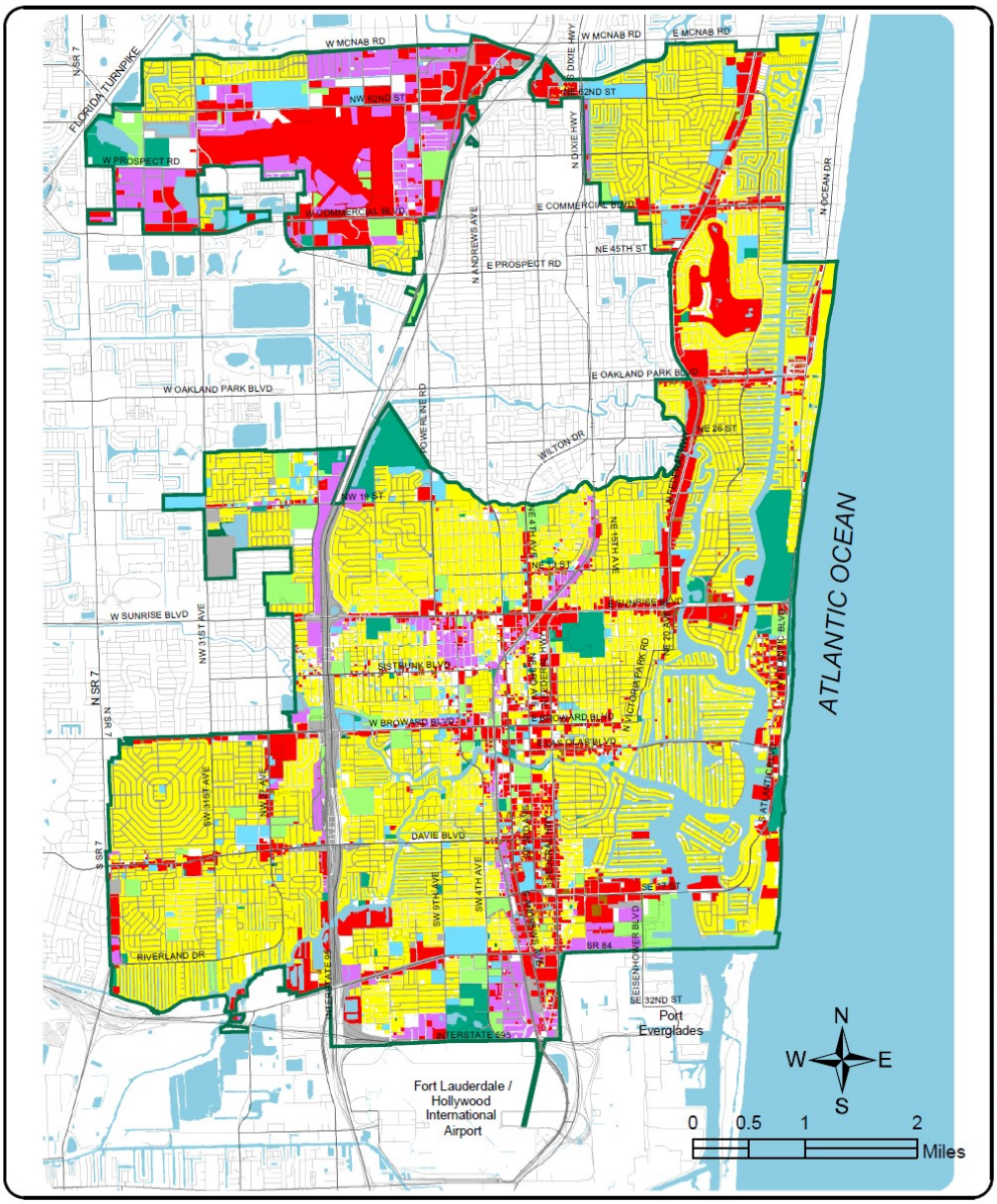
[12]Verified through GIS data from Broward County Property Appraiser
[23]Verified through GIS data from Broward County Property Appraiser

Residential uses are generally incompatible in areas that are regularly subject to aircraft noise levels of 60 decibels or higher. Figure 1.B.3 shows the current noise exposure contour map for Fort Lauderdale-Hollywood International Airport. Within the City of Fort Lauderdale, a few small existing pockets of medium and low density residential use are located within the 60-decibel noise level zone. The majority of uses in these zones, however, are designated for park-open space, commercial and industrial uses, which are compatible. The Airport's runway protection zones and overflight zones do not fall within the City Limits.

The Broward County Aviation Department (BCAD) and Federal Aviation Administration (FAA) closely monitor the height of all structures around the airport so that there are no new hazards created. Of particular concern are structures that exceed 200 feet in height, including construction cranes. BCAD has standard language for developers as they propose new construction within a 20,000-foot radius of a runway. Developers are further advised to file an on-line application with the FAA for the building, and for any temporary construction cranes. The FAA prepares an analysis of the potential for any development to be a hazard to the airspace and provides a copy of the analysis to the BCAD and other interested parties.

In addition, the City of Fort Lauderdale operates the Fort Lauderdale Executive Airport, a 1,000-acre general aviation facility located in the Uptown Business District. Fort Lauderdale Executive Airport is one of the busiest general aviation airports in the U.S., with more than 165,000 annual operations and an annual economic impact of $839 million. Figure 1.B.5. shows the current noise contour map for Fort Lauderdale Executive Airport. As can be seen, there are no residential uses in the airports noise zones.

Figure I.B.1. Existing Land Use



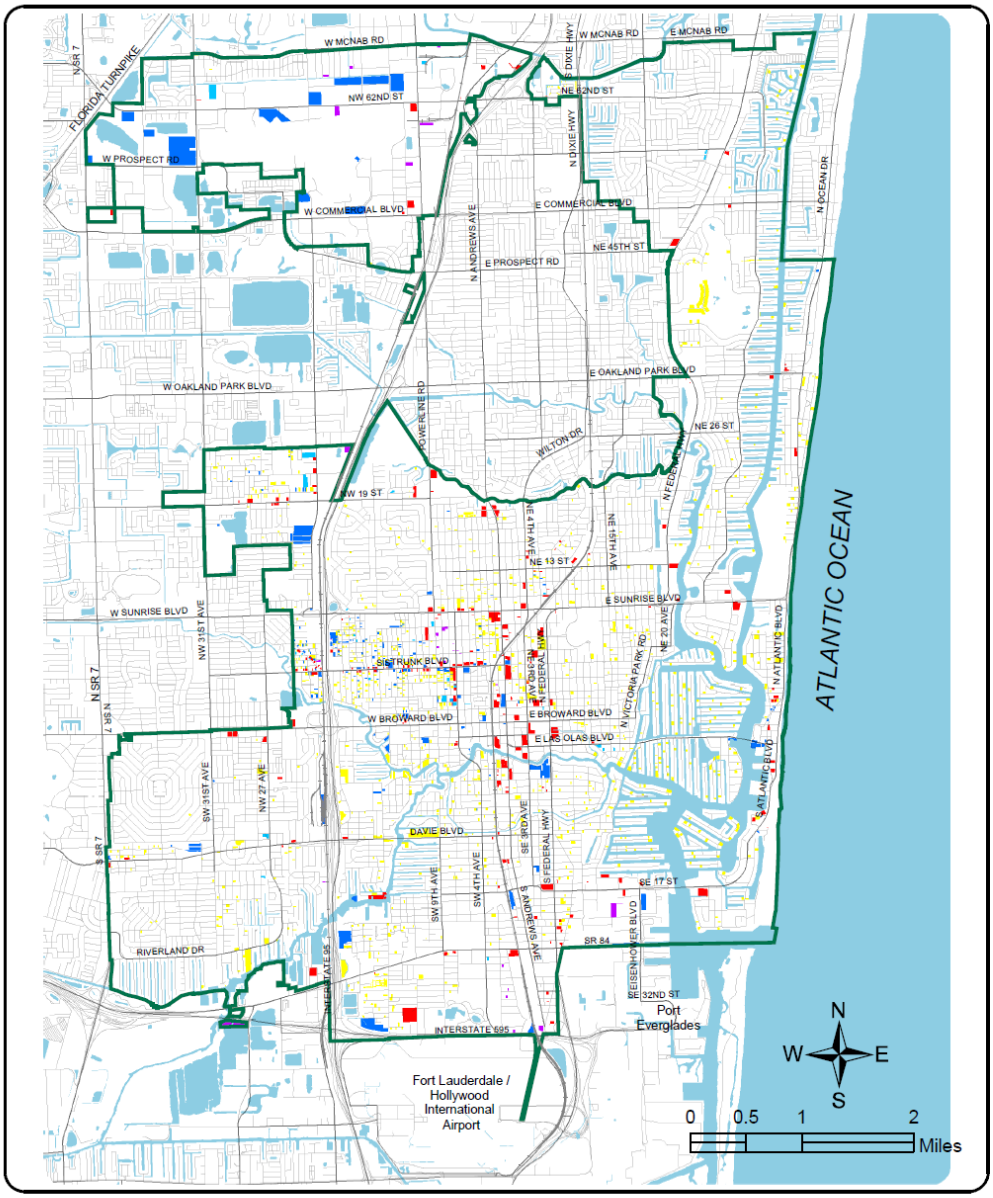
City Of Fort Lauderdale Existing Land Use

Legend

Residential	Industrial	Government
Commercial	Institutional	Agricultural
Mixed Use	Parks, Forest & Recreation	Miscellaneous

MAP SOURCE: CITY OF FORT LAUDERDALE URBAN DESIGN & PLANNING DEPARTMENT

Figure I.B.2. Vacant Land



City Of Fort Lauderdale Vacant Parcels

Legend

- Residential - Vacant Residential
- Commercial - Vacant Commercial
- Industrial - Vacant Industrial
- Institutional - Vacant Institutional
- Government - Undefined

MAP SOURCE: CITY OF FORT LAUDERDALE URBAN DESIGN & PLANNING DEPARTMENT

Figure I.B.3. Fort Lauderdale-Hollywood International Airport Noise Contour Map

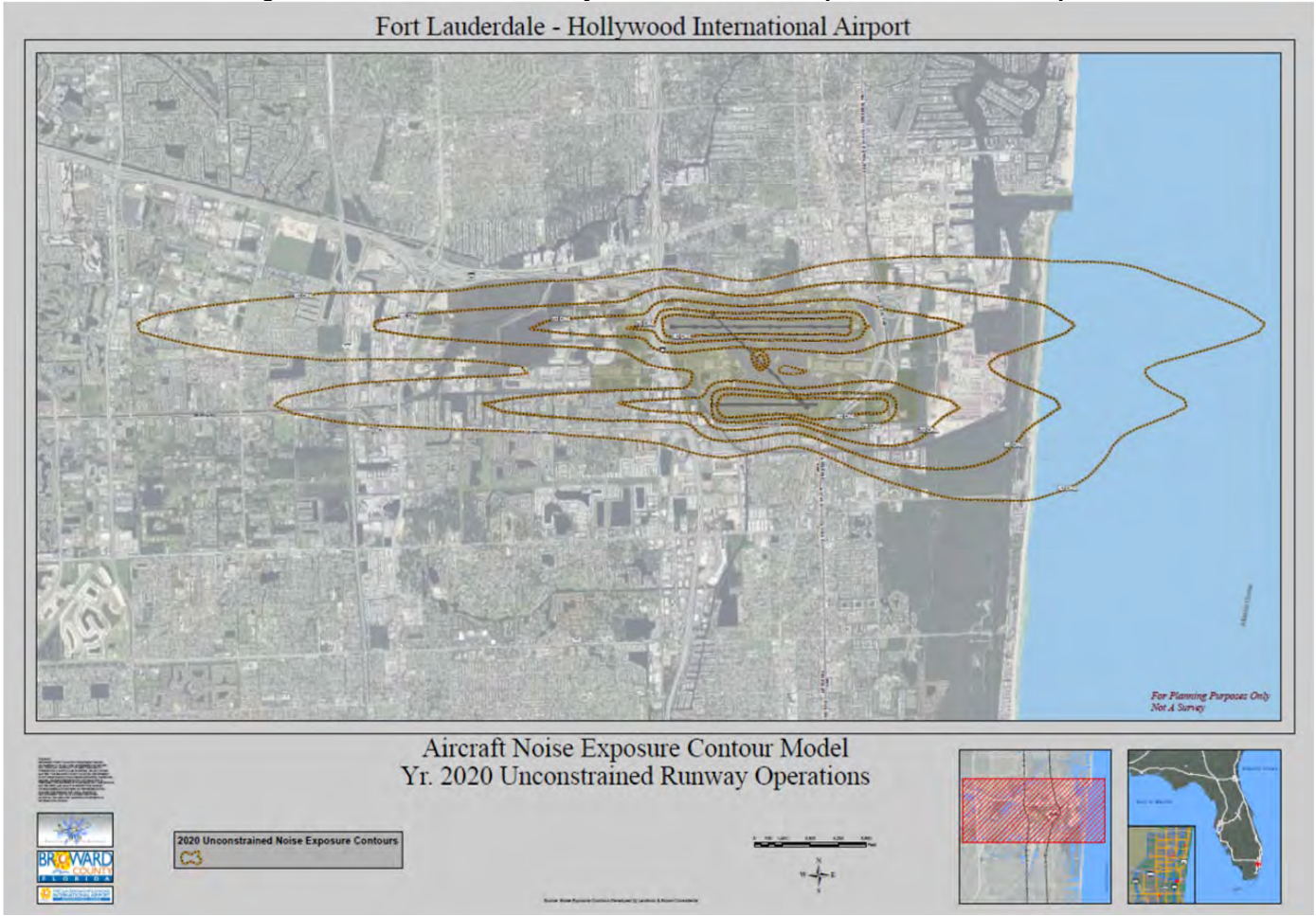
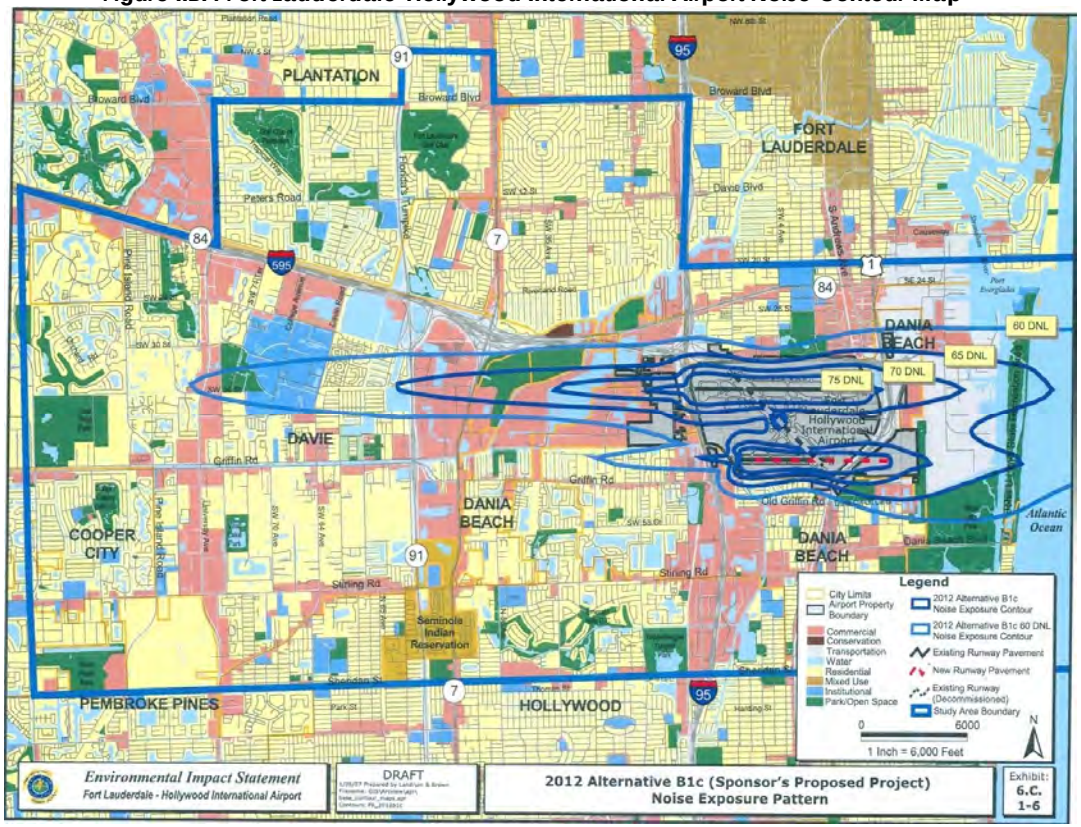
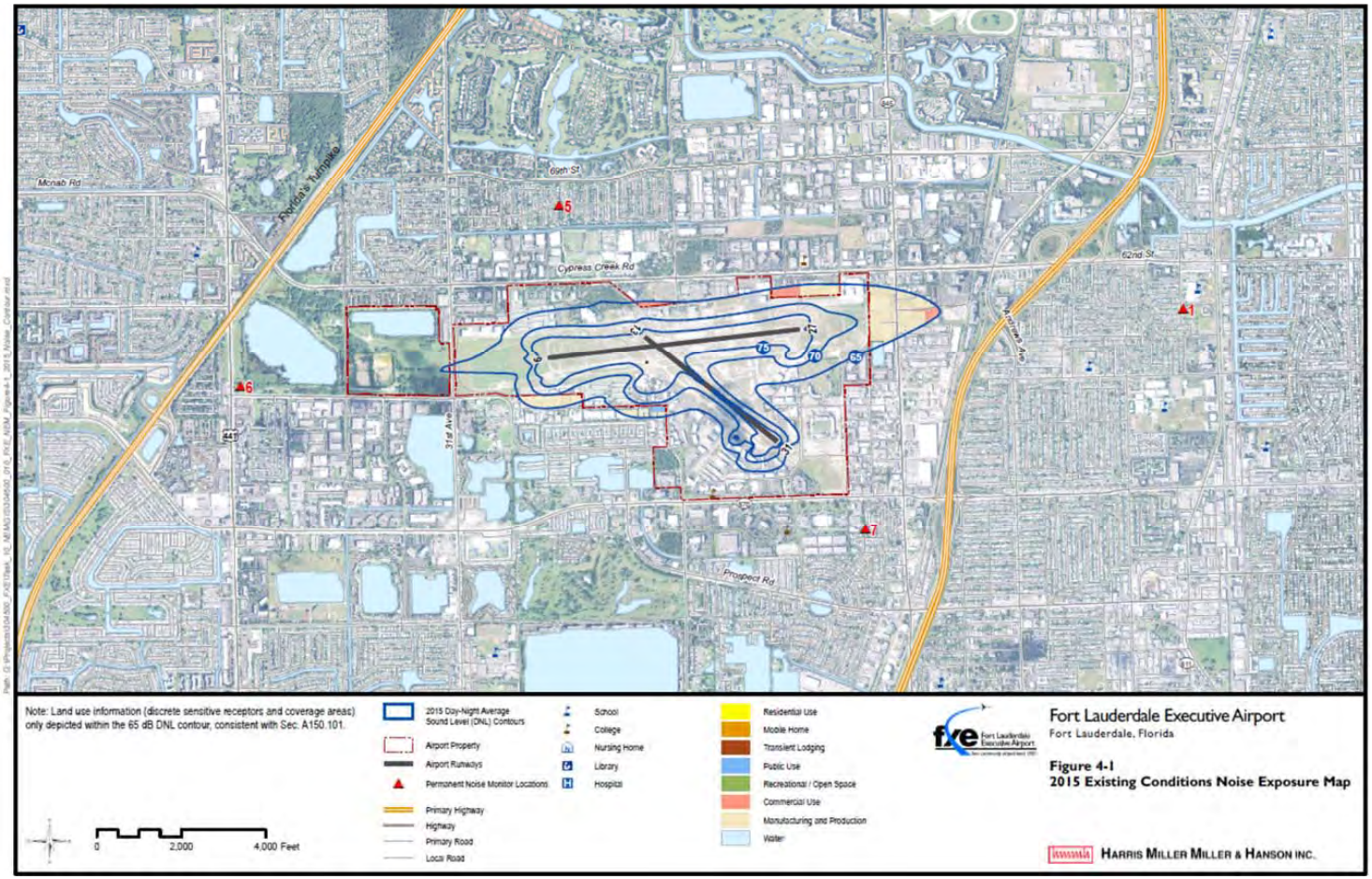


Figure I.B.4 Fort Lauderdale-Hollywood International Airport Noise Contour Map[3][4]



[3] Broward County

Figure I.B.5. Fort Lauderdale Executive Airport Noise Contour Map



C. FUTURE LAND USE

The City's adopted Future Land Use Map is shown on Figure 1.C.1. Table 1.C.1. below indicates acreage and maximum development potential by Future Land Use District in the City. The City's ultimate residential development capacity can be calculated based on the acreage and maximum permitted residential density in each of the districts. A total of 162,928 units could be permitted in the City Future Land Use Districts are built out to the maximum residential density allowed in the Comprehensive Plan. Based on the average household size of 2.196 persons per unit, if the City were built out to the maximum residential capacity permitted in the Comprehensive Plan, a population of approximately 357,783 could be accommodated. In 2016,~~In actuality,~~ the City projecteds that its population will increase slightly in the planning period from 175,123 in 2015 to 186,645 in 2030. According to 2017 population projections provided by Broward County, the population will increase from 179,991 in 2020 to 247,613 in 2040. In addition, the City has ~~18,000~~ residential flex units which can be used to provide for residential housing needs. The Comprehensive Plan is therefore providing an adequate supply of residential lands to meet existing and current demand.

Table I.C.1. Future Land Use and Maximum Development Potential in Fort Lauderdale

Future Land Use District	Density/Intensity	Acres	Development Potential
Central Beach Regional Activity Center	5,550 units, square feet capped at 3,220 generated trips	232	5,550 units, approx. 1,000,000 square feet (est.)
Commercial	3 Floor Area Ratio	2182	276,797,160 square feet
Commercial Recreation	3 Floor Area Ratio	14	1,829,520 square feet
Community Facilities	3 Floor Area Ratio	678	88,601,040 square feet
Conservation	n/a	210	n/a
Downtown Regional Activity Center	11,060 units, 4 Floor Area Ratio	695	11,060 units, 121,096,800 square feet
Employment Center	3 Floor Area Ratio	1,557	203,468,760 square feet
High Density Residential	60 units/net acre	407	19,236 units
Industrial	3 Floor Area Ratio	791	103,367,880 square feet
Irregular Residential	varies	1,760	11,613 units
Low Density Residential	4.4 units/net acre	1,505	5,297 units
Low-Medium Density Residential	8 units/net acre	5,026	32,166 units
Medium Density Residential	15 units/net acre	2,128	31,920 units
Medium-High Density Residential	25 units/net acre	1,370	34,250 units
Northwest Regional Activity Center	10,900 units, 11,500,000 square feet	1,077	10,900 units, 11,500,000 square feet
Office Park	3 Floor Area Ratio	19	2,482,920 s.f.
Park-Open Space	3 Floor Area Ratio	1,012	132,248,160 s.f.

South Regional Activity Center	936 units, 115,000,000 square feet	267	936 units, 115,000,000 square feet
Transportation	3 Floor Area Ratio	1,225	160,083,000 square feet
Utilities	3 Floor Area Ratio	54	7,056,720 square feet
Water	n/a	1,022	n/a
Total		**22,214**	**162,928 units, 1,121,031,960 square feet**

Maintaining an adequate supply of non-residential lands to support the City's planning program is an important consideration. The City currently has a maximum development potential of 1,121,031,960 s.f. of non-residential development potential, including commercial development and employment generating uses. ~~This translates into over 6,000 s.f. per person currently and at the projected 2030 population.~~

Table 1.C.2. below lists Future Land Use Map amendments that have been adopted since 2007. The majority of these amendments were to provide City land use designations on annexed properties (June 2007 and February 2008 amendments), or to designate parcels throughout the City as parks (2010 amendments).

Table I.C.2. Future Land Use Map Amendments Since 2007

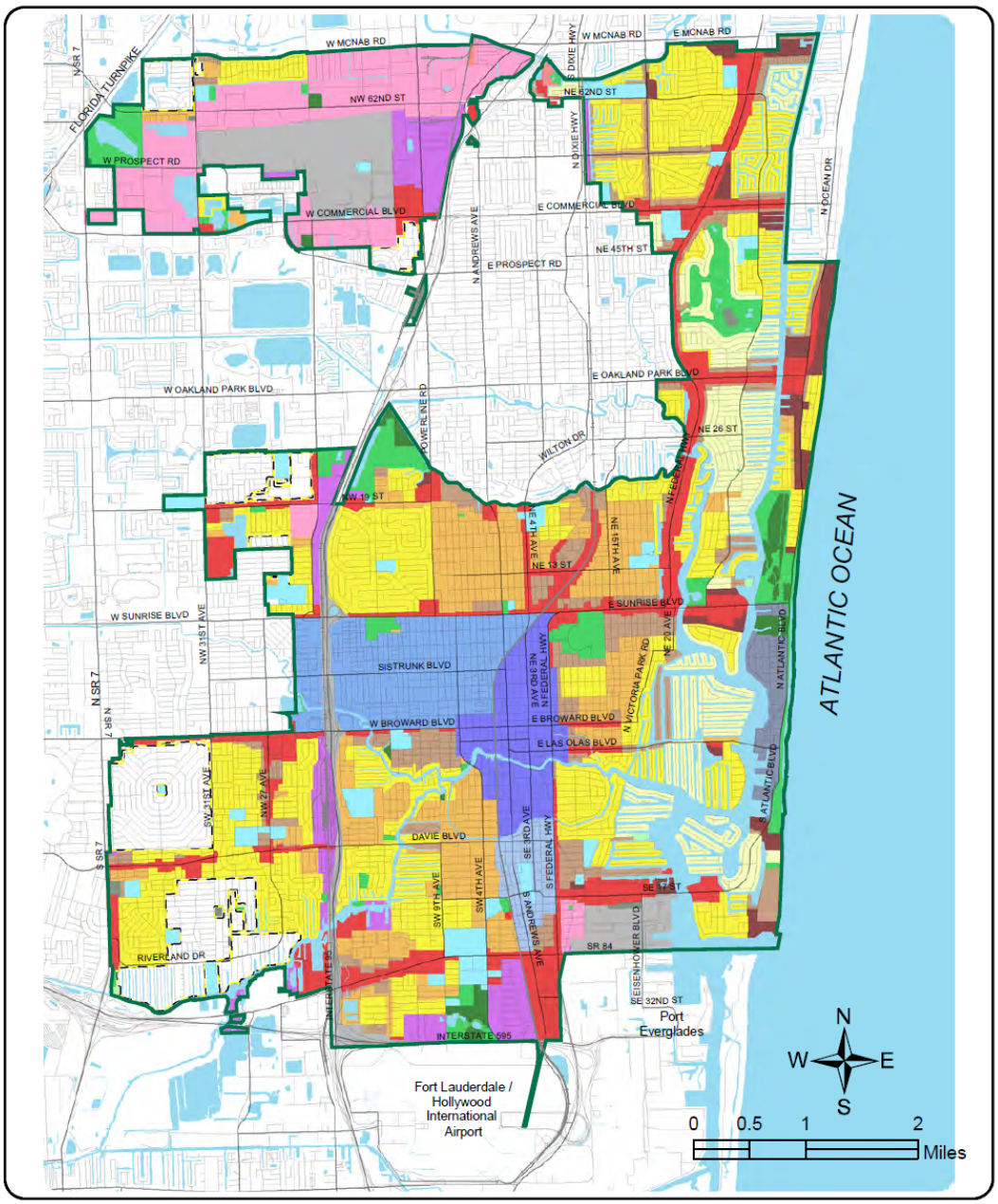
Designation	Date	Previous Designation	Acres	Map Code
Residential Irregular 6.47	June 2007	County Low Residential 5	16.25	1
Residential Irregular 15.58		County Low/Medium Residential 10	.51	
Residential Irregular 21.37		County Medium Residential 16	1.46	
Community Facilities	December 2007	Park-Open Space	1.30	2
Residential Irregular 6.80	February 2008	County Low Residential 5	124.78	3
Residential Irregular 11.00		County Low/Medium Residential 10	4.37	
Residential Irregular 18.07		County Medium Residential 15	78.15	
Commercial		County Commercial	26.81	
			18.59	

Community Facilities Industrial Park-Open Space		County Community Facilities County Industrial County Recreation & Open Space	39.73 27.89	
Commercial	August 2008	Park-Open Space	3.16	4
Park-Open Space	May, October 2010	Commercial Employment Center Employment Center Industrial Industrial Low Residential Low-Medium Residential Residential Irregular 12.22 Medium Residential Regional Activity Center Community Facilities Medium Residential Medium Residential	4.90 1 5 3.40 2.02 .29 2.60 .95 .22 .96 5.91 .78 1.82	5 6 7 8 9 10 11 12 13 14 15 16 17
Transportation	September 2010	Parks-Open Space, Employment Center	64.30	18
Commercial	December 2013	Medium-High Residential 25	23.89	19

Residential Irregular 1.7	February 2014	Park-Open Space	21.8	20

In January 2016 the City adopted a text amendment increasing the number of residential units permitted in the Downtown Regional Activity Center from 11,060 to 16,060 units. Of the 5,000 additional dwelling units, 750 were restricted to affordable housing as defined in the Broward County Land Use Plan. No other amendments to increase the number of permitted residential units in activity centers have been adopted since 2008.

Figure I.C.1. Future Land Use Map



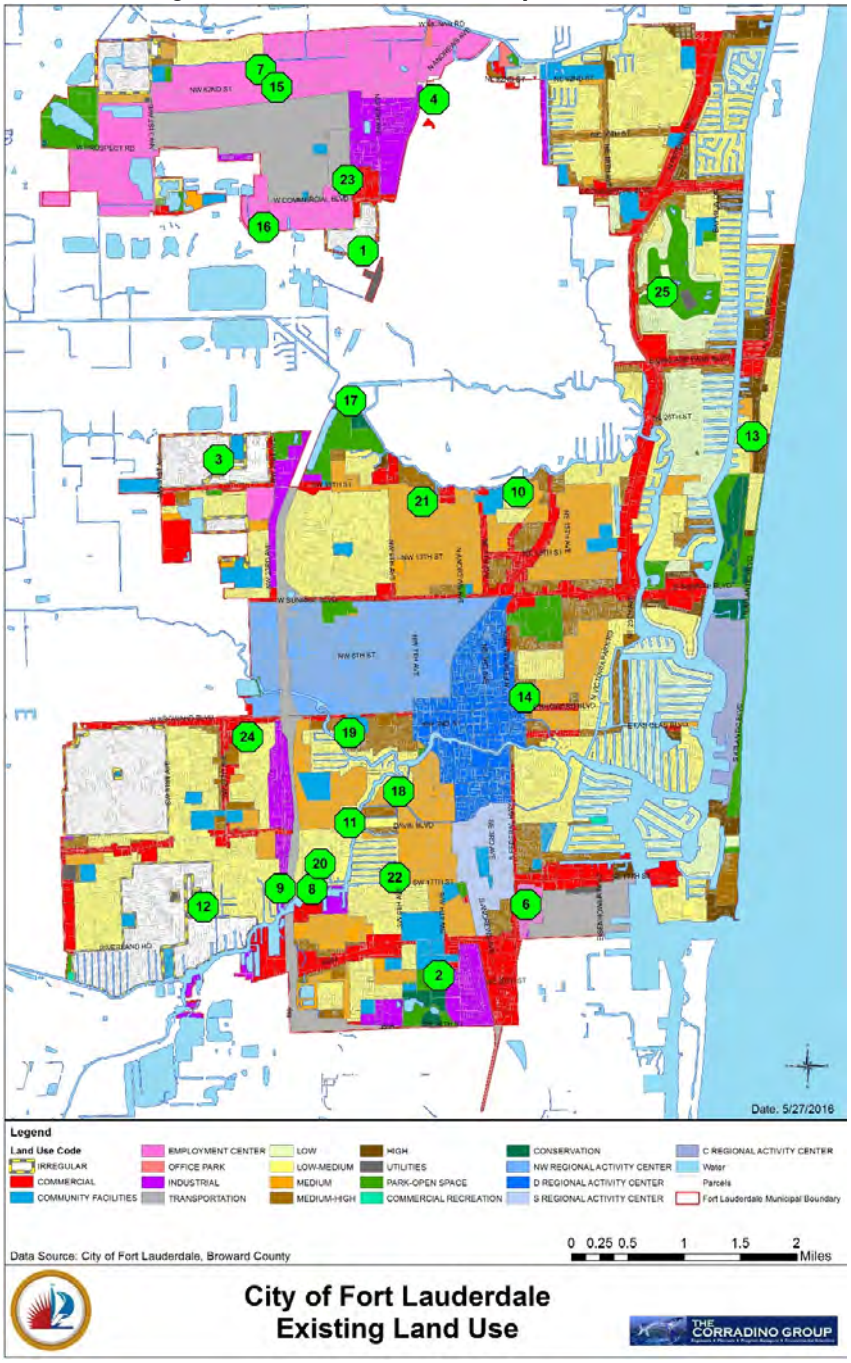
City Of Fort Lauderdale Future Land Use

LEGEND

- UTILITIES
- COMMERCIAL
- COMMUNITY FACILITIES
- EMPLOYMENT CENTER
- OFFICE PARK
- INDUSTRIAL
- TRANSPORTATION
- WATER**
- IRREGULAR*
- LOW 4.4
- LOW-MEDIUM 8
- MEDIUM 15
- MEDIUM-HIGH 25
- HIGH 60
- PARK-OPEN SPACE
- COMMERCIAL RECREATION
- CONSERVATION
- NW REGIONAL ACTIVITY CENTER
- DOWNTOWN REGIONAL ACTIVITY CENTER
- SOUTH REGIONAL ACTIVITY CENTER
- CENTRAL BEACH REGIONAL ACTIVITY CENTER
- REGIONAL ACTIVITY CENTER - PARK
- REGIONAL ACTIVITY CENTER CONSERVATION

MAP SOURCE: CITY OF FORT LAUDERDALE URBAN DESIGN & PLANNING DEPARTMENT

Figure I.C.1. Future Land Use Map Amendments



D. REDEVELOPMENT NEEDS

New development needs to be compatible with existing development in order to preserve and strengthen neighborhood character and sense of place. The City's existing ULDR regulations require that new development be compatible with and preserve the character and integrity of adjacent neighborhoods. Development and design issues addressed in the ULDR include traffic, noise, odors, shadow, scale, placement or orientation of buildings and entryways, parking areas, buffer yards, building mass, landscaping and numerous other development elements. The Neighborhood Compatibility regulations also require that consideration be given to the recommendations of the adopted neighborhood master plan in which the proposed development is to be located, a very important requirement that builds on the City's existing efforts to develop its neighborhoods in a sensitive manner.

Certain neighborhoods and areas face particular challenges, including vacant and/or underutilized parcels, deteriorating and blighted conditions, crime, disinvestment, and a lack of connectivity and access. The Fort Lauderdale Beach Community Redevelopment Area was established to focus and implement redevelopment activities in a declining 121-acre area in central Fort Lauderdale Beach. The Northwest/Progresso/Flagler Heights Redevelopment Area addresses redevelopment activities and needs in the area between Sunrise Boulevard on the north, Broward Boulevard in the south, the City Limits to the west and Federal Highway on the east. The neighborhoods in the Northwest/Progresso/Flagler Heights CRA have historically faced a number of challenges, including high unemployment rates, disinvestment, and deteriorating and blighted conditions.

Fort Lauderdale's 1.1 square mile Downtown is characterized by a modern skyline, pedestrian-scale activity and entertainment centers such as Las Olas Boulevard and Himmarshee Village; cultural and educational institutions; Riverwalk, a one-mile waterfront promenade along the New River, and other assets. Downtown also faces challenges, including vacant, deteriorating or underutilized properties that contribute to blight conditions. The City and partners such as the Downtown Development Authority will continue to implement projects and activities to help Downtown achieve its potential as Broward County's premier business and 24-hour activity center.

The City of Fort Lauderdale has proactively engaged in a number of planning initiatives in order to address the redevelopment needs and enhance the sense of place in targeted areas. The Downtown Master Plan, adopted in 2003 and updated in 2007, provides a comprehensive vision for development and redevelopment in Downtown Fort Lauderdale, and establishes a series of design guidelines for achieving this vision. These guidelines address a number of areas, including: street and building design; quality of architecture; storefront design; character area guidelines (i.e. Downtown Core, Near Downtown, Neighborhood Transition Areas); thematic planning districts (i.e. Arts & Entertainment/Cultural District, F.A.T. Village, Government Campus, Judicial Campus); riverfront design, and implementation. The Plan was updated in 2014 to include Transit Oriented Development Guidelines.

The 2008 Downtown New River Master Plan/2010 Riverwalk District Plan further built upon the groundwork laid in the Downtown Master Plan for the area surrounding the New River waterfront. The plans recognized that the Riverwalk Promenade, despite being a major asset for Downtown, was not realizing its full potential; challenges include a lack of activity in certain areas, poor connections to surrounding activity centers, and public spaces that function more as special event venues than for daily use. The plans made a number of recommendations, including better connectivity to the Las Olas Corridor and between the north and south sides of the Riverwalk, improved public spaces, economic revitalization and activation strategies, and riverfront design guidelines.

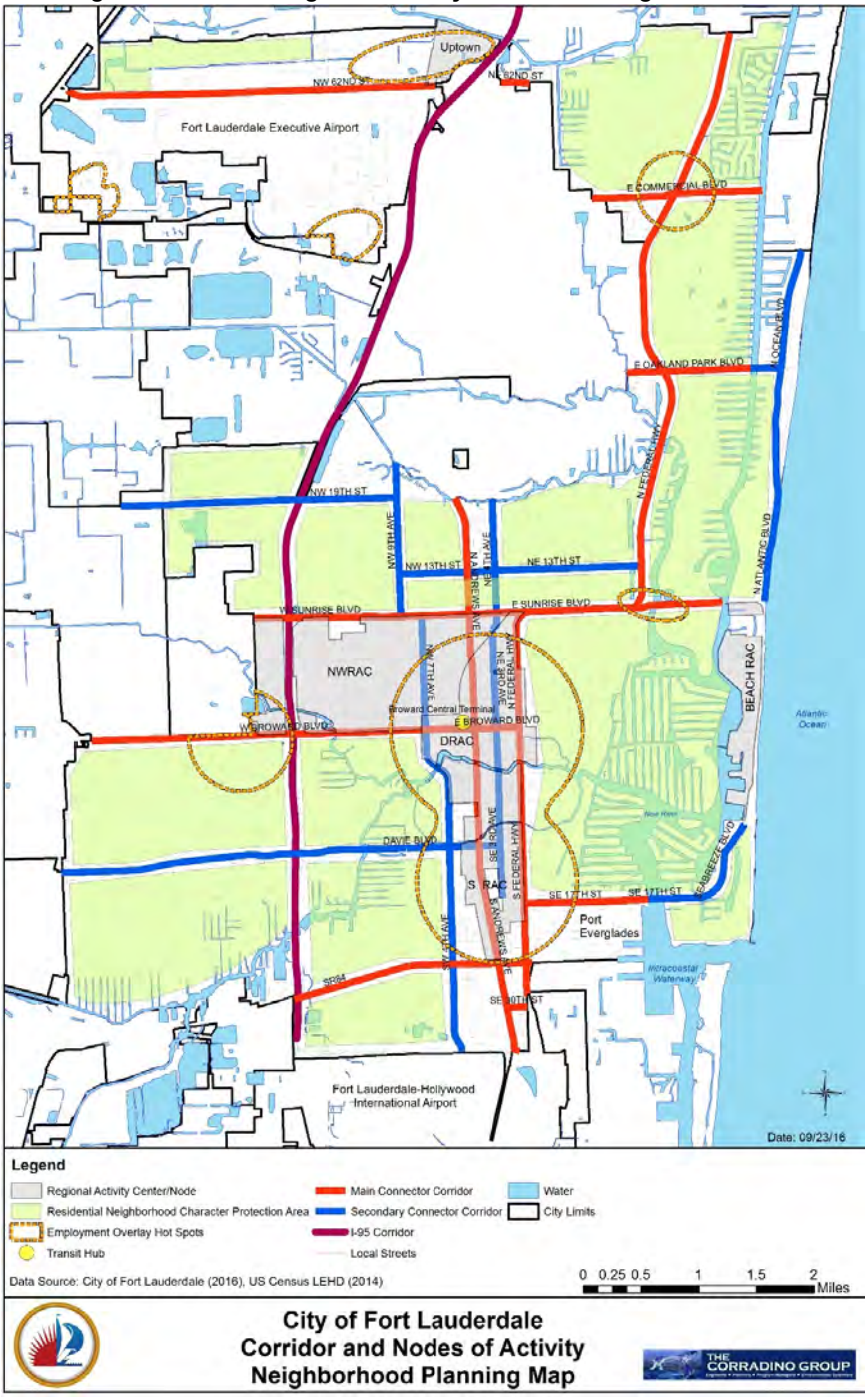
The City has also prepared, or is in the process of preparing, master plans for a number of other targeted areas, including Central Beach, the Davie Boulevard Corridor, North US-1, South Andrews Avenue, and the Northwest Activity Center. These plans advance the sense of place and address specific challenges in these areas through design guidelines, streetscape improvements, targeted development strategies, and other redevelopment mechanisms.

Chapter 163, Florida Statutes, defines "urban sprawl" as "a development pattern characterized by low density, automobile-dependent development with either a single use or multiple uses that are not functionally related, requiring the extension of public facilities and services in an inefficient manner, and failing to provide a clear separation between urban and rural uses." Fort Lauderdale is a mature urban environment that is nearly at build-out. At present, only two percent of the City land area is vacant, most of which is zoned for industrial, institutional or commercial land uses. Thus, most future development will be the result of redevelopment, with no opportunity for sprawl into rural and undeveloped areas that would require the inefficient extension of infrastructure and services. The City is, however, largely characterized by low density, automobile dependent development, particularly along major transportation corridors. In response, the City's 2016 Evaluation and Appraisal Report called for revising the goals, objectives and policies of the Comprehensive Plan to promote compact mixed-use development as the City's preferred development pattern; to call for higher density in appropriate areas, transit supportive mixed-use development along major transportation corridors and Downtown; and targeting future development and redevelopment to appropriate areas.

Flex Units and Accommodation of Development Needs

In planning for the future, the City needs to determine where it should distribute 5000 housing flex units. Given this number of housing, there is a potential impact on neighborhoods and density where the units are emplaced. It is also, important, however, that the character of existing neighborhoods be preserved; therefore, the City needs to determine areas where growth should occur and is warranted, such as in areas such as the Regional Activity Centers and planned neighborhoods with higher densities, such as Uptown as part of the Cypress Creek TOD area. In Figure 1.D.1, the City has reviewed and cross-referenced its land use map, transportation corridors, and employment density, based on LEHD data, to determine major (Red Lines) and secondary corridors (Blue Lines) as well as nodes of activity where these flex units can be emplaced (Gray, such as the RACs and Uptown), while at the same time providing for protection of the character of local neighborhoods (Light Green).

Figure I.D.1. Neighborhood and Regional Activity Center Planning - Corridor and Nodes Map



E. JOB CREATION/ECONOMIC DEVELOPMENT

Greater Fort Lauderdale, with a gross metro product of $81.3 billion[4], boasts a vibrant and diverse economy. Marine commerce is the area's leading industry, providing more than 134,000 jobs and an annual economic impact of $10.78 billion. (The Fort Lauderdale International Boat Show, the world's largest in-water boat show, alone has an annual economic impact of $650 million.) Tourism is the area's second largest industry, employing 114,386 and having an annual economic impact of $9.1 billion. The Greater Fort Lauderdale Convention and Visitors Bureau estimates that the area had 13.4 million visitors in 2013. Greater Fort Lauderdale is also an important center for international trade and business, has a strong manufacturing base, and serves as the corporate or regional headquarters for a number of corporations. The City's strong business climate and central location on South Florida's "Internet Coast", an emerging high-tech corridor that is home to more than 6,000 high technology firms, has made it a high-tech hotbed.

Fort Lauderdale's economy is based on a number of economic drivers. The tourism industry is largely centered on the City's seven miles of beaches and extensive system of waterways. The 600,000-square-foot LEED certified Greater Fort Lauderdale Convention Center hosts numerous large conventions and smaller meetings annually. Fort Lauderdale-Hollywood International Airport is the nation's 21st busiest airport and includes a growing number of international flights. The airport and related business provide more than 44,000 jobs and have an annual economic impact of $2.6 billion[5]. Fort Lauderdale's City-owned and operated Executive Airport is one of the nation's busiest general aviation airports. According to the Florida Department of Transportation's 2014 Statewide Economic Impact Study, the Executive Airport contributes to more than 5,100 jobs, and economic activity associated with FXE was reported to be $839 million annually. Port Everglades is ranked as the 11th busiest cargo port in the nation, and the second busiest cruise port in the world. Other major economic assets and employment centers include a number of major medical centers, Downtown, and the Cypress Creek Uptown business and technology district.

Greater Fort Lauderdale's median household income of $50,997 is higher than the median household income in the State ($45,050), while the median home or condominium value in 2012 was $223,400, compared to $148,200 in the State. The City's unemployment rate in March 2015 was 5.5%, equal to the national rate and slightly lower than the State's rate of 5.7%.[6] The cost of living in Fort Lauderdale is 9% above the national average, and the 2013 job growth rate of 2.5% ranks 125th among metropolitan areas.[7] Education attainment for the over 25 population indicates that 85.2% have completed high school, 33.9% have earned a Bachelor's degree and 12.3% have earned a graduate or professional degree.[8] This is comparable to the rest of Broward County, where 30.2% have earned a Bachelor's degree or higher and 10.8% have earned a graduate or professional degree.

The City and its partners like the Greater Fort Lauderdale Alliance, Chamber of Commerce, Convention and Visitors Bureau, Downtown Development Authority, and Broward County Economic Development work together to implement economic development efforts. Many of these efforts are focused on creating, fostering and attracting jobs and businesses in targeted industry sectors, including: aerospace and aviation; advanced materials and high-tech manufacturing; alternative energy and renewable resources; global business services and logistics; human resources development and higher education; information and communications

4 www.forbes.com/places/fl/fort-lauderdale/
5 Fort Lauderdale Economic &Community Investment Division
6 U.S. Bureau of Labor Statistics, April 2015
7 www.forbes.com/place/fl/fort-lauderdale
8 www.city-data.com/city/Fort-Lauderdale-Florida.html

technologies; creative economy and film; corporate headquarters; global logistics; life science; and marine. Tax refunds and other incentives are available to companies that commit to providing high-wage jobs in these sectors.

In addition to these programs, another strategy to expand economic opportunities is to create synergies between the City's core economic assets by seamlessly linking them via a dedicated bus line. Such a link between the airport, port, downtown, beach, and northern business areas would allow for more efficient and easy movement between the locations which can clearly enhance economic activity. For example, business travelers who might stay in the northern Cypress Creek area to be near an office for meetings might be enticed to visit downtown destinations if the connection was easy and inexpensive.

An urban design option for linking the core asset locations is a sophisticated gateway and wayfinding program that shows users the easiest and fastest way to travel between the locations. Such a program would enable even short-term visitors to the City to quickly navigate to multiple destinations.

While helping existing economic assets to expand is a logical focus for economic development, an equally important effort is to encourage innovation and start-up efforts which are frequently undertaken by what has been termed the creative class. Strategies to encourage creative class activity include creating attractive public spaces, and collaborative and inexpensive workspaces where people can exchange ideas with low up-front costs. Another component for encouraging innovation and the creative class is the promotion of arts activities of all kinds including permanent museums, pop up exhibits, public art, art festivals and events, street murals on buildings, and any of the many other forms of art expression that are constantly being developed and repurposed.

Another major component of encouraging innovative economic development is supporting the development of knowledge. While the comprehensive plan does not set educational policies, it does deal with the development of the physical facilities where education is provided. In general, the widest flexibility needs to be shown in the location and design of educational facilities so that they can be responsive to the host the constantly evolving needs of innovative education programs.

SANITARY SEWER, WATER, AND STORMWATER ELEMENT DATA INVENTORY AND ANALYSIS

The Infrastructure Element addresses the physical capacity and condition of the City's hard infrastructure system (sanitary sewer, potable water, solid waste, drainage and aquifer recharge). In order to maintain the physical capacity of its infrastructure system, the City of Fort Lauderdale has adopted Level of Service Standards in the Comprehensive Plan and Land Development Code. The City ensures that these standards are met through: Concurrency Management, which requires that the infrastructure needed to serve new development and redevelopment is in place prior to or at the time of development; capital improvement projects, and; coordination with other service providers, such as Broward County.

A. Sanitary Sewer

The City's adopted Level of Service standards for sanitary sewer, daily and by type of development, are as follows:

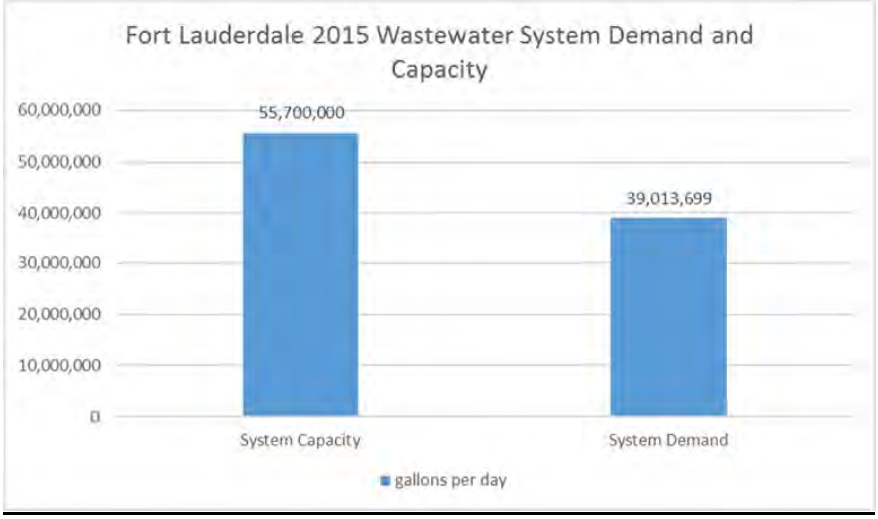
- Single family housing, Duplex, Triplex - 300 gallons per day per unit;
- Condominiums and Apartments – 241.5 gallons per day per unit;
- Merchandising – 165 gallons per 1000 square feet of building area;
- Hotels (with restaurants and/or meeting rooms) 260.4 gallons per day per room;
- Hotels (without restaurants and/or meeting rooms) 77 gallons per day per room;
- Office uses - 191 gallons per square feet of building area;
- Institutional uses, 200 gallons per day per bed;
- Other Commercial – 157 gallons per square feet of building area;
- Restaurant, 749 gallons per 1000 square feet of building area.

Prior to issuing a development order, the City ensures that the system-wide capacity of the wastewater treatment system, and the sanitary sewer infrastructure that serves the site (i.e. pipes, pump stations), are sufficient to meet the standard based on the type and scale of development. If they are not sufficient, the developer may be required to provide the necessary improvements.

Central wastewater treatment in the City is provided through the George T. Lohmeyer Wastewater Treatment Plant, which is located on a ten-acre site at Port Everglades. The plant provides continuous wastewater treatment to approximately 180,000 customers in Fort Lauderdale, Wilton Manors, and Oakland Park, as well as sections of Tamarac, Davie and unincorporated Broward County. Some residents in the service area remain on septic tank systems, mostly within the southern portion of the City of Fort Lauderdale. It is anticipated that these septic systems will be replaced with sewer service during the ten-year planning period. The Plant has a current treatment capacity of 56.6 million gallons per day. In 2014, the City treated 14.24 billion gallons of wastewater, an average of 39,013,699 gallons per day.[1]

In addition to ensuring capacity to meet demand, the City is also implementing strategies to reduce wastewater flow. The Waterworks 2011 program identified approximately $70 million in capital projects to reduce groundwater infiltration and unnecessary treatment, modernize infrastructure, and otherwise improve the operation and efficiency of the system.[2] This work has been completed. The 2015 Commission Annual Action Plan prioritized wastewater infiltration and inflow reduction through the rehabilitation of gravity mains, sewer laterals, manholes, and ten pump station areas between 2016 and 2019.[3]

1 City of Fort Lauderdale Comprehensive Annual Financial Report, September 30, 2014
2 City of Fort Lauderdale Sustainability Action Plan, 2011
3 City of Fort Lauderdale Press Play Progress Report, January 2015



B. Potable Water

Potable Water Level of Service

The City's adopted potable water level of service is 170 gallons per capita per day. The City of Fort Lauderdale has been promoting water conservation for more than 25 years. In 2008, the City established a goal of reducing finished water demand which resulted in an annual average day finished water produced averaged 164-gpcd from 2014 to 2018.

Potable Water Service Area

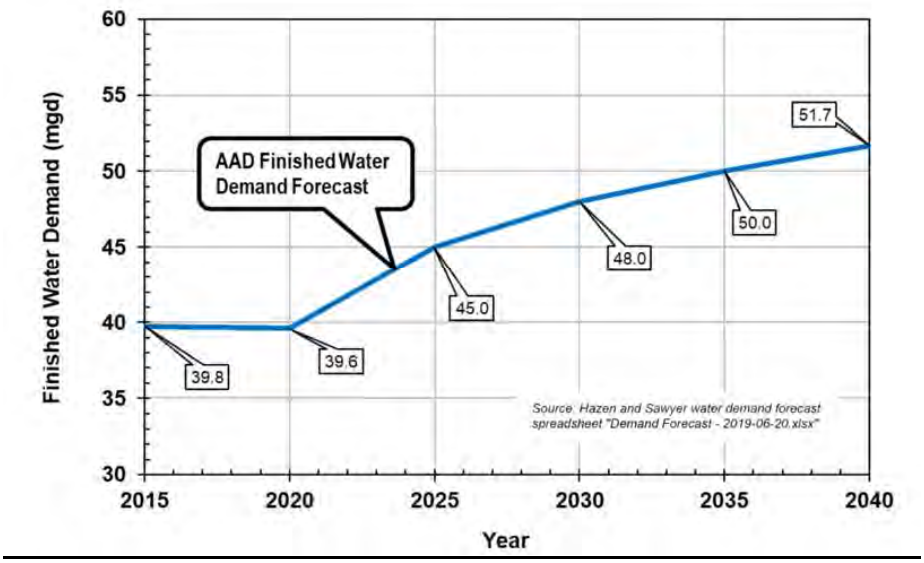
The City of Fort Lauderdale is the largest potable water supplier in Broward County. The City's Water Service Area provides potable water to a projected 241,454 customers in 2020. By 2025, the number of customers is project to be 274,470 and 315,109 by 2040.

Plant Capacity

The City has a capacity of treating up to 82 million gallons per day of potable water per day. The Fiveash water treatment plant (WTP) design capacity is permitted at 70 million gallons per day (mgd). The existing Peele-Dixie WTP has an existing capacity of treating 12 million gallons per day. The Peele-Dixie Plant can be expanded by the addition of three Reverse Osmosis (RO) that would utilize the Floridan Aquifer. If the RO system is constructed, the total installed potable water production capacity would increase by 6 million gallons per day at the Peele Dixie WTP site for a total 18 million gallons per day.

Finished Water Demand Forecast and Level Service Projection

The finished water demand forecast is projected be 39.6 million gallons per day on an annual average day basis for the City's water service area in 2020. The finished water demand will increase to 48 million gallons per in 2030 and 51.7 million gallons per day in 2040. With the available capacity to treat up 82 million gallons per day, it is anticipated that the City will continue to meet its potable water level of service standard through the short- and long-term planning periods. However, it should be noted that the City is not limited by treatment capacity, but by the its water use permit with the South Florida Water Management District.



Water Supply

The City is limited to withdraw raw water by the South Florida Water Management District Water Use Permitting process. The City's traditional source of water has been the Biscayne Aquifer, which is a shallow, surficial aquifer that is highly porous, and transmissive. It is the traditional supply in Southeast Florida. The City's existing Fiveash and Peele-Dixie water treatment plants are designed to treat water from the Biscayne Aquifer.

The SFWMD issued the City's Water Use Permit (No. 06-00123-W) on September 11, 2008; the permit expires on September 11, 2028. The permit limits withdrawal from the Biscayne Aquifer and the Florida Aquifer System as follows, on Annual Average Day (AAD) basis:

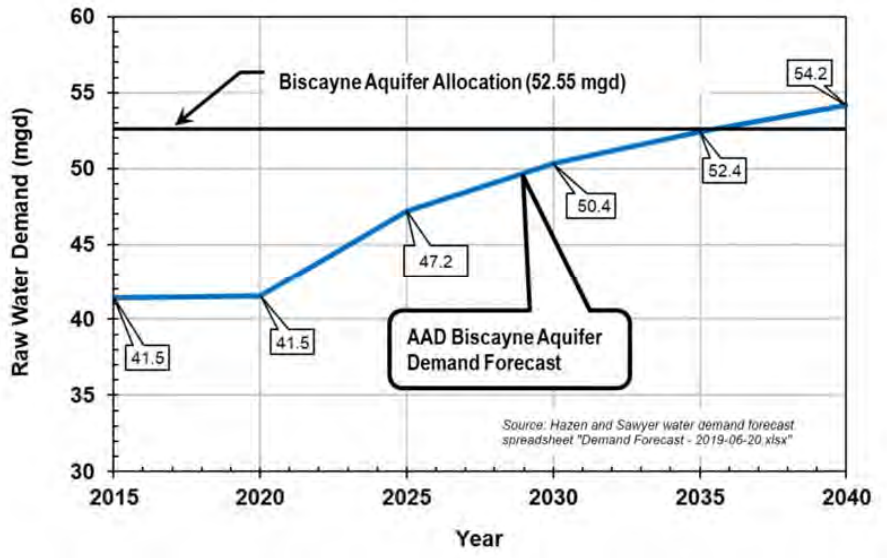
- Biscayne Aquifer Withdrawal Limit: 52.55 mgd (AAD)
- Florida Aquifer System Withdrawal Limit: 8.64 mgd (AAD)

In addition, the City Commission on December 17, 2020 authorized securing an allocation of 3 million gallons (mgd) per day of alternative water supply from the C-51 reservoir for the near distant future. The City is currently in the process of modifying its Water Use Permit to incorporate the additional 3 mgd allocation from the agreement related to the C-51 reservoir.

Raw Water Demand Forecast

In order to the meet the City level of service for the service area, the projected average day service demand is 41.5 million gallons per day in 2020. A water supply deficit is forecasted begin in the year 2035 based upon the Biscayne Aquifer withdrawal limit of more than 52 million gallons per day and more than 54 million gallons per day in 2040. If the water is allocated through the modified water use permit, additional raw water can be drawn from the C-51 Biscayne Aquifer to make up for the deficit. An alternate would include water before Floridan Aquifer. A deficit would be made up by water from the Floridan Aquifer as described in the following Alternate Water Supply Plan section. Raw water demand is based upon the City operating the Peele-Dixie WTP to produce approximately 6-mgd of finished water indefinitely. Furthermore, this figure assumes that lime softening is continued at the Fiveash WTP indefinitely. If the City increases finished water produced at the Peele-Dixie WTP or decides to change the treatment technology at the Fiveash

WTP to a lower efficiency technology, then the demand curve would increase – resulting in a water supply deficit earlier than currently forecasted.



Alternative Water Supply Plan

Due to projected demand exceeding Biscayne Aquifer supply in the year 2035, the City plans that this supply deficit will be addressed via reverse osmosis treatment of the Florida Aquifer System with flexibility to alter this plan based on the findings of ongoing City studies and future CUSMP updates. Additionally, this plan may be altered as additional data becomes available regarding the risks presented by unexpected changes to water quality in the FAS.

In 2008, the City completed conceptual plans for implementing 6-mgd of finished water capacity reverse osmosis at the Peele-Dixie WTP. Five Floridan Aquifer System wells were also conceptually planned. These plans provide the City with a roadmap to quickly implement this alternative water supply in advance of demand exceeding its traditional Biscayne Aquifer supply. It is estimated that it would require approximately five years to implement Florida Aquifer System wells and Reverse Osmosis treatment at the Peele-Dixie WTP.

The costs for implementing 6-mgd of finished water capacity RO at the Peele-Dixie WTP along with five FAS wells are presented in the reports titled "Floridan Aquifer Conceptual Plan for the Dixie Wellfield" and "Peele-Dixie Reverse Osmosis Basis of Design Report".

Comprehensive Utility Strategic Master Plan (CUSMP)

The City's Comprehensive Utility Strategic Master Plan (CUSMP), completed by Reiss Engineering, Inc., in 2017 is a planning document that evaluated the City's water and wastewater systems and recommends improvements to maintain or improve levels of service over a 20-year period ending in 2035. The CUSMP aligned its recommendations with the City's long-term goals identified in the City's Fast Forward Fort Lauderdale 2035 Strategic Plan and the Southeast Florida Regional Climate Action Plan.

As indicated in the CUSMP, the City's existing water supply, treatment and distribution infrastructure is aging. The City recognizes that significant investment is necessary to sustain the

reliability of its infrastructure. The City is actively planning the necessary investment decisions to ensure maintaining its level-of-service. For example, the City has begun a project titled "Granular Activated Carbon Pilot and Plant Evaluation at the Fiveash Water Plant". This project includes evaluation of treatment technologies to achieve the City's color goal at the Fiveash WTP. The project is ongoing and is expected to be completed in late 2019. This study will recommend to either replace all or part of the Fiveash WTP and includes evaluation of alternative water supply technologies. The City will use this report to inform future CIP scheduling decisions.

10-Year Water Supply Facilities Work Plan

In 2020, the City updated its 10-Year Water Supply Facilities Work Plan, which indicates how it will meet its potable water needs and level of service standard during the ten-year planning period. Requirements for the 10-year WSFWP 2020 Update address the development of traditional and alternative water supplies and management strategies, including water conservation and reuse. The data and analyses, including population projections and water demands span at least a 10-year planning period and must be consistent with the 2018 LECWSP Update.

The 10-year WSFWP 2020 Update addresses the development of traditional and alternative water supplies and management strategies, including water conservation and reuse. The data and analyses, including population projections and water demands spans a 10-year planning period and be consistent with the 2018 LECWSP Update. The data presented in the WSFWP 2020 Update are for the planning period through the year 2040.

The 10-Year Water Supply Facilities Work Plan is included as part of the Sanitary Sewer, Water, and Stormwater Data Requirements Inventory and Analysis. It includes the Five Year (FY2020 to FY2024) Water Supply, Treatment and Distribution Community Investment Plan.

Saltwater Intrusion

The City measures conductivity at its saltwater monitoring wells on a monthly basis. The latest data available are presented in the City's report titled "2018 Annual Saltwater Intrusion Monitoring Report". The data indicate no evidence of saltwater instruction at the Prospect Wellfield. Additionally, the report documents evidence of high chlorides at the Dixie Wellfield.

The City operates a Saline Intrusion Monitoring Program (the "SALT Program"). The goal of the SALT Program is to locate and monitor the saltwater interface in and around the City's wellfields. The purpose of the Program is to provide an early warning monitoring system to assist wellfield managers in tracking the location and to manage withdrawals to limit the inland movement of the salt front. The City currently has 10 saltwater monitoring wells.

The City has been proactively managing saltwater intrusion risk through a combination of managing wellfield pumpage and the collection of data from 10 saltwater monitoring wells constructed in 2002. The City will continue its efforts to manage and prevent further saltwater intrusion through the short- and long-range planning periods.

Note: The Potable Water Data Inventory and Analysis was updated in 2020 after transmittal of the elements to the state agencies the 10-Year Water Supply Facility Work Plan. The remainder of the data in was prepared in 2016.

~~The City's adopted Level of Service Standard for potable water is 197 gallons per capita per day. In 2014 the City updated its 10-Year Water Supply Facilities Workplan, which indicates how it will meet its potable water needs and level of service standard during the ten year planning period. Water consumption was 173 gallons per capita per day (gpcd) in 2015 and 165 gpcd in 2014. The~~

City should monitor the water use closely to determine if the low usage is not a weather or economy related activity.

The City of Fort Lauderdale is the largest potable water supplier in Broward County. The City's Water Service Area provides potable water to 228,546 customers in the City and surrounding areas. By 2025 the service area population in projected to increase to 251,758, and by 2035 it is projected to increase to 267,196.

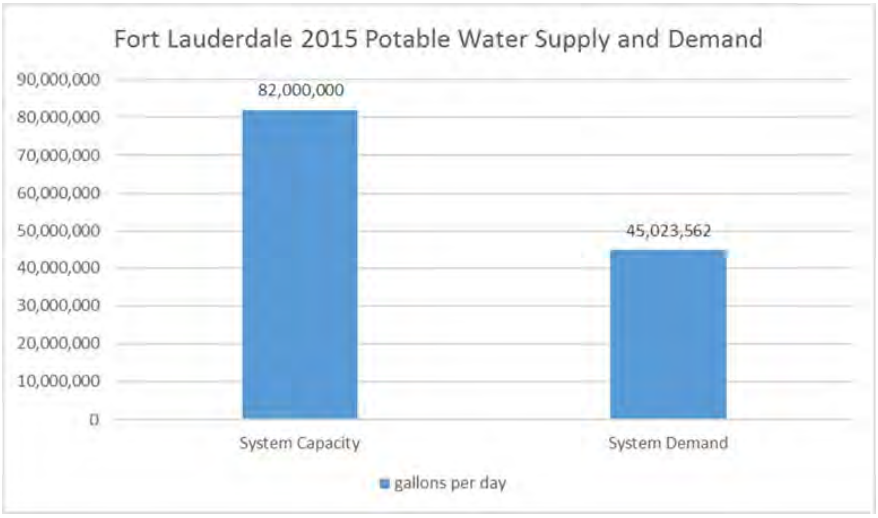
In order to meet the Level of Service, the City needs to have the capacity to provide 45,023,562 gallons of potable water per day. To meet projected demand in 2035, the City will require the capacity to treat 52,637,612 gallons per day. The City currently has the capacity to treat 82,000,000 gallons per day. However, the City is not limited by treatment capacity, but by the permitted quantity of water. The South Florida Water Management District (SFWMD) limits the City's raw water withdrawals from the Biscayne Aquifer to 52.55 million gallons per day. Increasing the amount withdrawn will require an adjustment to the City's Water Use Permit from SFWMD, which is not likely to be granted. In observance of this, the City has a long range plan to add 6.0 million gallons a day of treated water capacity from the brackish Floridan Aquifer. This water source will require treatment by reverse osmosis, which is very expensive. Fortunately, the City's water demand forecast shows that no additional water will be needed in the planning period ending in 2035.

It is therefore anticipated that the City will continue to meet its potable water Level of Service Standard through the short and long range planning periods. The City has established a conservation goal to reduce the potable water Level of Service Standard to 170 gallon per day by 2028. In order to achieve this goal, the City will continue to implement programs and activities such as:[4]

- Broward Water Partnerships – collaboration with other municipalities to achieve shared conservation goals;
- Conservation Pay$ Program – encourages water customers to reduce water use through rebates and the provision of water-conservation devices (estimated to save approximately 23,000 gallons per day);
- NatureScape Irrigation Services - promotes efficient irrigation and landscaping practices (estimated to have saved 70.5 million gallons between 2010 and 2014);
- Water Matters Day
- Landscape Irrigation restrictions;
- New Utility Rates (Effective 10/1/2015)
- Conservation Rate Structure – progressively higher rates as water use increases;
- Irrigation System Design – All irrigation systems permitted since 2008 require rain sensors, and;
- Education programs such as *Water Matters Day* and the *Water Conservation Education Program* (brochures and literature, City website, etc.).

These programs are more fully described in the City's 10-Year Water Supply Facilities Workplan, adopted on October 6, 2014.

[4] City of Fort Lauderdale 0-Year Water Supply Facilities Work Plan, October 6, 2014



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~~The intrusion of coastal saltwater into the Biscayne Aquifer presents an ongoing threat to the City's potable water supply. An elevated concentration of chloride of 250 mg/liter is the limit above which water is not potable. The indication of saltwater intrusion is much lower. It could be as low as 10 mg/l. The City has a program to monitor the saltwater intrusion called SALT. Monthly samples are taken from ten monitoring wells and the level of chlorides and other parameters is recorded. At the end of each year, the sample results are included in a report to the SFWMD, as required by the City's water use permit. These reports show no significant increase of saltwater intrusion. The saltwater intrusion is there because of the significant number of canals in the City and the relatively few barriers to salt water (canal gates). The CUS Master Plan section WA2 contains the following conclusion: "[The City] Has not experienced significant advancements in the Biscayne Aquifer saline interface nor are such advancements predicted for the 20-year planning period, however, the City should continue to monitor in cooperation with Broward County and SFWMD."~~

~~The City addresses saltwater intrusion through such strategies as managing wellfield pumpage, relocating wellfields out of impacted areas, abandonment of eastern wells, and the collection and analysis of data from ten monitoring wells. The City will continue its efforts to manage and prevent further saltwater intrusion through the planning period.~~

C. Solid Waste

The City's Level of Service Standard for solid waste is 7.2 pounds per capita per day. This requires a collection and disposal capacity of 1,235,189 lbs. per day at present (current population 171,544) and will require a collection and disposal capacity of 1,360,354 lbs. per day in 2035 (projected population 188,938).

In order to increase efficiencies and reduce the amount of solid waste produced, the City of Fort Lauderdale follows an integrated approach to solid waste management, including municipal solid waste, recycling, bulk trash, yard waste, and household waste and electronics disposal. In 2010, the City collected and disposed of approximately 40,000 tons of municipal solid waste, recycled approximately 10,000 tons and diverted 25,000 tons of yard waste from the waste stream. The amount of landfilled solid waste decreased almost 6,000 tons between 2007 and 2010, while

the amount of materials recycled doubled and the amount of yard waste diverted almost tripled.[5] The City, in accordance with its Sustainability Action Plan and other green initiatives, plans to achieve a recycling rate of 93% by 2020.

D. Drainage

The City's adopted Level of Service standards for stormwater drainage are: a minimum public road elevation to withstand flooding that will occur during a ten year, one-day storm event, and; a minimum floor elevation to withstand flooding during a 100 year, three day storm event. In addition, new development and redevelopment must provide for retention and treatment of the first inch of stormwater runoff through the use of vegetative swales, perforated pipes, deep well injection, or other means acceptable to City, County and/or State agencies or departments.

The City's stormwater drainage infrastructure includes 171 miles of stormwater pipes, 2,324 manholes, 1,258 outfalls, 37 drainage wells, and 8,288 catch basins. The City participates in the [6]Federal Emergency Management Agency's (FEMA) Community Rating System, which allows residents to receive discounts on federal flood insurance. In addition, the City maintains a Stormwater Master Plan, which identifies projects to maintain and improve drainage performance through 2025.

E. Other Planning Efforts

The 2011 *Sustainability Action Plan* outlines a number of strategies to increase the sustainability and performance of the City's infrastructure. The *Sustainability Action Plan* calls for reducing water demand 20% by 2020. Action steps to achieve this goal include water-efficient plumbing and fixtures, escalation of potable water fees for high-users in single family areas, low volume/avoidance watering, resource planning and conservation efforts focused on large water users, and rainwater harvesting. The *Sustainability Action Plan*'s wastewater and stormwater goal is to reduce and improve wastewater treatment through reduced inflow and infiltration, runoff pre-treatment requirements, bioswales, and storm inlet improvements. With regard to solid waste, the *Sustainability Action Plan* establishes recycling and waste reduction goals for City departments and calls for increasing recycling rates by 50% by 2020.

Infrastructure is also addressed in the City's *Fast Forward Fort Lauderdale Our City Our Vision Plan*. Of the 1,562 ideas received during the visioning process, eight were specific to potable water supply and demand, two addressed recycling and composting, six addressed drainage, and four addressed wastewater treatment. The *Press Play* (Strategic Plan) addresses infrastructure under Goal 2, "Be a sustainable and resilient community". Objective 1 is "Proactively maintain our water, wastewater, road and bridge infrastructure". Objective 2 is "Reduce flooding and adapt to sea level rise". Objective 4 is "Reduce solid water disposal and increase recycling". Objective 6 is "Secure our community's water supply". Strategic initiatives to achieve these objectives include developing performance measures to reduce infiltration and inflow, expanding multi-family and commercial recycling programs, reusing yard waste in a free mulch program, and identifying and implementing water reuse opportunities.

The January 2015 *Press Play Strategic Plan Progress Report* indicates that the City has made progress in implementing its strategic initiatives. For example, water line breaks decreased by 20% in 2014, and storm drains are inspected and cleaned on a more frequent basis.

Element	Coordination Needs	Agency
Future Land Use Element	Review of Comprehensive Plan and land use amendments.	Adjacent local governments, Broward County (Regulatory Approval), State Department of Economic Opportunity, designated review agencies
Transportation Element	Improving regional and local mobility, coordinated planning with agencies having jurisdiction over transportation facilities	Florida Department of Transportation, Broward County MPO, South Florida Regional Transportation Authority, Broward County Seaport Authority, Broward County Aviation Dept., other local governments
Housing Element	Housing needs in the City and regionally	U.S. Department of Housing & Urban Development, State of Florida, Fort Lauderdale Housing Authority, Broward County, South Florida Regional Planning Council
Infrastructure Element	Infrastructure needs in the City and regionally	South Florida Water Management District, Broward County, service providers, adjacent local governments
Coastal Management Community Health and Safety Element	Management of coastal resources with jurisdictional agencies Improve community health and safety, emergency response	U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, State of Florida, South Florida Water Management District, Broward County, Department of Homeland Security, Florida Law Enforcement Accreditation, National Fire Protection Association, Federal Emergency Management Agency, Centers for Disease Control and Prevention, Florida Department of Health, Broward County Health Department, Local Governments
Conservation Element	Resource management and protection	U.S. Environmental Protection Agency, State of Florida, Broward County, other local governments
Recreation and Open Space Element	Regional and local recreation needs	State of Florida, Broward County
Historic Preservation Element	Protection of historic resources	National Register, State of Florida, Broward County
Capital Improvements Element	Levels of Service	Florida Department of Transportation, Broward County, Service Providers
Public Schools Element	Public Education	State of Florida, Broward County Public Schools
Proposed Climate Change Element	Regional strategies to address climate change	U.S. Environmental Protection Agency, Broward County, South Florida Regional Climate Compact, Local Governments
Proposed Economic Development Element	Economic Development	State of Florida, Broward County, Private Sector, Educational Institutions