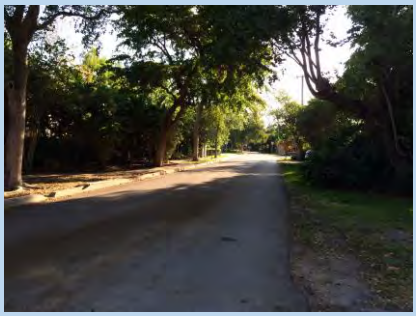
ARCH CREEK STUDY AREA

Miami-Dade County, Florida



Briefing Book for ULI
Advisory Services Panel

May 22-27 2016

MIAMI-DADE COUNTY

Table of Contents

Contents

Acronyms and Abbreviations

Acronym	Full name
CDMP	Miami-Dade County Comprehensive Development Master Plan
WASD	Miami-Dade County Water and Sewer Department
AAA	Adaptation Action Area
County	Miami-Dade County
SDRC	Biscayne Bay Shoreline Development Review Committee
FIRM	Flood Insurance Rate Map
ULI	Urban Land Institute
FEMA	Federal Emergency Management Agency
BCC	Miami-Dade County Board of County Commissioners
Compact	Southeast Florida Regional Climate Change Compact
NGVD	National Geodetic Vertical Datum

Background

With a population of 2.6 million and ±84 miles of coastline, Miami-Dade County (County) is considered one of the most vulnerable areas to sea level rise in the country. The County has the largest amount of exposed assets in the world estimated at $416 billion and the greatest amount of exposed population in the United States.[1] The County is also susceptible to extreme weather events that may result in catastrophic winds, flooding, and storm surge. The U.S. Global Change Research Program indicates that South Florida, including Miami-Dade County, is anticipated to experience primary impacts from climate change, such as significant sea level rise, higher storm surges as well as the potential for increased hurricane intensity and downpours.[2]

Many areas of the County are already experiencing flooding caused by low elevations and drainage problems during seasonal high tides and heavy rains. Currently, the South Florida Water Management District, the County, and municipalities operate a complex water management system to balance canal and water table levels to minimize flooding in urban areas and to prevent salt water in coastal areas from migrating westward. The porous substrate that characterizes South Florida presents a unique challenge for managing groundwater levels and flooding and makes traditional flood defenses designed to keep the water out, such as levees, less effective here. The region's current land development pattern, unique geophysical and socioeconomic conditions lead to a complex exposure to the effects of climate change. Because of these various factors, maintaining this delicate balance of water management will become more challenging in the face of sea level rise.

Arch Creek was selected for the Advisory Services Panel because it provides an excellent case study for resilience planning. The Study Area comprises approximately 2,838 acres and is located in northeastern Miami-Dade County along the coast of Biscayne Bay. The area is economically diverse, includes numerous historical resources and is the possible site for a future passenger rail station that would provide an opportunity for transit-oriented redevelopment in the area. The study area also crosses jurisdictional boundaries for five different local governments and can provide a model for multi-jurisdictional coordination on resilience. The area's vulnerabilities are characteristic of other areas of the County, therefore, solutions developed for the Arch Creek area will likely have wide applicability.

In 2013, Florida passed legislation that provided for local governments to designate areas that are uniquely vulnerable to coastal flooding and the related impacts of sea level rise as "Adaptation Action Areas" (AAA). The designation was created to serve as a planning tool and encourage technical assistance and funding opportunities. On January 20, 2016, the Miami-Dade County Board of County Commissioners adopted Resolution No. R-66-16 directing County staff to actively proceed with a pilot program for Adaptation Action Areas. The Arch Creek area has been selected as the County's first AAA pilot project and will serve as a model for future adaptation initiatives. The ULI Advisory Services Panel will inform implementation of the AAA in this area. Figure 1 includes a full description of Adaptation Action Areas.

---

[1] Hallegatte, S. et al. (2008), "Assessing Climate Change Impacts, Sea Level Rise and Storm Surge Risk in Port Cities: A Case Study on Copenhagen", OECD Environment Working Papers, No. 3, OECD Publishing. http://dx.doi.org/10.1787/236018165623

[2] Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2.

Figure 1: History of Adaptation Action Areas

The History of Adaptation Action Areas

In 2011 the Florida Legislature created Adaptation Action (S.163.3177 Florida Statutes). This statutory policy tool, which is an optional designation within the Coastal Management Element, is defined as:

"Adaptation Action Area" or "Adaptation Area" means a designation in the coastal management element of a local government's comprehensive plan which identifies one or more areas that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning"

"At the option of the local government, develop an Adaptation Action Area designation for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. Local governments that adopt an Adaptation Action Area may consider policies within the coastal management element to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea-level rise. Criteria for the Adaptation Action Area may include, but need not be limited to, areas for which the land elevations are below, at, or near mean high water, which have a hydrologic connection to coastal waters, or are designated as evacuation zones for storm surge." Section 163.3177(6)(g)(10), Florida Statutes

Adaptation Action Areas have been recommended as a policy tool by the Southeast Florida Regional Climate Action Plan (recommendations SP 3-6, 8-9 & PP-11), recommendations by the Miami-Dade Sea Level Rise Task Force, and in the Miami-Dade County's Comprehensive Development Master Plan.

On January 20, 2016, the Miami-Dade County Board of County Commissioners adopted Resolution No. R-66-16 directing County staff to actively proceed with a pilot program for Adaptation Action Areas.

Study Area Description

The Arch Creek Study Area has a rich history, significant development pressure and substantial vulnerability to flooding, which will be exacerbated by climate change. The Study Area comprises approximately 2,838 acres in northeastern Miami-Dade County along the coast of Biscayne Bay. The boundary of the study area follows the Arch Creek stormwater basin and includes land within four cities and unincorporated Miami-Dade County as detailed in Figure 2. The municipal boundaries are depicted on Map 2.

Figure 2: Area by Governing Entity

GOVERNING ENTITY	AREA WITHIN THE STUDY BOUNDARY	PERCENTAGE OF STUDY AREA
North Miami	1,784 acres	62.9%
Miami-Dade County	579 acres	20.4%
Biscayne Park	332 acres	11.7%
North Miami Beach	92 acres	3.2%
Miami Shores	51 acres	1.8%

The study area is highly vulnerable to flooding with approximately 67% of the area located in a Special Flood Hazard Area, as defined by FEMA. The boundaries of the Special Flood Hazard areas are also likely to be amended at the conclusion of FEMA's remapping of the area to reflect the most recent data and mapping methodologies. As a result, it is likely that the extent of the Special Flood Hazard Area could expand and the expected flood depths could increase. Under current estimates, approximately 62% of the study area is vulnerable to storm surge from a category storm 3 or greater. The basin, or study area, has 78 properties classified as having repetitive losses, with 7 of those properties classified as having severe repetitive losses.[3] Many of the repetitive losses in the area are not associated with a tropical storm event. Rather, the repetitive loss properties are primarily located in the low-lying areas that experience flooding due to seasonally high tides. These higher water levels increase the groundwater heights leaving a limited capacity to drain or infiltrate water when it rains. Historic sea level rise has exacerbated these problems and future sea level rise will only increase the magnitude of these issues in this area.

Many of the properties within the study area were developed prior to the establishment of County flood criteria and the creation of The National Flood Insurance Program (NFIP). Figure 3 summarizes the development of housing stock within the study area relative to the establishment of key flood regulations. Over 80% of the housing stock was built prior to development of the 1973 FIRM (Flood Insurance Rate Map) maps and 37% of the housing stock was built before any county flood regulation was put in place.

[3] More information on repetitive loss thresholds and guidelines can be found at www.fema.gov

Figure 3: Major Flood Regulation Dates for Miami-Dade County and Housing Stock in Arch Creek

Year	Description	% of housing stock*
Pre-1957	No special elevation requirements in effect.	37%
1957-1973	General Countywide requirement of the highest of the County Flood Criteria maps (10-year event), back of sidewalk, or highest adjacent crown of road + 8 inches for residential or 4 inches for commercial construction	47%
1973-1992	First FIRM maps developed identifying flood areas. CFC still enforced.	14%
1993-2008	Incorporated areas begin enforcing flood codes.	2%
2009-2011	Updated FEMA Flood Maps	>1%
2012 -present	New Florida Building Code requiring free board for properties within Special Flood Hazard areas, following ASCE24 Table, to be elevated depending on the building category	>1%

Purpose and Key Questions

The AAAs (Adaptation Action Areas) and their designation are meant to bridge the gap between vulnerability assessments and implementation. The AAA designation is a flexible planning tool to begin the complicated task of addressing the interrelated risks associated with climate change and rising seas more holistically. This concept allows challenges to be addressed on a more manageable scale and also creates an environment for testing and development of best practices, fosters collective learning, and facilitates infrastructure investments and prioritization of capital improvement projects. The Urban Land Institute (ULI) Advisory Services Panel work will help launch local efforts for the County's first AAA – the Arch Creek Basin.

Questions are intended to focus on implementation strategies for specific adaptation actions needed in the Arch Creek Basin, as well as addressing funding mechanisms to achieve them. Key questions and issues include:

1. The identified study area is a drainage basin, rather than a political subdivision, such as a city or county. Ultimately the issues for this panel will be organized around the theme of how to best move and manage water.
2. Some neighborhoods within the study area were built in low-lying areas or created by "dredge and fill" policies which formed inland canals. In light of today's knowledge about sea level rise and enhanced storm events, what opportunities exist to incrementally move toward a more sustainable development pattern in the study area?
3. As the area adapts to reduce flooding risks how can housing affordability concerns also be addressed simultaneously? Particularly in areas with very low elevations, redevelopment and elevation will be required to effectively address these risks. How can that redevelopment improve access to quality affordable housing?
4. In the wake of a strong tropical storm, communities within this focus area would have varying abilities to respond and be resilient. How can those vulnerabilities be addressed before such an event? What policies could be put in place to reduce these disproportionate impacts?
5. A proposed commuter rail station is located in the geographic center of the study area. Through a climate adaptation lens, what opportunities exist to implement more sustainable design and land use for the area around the proposed station site and connections to the new site?
6. What capital and/or operational improvements are needed to make the area more resilient? How and what best practices can be used to manage and enhance the identified green & open space within the study area. What "green infrastructure" should be planned and implemented, particularly along waterways and shorelines?
7. How should the county, multiple cities, and other taxing authorities best manage implementation and funding of a plan for this multi-jurisdictional drainage basin?

Focus Areas

The study area boundary follows the Arch Creek stormwater basin. The primary question for the panel for the broader study area is how to best move and manage water and mitigate the disruption from climate change within the overall study area. To better address the key questions, the County has identified three focus areas within the Study Area for more detailed analysis. These focus areas represent land use typologies present elsewhere in the County; therefore, resilience, development or infrastructure strategies could have wider applicability. Focus areas are described in further detail below and depicted on Map 1.

Focus Area 1: Possible Future Passenger Rail Station

Figure 4: Area of Proposed Tri-Rail Station

The intersection of the Florida East Coast Railway and NE 125th Street has been identified as a potential location for a future passenger rail station (Figure 4). The Tri-Rail Coastal Link is an initiative to implement passenger rail service along the Florida East Coast (FEC) Railway between Palm Beach County and downtown Miami. The focus area comprises the land within a ½-mile radius around the proposed transit station which is on relatively higher ground. The ½ mile radius corresponds with the radius for urban centers, as defined in the County's Comprehensive Development Master Plan (CDMP). The radius identified in the CDMP is a guideline that generally defines the area where moderate to high density development with vertically and horizontally integrated uses is desirable. Area planning studies are utilized to define the specific limits of individual urban centers. The full text of the Urban Centers section of the CDMP is provided in Appendix A.

Focus Area 2: Development on Biscayne Bay

Figure 5: Aerial View of Sans Souci Estates

Sans Souci Estates is an example of a single family residential subdivision that was platted in the 1950s that used cut and fill techniques to develop residential lots on finger canals connecting to Biscayne Bay. This development pattern is characteristic of development along Biscayne Bay within this area of the county. Over 80% of the homes on the finger canals were developed prior to 1973, the date of the first Flood Insurance Rate Map. These areas are directly exposed to storm surge. This area has a higher median income and a higher rate of owner-occupied units when compared with the majority of the study area.

This area also lies within the review boundary for the Miami-Dade County Biscayne Bay Shoreline Development Review Committee (SDRC). The SDRC was established in 1981 for the purpose of providing a unified management system for the shoreline that would preserve the basic qualities, characteristics, and the natural, recreational and aesthetic values of the Biscayne Bay area. The Committee reviews development

proposals in both unincorporated and incorporated areas that abut Biscayne Bay and ancillary estuaries with the purpose of securing the maximum amount of visual and physical access to the bay waters, among other things. Single-family detached dwelling units are exempt from the requirements of the SDRC, however, other developments are subject to SDRC review and approval. A map of properties within the SDRC review boundary is included in Appendix B.

Focus Area 3: Low-Lying Areas with Vulnerable Populations and Repetitive Losses

Arch Creek Estates was platted in the 1940s. Most of the housing units in this low-lying area were built prior to the establishment of the County's Flood Criteria and the FEMA Flood Insurance Rate Map (FIRM). There are thirty-four repetitive loss properties located within this focus area, with three properties classified as severe repetitive loss. Because of the way these communities developed, the areas of repetitive losses snake through the grid system, likely conforming to historic waterbodies that were filled. Because the primary driver is the low elevation, traditional drainage infrastructure cannot fully address the challenges. Redevelopment and elevation will likely be required; however, with any redevelopment it is important to consider the implications on housing affordability.

Figure 6: Flooding in Arch Creek Estates

The housing units in the focus area are primarily renter-occupied leaving many residents vulnerable to displacement. A high proportion of the property owners and renters in this area are cost burdened. The area also has a high percentage of individuals living in poverty. Studies have shown that low-income communities may have less capacity to prepare for, respond to, and recover from climate-related hazards and effects and may, therefore, be disproportionately affected by the impacts of climate change.[4] These vulnerabilities are reflected in many areas of Miami-Dade County. Figure 6 shows flooding in the Arch Creek Estates neighborhood following a storm in 2013. Residents within this area have applied for funding from FEMA to address the issue of repeated flooding, however, to date these applications have not been funded.

[4] United States Department of Agriculture. Forest Service, Pacific Northwest Research Station. By Kathy Lynn, Katherine MacKendrick, and Ellen Donoghue. N.p., Aug. 2011. Web. < http://www.fs.fed.us/pnw/pubs/pnw_gtr838.pdf>

Map 1: Arch Creek Focus Areas

Governance

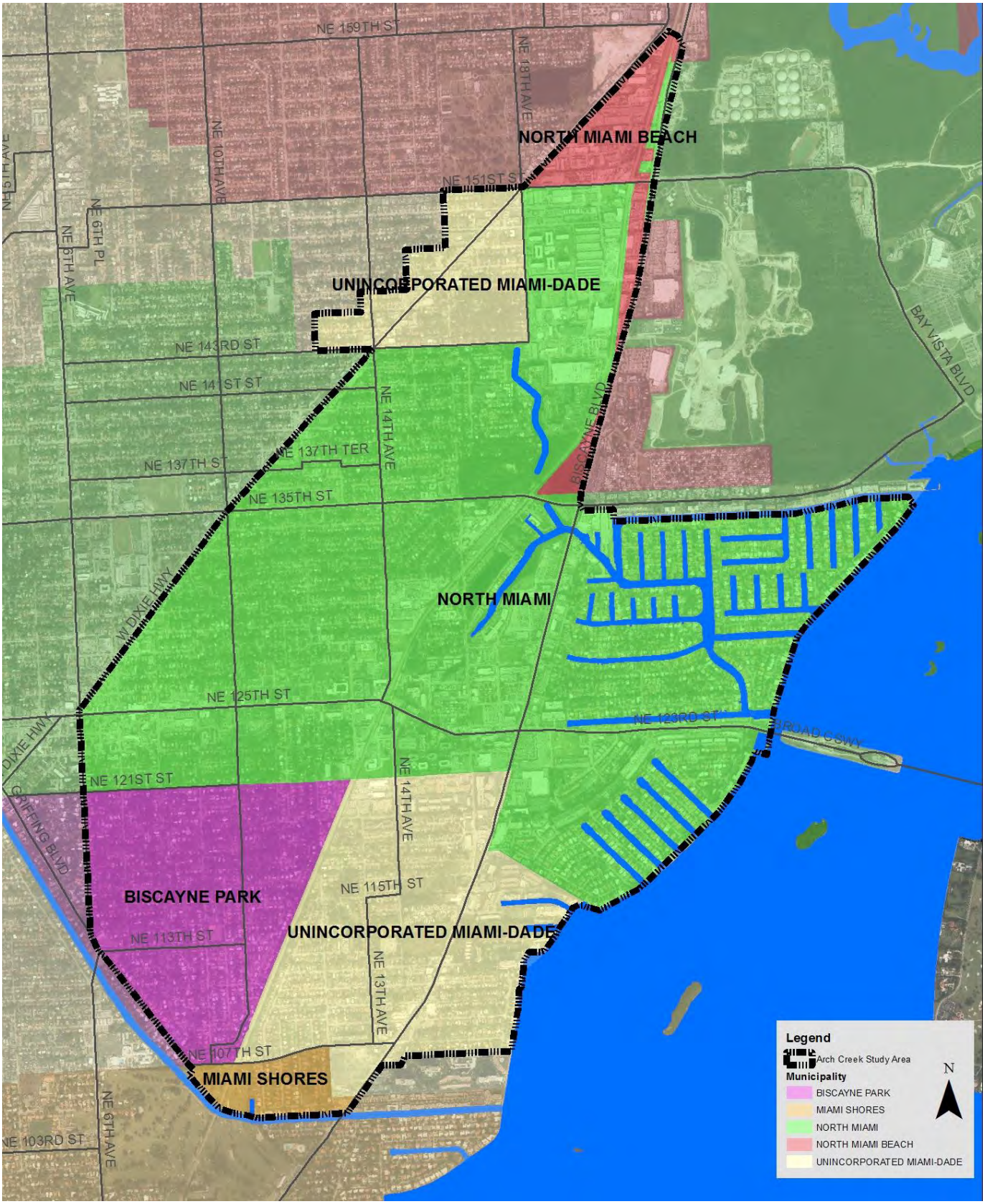
The Arch Creek Study Area includes portions of unincorporated Miami-Dade County and crosses the jurisdictional boundaries for four municipalities, as depicted on Map 2. The structure of these governmental entities is summarized below:

> ***Miami-Dade County –*** Over one million residents live in unincorporated Miami-Dade County. The Board of County Commissioners is comprised of thirteen single-member districts. The County Mayor is not a voting member but has veto authority over most decisions of the BCC. The County's Home Rule Charter provides the authority for the County to maintain regulatory jurisdiction over certain facilities and to set countywide minimum standards for land use and zoning, however, the County only exercises this authority in limited circumstances where specified in the Comprehensive Development Master Plan and Code of Ordinances. For the most part, municipalities assume control over land use and zoning for areas within its boundaries. The County serves as the municipal government for the unincorporated area of the county.
>
> ***City of North Miami –*** The City of North Miami was incorporated in 1926 and has a population of 58,786. North Miami operates under a council-manager form of government. The city's charter provides for a mayor, elected city-wide that serves up to two consecutive two-year terms; and four council members elected by district, who each serve no more than two consecutive four-year terms. The city council serves as the policy-making body of the city. The city manager oversees the daily operations of the city and ensures that the policies, directives, resolutions and ordinances adopted by the city council are implemented and enforced.
>
> ***Village of Biscayne Park*** – The Village of Biscayne Park has a population of 3,055. The Commission is comprised of a Mayor, Vice-Mayor and three Commissioners.
>
> ***Village of Miami Shores*** – The Village of Miami Shores has a population of 10,493. The Council is comprised of a Mayor, Vice-Mayor and three council members.
>
> ***City of North Miami Beach*** – The City of North Miami Beach has a population of 41,523. The City of North Miami Beach is governed by an elected mayor and six-member city council.

The portion of unincorporated land in the northern portion of the study area is part of the Biscayne Gardens Area Municipal Advisory Committee (MAC). The MAC was established in 2003 for the purpose of exploring the possible creation of a new municipality encompassing the area. The portion of unincorporated land in the southeast portion of the study area is considered to be an enclave as it is bordered by Biscayne Bay to the east, the City of North Miami to the north, the Village of Biscayne Park to the west, and the Village of Miami Shores to the south. In 2013, the City of North Miami proposed annexing a portion of the area. In 2014, the Village of Biscayne Park also proposed annexing a portion of the area. There was considerable overlap in the areas of proposed annexation. Although it is considered to be an enclave, the revenues of the area are estimated to be greater than the expenditures making it a "donor" area. The Miami-Dade County Board of County Commissioners recently commissioned a study to analyze the impacts of continued annexation and incorporation and continues to carefully analyze the implications of these proposals.[5]

[5] PMG Associates, Inc., Analysis of Incorporation and Annexation in Unincorporated Miami-Dade County, October 2015.

Map 2: Municipal Boundaries



Climate Change and Resilience Initiatives

Miami-Dade County has a strong foundation of resources as well as a strong commitment from County leadership to build local resilience. The County is supported in this effort by state legislation, regional guidance and municipal efforts.

South Florida Regional Partnership. At the regional level, the County is a consortium partner in the South Florida Regional Partnership which was awarded a $4.25 million grant from U.S. Departments of Housing and Urban Development (HUD), Transportation, and the Environmental Protection Agency to develop a regional plan for sustainable development. The Partnership subsequently published the 'Seven50: SE Florida Prosperity Plan'. In the plan's Preferred Scenario, climate change adaptation for coastal and inland areas is assigned a high priority to ensure the region's future economic prosperity.[6]

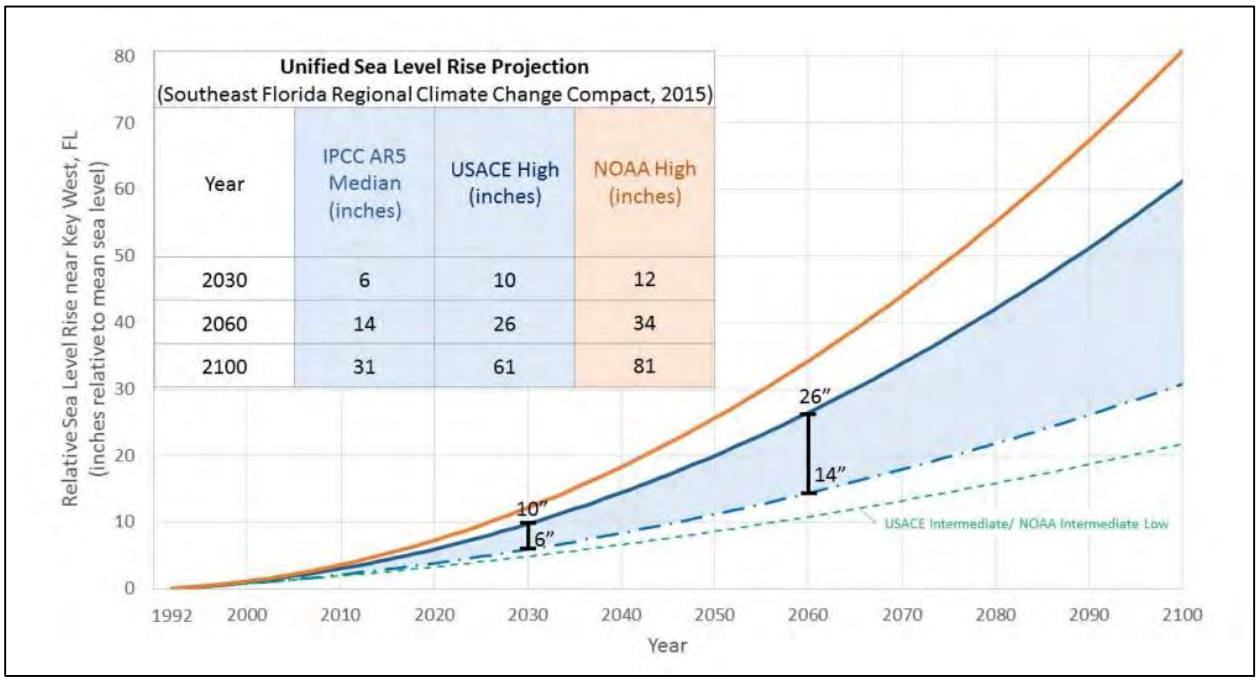
Southeast Florida Regional Climate Change Compact. In 2010 the County, along with Monroe, Broward and Palm Beach County, adopted an agreement to become partners in the Southeast Florida Regional Climate Change Compact ("Compact") to coordinate mitigation and adaption activities across county lines. Municipal governments were subsequently included and municipal workshops are regularly held to increase collaboration and capacity across the region. Recognizing the vulnerability of the region to the impacts of climate change, the Compact provides a forum for local governments to work collaboratively on strategies and funding for adaptation measures.

The Compact has developed a unified regional sea level rise projection (Figure 7), based on federal guidance and input from local experts.[7] The compact projections estimate that by 2030 the average sea level is expected to be 6 - 10 inches higher than it was when Hurricane Andrew hit in 1992. These projections also estimate that by 2100, the average sea level could be more than 72 inches (six feet) higher than 1992 levels, with more conservative predictions estimating sea level rise to be at least 30 inches or two and a half feet higher. Understanding the implications of these changes in average water levels will require detailed knowledge of the direct and indirect consequences of living with rising sea levels, such as reduced effectiveness of the gravity-based drainage networks, intrusion of salt water into freshwater aquifers, higher storm surges, and changes in regional infrastructure and ecosystem restoration programs. The County has recently completed a literature review of the existing studies and modeling efforts focused on these risk, which can be provided to interested panelists.

[6] More information can be found at http://seven50report.org/

[7] Southeast Florida Regional Climate Change Compact Sea Level Rise Work Group. October 2015. Unified Sea Level Rise Projection for Southeast Florida. A document prepared for the Southeast Florida Regional Climate Change Compact Steering Committee. 35 p. Available at http://www.southeastfloridaclimatecompact.org/wp-content/uploads/2015/10/2015-Compact-Unified-Sea-Level-Rise-Projection.pdf

Figure 7: Sea level rise projections for Southeast Florida



Another Compact initiative is "Resilient Redesign" which is an annual design exercise focused on selected sites throughout the region. The Southeast Florida Resilient Redesign began in July 2014, when the Compact collaborated with the Dutch Consulate in Miami to work with local practitioners, area stakeholders and experts from the Netherlands to propose resilient design strategies which could serve as models of resilience for communities throughout the south Florida region. The emphasis being on the integration of design solutions into future development and redevelopment projects, and in advance of a major climate disruption. The 2016 initiative, expected to commence in the fall, will focus on the Arch Creek Basin as one of three sites. The Resilient Redesign process can build on the recommendations from the ULI Advisory Services Panel.

Miami-Dade County. The Miami-Dade County Board of County Commissioners (BCC) has also taken steps to build local resilience to climate change. Climate Change/Sea Level Rise was addressed as a "Major Issue" in the County's 2010 Evaluation and Appraisal Report of the CDMP. As a result of this analysis, a series of policies were incorporated into the CDMP to address vulnerable areas of the County. Appendix C contains a selected listing of CDMP policies related to climate change and the associated impacts of sea level rise.

In 2013, the BCC convened a Sea Level Rise Task Force to provide recommendations to further the County's resiliency efforts. Recommendations No. 3 and 4 of the Sea Level Rise Task Force Final Report recommend that the County conduct a comprehensive study and develop adaptation strategies to address potential flood damage reduction and saltwater intrusion associated with sea level rise and implement Adaptation Action Areas. Subsequently, the Miami-Dade County Board of County Commissioners adopted Resolution No. R-66-16 directing County staff to actively proceed with a pilot program for Adaptation Action Areas. The BCC also adopted a resolution requiring all County infrastructure projects to consider the potential impacts of sea level rise during all project phases and to evaluate the existing infrastructure in the face of sea level rise.

City of North Miami. The City of North Miami is in the process of incorporating a Climate Change Element into the City's comprehensive plan. The Element has already received initial approval from the City Council and is currently being reviewed by the State of Florida Department of Economic Opportunity.

Climate Risk and Vulnerabilities

Vulnerability to Flooding

As depicted on Map 3, the current land elevations are very low in certain localized areas, with several streets constructed at or below the maximum tide levels. In addition, many of the subdivisions in the study area were constructed prior to the establishment of minimum fill requirements therefore streets generally do not comply with the current requirement that all roads be elevated to the 10 year highest water level.

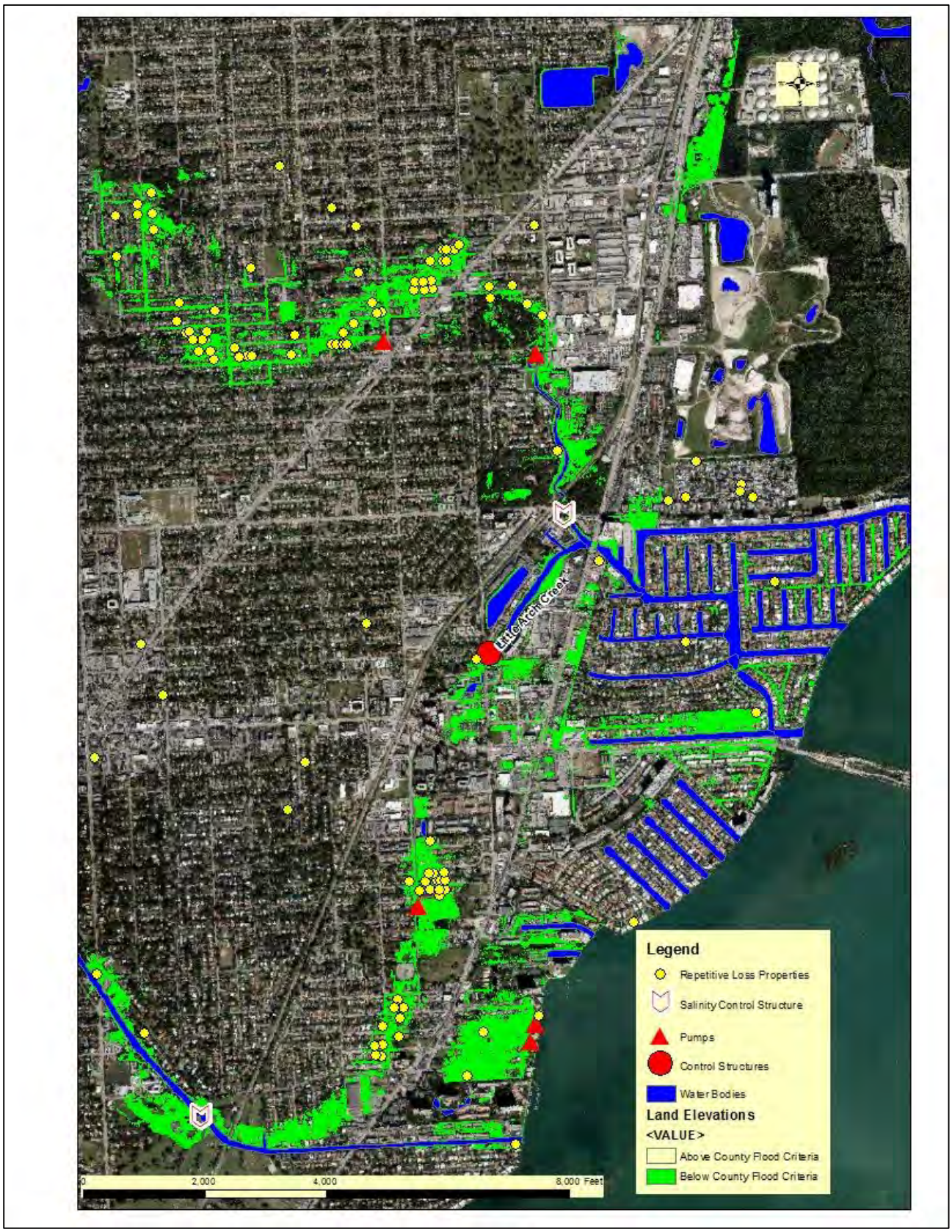
Unfortunately, due to the extremely low land elevations, often around 2 feet NAVD 88 in certain areas, flood mitigation is not possible without substantial redevelopment. Map 4 shows areas below the minimum fill requirements. The ground elevation of lots in this area should have been filled to at least the elevation contour of 5.0 feet NGVD. A recent analysis focused on protecting a nearby wastewater treatment facility from sea level rise and storm surge recommended new assets be constructed at or above 17.1 feet NGVD29.

Figure 8: Flooding on NE 144th Street (between 12th Ave and NE 13th Ave)

Repetitive loss properties are also clustered in these low lying areas. Because of the low elevation of the homes in these areas, it is not possible to elevate the roadways because these changes in roadway elevation could increase flooding to the properties. To avoid this risk, the County does not typically elevate roadways until after the homes have been elevated.

Map 3: Ground Elevations in Arch Creek

Map 4: Unfilled areas below the County Flood Criteria and repetitive loss properties



Flooding due to rainfall

Much of Miami-Dade County is susceptible to localized flooding, particularly during the rainy season of June through October. The County's flat terrain may cause extensive "ponding" due to the lack of elevation gradients to facilitate the quick movement of water. Extensive development and a lack of pervious surfaces also enhances the risk of flooding.

Figure 9: Firefighter looks into a home to see if there are any residents in need of assistance

Since most of the stormwater management systems in the County work by infiltration, rising sea levels and high groundwater levels have progressively led to a reduction of the capacity of the stormwater management systems and their ability to provide adequate flood protection, particularly in low lying and coastal areas.

Figure 10: The day after the storm, the streets were still not passable even though portable pumps were deployed to expedite the recovery of the area

Most systems in the area are designed to handle the volume produced during a 5 or 10year/24 hour storm. Therefore, larger storms typically overload the stormwater system producing shallow flooding or ponding. Research suggests that climate change has the potential to increase the frequency and severity of these storms.

Some areas, such as the Arch Creek basin, are particularly vulnerable to flooding. Figures 9 and 10 show the effects of the flood event of June 7, 2013 in the Arch Creek Area. During this storm more than 14 inches of rain fell in less than 24 hours, classifying the event as a 100-year (24h) rainfall event. This amount of rain exceeded the capacity of the stormwater infrastructure and led to substantial flooding.

Residents experienced flooding depths above the level of the lowest floor, reaching the electrical outlets and causing an emergency evacuation of the affected area. During this event, FEMA reported a total of 14 loss claims with a total of $350,000 dollars in payments to residents. Historically FEMA has reported a total of 197 flood insurance claims in the basin since 1999, with a total of $4,136,471 in payments.

Current flooding risk due to storm surge

The Arch Creek study area is also vulnerable to storm surge from tropical storms. Figures 11 and 12 shows the storm surge "maximum of maximums" due to a Category 5 storm. While no individual storm could likely cause this pattern of inundation, the map provides an overview of areas that are vulnerable to storm surge. It is important to note that these risks are not constrained to the coast, but also extend into the low-lying inland areas along the canals. The vulnerable area includes the major evacuation routes (Biscayne Boulevard and NE 125th Street). Focus area 2 is the most vulnerable to surge, with potential storm surge depths of 3-5 feet above ground.

Figure 11: Vulnerability to storm surge in a category 5 storm (showing the maximum of maximums)

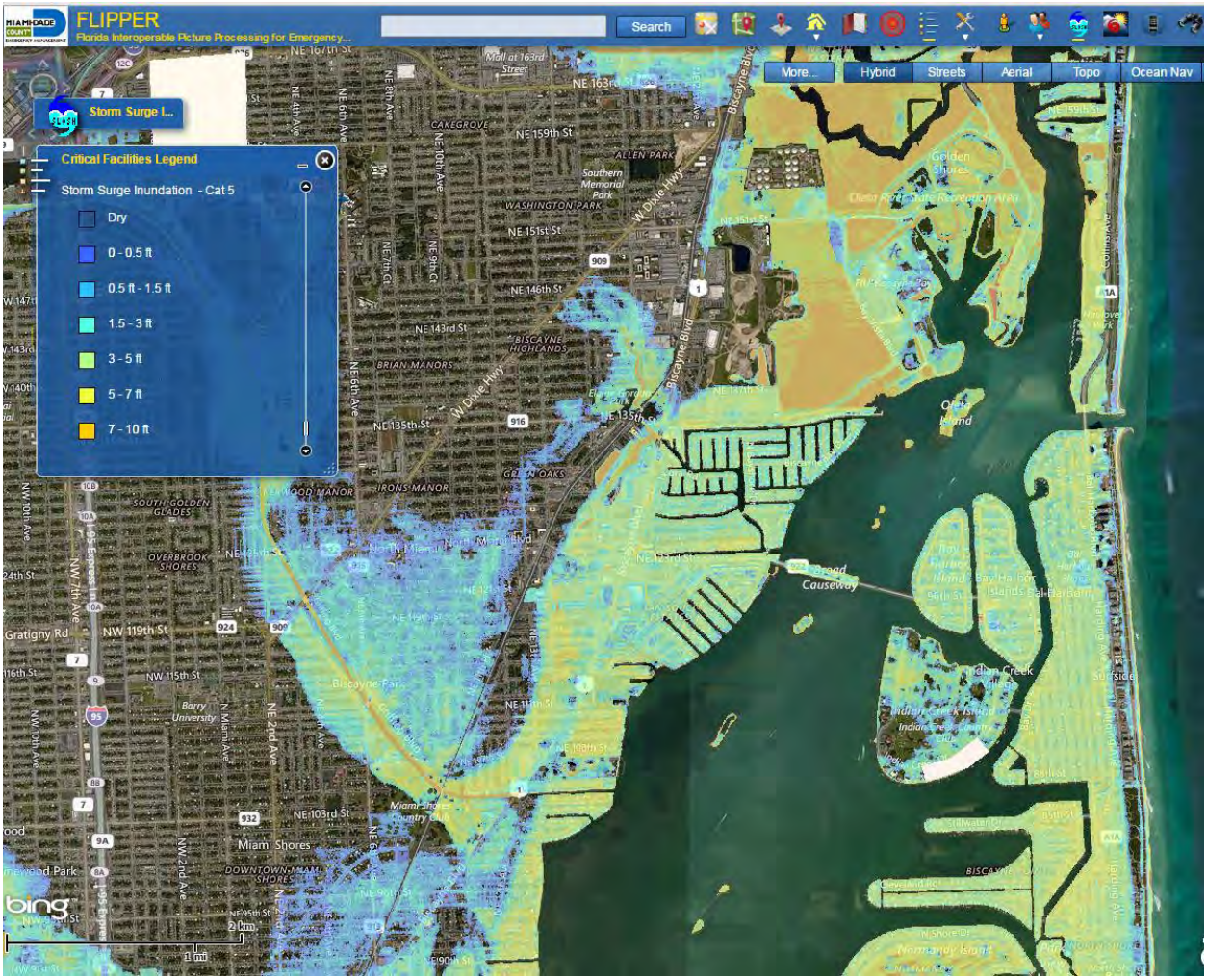


Figure 12: Vulnerability of Focus Area 2 to Storm Surge

Sea level rise and implications for flooding

Miami-Dade County's Water Management Division recently evaluated the implications of sea level rise on flooding risks to this area. They evaluated three different scenarios:

- Current Conditions with a syzygy (seasonal high tide) tide;
- 2030, with a syzygy (seasonal high tide) tide and 10inch rise in sea level
- 2060, with a syzygy tide (seasonal high tide) and 26-inch rise in sea level

The vulnerability analysis revealed that the inundation area is greatly expanded when considering both rainfall and tidal inundation. These results are more detailed than the more simplistic "bathtub" models. Map 5 below provides a summary of the areas expected to be impacted if no modifications in the land use pattern and stormwater management system are implemented. Figure 13 offers a closer look at the impacts on the identified focus areas.

Map 5: Potential future flooding in the Arch Creek Basin

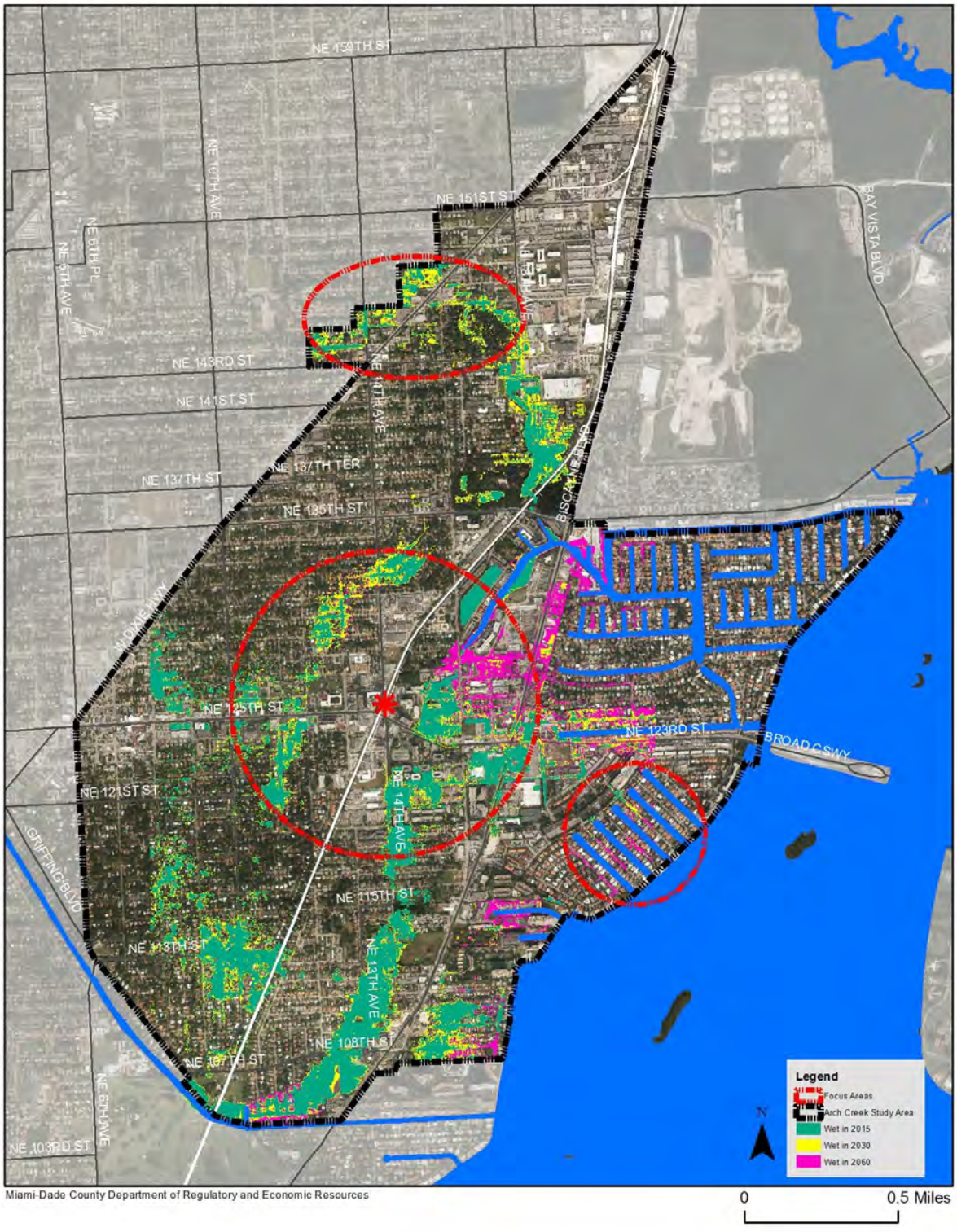
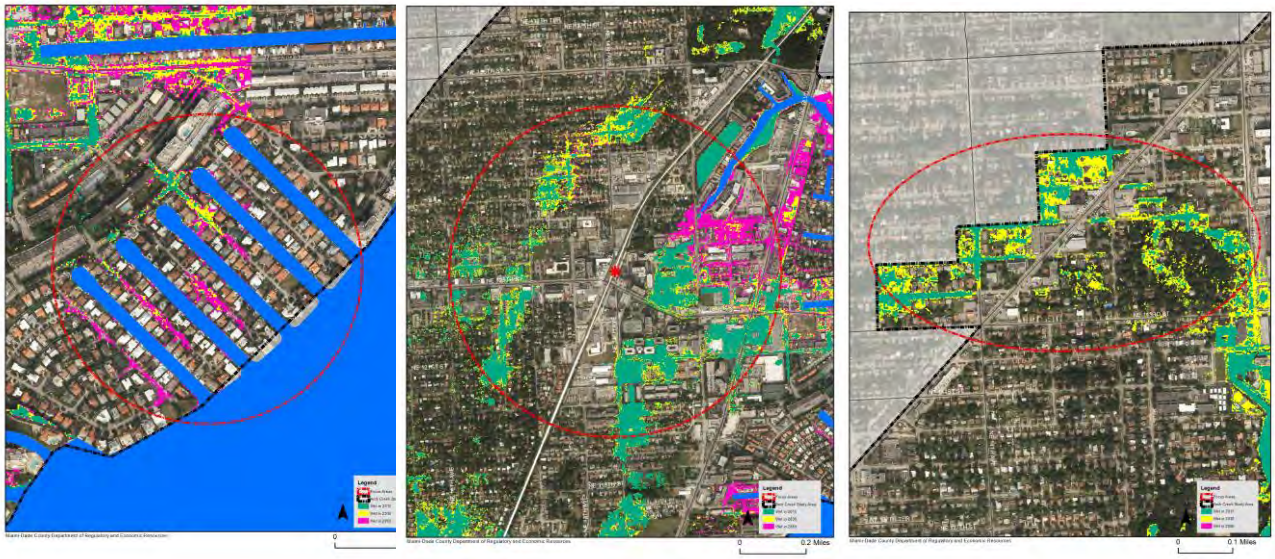
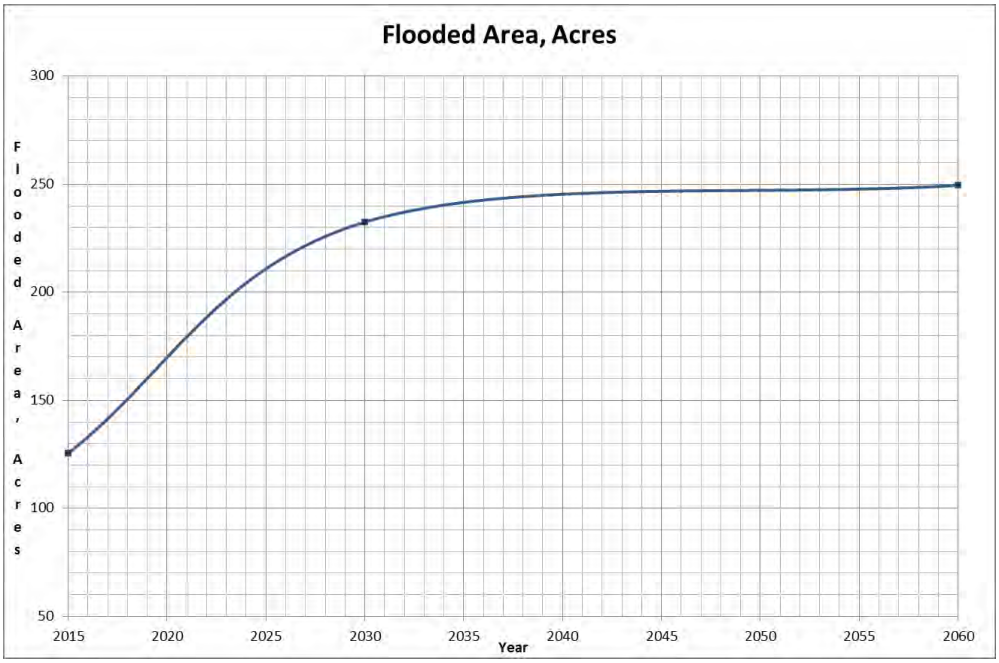


Figure 13: Amplified view of study results for focus areas



The graph below reflects the estimated increase in the areas that would be flooded within the Arch Creek Basin according to estimates from the County's Water Management Division estimates (Figure 14). As shown, the greatest change in flooded area is anticipated to occur between 2015 and 2030. Therefore, it is important to address these vulnerabilities in the near term.

Figure 14: Estimated increase in the flooded area within the Arch Creek Basin



Efforts to reduce flooding:

In order to minimize the frequency and duration of flood events in the area, Miami-Dade County installed five pump stations with discharge to drainage wells within the study area. Additionally, starting in 2003, the County constructed drainage upgrades to improve the water quality in the Arch Creek area by installing a new pipeline system, additional drainage wells, and emergency overflow to a nearby pond. This system was completed in 2005. Monitoring results seem to indicate a reduction of the levels of the pollutants of concern, but not of the fecal coliform and total coliform. The Infrastructure and Planned Improvements section of this report includes a broader discussion on current and planned stormwater improvements to reduce flooding in the area.

Existing Land Use

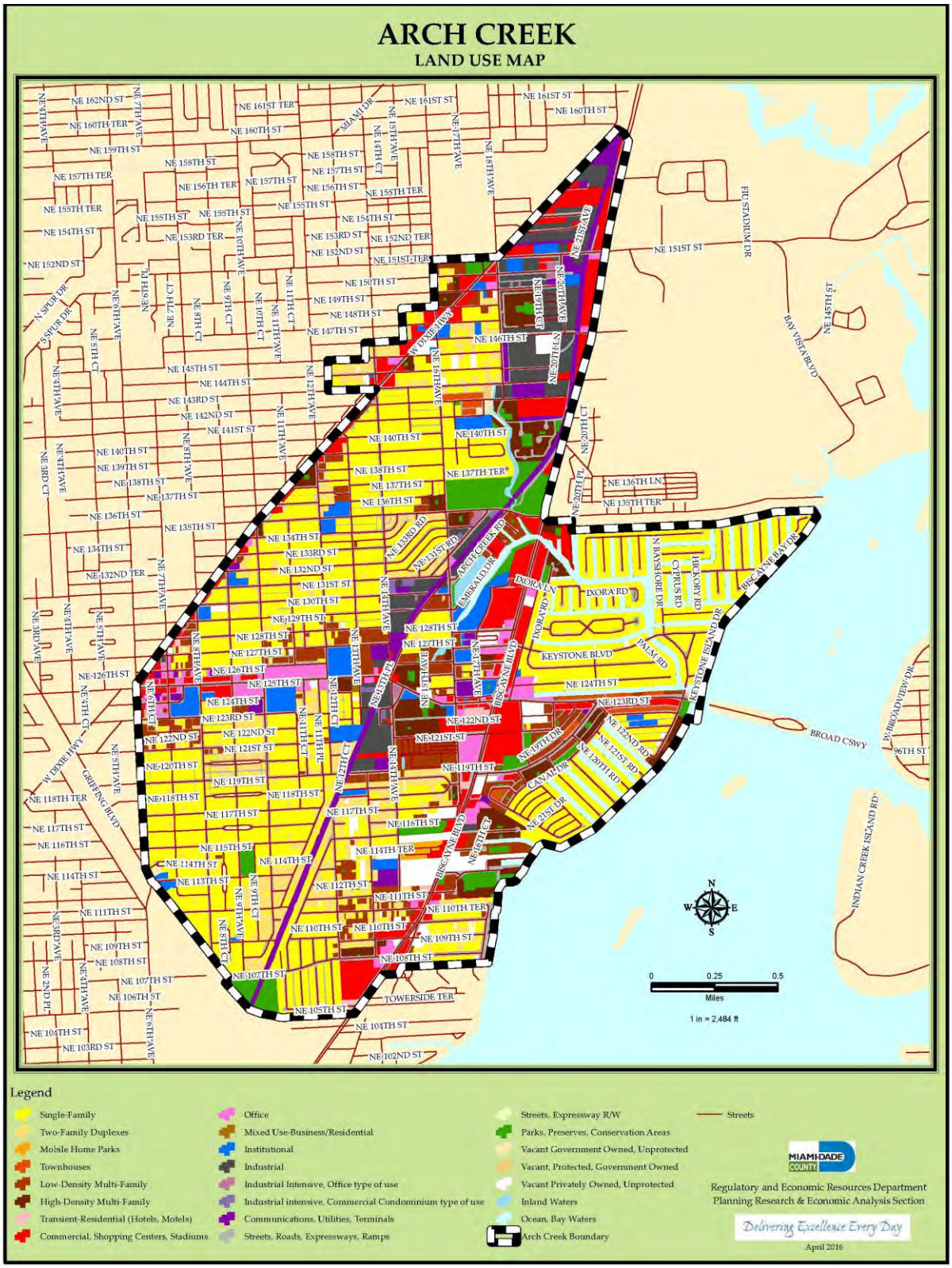
The following table summarizes the existing land uses within the Arch Creek Study Area which are depicted on Map 6. As shown, a large portion of the study area is dedicated to single-family residential uses. The major corridors within the study area, Biscayne Boulevard and NE 125th Street, primarily contain a mix of commercial, office and institutional uses.

Arch Creek
Miami-Dade County
2016 Existing Land Use

Land Use	Arch Creek Area (Acres)	Arch Creek Area (Percent of Total)	Miami-Dade County (Acres)	Miami-Dade County (Percent of Total)
Residential	1,378.8	48.6	112,319.3	7.2
Commercial, Office, Transient Residential *	249.3	8.8	14,448.0	0.9
Industrial	122.8	4.3	19,176.7	1.2
Institutional	81.9	2.9	14,980.0	1.0
Parks/Recreation	105.1	3.7	834,267.5	53.7
Transportation, Communication, Utilities	724.9	25.5	87,524.3	5.6
Agriculture	0.0	0.0	62,575.0	4.0
Undeveloped	63.4	2.2	83,790.6	5.4
Inland Waters & Coastal Water Bays and Oceans	111.6	3.9	323,378.8	20.8
Total:	**2,837.8**	**100.0**	**1,552,460.2**	**100.0**

* Transient Residential includes Hotels and Motels
Source: Miami-Dade County Department of Regulatory and Economic Resources, Planning Research & Economic Analysis Section April, 2016

Map 6: Arch Creek Existing Land Use



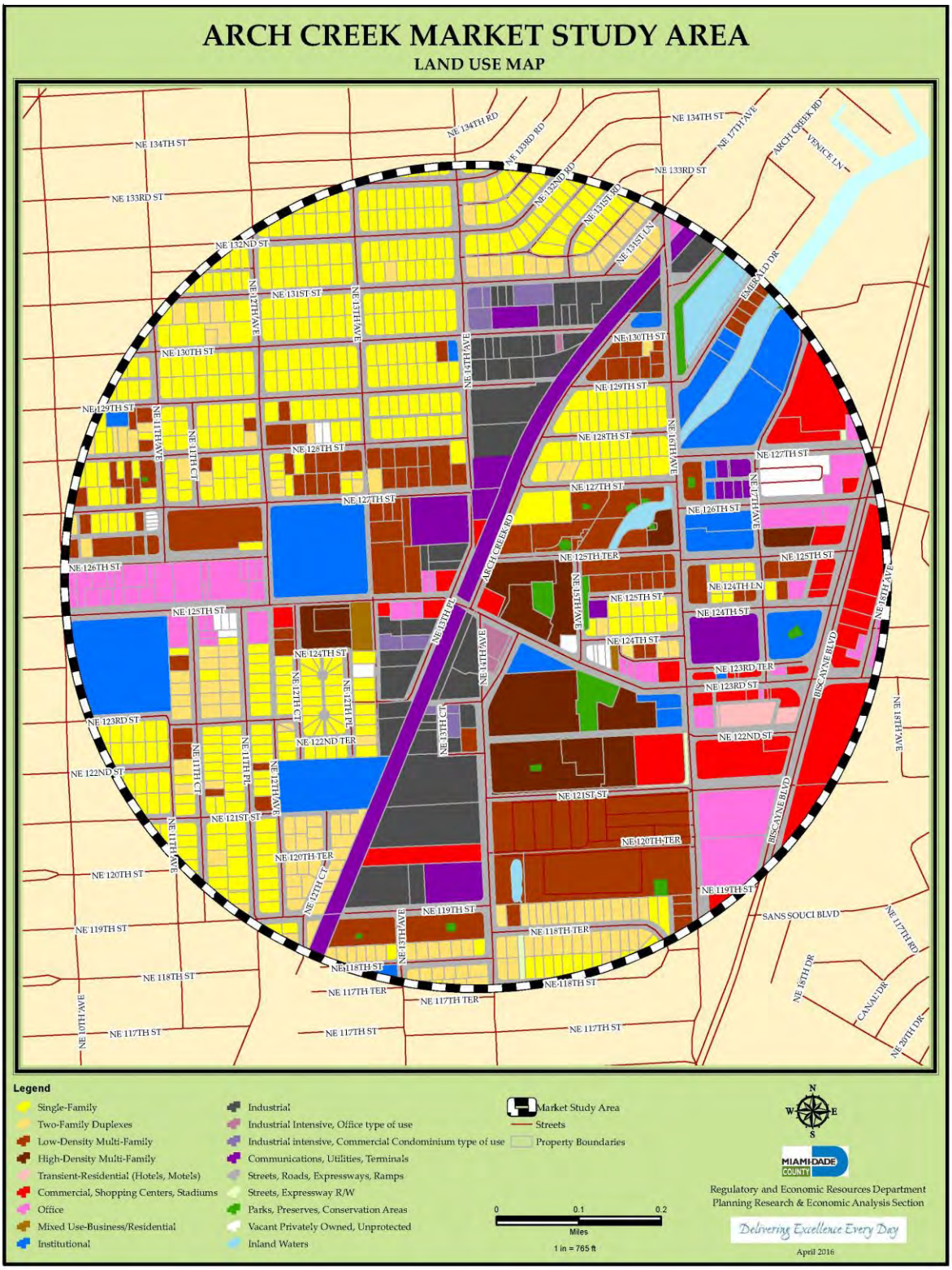
The below table summarizes the existing land uses for the area within one-half mile of the proposed Tri-Rail Coastal Link station as depicted on Map 7. As shown, the area west of the rail line is comprised primarily of single-family residences and institutional uses. The area east of the rail line contains a mix of multi-family residential, commercial and industrial uses.

Arch Creek Market Study Area
Miami-Dade County
2016 Existing Land Use

Land Use	Arch Creek Area (Acres)	Arch Creek Area (Percent of Total)	Miami-Dade County (Acres)	Miami-Dade County (Percent of Total)
Residential	218.7	43.5	112,319.3	8.9
Commercial, Office, Transient Residential *	53.3	10.6	14,448.0	1.1
Industrial	36.0	7.2	19,176.7	1.5
Institutional	38.7	7.7	14,980.0	1.2
Parks/Recreation	4.3	0.9	834,267.5	65.9
Transportation, Communication, Utilities	139.4	27.7	87,524.3	6.9
Agriculture	0.0	0.0	62,575.0	4.9
Undeveloped	4.6	0.9	83,790.6	6.6
Inland Waters	7.6	1.5	37,667.5	3.0
Total:	**502.6**	**100.0**	**1,266,748.9**	**100.0**

* Transient Residential includes Hotels and Motels
Source: Miami-Dade County Department of Regulatory and Economic Resources, Planning Research & Economic Analysis Section
April, 2016

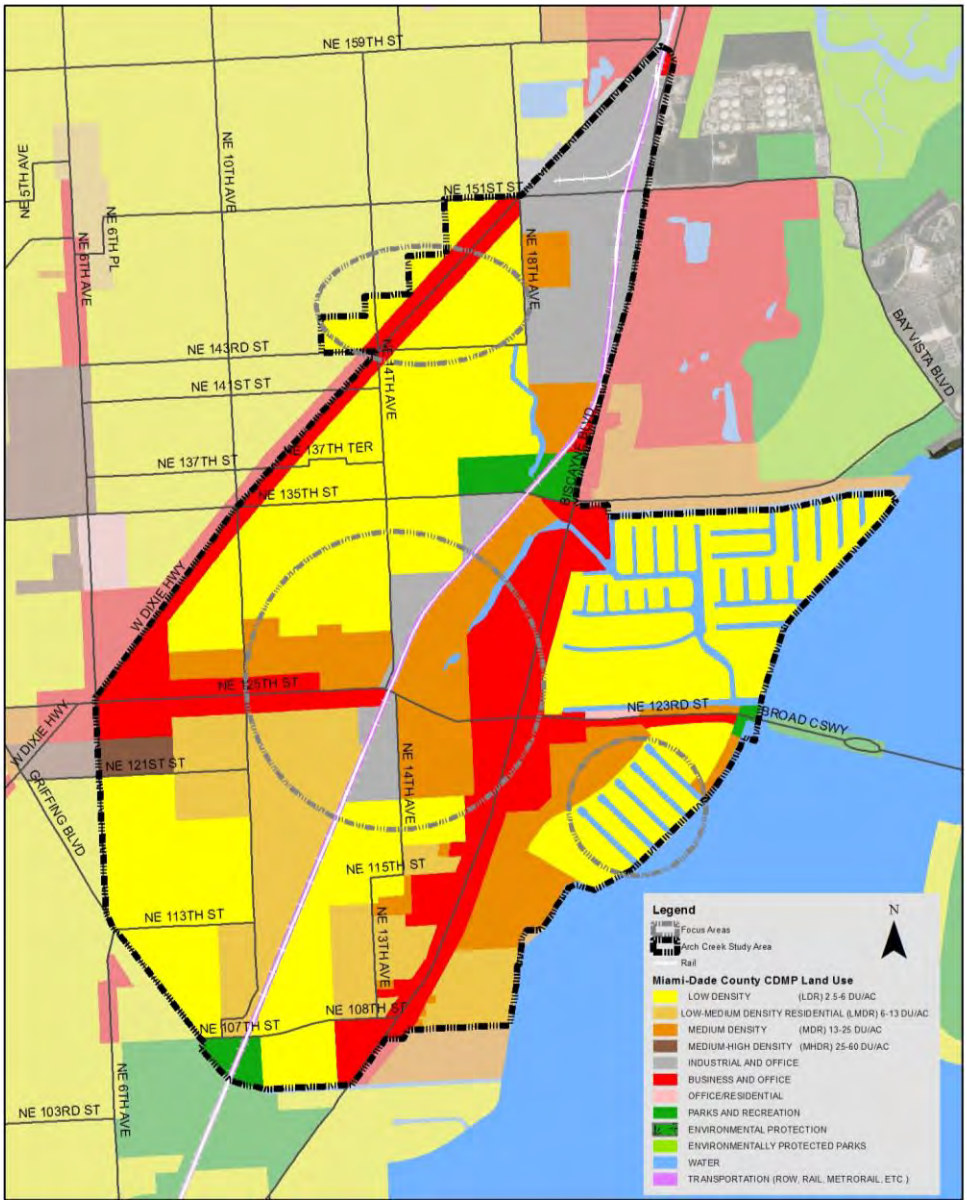
Map 7: Existing Land Use for Focus Area 1



Future Land Use/Zoning

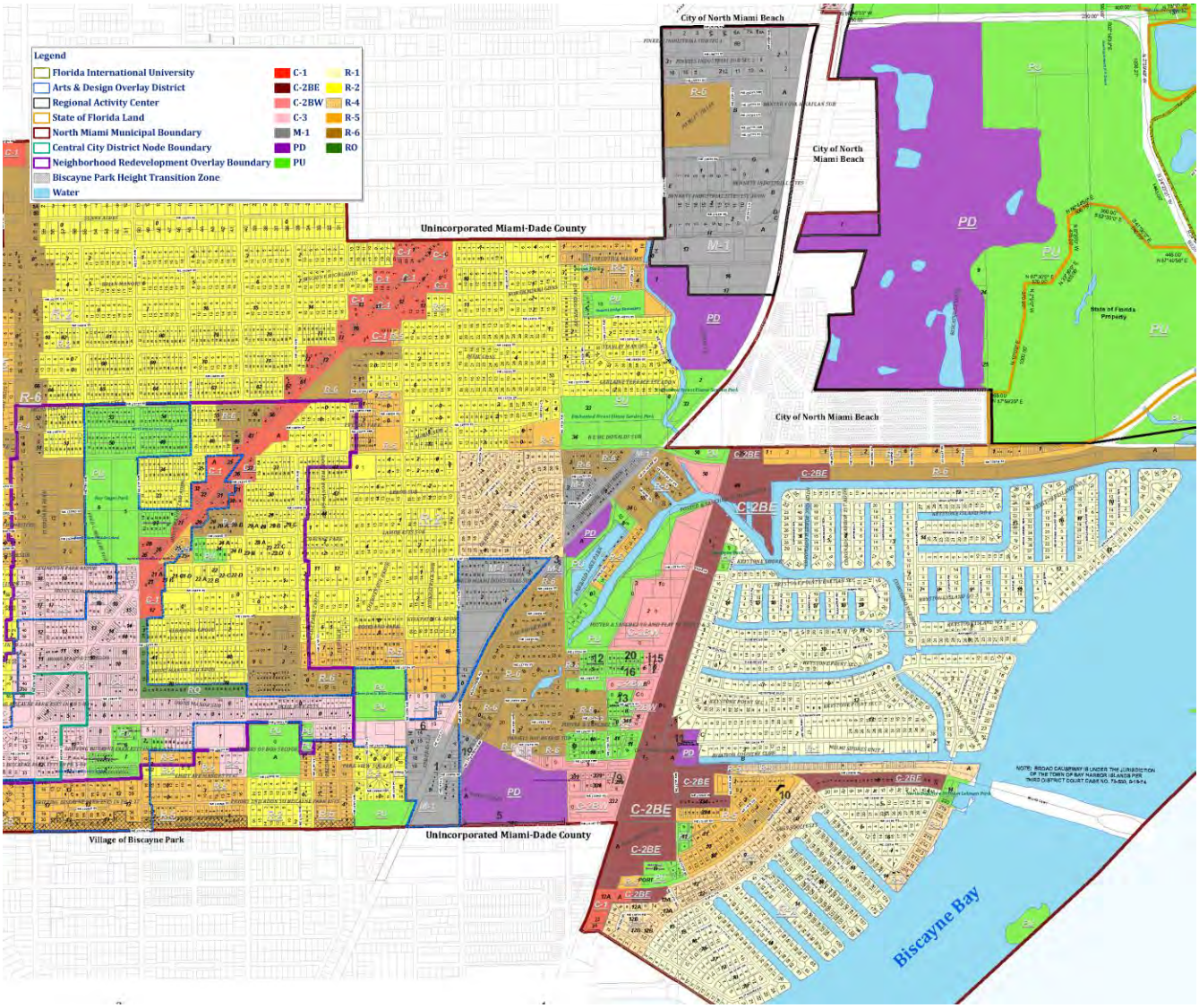
Map 8 shows the Miami-Dade County CDMP Land Use Plan map designations for the study area. The County's map addresses both the incorporated and unincorporated areas due to the many area-wide responsibilities of County government. Each municipality is also required by state law to adopt its own land use plan map and land development regulations[8]. The zoning map for the City of North Miami, which comprises a large portion of the study area, is shown on Map 9. Appendix D includes additional land use and zoning maps for the municipalities with land area in the study area boundary.

Map 8: Miami-Dade County CDMP Land Use Plan Map



[8] Land development regulations for each local government can be found at www.municode.com/library/FL

Map 9: City of North Miami Zoning Map



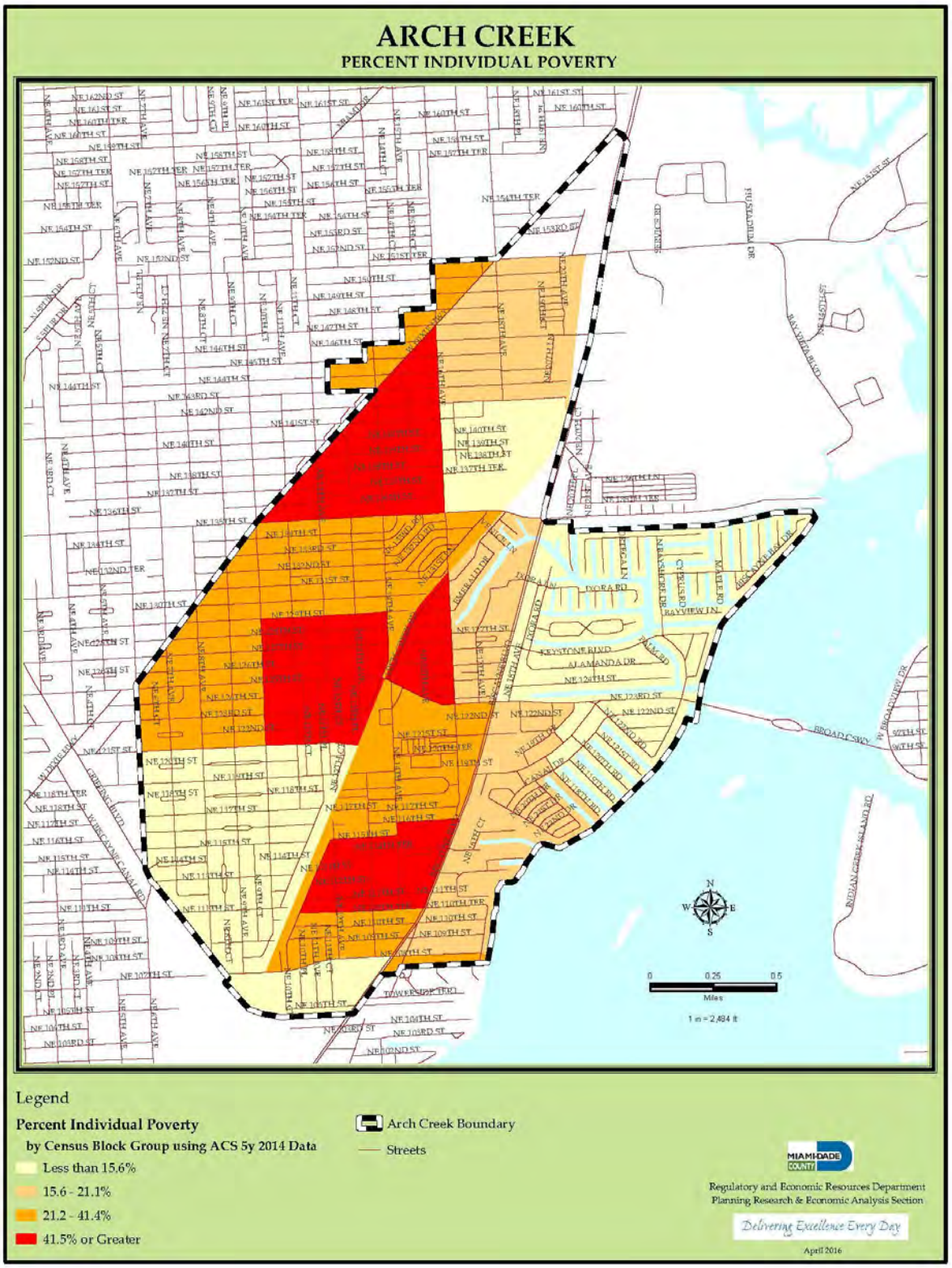
Demographic/Socioeconomic Profile

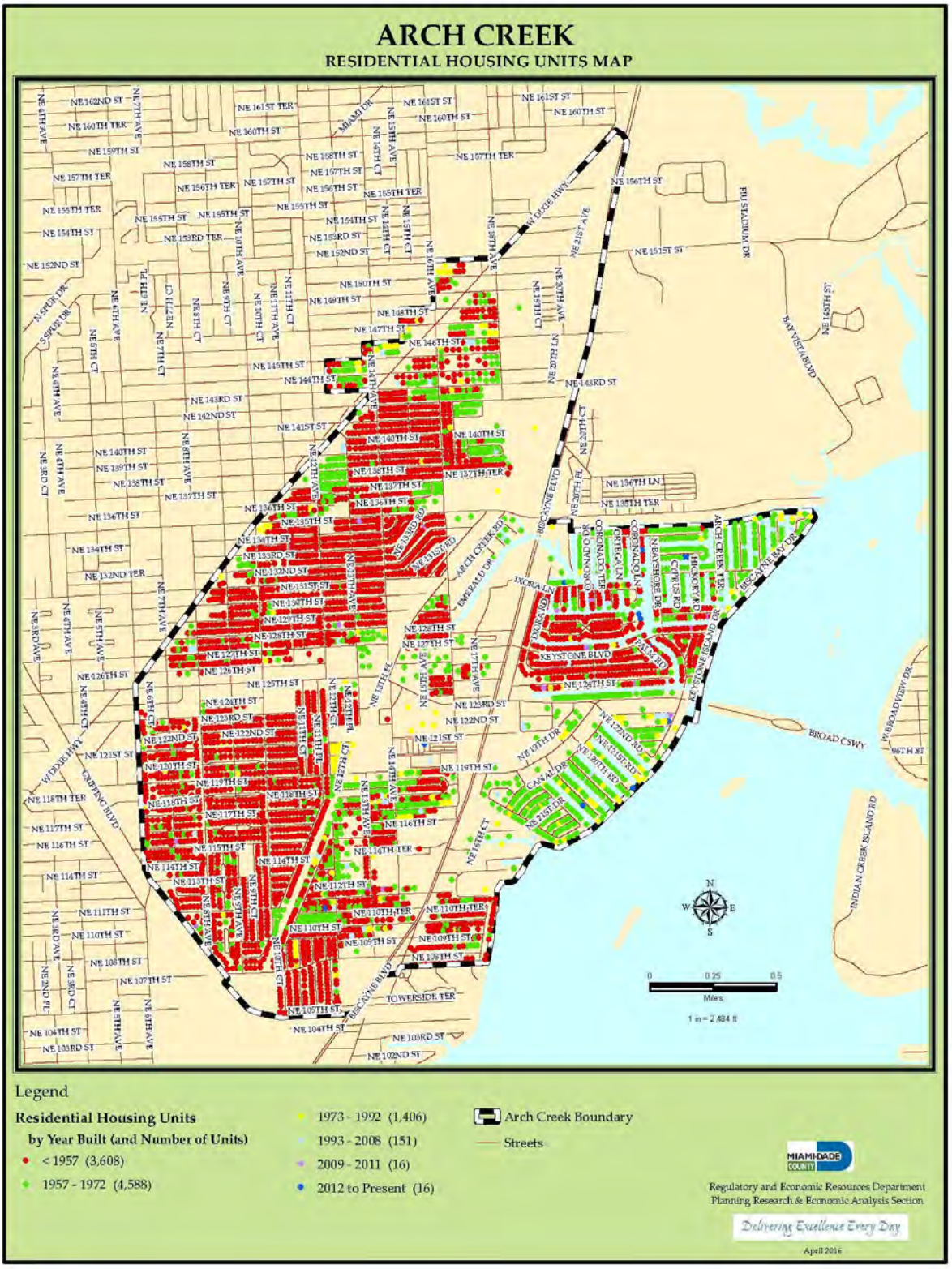
Table 15 and the maps presented on pages 32 through 38 illustrate the socioeconomic and demographic profile of the Arch Creek community. The maps include geographical information related to concentration of poverty (by census block), age of residential housing units, percentage of owner occupied housing, percentage renter occupied housing, percentage of cost burdened homeowners, and percentage of cost burdened renters by census block.

Significant portions of the study area include low and very low income census tracks and median incomes tend to be below county averages. Miami-Dade County ranks among the top locations nationally for cost-burdened communities. This trend is reflected in the Arch Creek Study Area, with several portions of the study area being identified as significantly cost burdened.

Figure 15: Arch Creek Study Area Socioeconomic Characteristics compared with Miami-Dade County

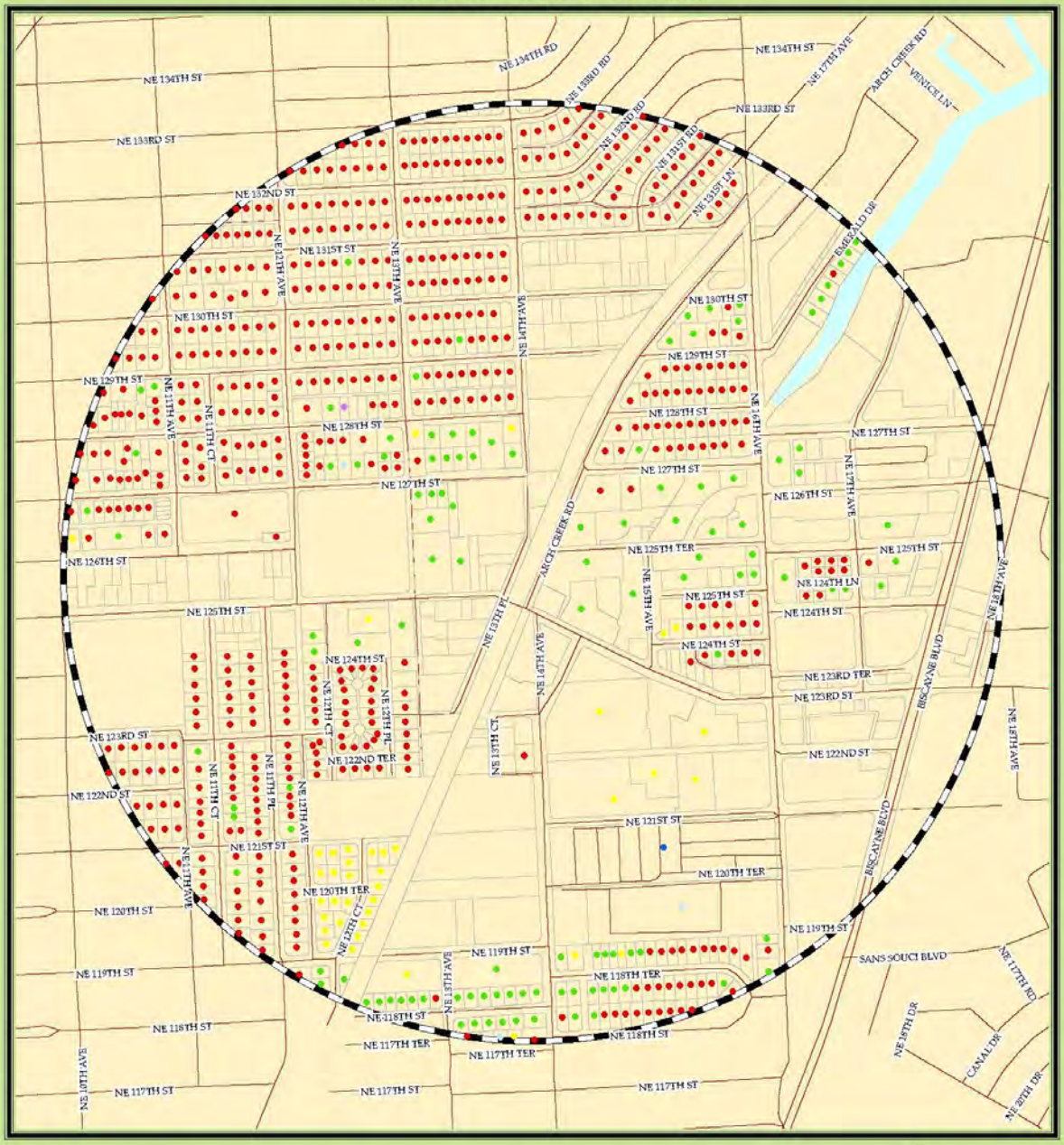
Arch Creek Study Area Socioeconomic Characteristics (compared with Miami-Dade County)				
	Arch Creek	***Percent***	**Miami-Dade County**	***Percent***
Population				
Total	43,876	*100%*	2,600,861	*100%*
Not Hispanic	31,558	*71.9%*	904,690	*34.8%*
White	9,843	*22.4%*	399,395	*15.4%*
Black	20,368	*46.4%*	441,994	*17.0%*
Other	1,347	*3.1%*	63,301	*2.4%*
Hispanic	12,318	*28.1%*	1,696,171	*65.2%*
Income				
Median Household Income	$ 36,340	-	$ 43,215	-
Average Household Income	$ 56,541	-	$ 66,561	-
Poverty Rate	26.0%	-	20.5%	-
Unemployment Rate	11.6%	-	11.2%	-
Housing				
Total Housing Units	18,400	-	994,596	-
Occupied Housing Units (Households)	15,223	*82.7%*	833,541	*83.8%*
Owner Occupied	6,930	*45.5%*	458,132	*55.0%*
Renter Occupied	8,293	*54.5%*	375,409	*45.0%*
Median Selected Monthly Costs (Dollars)				
Owner Costs (with a mortgage)	$ 1,753	-	$ 1,760	-
Renter Costs (Median Gross Rent)	$ 1,115	-	$ 1,212	-
Cost Burdened Households (Number)				
Owners with a mortgage	2,678	*73.5%*	160,195	*52.4%*
Renters	5,506	*66.4%*	231,212	*61.6%*
Educational Attainment				
Population 25 years and Over	29,438	-	1,799,044	-
12th Grade, No Diploma	1,198	*4.1%*	65,351	*3.6%*
High School Graduate (includes equivalency)	7,805	*26.5%*	511,895	*28.5%*
Some College, No Degree	6,242	*21.2%*	288,609	*16.0%*
Associate's Degree	2,446	*8.3%*	154,601	*8.6%*
Bachelor's Degree	4,503	*15.3%*	300,700	*16.7%*
Graduate or Professional Degree	2,740	*9.3%*	174,869	*9.7%*
Data Source: US Census Bureau 2014 ACS 5-year Estimates.				
Estimates are based on the Census Block Groups.				


ARCH CREEK
PERCENT INDIVIDUAL POVERTY
Legend
Percent Individual Poverty
by Census Block Group using ACS 5y 2014 Data
Less than 15.6%
15.6 - 21.1%
21.2 - 41.4%
41.5% or Greater
Arch Creek Boundary
Streets
Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section
Delivering Excellence Every Day
April 2016


ARCH CREEK
RESIDENTIAL HOUSING UNITS MAP
Legend
Residential Housing Units
by Year Built (and Number of Units)
< 1957 (3,608)
1957 - 1972 (4,588)
1973 - 1992 (1,406)
1993 - 2008 (151)
2009 - 2011 (16)
2012 to Present (16)
Arch Creek Boundary
Streets
Miles
1 in = 2,484 ft
Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section
Delivering Excellence Every Day
April 2016

ARCH CREEK MARKET STUDY AREA

RESIDENTIAL HOUSING UNITS MAP



Legend

Residential Housing Units

by Year Built (and Number of Units)

- < 1957 (608)
- 1957 - 1972 (876)
- 1973 - 1992 (335)
- 1993 - 2008 (3)
- 2009 - 2011 (1)
- 2012 to Present (1)

Market Study Area

Streets

Property Boundaries

0 0.1 0.2

Miles

1 in = 765 ft

N W E S

MIAMI-DADE COUNTY

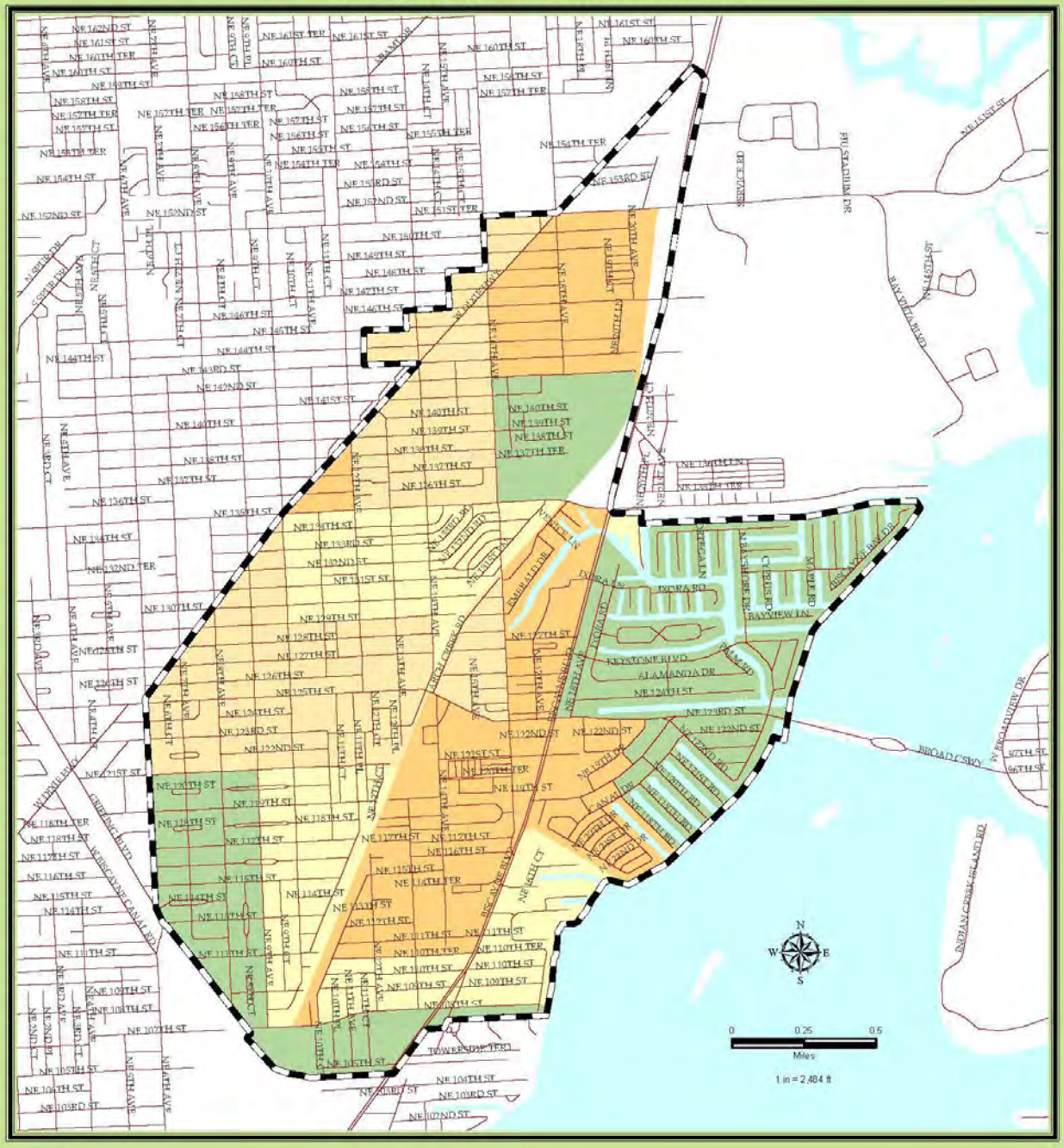
Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section

Delivering Excellence Every Day

April 2016

ARCH CREEK

PERCENT OWNER OCCUPIED HOUSING UNITS



Legend

Percent Owner Occupied Housing Units

by Census Block Group using ACS 5y 2014 Data

- Less Than 25.0%
- 25.0 - 40.0%
- 40.1 - 70.0%
- 70.1% or Greater

Arch Creek Boundary

Streets

MIAMI-DADE COUNTY

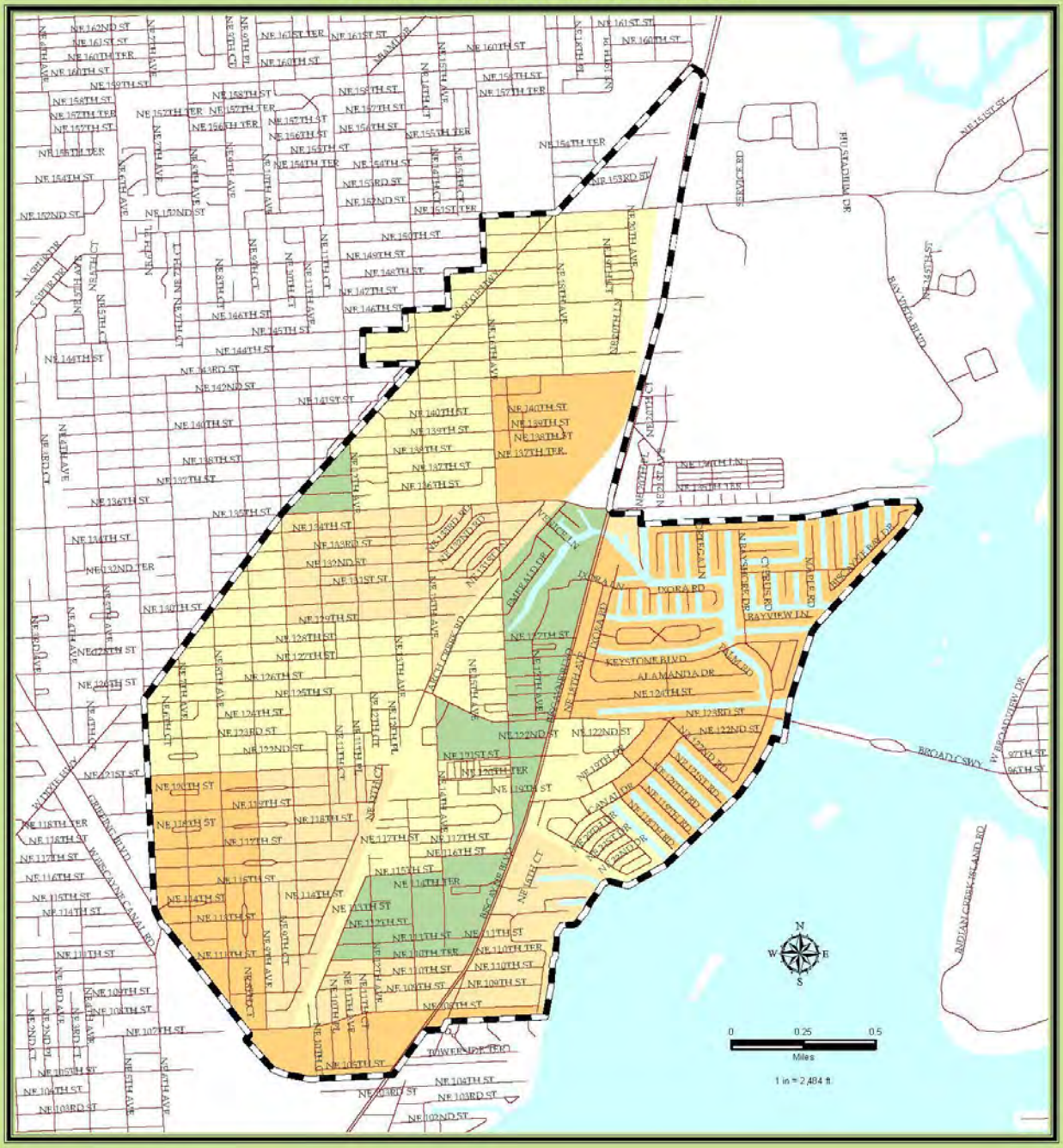
Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section

Delivering Excellence Every Day

April 2016

ARCH CREEK

PERCENT RENTER OCCUPIED HOUSING UNITS



Legend

Percent Renter Occupied Housing Units
by Census Block Group using ACS 5y 2014 Data

- Less Than 30.0%
- 30.0 - 60.0%
- 60.1 - 80.0%
- 80.1% or Greater

- Arch Creek Boundary
- Streets

MIAMI-DADE COUNTY

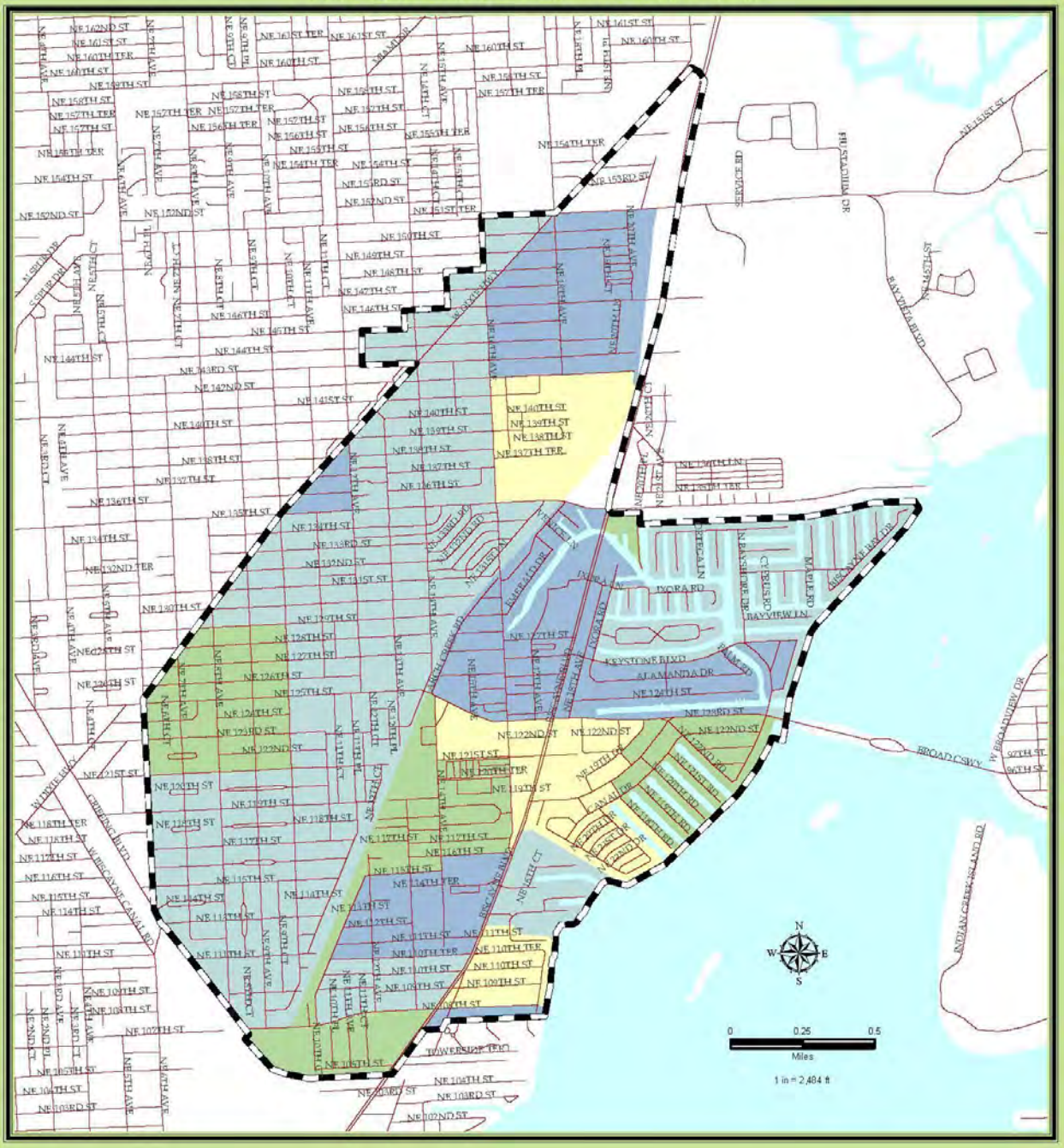
Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section

Delivering Excellence Every Day

April 2016

ARCH CREEK

COST BURDENED OWNERS WITH A MORTGAGE



Legend

Cost Burdened Owners with a Mortgage

Monthly Owners Cost as a Percent of Household Income

- Less Than 30.0%
- 30.1 - 50.0%
- 50.1 - 75.0%
- Greater Than 75.0%

- Arch Creek Boundary
- Streets

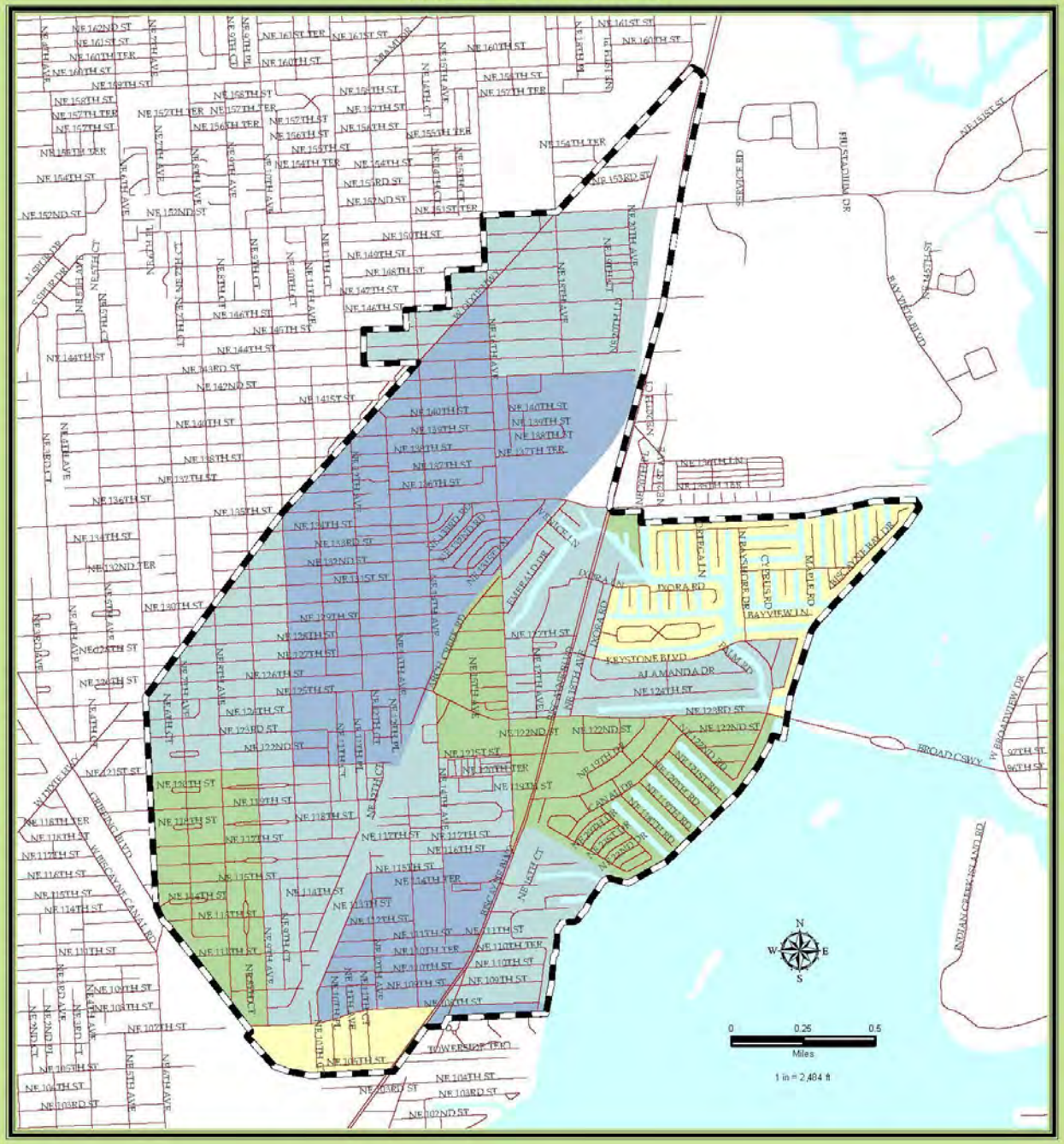
MIAMI-DADE COUNTY

Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section

Delivering Excellence Every Day

April 2016

ARCH CREEK
COST BURDENED RENTERS



Legend

Cost Burdened Renters

Gross Rent as a Percent of Household Income

- Less Than 30.0%
- 30.1 - 50.0%
- 50.1 - 75.0%
- Greater Than 75.0%

- Arch Creek Boundary
- Streets

MIAMI-DADE COUNTY

Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section

Delivering Excellence Every Day

April 2016

Market Analysis

The study area has good accessibility from I-95 and Biscayne Boulevard. Development of the Tri-Rail Coastal Link station would provide passenger rail connections to Downtown Miami and north to Broward and Palm Beach counties. The area also has immediate access to student markets at the Florida International University (Biscayne Campus), Johnson and Wales University, and Barry University (located just outside of the study area).

The following table shows major employers within the study area. As shown, the City of North Miami government is the largest employer. Other major employment fields include healthcare, education, manufacturing and retail trade. The map on page 40 shows the geographical distribution of businesses within the study area.

ARCH CREEK STUDY AREA - EMPLOYMENT BY BUSINESS AND INDUSTRY TYPE

COMPANY NAME	NO. OF EMPLOYEES	2 DIGIT NAICS CODE	2 DIGIT NAICS CODE DESCRIPTION
NORTH MIAMI CITY ADMIN	536	92	PUBLIC ADMINISTRATION
VILLA MARIA NURSING CTR	300	62	HEALTH CARE AND SOCIAL ASSISTANCE
LEXUS OF NORTH MIAMI	250	44	RETAIL TRADE
JOHNSON & WALES UNIVERSITY	215	61	EDUCATIONAL SERVICES
HOME DEPOT	201	44	RETAIL TRADE
WPBT CHANNEL 2	200	51	INFORMATION
TECHNO COATINGS INC	200	33	MANUFACTURING
WORLD EMBLEM INTL INC	200	31	MANUFACTURING
C SHARP MAJOR MUSIC INC	150	81	OTHER SERVICES (EXCEPT PUBLIC ADMINISTRATION)
PUBLIX SUPER MARKET	150	44	RETAIL TRADE
NORTH MIAMI POLICE DEPT	150	92	PUBLIC ADMINISTRATION
NORTH MIAMI PARKS & RECREATION	150	71	ARTS, ENTERTAINMENT, AND RECREATION
WHOLE FOODS MARKET	148	44	RETAIL TRADE
KMART	135	45	RETAIL TRADE
WILLIAM J BRYAN ELEMENTARY	130	61	EDUCATIONAL SERVICES
FARREY'S LIGHTING & BATH	116	33	MANUFACTURING
NORTH MIAMI BEACH SOLID WASTE	104	56	ADMINISTRATIVE AND SUPPORT AND WASTE MANAGEMENT AND REMEDIATION SERVICES
FLORIDA HOME BOUND MED MENTAL	100	62	HEALTH CARE AND SOCIAL ASSISTANCE
ARCH PLAZA NURSING & REHAB CTR	100	62	HEALTH CARE AND SOCIAL ASSISTANCE
RED LOBSTER	100	72	ACCOMMODATION AND FOOD SERVICES

Source: Miami-Dade County Department of Regulatory and Economic Resources, Planning Research & Economic Analysis Section; InfoUSABusinessData database provided by ESRI and obtained from InfoUSA - April 2016


ARCH CREEK
BUSINESSES BY INDUSTRY
Legend
ACCOMMODATION AND FOOD SERVICES (105)
ADMINISTRATIVE AND SUPPORT AND WASTE MANAGEMENT AND REMEDIATION SERVICES (72)
AGRICULTURE, FORESTRY, FISHING AND HUNTING (2)
ARTS, ENTERTAINMENT, AND RECREATION (45)
CONSTRUCTION (99)
EDUCATIONAL SERVICES (34)
FINANCE AND INSURANCE (109)
HEALTH CARE AND SOCIAL ASSISTANCE (193)
INFORMATION (54)
MANAGEMENT OF COMPANIES AND ENTERPRISES (6)
MANUFACTURING (57)
MINING, QUARRYING, AND OIL AND GAS EXTRACTION (1)
OTHER SERVICES (EXCEPT PUBLIC ADMINISTRATION) (242)
PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES (299)
PUBLIC ADMINISTRATION (19)
REAL ESTATE AND RENTAL AND LEASING (131)
RETAIL TRADE (306)
TRANSPORTATION AND WAREHOUSING (45)
UNCLASSIFIED ESTABLISHMENTS (34)
UTILITIES (1)
WHOLESALE TRADE (89)
ARCH CREEK BOUNDARY
STREETS
Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section
Delivering Excellence Every Day
April 2016
0 0.25 0.5
Miles
1 in = 2,313 ft

Buying power within the study area is generally low. As presented in the Demographic/Socioeconomic Profile section, the area has a lower median income than the county as a whole and large portions of the population are cost burdened and living below the poverty line. Despite limited buying power in the area, the land use summary for the area within ½ mile of the proposed Tri-Rail stations, as depicted on Figure 16, shows relatively low vacancy rates for industrial and retail land uses.

Figure 16: Vacancy Rates for Land Uses within ½ mile of proposed transit station

Land Use Summary - 2016:Q1

Land Use	Total Square Footage	Vacant Square Footage	Vacancy Rate	Available Square Footage	Available Rate
Office	898,543	111,913	12.5%	166,008	18.5%
Industrial-Flex	619,312	16,258	2.6%	16,258	2.6%
Retail	205,404	0	0.0%	4,283	2.1%

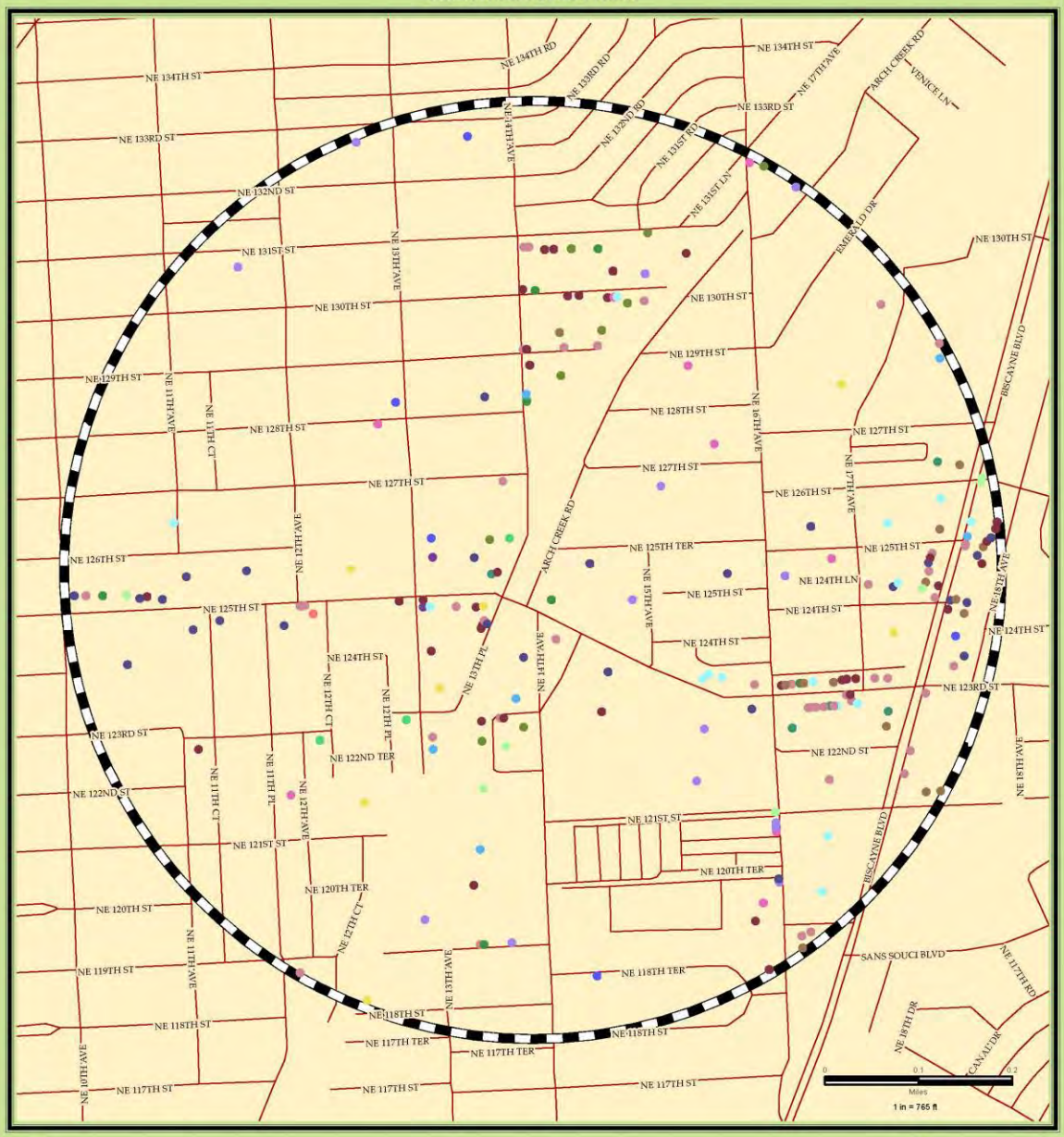
Data Source: Costar.com

The map on page 42 shows the distribution of businesses by industry for the area within ½ mile of the proposed transit station (Focus Area 1). As can be observed, businesses are primarily clustered along the major corridors.

Appendix E includes a market analysis that was completed as part of the Tri-Rail Coastal Link project for the area within ½ mile of the proposed station site at NE 125th Street which corresponds with the boundary of Focus Area 1. The analysis estimates that development growth between 2015 and 2025 with the station in place is expected to outpace growth if no station or service is put in place by 170 dwelling units and 334,000 square feet of non-residential development. Under the "high" development scenario, 230 dwelling units and 381,000 square feet of non-residential development could be expected within the station area. The additional development resulting from the station is expected to generate $776,000 in additional tax revenue for the city by 2025. Under the "high" development case, additional annual revenue is estimated to be as high as $940,000. Map 10 depicts the vacant and underutilized land within the area as presented in the Tri-Rail Coastal Link Station Area Market and Economic Analysis report.

ARCH CREEK

BUSINESSES BY INDUSTRY IN THE MARKET STUDY AREA



Legend

- ACCOMMODATION AND FOOD SERVICES (17)
- ADMINISTRATIVE AND SUPPORT AND WASTE MANAGEMENT AND REMEDIATION SERVICES (19)
- ARTS, ENTERTAINMENT, AND RECREATION (9)
- CONSTRUCTION (15)
- EDUCATIONAL SERVICES (11)
- FINANCE AND INSURANCE (34)
- HEALTH CARE AND SOCIAL ASSISTANCE (78)
- INFORMATION (12)
- MANAGEMENT OF COMPANIES AND ENTERPRISES (3)
- MANUFACTURING (10)
- MINING, QUARRYING, AND OIL AND GAS EXTRACTION (1)
- OTHER SERVICES (EXCEPT PUBLIC ADMINISTRATION) (54)
- PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES (117)
- PUBLIC ADMINISTRATION (1)
- REAL ESTATE AND RENTAL AND LEASING (43)
- RETAIL TRADE (62)
- TRANSPORTATION AND WAREHOUSING (10)
- UNCLASSIFIED ESTABLISHMENTS (9)
- WHOLESALE TRADE (21)
- MARKET STUDY AREA BOUNDARY
- STREETS

N W E S

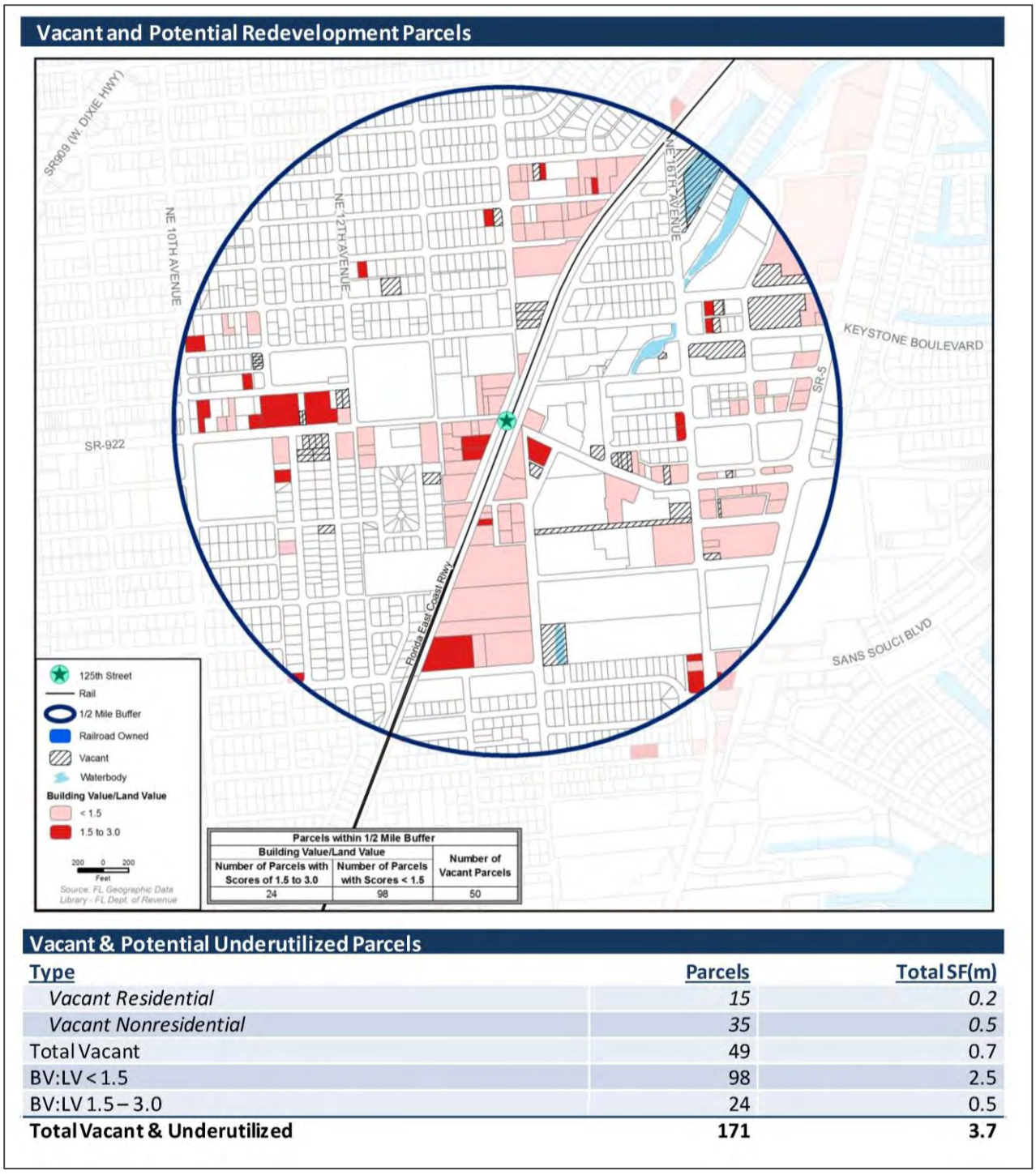
MIAMI-DADE COUNTY

Regulatory and Economic Resources Department
Planning Research & Economic Analysis Section

Delivering Excellence Every Day

April 2016

Map 10: Vacant and Potential Redevelopment Parcels in Focus Area 1



Vacant & Potential Underutilized Parcels

Type	Parcels	Total SF(m)
Vacant Residential	*15*	*0.2*
Vacant Nonresidential	*35*	*0.5*
Total Vacant	49	0.7
BV:LV < 1.5	98	2.5
BV:LV 1.5 – 3.0	24	0.5
Total Vacant & Underutilized	**171**	**3.7**

Source: Tri-Rail Coastal Link Station Area Market and Economic Analysis, South Florida Regional Transportation Authority, May 2013

Development Initiatives

Private Development

- SoLe Mia – This proposed project is located on 183 acres just east of the study area boundary (see Map 18 for location). SoLe Mia is a joint-venture development between Turnberry Associates and LeFrak. The project will consist of 4,390 residences, 673,900 square feet of retail/entertainment space, 220,000 square feet of office space, 37 acres of parkland and 4,171 parking spaces. The developers have already started infrastructure improvements on the site while awaiting final permitting approval from the City of North Miami on the final two towers. The North Miami Community Redevelopment Agency has identified the SoLe Mia project as a significant opportunity to reposition the area.

Figure 17: Proposed Sole Mia Project

Community Redevelopment Areas (CRA)

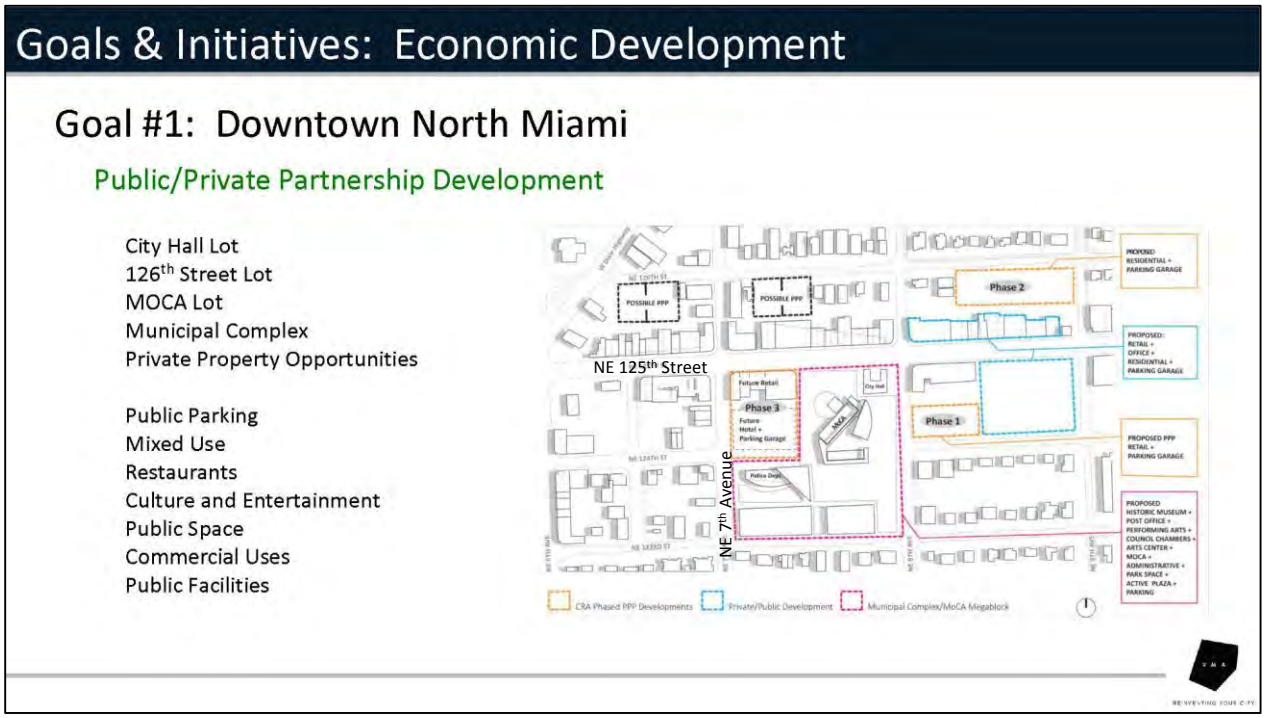
Community Redevelopment Agencies are sanctioned by state law (Chapter 163, Florida Statutes). In recognition of the need to prevent and eliminate slum and blight conditions, the law confers upon counties and municipalities the authority and powers to carry out "community redevelopment" as defined below. The CRA provides the ability to use future tax increment revenue to eliminate conditions of blight currently existing within the area through the implementation of a comprehensive redevelopment program. All redevelopment activities funded by tax increment revenue must be in accordance with an approved Redevelopment Plan.

> *"Community redevelopment" or "redevelopment" means undertakings, activities, or projects of a county, municipality, or community redevelopment agency in a community redevelopment area for the elimination and prevention of the development or spread of slums and blight, or for the reduction or prevention of crime, or for the provision of affordable housing, whether for rent or for sale, to residents of low or moderate income, including the elderly, and may include slum clearance and redevelopment in a community redevelopment area or rehabilitation and revitalization of coastal resort and tourist areas that are deteriorating and economically distressed, or rehabilitation or conservation in a community redevelopment area, or any combination or part thereof, in accordance with a community redevelopment plan and may include the preparation of such a plan. (Section 163.340, Florida Statutes)*

- ***North Miami Community Redevelopment Area***
  A large portion of the study area is located within the North Miami Community Redevelopment Area (see Map 11). The CRA was created in 2004 and generally consists of the older central core of the City and surrounding neighborhoods, which have become deteriorated due to age, obsolescence, and lack of investment. According to the North Miami CRA Plan, the most significant and immediate

opportunity for economic development within the CRA derives from the City of North Miami's ownership of three properties in the Downtown North Miami area that can be developed as Public Private Partnerships (see Figure 18).[9] As mentioned previously, the CRA has also identified the SoLe Mia project as a significant opportunity to reposition the area.

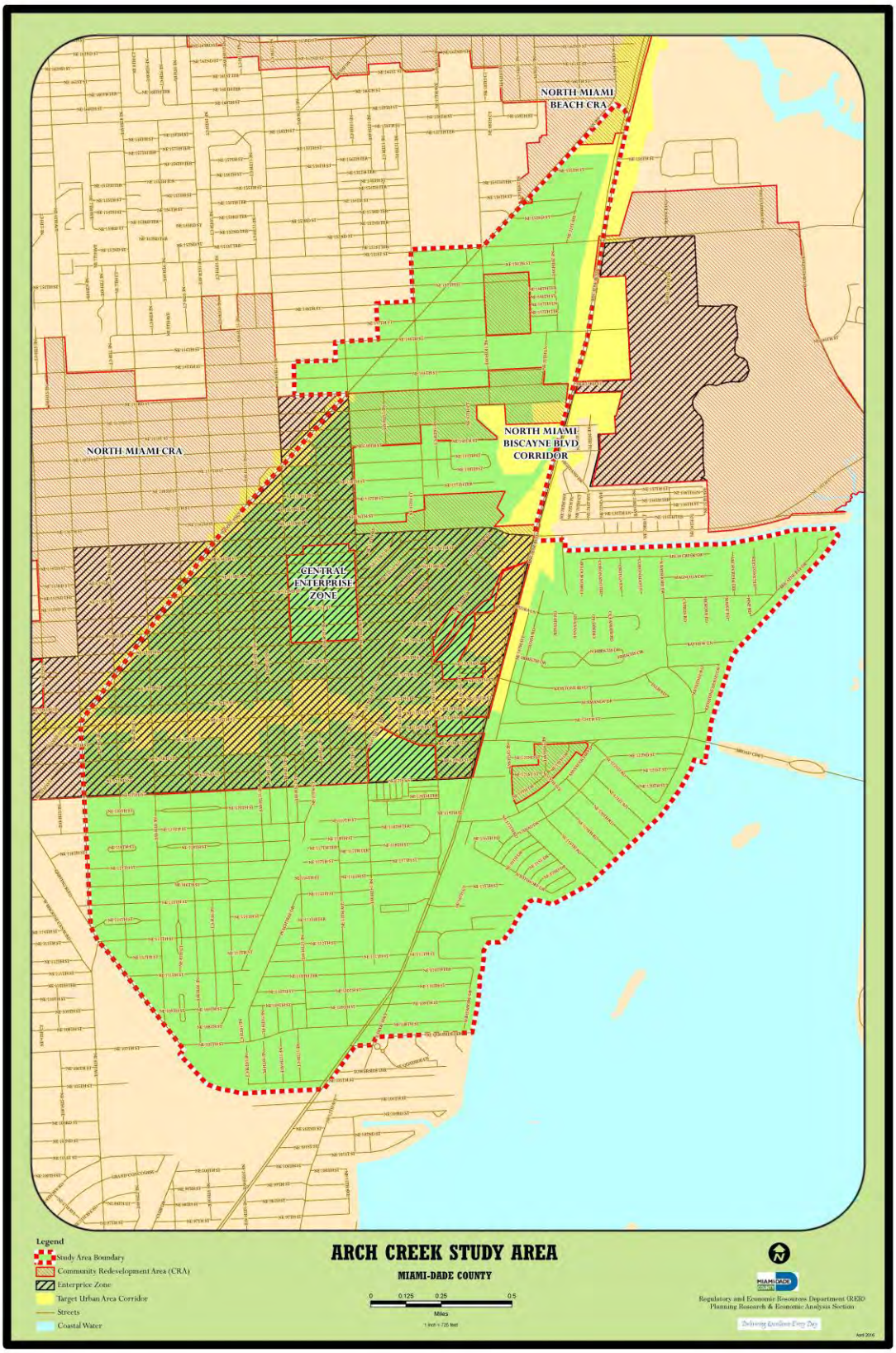
Figure 18: Public Private Partnerships in North Miami CRA



- ***North Miami Beach Community Redevelopment Area.***
  The northern portion of the study area is located within the North Miami Beach Community Redevelopment Area (see Map 11). There are no projects planned for this area, however, the CRA provides assistance for an area wide commercial façade improvement program. The CRA has also identified the Tri-Rail Coastal Link station located at NE 163 Street, just north of the study area, as a potential project. The North Miami Beach CRA Plan also indicates that the CRA may consider allocating funding to remedy infrastructure deficiencies and projected needs including utility, roadway and stormwater drainage improvements.

[9] More information on initiatives of the North Miami CRA can be found at www.northmiamicra.org

Map 11: Community Redevelopment Areas in the Arch Creek Study Area



Infrastructure and Planned Improvements

Waterways

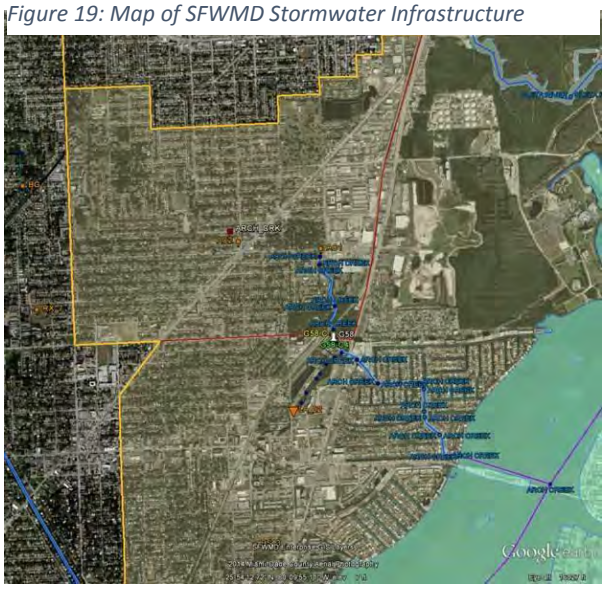
- The historic course of Arch Creek was diverted in the 1950s when the federal government constructed the existing Central and Southern Florida system, with little or no consideration given to potential future sea level rise. Some of the areas along the historic path of Arch Creek (such as Focus Area 3) are at lower elevations compared to adjacent areas. Some of the region's major drainage canals traverse the study area including the Arch Creek Canal and Biscayne Canal, which runs along the southern boundary. The regional drainage canals are built and operated by the South Florida Water Management District. Little Arch Creek Canal is managed by Miami-Dade County. There are also a series of private canals located within gated subdivisions along Biscayne Bay. Waterways located within and adjacent to the study area provide critical habitat for Johnson's seagrass ("threatened") and the West Indian Manatee ("endangered") as designated by the U.S. Fish and Wildlife Service.

Stormwater Infrastructure

- The Arch Creek basin discharges into the Keystone Point Canals then to Biscayne Bay. The total drainage basin has an area of approximately 2,838 acres, with 615 acres controlled by the G-58 structure, operated by the South Florida Water Management District, and 574 acres controlled by the Little Arch Creek Structure, operated by Miami-Dade County. The structures mentioned above control the canal discharges, opening at low tide and closing at high tide, preventing salinity intrusion to the aquifer. These structures are described in more detail below.

- ***South Florida Water Management District.*** The South Florida Water Management District (SFWMD) operates one primary structure in Arch Creek, the G58 structure, and six secondary structures.[10] The location of these structures can be seen in Figure 19. G58 is a four barreled culvert located downstream of the East Coast Railroad Bridge on the Arch Creek canal. A description of the G58 structure is included in Appendix F. This structure was rebuilt in 2015. The SFWMD maintains two pumps[11] upstream and a gated weir downstream of this structure. . The structures BS_1, BS_2, and BS_3, are pumps that are also maintained by the SFWMD Miami Field Station. All of these structures are vulnerable to

Figure 19: Map of SFWMD Stormwater Infrastructure



[10] The secondary structures are the AC1, AC2, LA_92, BS_1, BS_2, and BS_3

[11] The two drainage pumps are the AC_1 and AC_2, and the gated weir is LA_92 is maintained by SFWMD

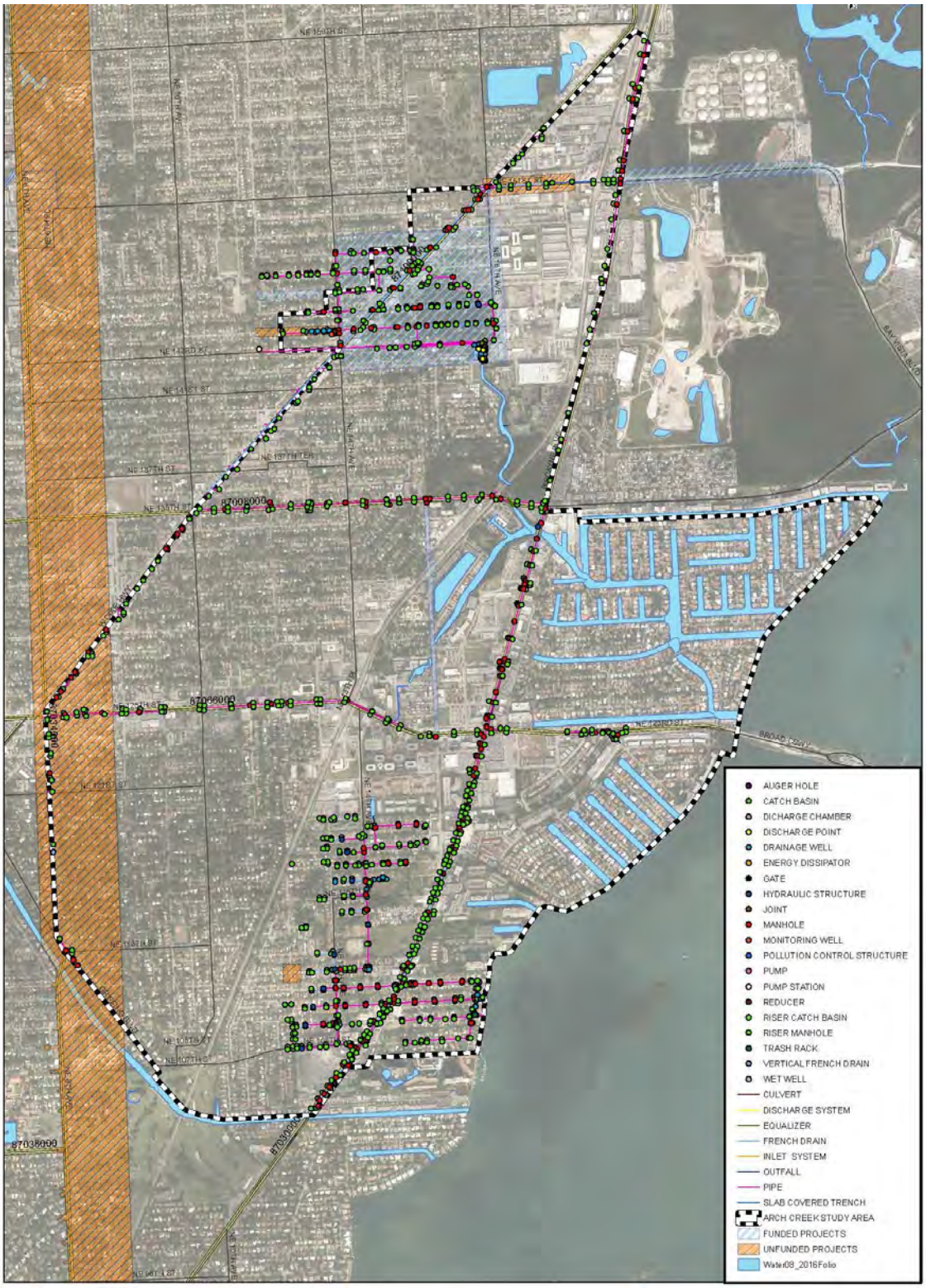
sea level rise. The SFWMD also operates the S28 structure in the Biscayne Canal which runs along the southern boundary of the study area.

There are no identified SFWMD mitigation studies or projects in the study area. SFWMD is in the early stages of a flood protection level of service study of three watersheds that surround the Arch Creek watershed but do not include it. This study is funded by a FEMA grant and will look at the current level of service and diminished flood protection caused by sea level rise plus storm surge. The study will also identify potential mitigation measures (e.g., local pumps, regional pumps, tide barriers) then analyze their effectiveness with a goal of incorporating regional flood protection measures into local flood mitigation strategies. The overall goal of the program is to identify long-term infrastructure needs. The program could be expanded to examine the vulnerability of the structures in Arch Creek; however, the focus of the study to date has been on larger watersheds.

- ***Miami-Dade County.*** The Little Arch Creek salinity control structure, located in Arch Creek, is operated by Miami-Dade County. The County also operates several pump stations.[12] In order to minimize the frequency and the duration of flood events in the area, Miami-Dade County installed 5 pump stations with discharge to drainage wells. Additionally, starting on 2003, Miami-Dade County constructed drainage improvements with the objective of improving the water quality in the Arch Creek by the installation of a new pipeline system, additional drainage wells, and emergency overflow to a pond. The system was completed in 2005 and monitoring results indicate a reduction of the levels of the pollutants of concern, but not of the fecal coliform and total coliform. Map 12 shows the location of funded and unfunded drainage improvements planned for the area.

[12] These include Arch Creek 1 and 2, Biscayne 109 ST, Biscayne 110 ST, Biscayne 116 ST, Biscayne Gardens and Seaboard Acres.

Map 12: Miami-Dade County Stormwater Infrastructure in Arch Creek



- ***City of North Miami.*** Below is a list of upcoming stormwater improvements planned for the Arch Creek area by the city of North Miami:

City of North Miami Upcoming Stormwater Public Investments			
	Project	Cost	Description
1	Stormwater Improvements - Basin Construction	$1M	This project provides funding for drainage improvements to drainage basin as outlined in the Stormwater Master Plan. This will alleviate flooding and also address water quality to be in compliance with the City's NPDES permit. Construction of the Arch Creek North/Arch Creek South Drainage basins from NE 135th Street to north, NE 126th St (South), West Dixie Hwy (West), and Arch Creek Road (East). According to the 2012 Stormwater Master Plan there were several areas within the Arch Creek North/Arch Creek South Drainage Basins that had experienced flooding and did not meet the 5 year Level of Service. The purpose is to construct improvements that alleviate the flooding with the corridor. We have applied for a Federal Grant to assist with this project for $1,000,000. The City would be responsible for a $500,000 match if grant is obtained.
2	Surge Resistance and Flood Mitigation	$0.5M	In 1998, the City received a Federal Emergency Management Agency grant to reconstruct nineteen (19) of the twenty-eight (28) seawalls. While two existing retaining walls do not need repairs, the remaining seven (7) retaining walls need reconstruction to ensure structural integrity in the event of storm-related tidal surges. Approximately 50 homes will be affected if the remaining retaining walls are damaged by a tidal surge. In addition, any surface or subterranean deterioration to the existing retaining walls will adversely impact the structural integrity of the swales directly behind the seawalls and subsequently damage underground utilities in close proximity to the retaining walls. Other locations with retaining walls throughout the City will also be considered for reconstruction.
3	Emergency Portable Stormwater Pumps	$0.5M	The easternmost boundary of North Miami borders Biscayne Bay for approximately 3 miles. There are several low-lying areas that flood during regular rainfall and major storm events. These portable stormwater pumps will help prevent repetitive flooding, reduce damages to residential properties, and decrease the number of recurring insurance claims.
4	Tressler Street Drainage Improvements	$0.5M	The Tressler St project is located in the Arch Creek North/Arch Creek South problem area which is located in the eastern portion of the City. The area has a mix of commercial and residential development. The existing system is inadequate to handle medium to high frequency rainfall events. The primary outfall for the problem area is a 42" reinforced concrete pipe trunk line along NE 135 ST, which discharges into Arch Creek immediately upstream of the railroad crossing. Presently, there is limited drainage for the area. Scope of Work: 1100 LF of solid piping, 800 LF of exfiltration trench, new catch basins, reshaping and regrading swales, along with street, sidewalk and curbing.

Transportation Infrastructure

- ***Roadways and Mass Transit.*** Map 13 shows the major roadways through the study area. The study area is located approximately 1.5 miles east of Interstate 95. Major roads in the study area include US-1 (Biscayne Boulevard) and NE 125th Street, which continues over the bay providing access to the barrier islands. These two roadways are also designated evacuation routes. The study area is served by several Miami-Dade County Metrobus routes as depicted on Map 14. There are several emergency bus pick up locations along the designated evacuation routes to facilitate evacuations. Many of the major roads through the study area are state roads, managed by the Florida Department of Transportation, including:
  - Biscayne Boulevard
  - NE 125th Street
  - West Dixie Highway
  - NE 135th Street
  - NE 6th Avenue

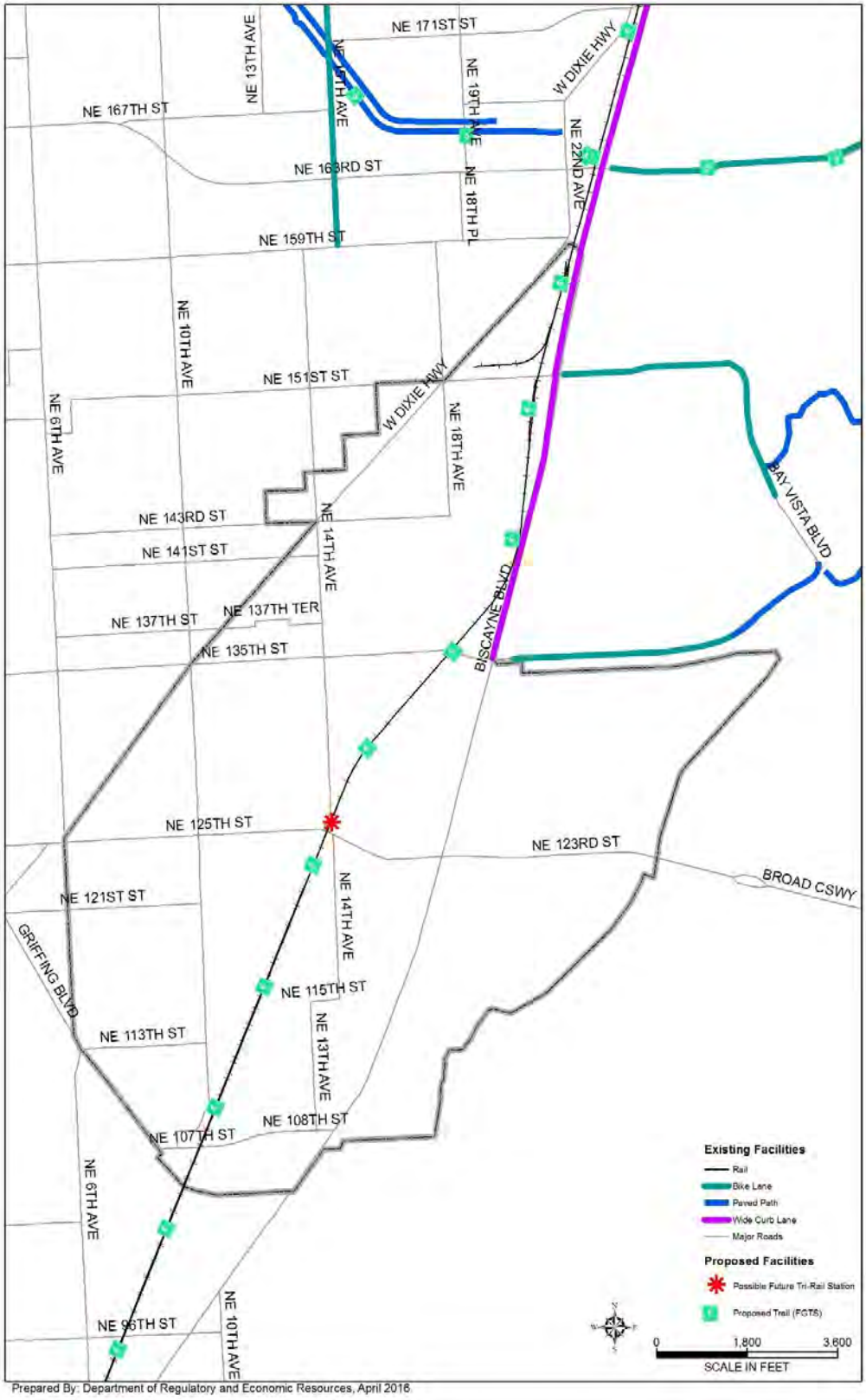
- ***Rail.*** As depicted on Map 13, the Florida East Coast (FEC) railway runs through the study area. It is a Class II regional railroad that provides service to the heavily populated Atlantic Coast Corridor from Jacksonville to Miami. FEC provides exclusive rail service to the Ports of Palm Beach, Everglades (Fort Lauderdale), Miami, and the Kennedy Space Center. The FEC's principal carload transfer yards are located at Fort Pierce, Cocoa, Pompano, Fort Lauderdale, and Miami, and its intermodal facilities are located at Jacksonville, Fort Lauderdale, Ft. Pierce, and Miami. Annually, FEC moves approximately 30 million tons of freight, including 100,000 carloads of aggregate and 170,000 new autos from its rock distribution centers in Miami, Fort Pierce, Cocoa, Daytona, St. Augustine, and Jacksonville, and from its Miami auto facility. Other important commodities moved by the FEC include: lumber, cement, chemicals, paper products, food products (including orange juice and pulp), primary metal products, machinery, bulk freight, and farm products.[13] As discussed in subsequent paragraphs, the FEC railway is proposed for passenger rail service as part of the Tri-Rail Coastal Link and Brightline projects.

- ***Bicycle Facilities.*** In recent years, the county has been increasing attention toward improving safety and access to bicycling. The study area currently lacks a connected bicycle network. Figure 20 shows a wide right curb lane bicycle facility. As depicted on Map 13, the existing bicycle network is fragmented and consists of facilities that would only be utilized by bicyclists that are comfortable mixing with vehicular traffic. Since multiple agencies are responsible for the provision of on-road bicycle facilities, the various efforts are coordinated through the Miami-Dade County Metropolitan Planning Organization.

Figure 20: Photograph of wide curb lane bicycle facility along US-1

[13] Source: 2006 Florida Freight & Passenger Rail Plan, Florida Department of Transportation

Map 13: Major Roads and Bicycle Facilities



Map 14: Metrobus Routes

Planned Transportation Improvements

- ***Tri-Rail Coastal Link*** – The intersection of the Florida East Coast Railway and NE 125th Street has been identified as a potential location for a future passenger rail station. The Tri-Rail Coastal Link is an initiative to implement passenger rail service along the Florida East Coast (FEC) Railway between Palm Beach County and downtown Miami. Service is expected to begin in 2018. The Tri-Rail Coastal Link Station Area Opportunities study identified an opportunity for redevelopment east and north of the proposed station area.[14] The study also identified weaknesses of the area, including primarily low-density residential land use and poor connectivity. A station is also planned on the FEC railway near NE 163 Street which is located just north of the study area. Figure 21 shows potential redevelopment opportunities that have been identified as part of the economic impact of the station.

Figure 21: Possible redevelopment around transit station

- ***Brightline*** – The FEC Railway has also been identified for a future privately-funded passenger rail service ("Brightline") that will connect Miami and Orlando. Brightline will use the existing Florida East Coast Railway corridor between Miami and Cocoa, and is building new track along State Road 528 between Cocoa and Orlando. The Brightline trains will pass through with no planned stops in the study area. Service between Miami and West Palm Beach is expected to begin in 2017. No date has been announced for completion of the final leg to Orlando. The only station planned for Miami-Dade County will be located in Downtown Miami.

  A rail-with-trail has been proposed as part of the Florida East Coast Railroad 'Brightline' project (see Figure 22). The Flagler Trail, as it has been named, is identified by the Florida Department Environmental Protection, Office of Greenways and Trails as a priority trail. Discussions with the developers of the Brightline project regarding incorporation of a trail component are in the preliminary stages.

[14] The full report can be found at http://tri-railcoastallink.com/downloads/Station_Area_Opportunities.pdf

Figure 22: Rendering of Possible Flagler Rail-with-Trail

- ***Long Range Transportation Plan*** – The Miami-Dade County Metropolitan Planning Organization (MPO) is a federally-mandated agency that guides the transportation process in Miami-Dade County. A primary function of the MPO is to produce and update (every 5 years) a Long Range Transportation Plan (LRTP) with a minimum time horizon of 20 years. The LRTP is a comprehensive transportation infrastructure plan that includes highway, transit, freight, and non-motorized components. The LRTP allows for multi-jurisdictional coordination on these issues. The 2040 LRTP identifies the following projects within the study area:
  - Northeast Corridor (Biscayne Blvd) Enhanced Bus Service (Priority II project)
  - West Dixie Highway (from NE 163 Street to NE 175 Street) widen to four lanes (Priority II project)
  - NE 151 Street (from NE 10 Avenue to West Dixie Highway) add two lanes and reconstruct (Priority III project)
  - NE 159 Street (from NE 6 Avenue to West Dixie Highway) add two lanes and reconstruct (Priority IV project)
  - Tri-Rail Coastal Link Project (partially funded project)
  - Natural Bridge Elementary Safe Routes to School (Priority I project)

Public Parks and Green Spaces

Public parks and green spaces located in and around the Arch Creek study area are depicted on Map 15. There are 47.5 acres of park space within the study area including the 9.3-acre Arch Creek Park, which is an Environmentally Endangered Lands site.[15] A portion of the 123-acre Miami Shores Golf Course is also located within the study area boundary and the Oleta River State Park lies just northeast of the study area boundary. These green spaces become important focal points for special emphasis within the study area. As depicted on Map 15, there are several areas of the study area (particularly west of the FEC rail line) that do not have local park space within walking distance (¼ to ½ mile). Key parks within and near the study area are described below:

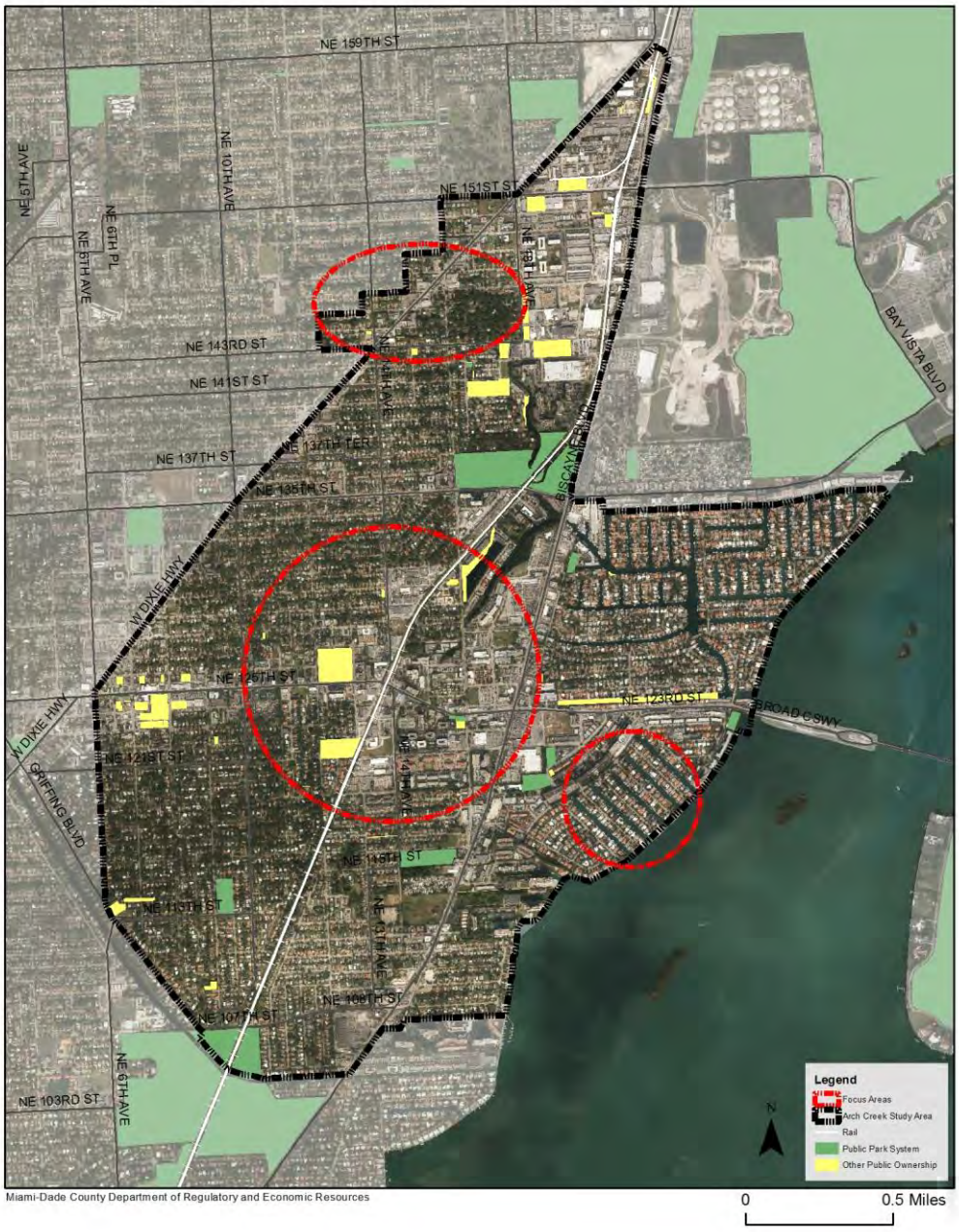
- Arch Creek Park – The 9.3-acre Arch Creek Park is managed through the County's Environmentally Endangered Lands program. The property contains an archaeological site, former military trail, and remnant oak hammock, which make it unique. The park has a museum containing artifacts left by natives who homesteaded the site as they passed over the arched bridge. The park offers nature-based recreation. Arch Creek Park is designated as a Florida State Historical Preserve.

- Enchanted Forest Elaine Gordon Park - The Enchanted Forest Elaine Gordon Park is adjacent to Arch Creek Park, just across the rail line. It is a 22-acre oasis of subtropical plants, trees, and animals, which borders Arch Creek in the heart of North Miami. It offers scenic beauty, paved trails and 2 picnic facilities that can be rented for special events and parties. There is also a private pony ride concession within the park. This park is managed by the City of North Miami.

- Oleta River State Park – Florida's largest urban park, Oleta River State Park is located on Biscayne Bay just northeast of the study area boundary. It is best known for miles of off-road bicycling trails and also offers opportunities for canoeing, kayaking, and camping. Swimming from a 1,200-foot sandy beach and saltwater fishing are also popular activities. Along the Oleta River, at the north end of the park, a large stand of beautiful mangrove forest preserves native South Florida plants and wildlife. The park is managed by the State of Florida Parks Service.

[15] More information on Environmentally Endangered Lands can be found in the following site: http://www.miamidade.gov/environment/endangered-lands.asp

Map 15: Green Spaces in Arch Creek Study Area



Proposed Park Improvements

- ***Eco-Zone.*** The Miami-Dade County Open Space Master Plan (OSMP) identifies a portion of the study area as a possible Eco-zone. According to the OSMP, "*An Eco-zone is a group of protected natural areas that are connected through greenways, blueways and biotic corridors that provide the community with experience that inspire, educate and foster stewardship of the natural environment of South Florida. Within an Eco-zone there shall be a series of connected Eco-hubs that provide resource-based education and recreation. The Vision for Miami-Dade is a system of Environmental "Zones" (clusters of environmentally endangered lands) that provide a variety of environmental education activities and programs; elevate the public's appreciate and understanding of the County's natural ecosystems; demonstrate the proper management of natural resources; engage the surrounding neighborhoods in the use and management of the sites; and link environmental sites with other elements of the open space system, through streets, greenways, trails and blueways. The concept promotes access and appreciation with responsible environmental stewardship. Over time, many of the existing EEL sites can be clustered into critical masses by acquiring neighboring lands. The vision for the environmental zones does not propose a radical amount of acquisition and physical change; instead, it is much more of a change in branding, marketing, and management, in short, repackaging what natural and cultural areas are and getting the word out about what makes it unique."*

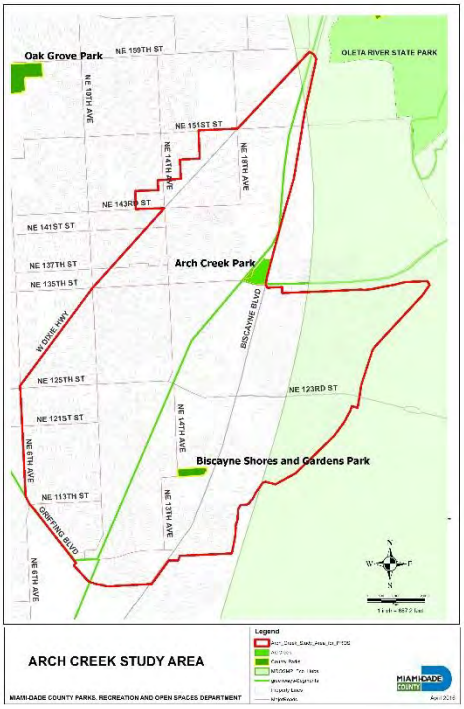


Figure 23: Open Space Master Plan

- ***Flagler Trail.*** The OSMP also depicts the "Flagler Trail" - a trail that is proposed to run along the rail line in conjunction with the Florida East Coast Railroad 'Brightline' project.

Utilities

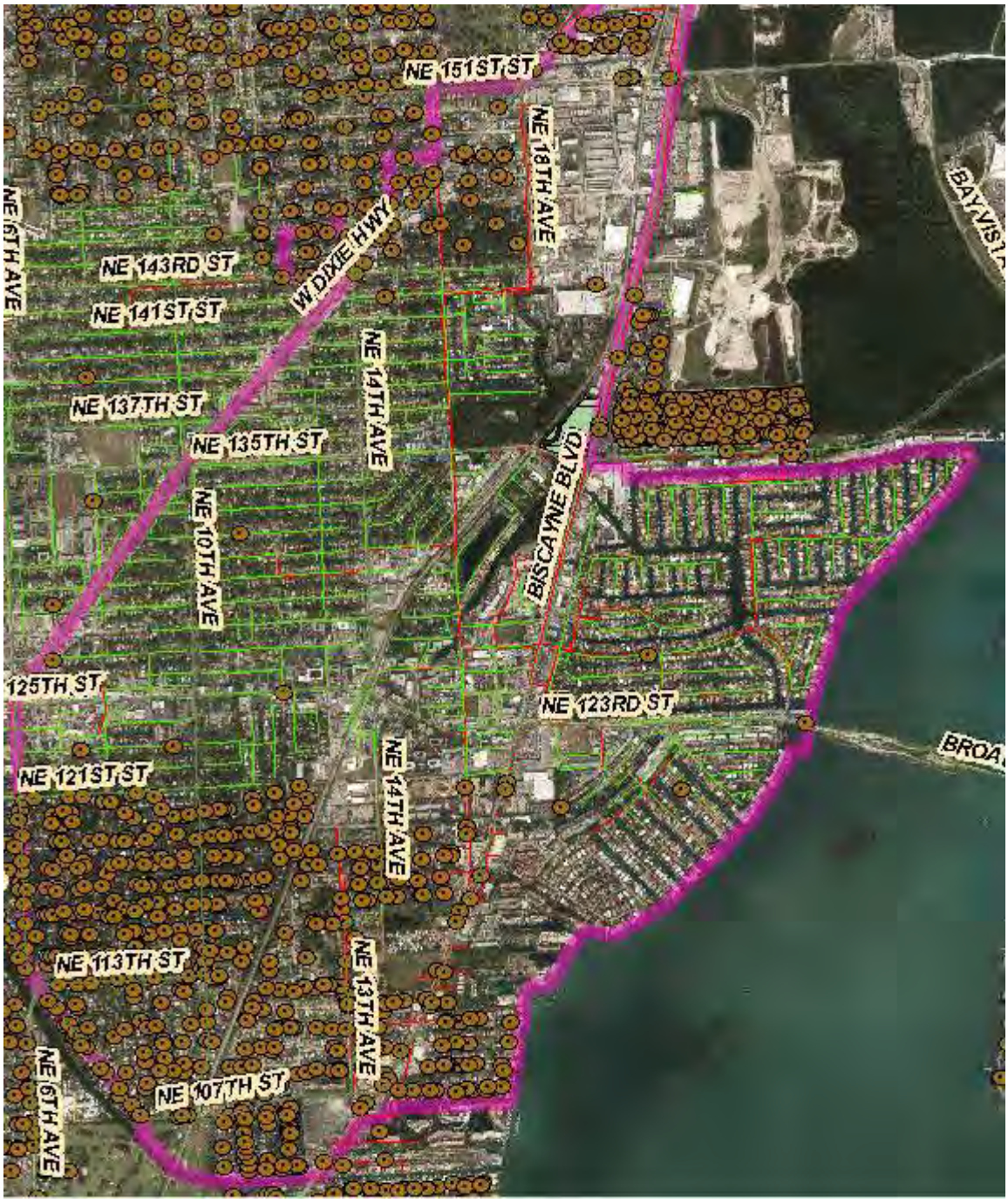
- ***Water.*** Map 16 depicts the water service area boundaries. The majority of the study area is located within the City of North Miami Water Service Area. The City of North Miami's only water plant, the Norman H. Winson Water Treatment Plant, supplies water to the western portion of the service area. The Winson Water Treatment Plant has been identified by the SFWMD as a "utility of concern" for saltwater intrusion.[16] The eastern portion of the service area (east of Biscayne Blvd) is supplied by several metered interconnects with Miami-Dade County Water and Sewer Department (WASD). The City has a 20-year contract with Miami-Dade County WASD for the wholesale purchase of water.

- ***Wastewater.*** The majority of the study area is within the City of North Miami Sewer Service Area as depicted on Map 17. Several portions of the study area lack central sewer service and rely on the use of individual septic tanks. The location of septic tanks are depicted on Figure 24. There are water quality issues due to elevated levels of fecal coliform in the area. The functionality of these septic tanks will be further challenged by rising groundwater levels. The City of North Miami does not operate a wastewater treatment plant; instead, it sends wastewater to the Miami-Dade County WASD for processing. Wastewater for those portions of the study area that are connected to central sewer service is treated at the North District Wastewater Treatment Plant, located just east of the study area boundary (see Map 18 for location).

  The North District Wastewater Treatment Plant (NDWWTP) serves the northern portion of the County and is permitted to treat an annual average daily wastewater flow of 112.5 million gallons per day to secondary treatment standards with basic disinfection. The pure oxygen activated treatment plant with primary and secondary clarification discharges effluent via ocean outfall and deep injection wells. The ocean outfall is a 90-inch pipe that extends just over 2, liquid waste or sewage discharged into, miles from the shoreline at a depth of 108 feet. In past years, there have been sewage overflows at the North District Wastewater Treatment Plant as a result of heavy rains, which have resulted in swimming bans at Oleta River State Park.

[16] South Florida Water Management District, Lower East Coast Water Supply Plan (2013)

Figure 24: Map showing the location of septic tanks (brown dots), gravity sewer lines (green lines) and sanitary sewer force mains (red lines).



In 2008, state law was amended to require all wastewater utilities in Southeast Florida utilizing ocean outfalls for disposal of treated wastewater to reduce nutrient discharges by 2018, cease using the outfalls by 2025, and reuse 60% of the wastewater flows by 2025. Reduction of nutrient discharges

is accomplished by continued use of four deep injection wells at the North District plant, thereby diverting flows from the outfall. The County's Ocean Outfall Compliance Plan recommends construction of a new wastewater treatment plant in the western portion of the County that would reduce flows to the NDWWTP.

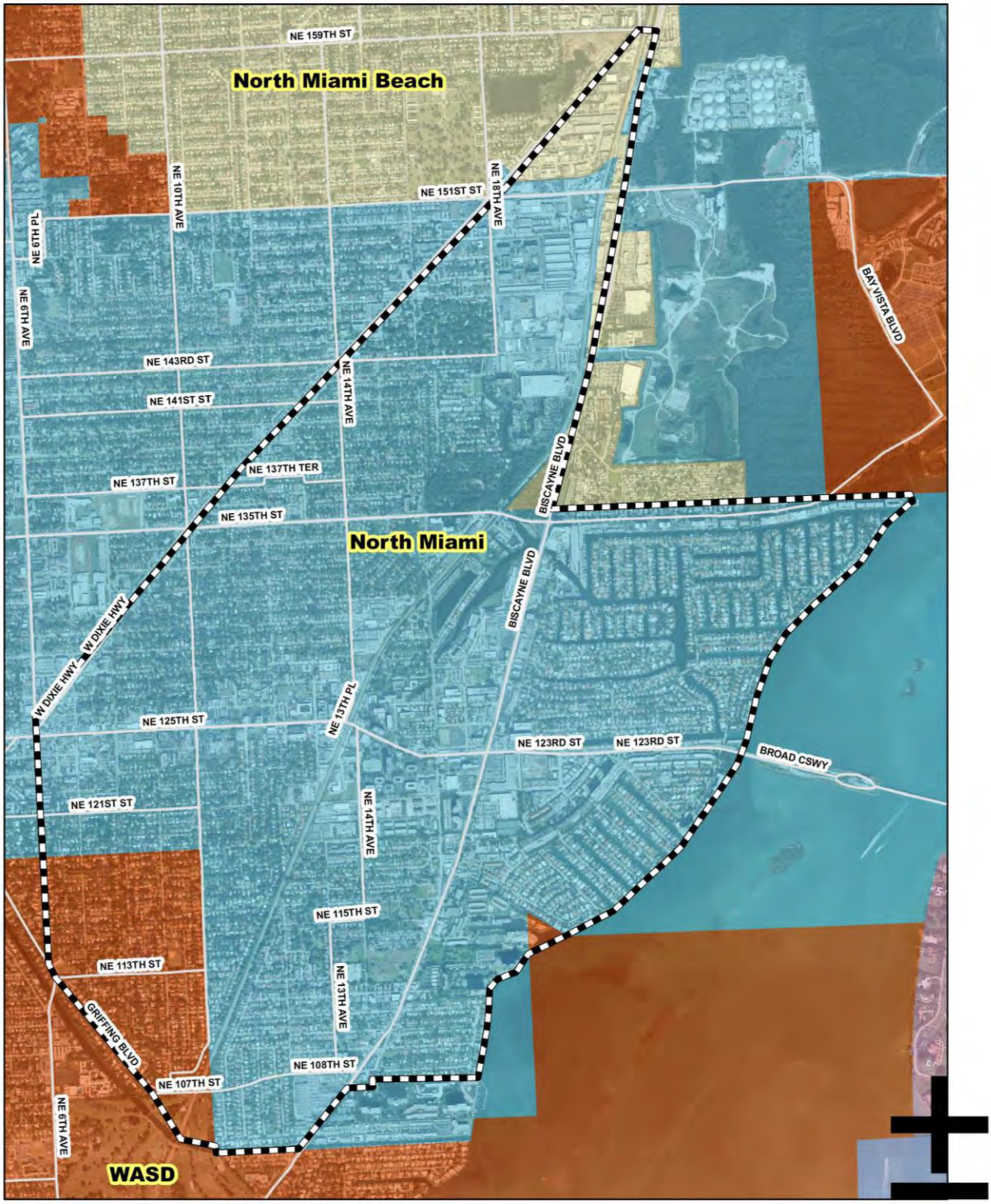
Miami-Dade County WASD has recently completed an assessment of the vulnerability of their facilities to higher storm surges due to expected sea level rise. As a result of that work, WASD has committed to a program to "harden" the existing facilities. In addition, WASD will proceed with a program to add concrete walls at strategic plant locations to reduce effects of storm surge, the addition to flood logs, which are installed before an approaching storm, and watertight doors in buildings. The department is recommending new facility assets be built at or above 17.1 feet (NGVD29). This elevation has been calculated to be above surge height, the expected sea level rise by 2075, an extreme rainfall event, and a margin of safety of 3 feet. While these design guidelines were created for a critical facility and therefore may not be an appropriate standard to apply to other types of development, these guidelines are nevertheless useful for benchmarking existing development against future conditions.

WWTP Summary of Design Criteria for Hardening against Flooding from Surge, Sea Level Rise and Extreme Storm Events.

	Existing WWTP Facility Assets		New WWTP Facility Assets	
	ft. NGVD29	**Basis**	**ft. NGVD29**	**Basis**
CDWWTP	16.0	FEMA BFE + 3ft SLR from SEFLCC(2011) +FB +SF	20.3	2075 Surge+1.23m(48")SLR + FB +SF+21"(100-yr, 72-hr rainfall)
SDWWTP	16.0	FEMA BFE + 3ft SLR from SEFLCC(2011) +FB +SF	19.0	2075 Surge+1.23m(48")SLR + FB +SF+21"(100-yr, 72-hr rainfall)
NDWWTP	16.0	Same as CDWWTP and SDWWTP	17.1	2075 Surge+1.23m(48")SLR + FB +SF+21"(100-yr, 72-hr rainfall)
FB= Freeboard = 2.0 ft. per ASCE Standard 24-05/2010 FBC Category IV				
SF= Safety Factor = 1.0 ft. per 2014 MWH study at CDWWTP				
SLR = 1.23m = 48" per NOAA High projection for 2075 (USACE High projection is 0.93m)				

Map 16: Water Service Area Map

Map 17: Sewer Service Area Map



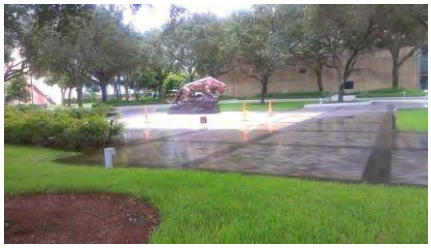
Educational and Cultural Facilities

Map 18 depicts key facilities within the study area including the educational and cultural facilities detailed below:

Public Schools. The public school locations and attendance boundaries are depicted on Maps 19 through 21.

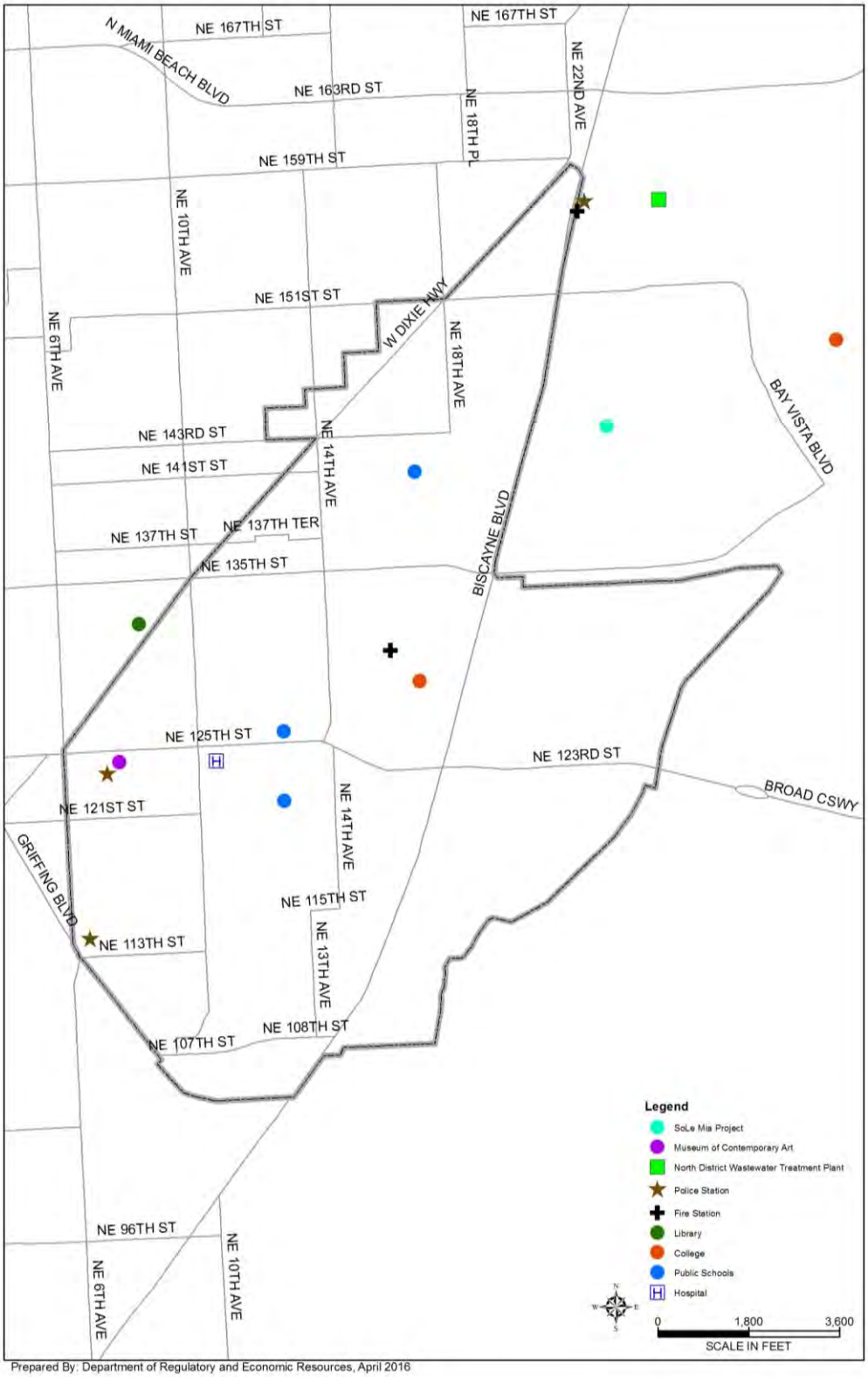
Johnson & Wales University. (1701 NE 127th Street)
Founded in 1914, Johnson & Wales University is a private, nonprofit, accredited institution. The North Miami campus, which is situated on twenty nine acres, is home to approximately 1,900 students. The University specializes in hospitality and culinary arts.

Florida International University - Biscayne Bay Campus. (3000 NE 151st Street) The Biscayne Bay Campus of Florida International University is located east of the study area. The campus is home to approximately 7,000 students. The picture to the right shows flooding at the FIU Biscayne Bay Campus.

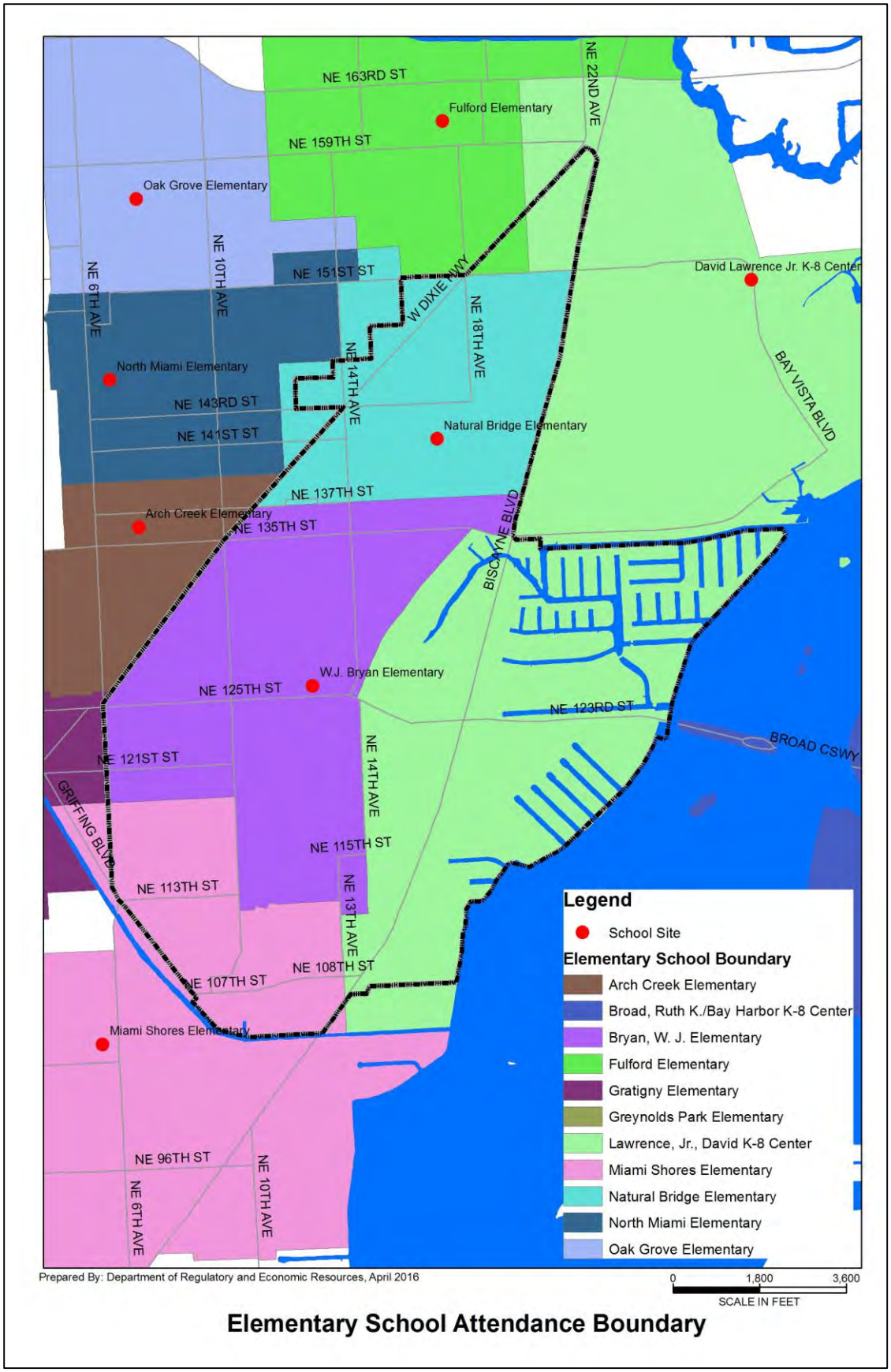


Museum of Contemporary Art
The Museum of Contemporary Art expanded from the original Center of Contemporary Art, which was inaugurated in 1981 in a modest single gallery space and expanded in 1996. The museum is a site for discovering new artists, contemplating the work of contemporary masters, and learning about our living cultural heritage.

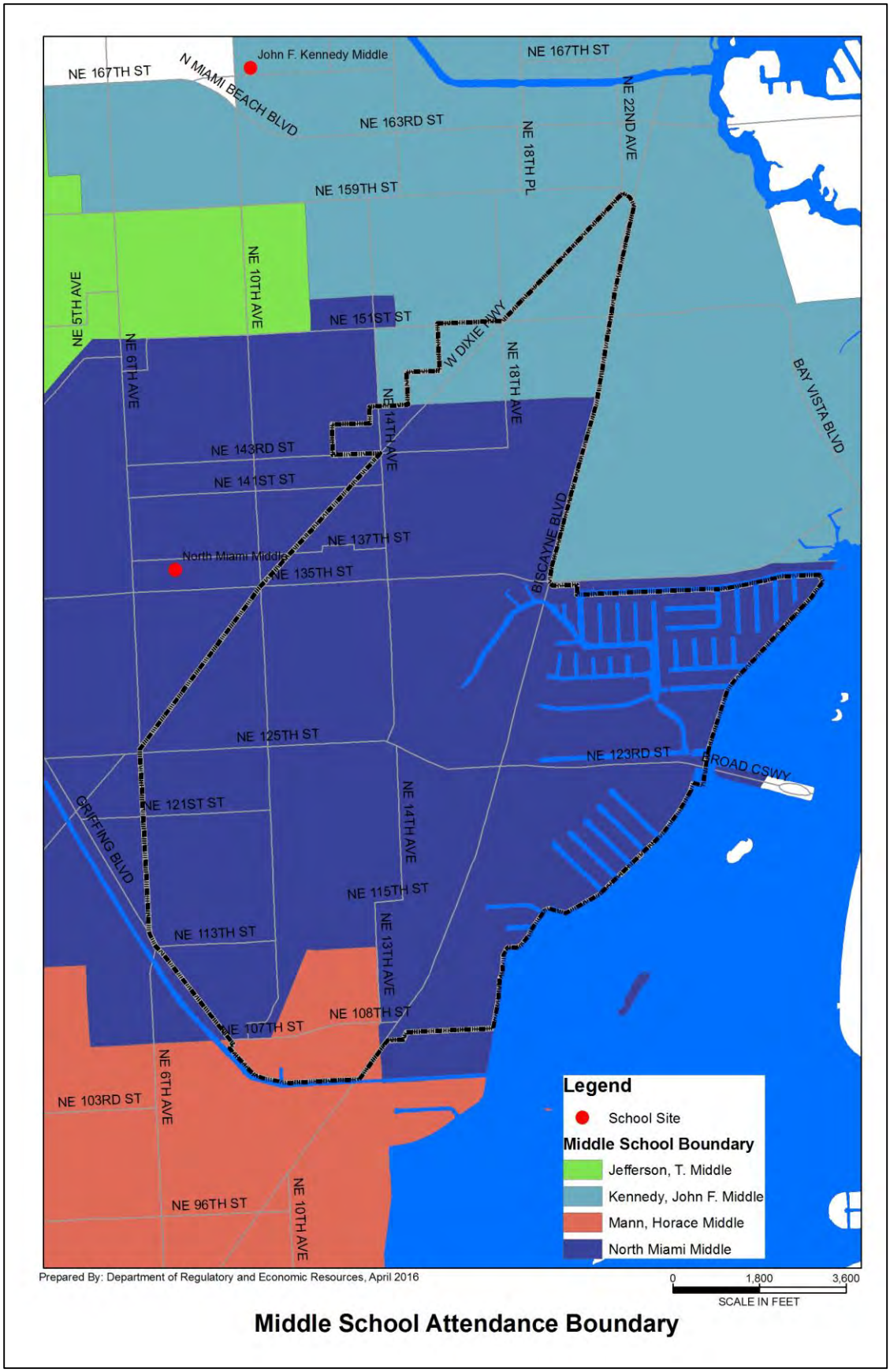
Map 18: Key Facilities in and near the study area



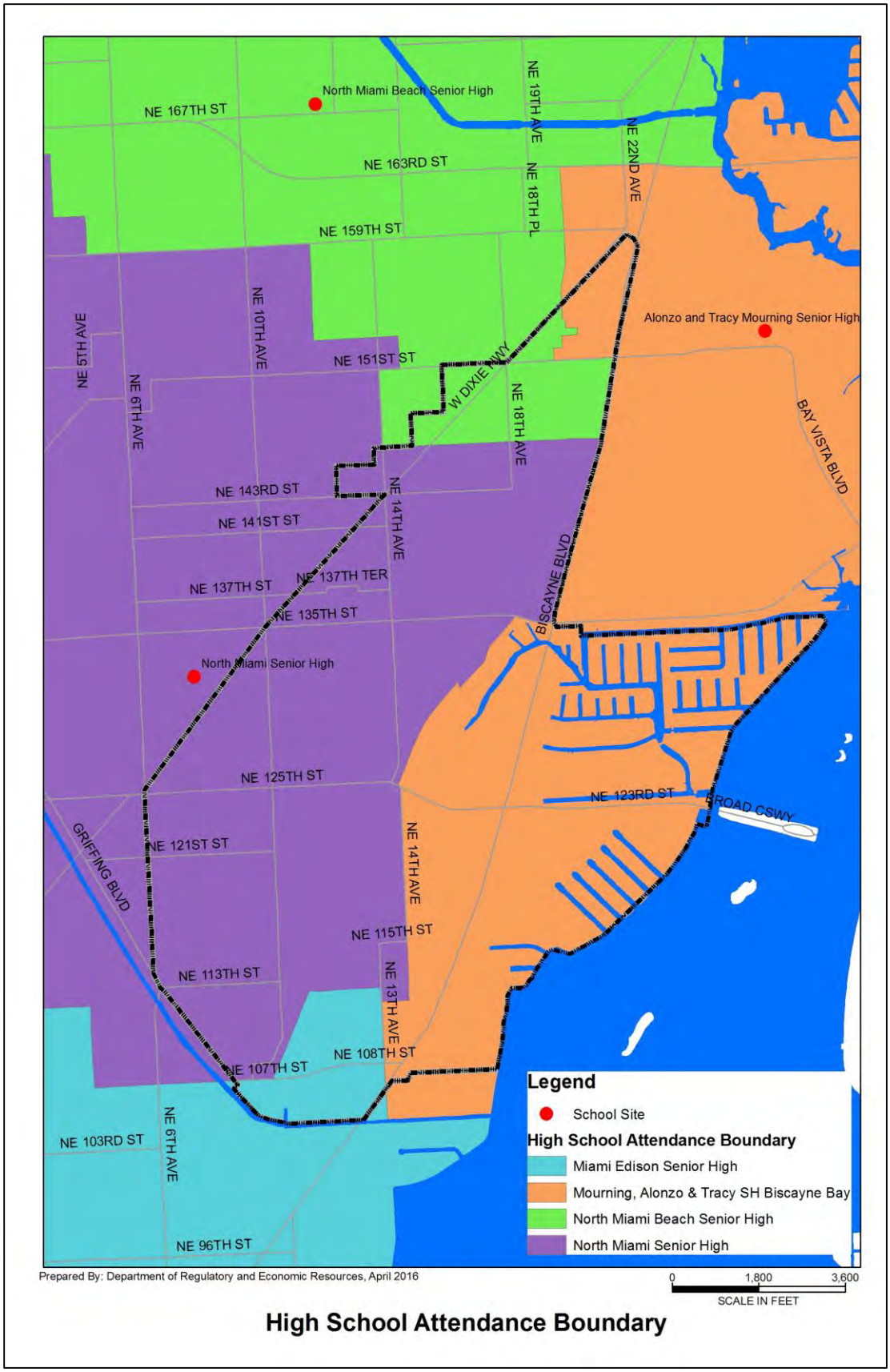
Map 19: Elementary School Attendance Boundary



Map 20: Middle School Attendance Boundary



Map 21: High School Attendance Boundary



Historical/Archaeological Resources

Prehistoric indigenous peoples occupied the area that is now Arch Creek Park hundreds of years before European exploration. A natural limestone bridge spanning 40 feet over the creek provided an excellent location for fishing. In the early 1800s, Seminole Indians lived in the area until forced out by United States soldiers during the Second Seminole War (1836-42). During the Third Seminole War (1855-59) a military trail connecting Miami and Ft. Lauderdale passed over the bridge.[17] In the late 19th Century, the Florida East Coast Railroad extended through the area. A community known as Arch Creek grew up around the Arch Creek railroad depot. By 1903 there were sufficient settlers to warrant the opening of the Arch Creek Post Office, which later became the North Miami Post Office. Below is a list of historical and archaeological resources within the Arch Creek Study Area:

Figure 36 Historical Arch Creek limestone bridge

Source: Historical Association of South Florida

- ***Arch Creek Park.***
  In 1985, the County's Historic Preservation Board designated Arch Creek Park as the Arch Creek Historical and Archaeological Park. Tequesta Indians inhabited the area from 500 B.C. to 1300 A.D. The park property also represents an integral part of Arch Creek's early Florida pioneer history. The unused roadbed between the railroad ROW and the park was the site of the historic Military Trail. It was the primary corridor for troop movement during the Seminole Wars of the 19th century. Below is a list of archaeological resources in Arch Creek Park and adjacent Enchanted Forest Park:
  - Arch Creek Historic and Archaeological Site - Historic Coontie Mill and Military Trail - Early American
  - Historic Arch Creek Road – One of Dade County's earliest roads; a military trail built by the US Army in 1856-1857 during the Third Seminole War
  - Arch Creek Site –Prehistoric Tequesta midden, habitation/village site 1000BC-AD1700
  - Arch Creek Ridge –Prehistoric Tequesta midden, habitation/village site AD750-AD1200
  - North Arch Creek Site – Prehistoric Tequesta midden, campsite, habitation/village site
  - Arch Creek midden – Prehistoric Tequesta habitation site
  - Arch Creek Site - Prehistoric Tequesta midden, habitation/village site 1000BC-AD1700
  - Enchanted Forest Site - Prehistoric Tequesta midden, habitation/village site

- ***Arch Creek Road*** *(approx. 13890 Biscayne Boulevard, North Miami Beach, Designated in 1983)*
  The historic Arch Creek Road extends through Arch Creek Park and north, just west of Biscayne Boulevard. It is historically significant as a portion of the Military Trail constructed from Fort Pierce to Fort Dallas during the Third Seminole War, 1855-1858. It was used to transport supplies and improve communications. This is one of the last visible remains of the trail that can be found in Miami-Dade County.

[17] Sources: Historical Association of Southern Florida and the Greater North Miami Historical Society

- ***Biscayne Park Village Hall*** *(640 NE 114 Street, Biscayne Park, Designated in 1983)*
  This historic log cabin is significant as a rare example of vernacular architecture in South Florida and for its association with the early Biscayne Park community. The log cabin was originally built in 1933 by the Works Progress Administration, providing much needed work for local laborers. Originally, it served as Village Hall for Biscayne Park, and has continued to serve as a prominent office and meeting space for the Village for the past 83 years. It underwent an extensive restoration in 2015 and now serves as the Village Commission Chambers.

- ***William Jennings Bryan Elementary*** *(1201 NE 125 Street, Designated in 1983)*
  Built in 1928, Willian Jennings Bryan Elementary was erected on the site of the former Arch Creek School, which served the pioneer community starting in 1905. It was designed by architect E.L. Robertson, who was later recognized for his designs in Miami Beach's Art Deco National Register Historic District. It is historically significant not only for its association with a prominent local architect, but for its important role in educating the early Arch Creek community.

- ***Burr House*** *(11900 NE 16 Avenue, Designated in 1983)*
  Built in 1907 for Edward De Vere Burr, the Burr House is one of the oldest residences in the northeastern part of the county. It is also significant for its association with the Burr family, who were influential and prominent citizens in many early Miami-Dade County communities, including Piney Woods, Lemon City, Little River, the City of Miami, Goulds, and Arch Creek. Edward De Vere Burr represented the Arch Creek area as a County Commissioner from 1914-1920, serving as Commission Chair from 1918-1920. He was also involved with the creation of the Tamiami Trail during his time as a commissioner.

- ***Green Acres Villas*** *(1465 NE 110 Street, Designated in 2010)*
  Built in 1938, Green Acres Villas is a complex of four wood-frame vernacular cottages. It is a significant example of a tourist court, which was a popular trend in Miami-Dade County during the early 20th century. Tourist courts were roadside tourist motels and reflect one of the earliest stages of motel type structures. These types of tourist courts were constructed as Miami became a popular vacation destination.

- ***Staehle House*** *(1511 NE 132 Road, Designated in 2010)*
  Built in 1948, the Staehle House is a typical example of homes in the area built specifically for World War II servicemen and their families in the late 1940s. More significantly, it is historic because it was once the home of Albert Staehle, a nationally-renowned artist and illustrator. Staehle is best known for creating Smokey the Bear.

- **Irons Manor Fountain** *(Intersection of W Dixie Highway, NE 132 Street & NE 9 Avenue, North Miami, Designated in 2015)*
  Erected circa 1925, The Irons Manor fountain is historically significant for its association with the Irons Manor subdivision, which reflects the pattern of development in the City of North Miami. The Fountain also reflects the influence of the City Beautiful movement on the early development in North Miami, where developer V. Earl Irons erected the fountain at a significant intersection as an entry feature for his Irons Manor subdivision. It is also significant for its association with V. Earl Irons, President of the Irons Land & Development Co. Irons played a significant role in the early development of the area that would become the City of North Miami, notably through the development of the Irons Manor subdivision. The fountain served as a form of public art for the earliest residents of North Miami.

Carlos A. Gimenez, Mayor

Prepared By:

Miami-Dade County Department of Regulatory and Economic Resources

Jack Osterholt, Deputy Mayor/Department Director

James F. Murley, Chief Resilience Officer

Nichole L. Hefty, Sustainability Manager

Katherine Hagemann, Sustainability Initiatives Coordinator

Mark R. Woerner, AICP, Assistant Director of Planning

Kimberly Brown, AICP, Principal Planner

MIAMI-DADE COUNTY

Appendix A

Miami-Dade County
Comprehensive Development Master
Plan (CDMP) Text related to Urban Centers

Urban Centers

Diversified urban centers are encouraged to become hubs for future urban development intensification in Miami-Dade County, around which a more compact and efficient urban structure will evolve. These Urban Centers are intended to be moderate- to high-intensity design-unified areas which will contain a concentration of different urban functions integrated both horizontally and vertically. Three scales of centers are planned: Regional, the largest, notably the downtown Miami central business district; Metropolitan Centers such as the evolving Dadeland area; and Community Centers which will serve localized areas. Such centers shall be characterized by physical cohesiveness, direct accessibility by mass transit service, and high quality urban design. Regional and Metropolitan Centers, as described below, should also have convenient, preferably direct, connections to a nearby expressway or major roadways to ensure a high level of countywide accessibility.

The locations of urban centers and the mix and configuration of land uses within them are designed to encourage convenient alternatives to travel by automobile, to provide more efficient land use than recent suburban development forms, and to create identifiable "town centers" for Miami-Dade's diverse communities. These centers shall be designed to create an identity and a distinctive sense of place through unity of design and distinctively urban architectural character of new developments within them.

The core of the centers should contain business, employment, civic, and/or high-or moderate-density residential uses, with a variety of moderate-density housing types within walking distance from the centers. Both large and small businesses are encouraged in these centers, but the Community Centers shall contain primarily moderate and smaller sized businesses which serve, and draw from, the nearby community. Design of developments and roadways within the centers will emphasize pedestrian activity, safety and comfort, as well as vehicular movement. Transit and pedestrian mobility will be increased and areawide traffic will be reduced in several ways: proximity of housing and retail uses will allow residents to walk or bike for some daily trips; provision of jobs, personal services and retailing within walking distance of transit will encourage transit use for commuting; and conveniently located retail areas will accommodate necessary shopping during the morning or evening commute or lunch hour.

Urban Centers are identified on the LUP map by circular symbols noting the three scales of planned centers. The Plan map indicates both emerging and proposed centers. The designation of an area as an urban center indicates that governmental agencies encourage and support such development. The County will give special emphasis to providing a high level of public mass transit service to all planned urban centers. Given the high degree of accessibility as well as other urban services, the provisions of this section encourage the intensification of development at these centers over time. In addition to the Urban Center locations depicted on the Land Use Plan Map, all future rapid transit station sites and their surroundings shall, at a minimum, be developed in accordance with the Community Center policies established below.

Policies for Development of Urban Centers

Following are policies for development of Urban Centers designated on the Land Use Plan (LUP) map. Where the provisions of this section authorize land uses or development intensities or densities different or greater than the underlying land use designation on the LUP map, the more liberal provisions of this section shall govern. All development and redevelopment in Urban Centers shall conform to the guidelines provided below.

Uses and Activities. Regional and Metropolitan Centers shall accommodate a concentration and variety of uses and activities which will attract large numbers of both residents and visitors while Community-scale Urban Centers will be planned and designed to serve a more localized community. Uses in Urban Centers may include retail trade, business, professional and financial services, restaurants, hotels, institutional, recreational, cultural and entertainment uses, moderate to high density residential uses, and well planned public spaces. Incorporation of residential uses is encouraged, and may be approved, in all centers, except where incompatible with airport or heavy industrial activities. Residential uses may be required in areas of the County and along rapid transit lines where there exists much more commercial development than residential development, and creation of employment opportunities will be emphasized in areas of the County and along rapid transit lines where there is much more residential development than employment opportunity. Emphasis in design and development of all centers and all of their individual components shall be to create active pedestrian environments through high-quality design of public spaces as well as private buildings; human scale appointments, activities and amenities at street level; and connectivity of places through creation of a system of pedestrian linkages. Existing public water bodies shall also be incorporated by design into the public spaces within the center.

Radius. The area developed as an urban center shall extend to a one-mile radius around the core or central transit station of a Regional Urban Center designated on the LUP map. Designated Metropolitan Urban Centers shall extend not less than one-quarter mile walking distance from the core of the center or central transit stop(s) and may extend up to one-half mile from such core or transit stops along major roads and pedestrian linkages. Community Centers shall have a radius of 700 to 1,800 feet but may be extended to a radius of one-half mile where recommended in a professional area plan for the center, consistent with the guidelines herein, which plan is approved by the Board of County Commissioners after an advertised public hearing. Urban Center development shall not extend beyond the UDB.

Streets and Public Spaces. Urban Centers shall be developed in an urban form with a street system having open, accessible and continuous qualities of the surrounding grid system, with variation, to create community focal points and termination of vistas. The street system should have frequent connections with surrounding streets and create blocks sized and shaped to facilitate incremental building over time, buildings fronting on streets and pedestrian pathways, and squares, parks and plazas defined by the buildings around them. The street system shall be planned and designed to create public space that knits the site into the surrounding urban fabric, connecting streets and creating rational, efficient pedestrian linkages. Streets shall be designed for pedestrian mobility, interest, safety and comfort as well as vehicular mobility. The size of blocks and network of streets and pedestrian accessways shall be designed so that walking routes through the center and between destinations in the center are direct, and distances are short. Emphasis shall be placed on sidewalks, with width and street-edge landscaping increased where necessary to accommodate pedestrian volumes or to enhance safety or comfort of pedestrians on sidewalks along any high-speed roadways. Crosswalks will be provided, and all multi-lane roadways shall be fitted with protected pedestrian refuges in the center median at all significant pedestrian crossings. In addition, streets shall be provided with desirable street furniture including benches, light fixtures and bus shelters. Open spaces such as public squares and greens shall be established in urban centers to provide visual orientation and a focus of social activity. They should be located next to public streets, residential areas, and commercial uses, and should be established in these places during development and redevelopment of streets and large parcels, particularly parcels 10 acres or larger. The percentage of site area for public open spaces, including squares, greens and pedestrian promenades, shall be a minimum of 15 percent of gross development area. This public area provided outdoor, at grade will be counted toward satisfaction of requirements for other common open space. Some or all of

this required open space may be provided off-site but elsewhere within the subject urban center to the extent that it would better serve the quality and functionality of the center.

Parking. Shared parking is encouraged. Reductions from standard parking requirements shall be authorized where there is a complementary mix of uses on proximate development sites, and near transit stations. Parking areas should occur predominantly in mid-block, block rear and on-street locations, and not between the street and main building entrances. Parking structures should incorporate other uses at street level such as shops, galleries, offices and public uses.

Buildings. Buildings and their landscapes shall be built to the sidewalk edge in a manner that frames the adjacent street to create a public space in the street corridor that is comfortable and interesting, as well as safe for pedestrians. Architectural elements at street level shall have a human scale, abundant windows and doors, and design variations at short intervals to create interest for the passing pedestrian. Continuous blank walls at street level are prohibited. In areas of significant pedestrian activity, weather protection should be provided by awnings, canopies, arcades and colonnades.

Density and Intensity. The range of average floor area ratios (FARs) and the maximum allowed residential densities of development within the Regional, Metropolitan and Community Urban Centers are shown in the table below. Average Floor Area Ratios (FAR)

	Average Floor Area Ratios (FAR)	Max. Densities Dwellings per Gross Acre
Regional Activity Centers	greater than 4.0 in the core not less than 2.0 in the edge	500
Metropolitan Urban Centers	greater than 3.0 in the core not less than 0.75 in the edge	250
Community Urban Centers	greater than 1.5 in the core not less than 0.5 in the edge	125

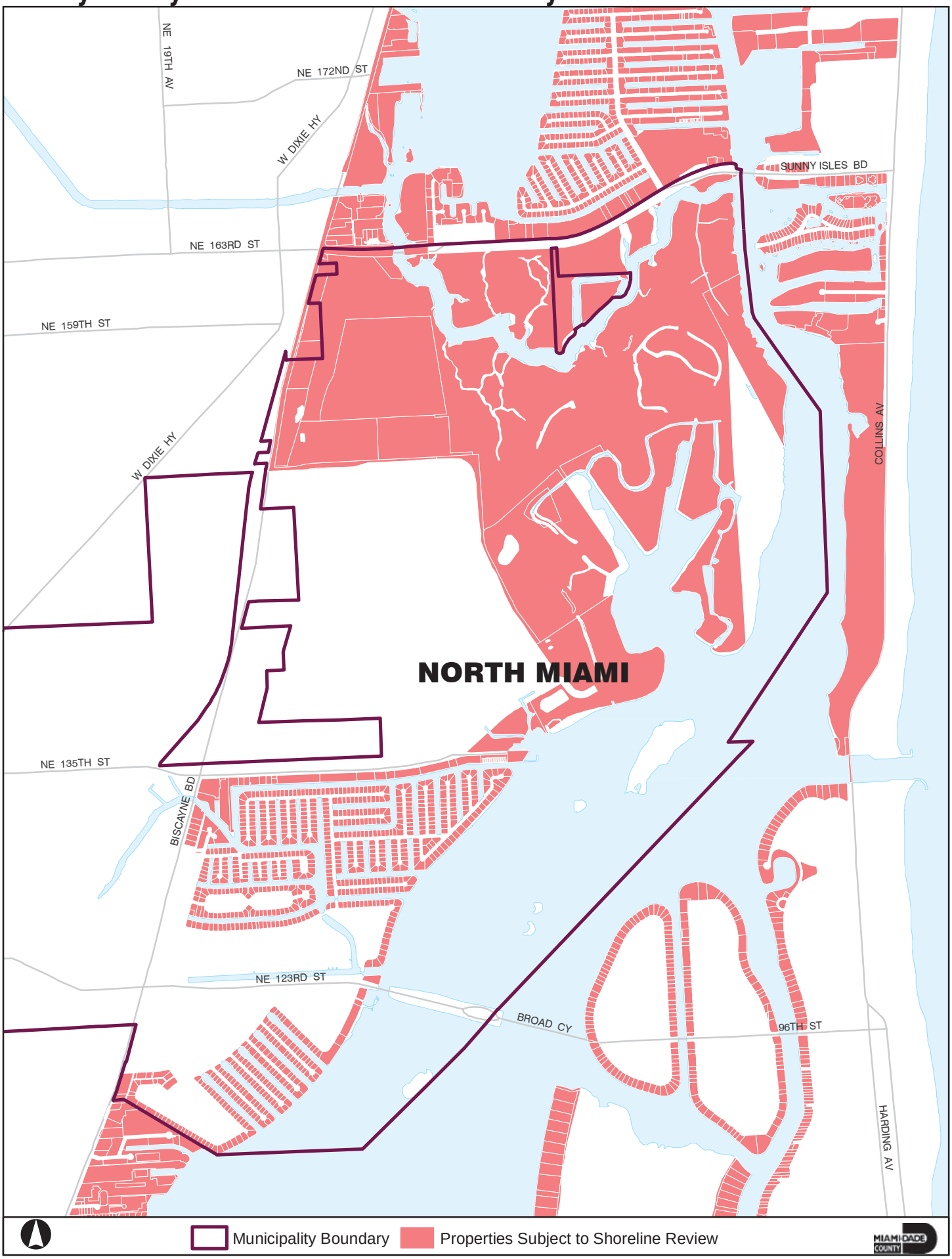
In addition, the densities and intensities of developments located within designated Community Urban Centers and around rail rapid transit stations should not be lower than those provided in Policy LU-7F. Height of buildings at the edge of Metropolitan Urban Centers adjoining stable residential neighborhoods should taper to a height no more than 2 stories higher than the adjacent residences, and one story higher at the edge of Community Urban Centers. However, where the adjacent area is undergoing transition, heights at the edge of the Center may be based on adopted comprehensive plans and zoning of the surrounding area. Densities of residential uses shall be authorized as necessary for residential or mixed-use developments in Urban Centers to conform to these intensity and height policies.

As noted previously in this section, urban centers are encouraged to intensify incrementally over time. Accordingly, in planned future rapid transit corridors, these intensities may be implemented in phases as necessary to conform with provisions of the Transportation Element, and the concurrency management program in the Capital Improvement Element, while ensuring achievement of the other land use and design requirements of this section and Policy LU-7F.

Appendix B

Map of Properties within the Review Boundary
of the Miami-Dade County Shoreline Development
Review Committee

Biscayne Bay Shoreline Review Boundary



Appendix C

Miami-Dade County
Comprehensive Development Master
Plan (CDMP) Policies Related to
Climate Change

COMPREHENSIVE DEVELOPMENT MASTER PLAN (CDMP)
CLIMATE CHANGE POLICIES

LU-3E. By 2017, Miami-Dade County shall initiate an analysis on climate change and its impacts on the built environment addressing development standards and regulations related to investments in infrastructure, development/redevelopment and public facilities in hazard prone areas. The analysis shall consider and build on pertinent information, analysis and recommendations of the Regional Climate Change Action Plan for the Southeast Florida Regional Climate Change Compact Counties, and will include the following elements:

a) an evaluation of property rights issues and municipal jurisdiction associated with the avoidance of areas at risk for climate hazards including sea level rise;

b) an evaluation of the current land supply-demand methodology to consider and address, as appropriate, the risk associated with infrastructure investments in flood prone areas; and

c) an evaluation of the CDMP long-term time horizon in relation to addressing projected long-range climate change impacts.

Recommendations from the analysis shall address appropriate changes to land use designations and zoning of impacted properties, and development standards, among other relevant considerations.

LU-3F. By 2017, Miami-Dade County shall develop a Development Impact Tool or criteria to assess how proposed development and redevelopment project features including location, site design, land use types, density and intensity of uses, landscaping, and building design, will help mitigate climate impacts or may exacerbate climate related hazards. The tool would also assess each development's projected level of risk of exposure to climate change impacts, such as inland flooding.

LU-3G. Miami-Dade County shall, by 2017, analyze and identify public infrastructure vulnerable to sea level rise and other climate change-related impacts. This analysis shall include public buildings, water and waste water treatment plants, transmission lines and pump stations, stormwater systems, roads, rail, bridges, transit facilities and infrastructure, airport and seaport infrastructure, libraries, fire and police stations and facilities.

LU-3H. In order to address and adapt to the impacts of climate change, Miami-Dade County shall continue to improve analysis and mapping capabilities for identifying areas of the County vulnerable to sea level rise, tidal flooding and other impacts of climate change.

LU-3I. Miami-Dade County shall make the practice of adapting the built environment to the impacts of climate change an integral component of all planning processes, including but not limited to comprehensive planning, infrastructure planning, building and life safety codes, emergency management and development regulations, stormwater management, and water resources management.

LU-3J. Miami-Dade County shall continue to actively participate in the Southeast Florida Regional Climate Change Compact and collaborate to increase regional climate change resiliency by sharing technical expertise, assessing regional vulnerabilities, advancing agreed upon mitigation and adaptation strategies and developing joint state and federal legislation policies and programs.

LU-3K. By 2017, Miami-Dade County shall determine the feasibility of designating areas in the unincorporated area of the County as Adaptation Action Areas as provided by Section

163.3177(6)(g)(10), Florida Statute, in order to determine those areas vulnerable to coastal storm surge and sea level rise impacts for the purpose of developing policies for adaptation and enhance the funding potential of infrastructure adaptation projects.

LU-3L. Miami-Dade County shall work with its local municipalities to identify and designate Adaptation Action Areas as provided by Section 163.3164(1), Florida Statute, in order to develop policies for adaptation and enhance the funding potential for infrastructure projects.

LU-3M. Miami-Dade County shall support the implementation of climate-change related policies, through education, advocacy and incentive programs. Public outreach, such as workshops or a website with relevant information, shall seek to shift residents' everyday transportation decisions and housing choices to support transit oriented communities and travel patterns. The County shall provide opportunities for the public, including students, building industry and environmental groups, to participate in the development of any new climate change related land development regulations and initiatives.

GOAL. DEVELOP AND MAINTAIN AN INTEGRATED MULTIMODAL TRANSPORTATION SYSTEM IN MIAMI-DADE COUNTY TO MOVE PEOPLE AND GOODS IN A MANNER CONSISTENT WITH OVERALL COUNTYWIDE LAND USE AND ENVIRONMENTAL PROTECTION GOALS AND INTEGRATION OF CLIMATE CHANGE CONSIDERATIONS IN THE FISCAL DECISION-MAKING PROCESS.

Objective TE-1. Miami-Dade County will provide an integrated multimodal transportation system for the circulation of motorized and non-motorized traffic by enhancing the Comprehensive Development Master Plan and its transportation plans and implementing programs to provide competitive surface transportation mode choice, local surface mode connections at strategic locations, and modal linkages between the airport, seaport, rail and other inter-city and local and intrastate transportation facilities. These plans and programs shall seek to ensure that, among other objectives, all transportation agencies shall consider climate change adaptation into their public investment processes and decisions.

TE-1G. Miami-Dade County shall develop and adopt climate change adaptation and mitigation strategies for incorporation into all public investment processes and decisions, including those concerning transportation improvements.

TE-1H. Transportation agencies developing their transportation plans for Miami-Dade County shall take into consideration climate change adaptation and mitigation strategies through project review, design, and funding for all transportation projects. Transportation agencies should consider extending their planning horizons appropriately to address climate change impacts.

Objective TC-6. Plan and develop a transportation system that preserves environmentally sensitive areas, conserves energy and natural resources, addresses climate change impacts, and promotes community aesthetic values.

TC-6A. The County shall avoid transportation improvements which encourage or subsidize increased development in coastal high hazard areas, or environmentally sensitive areas

identified in the Coastal Management and Conservation, Aquifer Recharge and Drainage Elements, and areas of high risk of significant inland flooding.

TC-6D. New roadways shall be designed to prevent and control soil erosion, minimize clearing and grubbing operations, minimize storm runoff, minimize exposure and risk of climate change impacts such as increased flood conditions, and avoid unnecessary changes in drainage patterns.

TC-7E. The County shall promote coordination with all relevant transportation agencies to address climate change impacts.

MT-2E. Miami-Dade Transit should consider climate change mitigation and adaptation strategies and prioritize those strategies and programs.

Objective CON-1
Improve air quality in the County to meet all National Ambient Air Quality Standards set by the Environmental Protection Agency (EPA) and their respective deadlines; and reduce human exposure to air pollution; and take into consideration climate change mitigation and adaptation strategies.

CON-1J. Miami-Dade County shall continue to implement its CO2 Plan recommendations to reduce CO2 levels and take into consideration the recommendations of the Southeast Florida Regional Climate Change Compact to reduce greenhouse gas emissions in accordance with all applicable regulations.

CON-6F. Miami-Dade County shall coordinate with cities to develop a long-term vision for agricultural and other undeveloped lands outside of the UDB to ensure these lands continue to support urban communities and protect native plant and animal species from climate related impacts. Long-term land planning outside the UDB should also consider water storage opportunities.

WS-3F. The Miami-Dade County Water, Wastewater, and Reuse Integrated Master Facilities Plan, the primary vehicle for planning for water, sewer, and reuse facilities, shall continue to be updated on a regular basis. The integrated Master Plan shall include initiatives to address climate change and sea level rise that would impact the water and sewer infrastructure and drinking water supplies.

WS-4H. Miami-Dade County shall coordinate with municipalities and the State of Florida to monitor existing septic tanks that are currently at risk of malfunctioning due to high groundwater levels or flooding and shall develop and implement programs to abandon these systems and/or connect users to the public sewer system. The County shall also coordinate to identify which systems will be adversely impacted by projected sea level rise and additional storm surge associated with climate change and shall plan to target those systems to protect public health, natural resources, and the region's tourism industry.

Objective WS-4. Reduction in the use of septic tanks and other private wastewater treatment facilities. Recommended measurements include: proportion of septic tank permits issued that are for new septic tanks as opposed to septic tank abandonments; number of non-residential septic tanks and other private treatment facilities, unsewered and developed areas with wellfield protection areas; number of IW (industrial wastewater) permits; number of conversions by permit from septic tank system to central system per year or any given period; and location of existing

septic tanks in areas of the County at higher risk of malfunction due to climate change impacts such as higher groundwater levels and increased storm surges.

CM-9H. Rise in sea level projected by the federal government, and refined by the Southeast Florida Regional Climate Change Compact, shall be taken into consideration in all future decisions regarding the design, location, and development of infrastructure and public facilities in the County.

ICE-5F. The County shall continue participation in the Southeast Florida Regional Climate Change Compact and shall coordinate with other agencies, local municipalities, and the private sector to develop initiatives and goals to address climate change mitigation and adaptation. Climate change related goals that support regional climate change objectives shall be integrated into the CDMP as appropriate.

ICE-5G. All County departmental master plans and strategic business plans shall include and prioritize climate change mitigation and adaptation strategies. Climate change related amendments shall be recommended through the next feasible, regularly scheduled amendment process or departmental master plan update for each respective planning document.

a) Each County department shall consider extending planning horizons (i.e. 30, 50, 75-year plans) as appropriate to adequately address the projected long-term climate change impacts into resource allocation recommendations.

b) All new departmental climate change policies and programs shall be monitored for effectiveness.

Appendix D

Land Use and Zoning Maps for
Municipalities within the Study Area

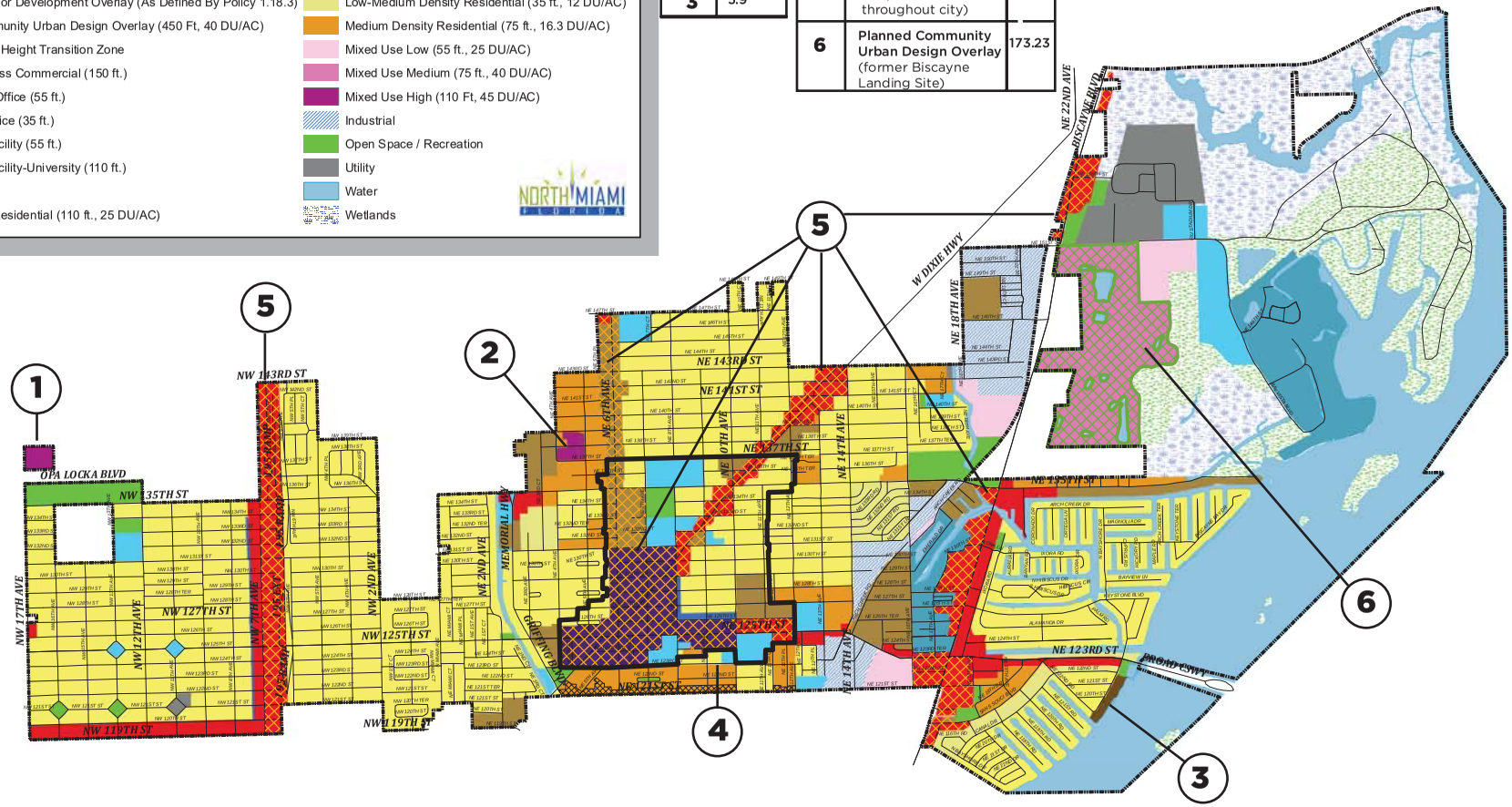
City of North Miami - Future Land Use Map

Legend

- City of North Miami Boundary
- NRO Boundary (130 Ft, 90 DU/AC)
- Planned Corridor Development Overlay (As Defined By Policy 1.18.3)
- Planned Community Urban Design Overlay (450 Ft, 40 DU/AC)
- Biscayne Park Height Transition Zone
- Central Business Commercial (150 ft.)
- Commercial / Office (55 ft.)
- Residential Office (35 ft.)
- Community Facility (55 ft.)
- Community Facility-University (110 ft.)
- Conservation
- High Density Residential (110 ft., 25 DU/AC)
- Bayshore Zone (115 ft, 100 DU/AC)
- Low Density Residential (35 ft., 5.1 DU/AC)
- Low-Medium Density Residential (35 ft., 12 DU/AC)
- Medium Density Residential (75 ft., 16.3 DU/AC)
- Mixed Use Low (55 ft., 25 DU/AC)
- Mixed Use Medium (75 ft., 40 DU/AC)
- Mixed Use High (110 Ft, 45 DU/AC)
- Industrial
- Open Space / Recreation
- Utility
- Water
- Wetlands

site	acres
1	7.96
2	6.2
3	5.9

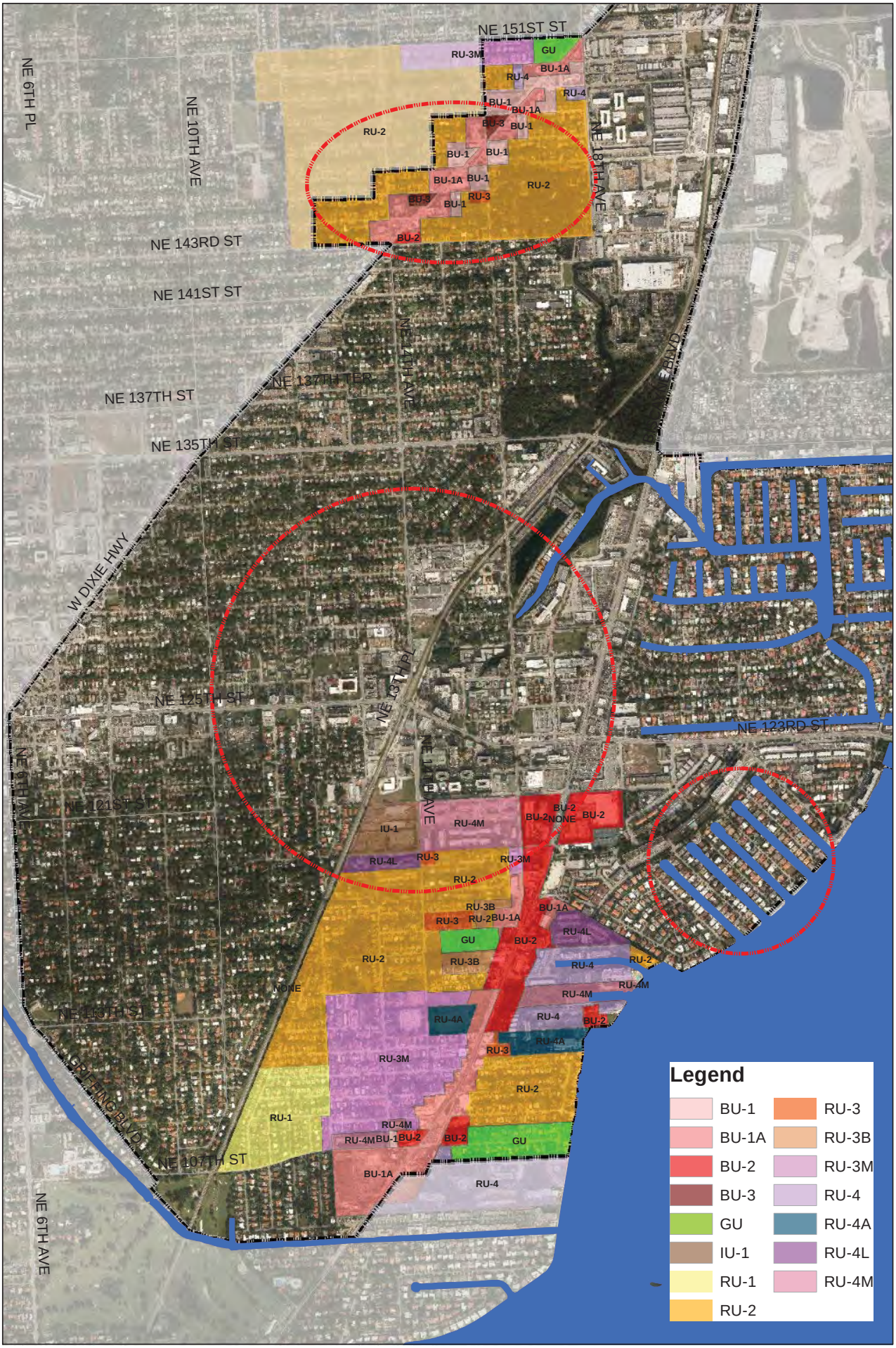
site	description	acres
4	NRO Adjustment (S.E Corner)	15.81
5	Planned Corridor Development Overlay (major corridors throughout city)	236.43
6	Planned Community Urban Design Overlay (former Biscayne Landing Site)	173.23



0 0.75 1.5 3 4.5 6 Miles

N W E S

Map Created March 2016



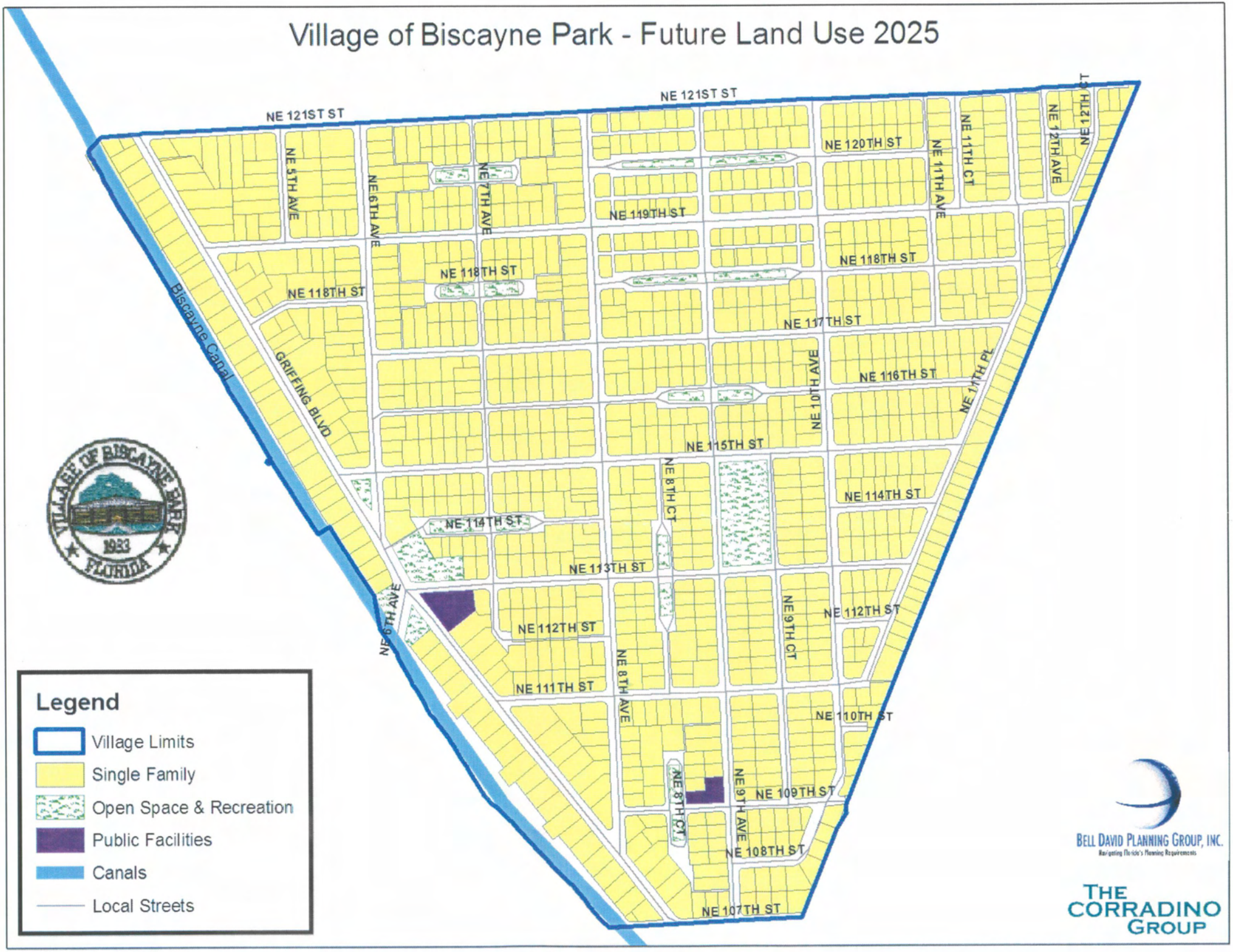
Prepared By: Department of Regulatory and Economic Resources, April 2016

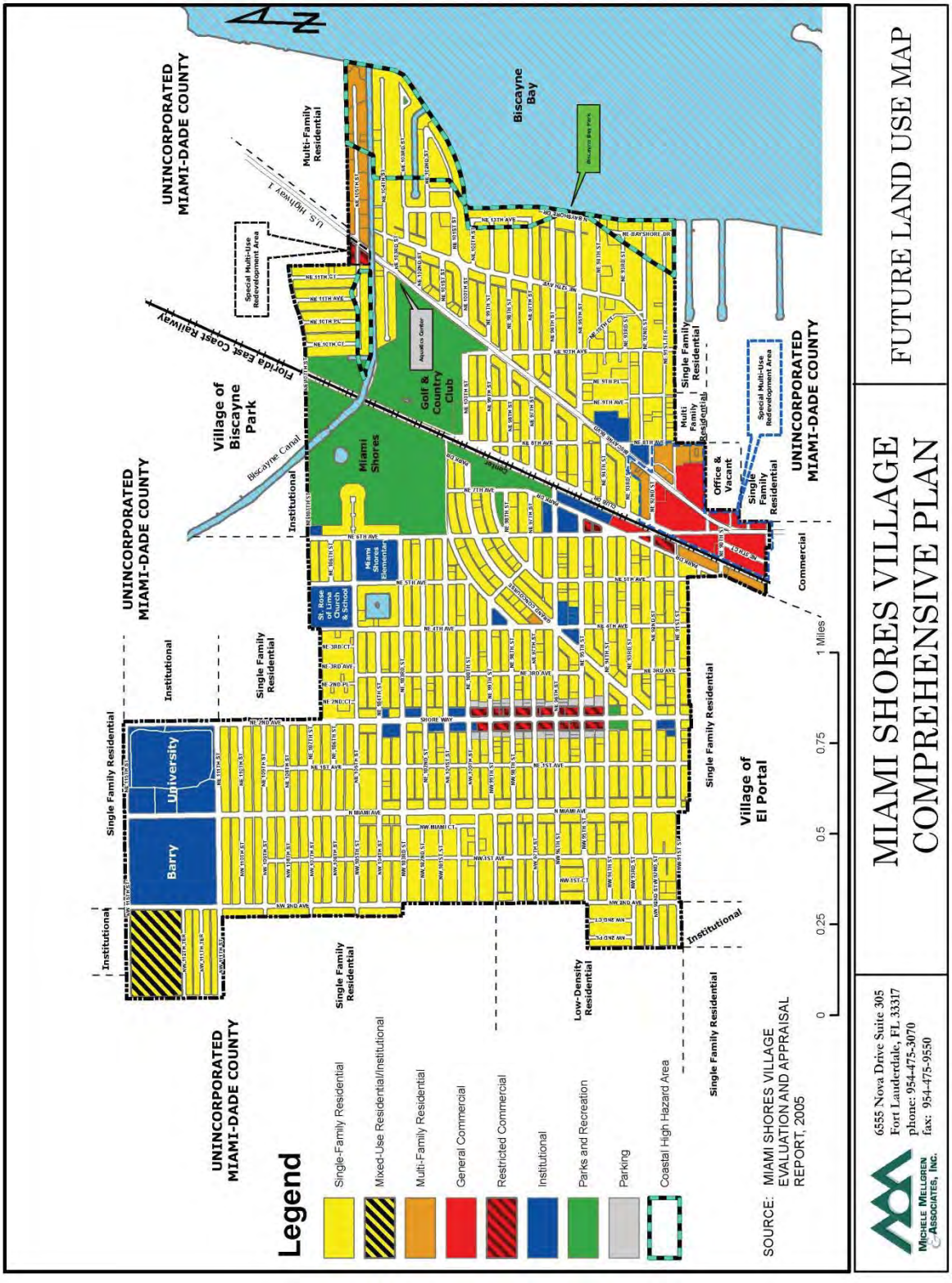
0 1,250 2,500

SCALE IN FEET

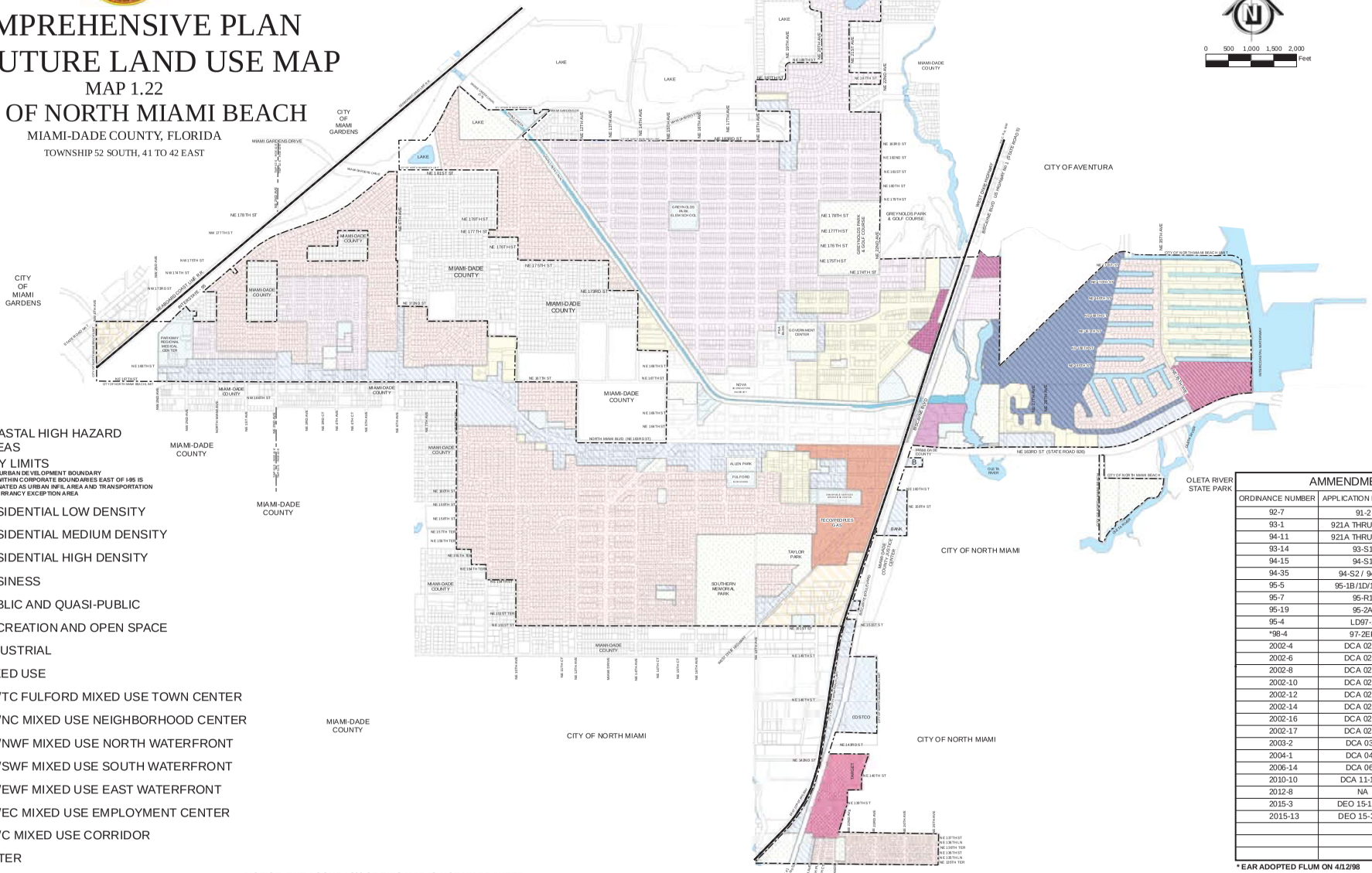
Miami-Dade County Zoning Map

Village of Biscayne Park - Future Land Use 2025




MIAMI SHORES VILLAGE
COMPREHENSIVE PLAN
FUTURE LAND USE MAP
Legend
Single-Family Residential
Mixed-Use Residential/Institutional
Multi-Family Residential
General Commercial
Restricted Commercial
Institutional
Parks and Recreation
Parking
Coastal High Hazard Area
SOURCE: MIAMI SHORES VILLAGE EVALUATION AND APPRAISAL REPORT, 2005
0 0.25 0.5 0.75 1 Miles
Biscayne Bay
Biscayne Canal
Florida East Coast Railway
U.S. Highway 1
Village of Biscayne Park
Village of El Portal
Miami Shores
Golf & Country Club
Aquatic Center
Barry University
Miami Shores Elementary
St. Rose of Lima Church & School
Special Multi-Use Redevelopment Area
UNINCORPORATED MIAMI-DADE COUNTY
Multi-Family Residential
Single Family Residential
Institutional
Commercial
Office & Vacant
Low-Density Residential
MICHELE MELLGREN & ASSOCIATES, INC.
6555 Nova Drive Suite 305
Fort Lauderdale, FL 33317
phone: 954-475-3070
fax: 954-475-9550

COMPREHENSIVE PLAN
2015 FUTURE LAND USE MAP
MAP 1.22
CITY OF NORTH MIAMI BEACH
MIAMI-DADE COUNTY, FLORIDA
TOWNSHIP 52 SOUTH, 41 TO 42 EAST



LEGEND:

- COASTAL HIGH HAZARD AREAS
- CITY LIMITS

NOTE: URBAN DEVELOPMENT BOUNDARY AREA WITHIN CORPORATE BOUNDARIES EAST OF I-95 IS DESIGNATED AS URBAN INFIL AREA AND TRANSPORTATION CONCURRANCY EXCEPTION AREA

- RESIDENTIAL LOW DENSITY
- RESIDENTIAL MEDIUM DENSITY
- RESIDENTIAL HIGH DENSITY
- BUSINESS
- PUBLIC AND QUASI-PUBLIC
- RECREATION AND OPEN SPACE
- INDUSTRIAL
- MIXED USE
- MU/TC FULFORD MIXED USE TOWN CENTER
- MU/NC MIXED USE NEIGHBORHOOD CENTER
- MU/NWF MIXED USE NORTH WATERFRONT
- MU/SWF MIXED USE SOUTH WATERFRONT
- MU/EWF MIXED USE EAST WATERFRONT
- MU/EC MIXED USE EMPLOYMENT CENTER
- MU/C MIXED USE CORRIDOR
- WATER

AMMENDMENTS		
ORDINANCE NUMBER	APPLICATION NUMBER	DATE
92-7	91-2	5/19/1992
93-1	921A THRU 92-1F	1/19/1993
94-11	921A THRU 92-1F	5/17/1994
93-14	93-S1	12/21/1993
94-15	94-S1	6/21/1994
94-35	94-S2 / 94-S3	10/18/1994
95-5	95-1B/1D/1E/1F	4/18/1995
95-7	95-R1	8/15/1995
95-19	95-2A	12/5/1995
95-4	LD97-1	4/21/1998
*98-4	97-2ER	4/21/1998
2002-4	DCA 02S4	9/3/2002
2002-6	DCA 02S8	9/3/2002
2002-8	DCA 02S1	9/3/2002
2002-10	DCA 02S2	9/3/2002
2002-12	DCA 02S3	9/3/2002
2002-14	DCA 02S5	9/3/2002
2002-16	DCA 02S7	9/3/2002
2002-17	DCA 02S6	9/3/2002
2003-2	DCA 03-1	4/15/2003
2004-1	DCA 04-1	2/3/2004
2006-14	DCA 06-1	10/3/2006
2010-10	DCA 11-1ER	4/26/2011
2012-8	NA	6/5/2012
2015-3	DEO 15-1ESR	3/17/2015
2015-13	DEO 15-3ESR	10/20/2015

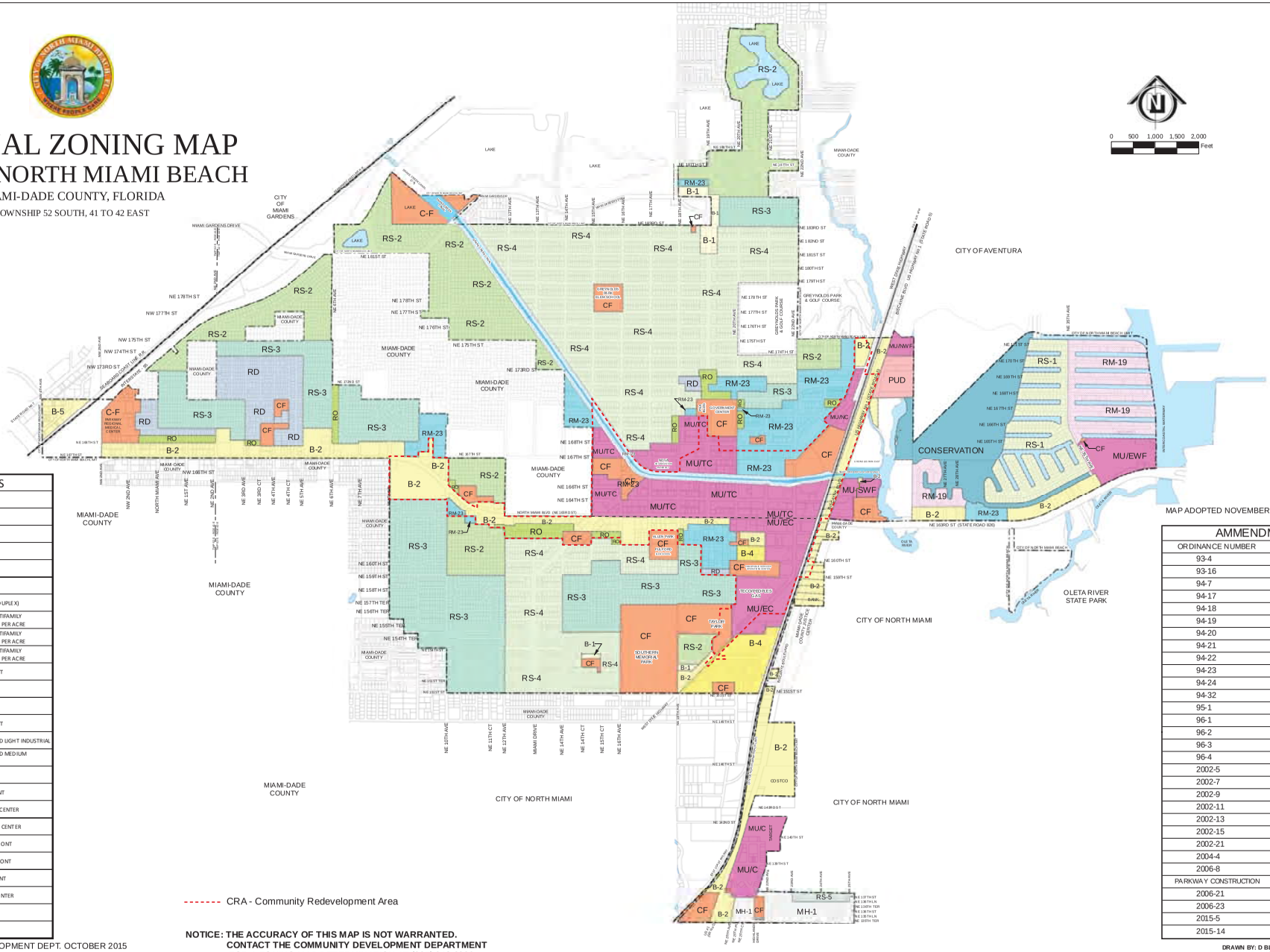
* EAR ADOPTED FLUM ON 4/12/98

MAP ADOPTION: APRIL 21, 1998
REVISED BY: COMMUNITY DEVELOPMENT DEPT. - OCTOBER 2015
REVISED: OCTOBER 26, 2015, MAP REPRINTED: OCTOBER 26, 2015

NOTICE: THE ACCURACY OF THIS MAP IS NOT WARRANTED.
CONTACT THE COMMUNITY DEVELOPMENT DEPARTMENT
FOR A FURUTRE LAND USE MAP DETERMINATION AT (305) 948-2966

DRAWN BY: D BLALOCK
MAP NAME: GIS\Users\SharedWorkSpace\Projects\CommDev\FLUM20151026.mxd

OFFICIAL ZONING MAP
CITY OF NORTH MIAMI BEACH
MIAMI-DADE COUNTY, FLORIDA
TOWNSHIP 52 SOUTH, 41 TO 42 EAST



ZONING DISTRICTS	
RS-1	RESIDENTIAL SINGLE FAMILY (8,000 SF MINIMUM)
RS-2	RESIDENTIAL SINGLE FAMILY (7,000 SF MINIMUM)
RS-3	RESIDENTIAL SINGLE FAMILY (6,000 SF MINIMUM)
RS-4	RESIDENTIAL SINGLE FAMILY (5,000 SF MINIMUM)
RS-5	RESIDENTIAL SINGLE FAMILY (1,200 SF MINIMUM)
MH-1	MOBILE HOME SUBDIVISION
RD	RESIDENTIAL TWO-FAMILY (DUPLEX)
RM-19	RESIDENTIAL LOW-RISE MULTIFAMILY MEDIUM DENSITY - 19 UNITS PER ACRE
RM-23	RESIDENTIAL LOW-RISE MULTIFAMILY MEDIUM DENSITY - 23 UNITS PER ACRE
RM-32	RESIDENTIAL LOW-RISE MULTIFAMILY MEDIUM DENSITY - 32 UNITS PER ACRE
RO	RESIDENTIAL OFFICE DISTRICT
B-1	LIMITED BUSINESS DISTRICT
B-2	GENERAL BUSINESS DISTRICT
B-3	INTENSIVE BUSINESS DISTRICT
B-4	DISTRIBUTION BUSINESS AND LIGHT INDUSTRIAL
B-5	DISTRIBUTION BUSINESS AND MEDIUM INDUSTRIAL
CF	COMMUNITY FACILITY
PUD	PLANNED UNIT DEVELOPMENT
MU/TC	FULFORD MIXED USE TOWN CENTER
MU/NC	MIXED USE NEIGHBORHOOD CENTER
MU/NWF	MIXED USE NORTH WATERFRONT
MU/SWF	MIXED USE SOUTH WATERFRONT
MU/EWF	MIXED USE EAST WATERFRONT
MU/EC	MIXED USE EMPLOYMENT CENTER
MU/C	MIXED USE CORRIDOR
	CONSERVATION

CRA - Community Redevelopment Area

NOTICE: THE ACCURACY OF THIS MAP IS NOT WARRANTED.
CONTACT THE COMMUNITY DEVELOPMENT DEPARTMENT
FOR A ZONING MAP DETERMINATION AT (305) 948-2966

MAP ADOPTED NOVEMBER 20, 1990, ORDINANCE 90-27

AMMENDMENTS	
ORDINANCE NUMBER	DATE AMENDED
93-4	06-15-1993
93-16	12-21-1993
94-7	04-05-1994
94-17	07-19-1994
94-18	07-19-1994
94-19	07-19-1994
94-20	08-02-1994
94-21	07-19-1994
94-22	07-19-1994
94-23	07-19-1994
94-24	07-19-1994
94-32	10-05-1994
95-1	02-21-1995
96-1	02-06-1996
96-2	02-06-1996
96-3	02-06-1996
96-4	02-06-1996
2002-5	09-03-2002
2002-7	09-03-2002
2002-9	09-03-2002
2002-11	09-03-2002
2002-13	09-03-2002
2002-15	09-03-2002
2002-21	11-19-2002
2004-4	05-04-2004
2006-8	07-11-2006
PARKWAY CONSTRUCTION	11-01-2006
2006-21	11-07-2006
2006-23	01-16-2007
2015-5	03-17-2015
2015-14	10/20/2015

REVISED BY: COMMUNITY DEVELOPMENT DEPT. OCTOBER 2015
MAP REPRINTED: OCTOBER 26, 2015

DRAWN BY: D BLALOCK
MAP NAME: GIS\Users\SharedWorkspace \Projects\CommDevZoning20151026.mxd

Appendix E

Selected Pages from the 'Tri-Rail Coastal Link Station Area Market and Economic Analysis' Report

5.1.23 125th Street, North Miami

Introduction

The Tri-Rail Coastal Link is an initiative led by the SFRTA and FDOT to implement passenger rail service on the Florida East Coast (FEC) railway between Jupiter, in Palm Beach County, and downtown Miami within the next three to five years. Up to 28 stations are proposed to connect activity centers along the Southeast Florida coastline. The Tri-Rail Coastal Link will provide up to 50 trains per weekday through an integration of the existing Tri-Rail service from the South Florida Rail Corridor and onto the FEC railway.

SFRTA and FDOT seek to fund the project's capital costs from Federal, State, and local sources. A greater challenge with the implementation of this new passenger service is identifying the funding source for operating costs. SFRTA and FDOT propose that each municipality where a station is planned make an annual contribution to support the Tri-Rail Coastal Link operation costs. In return, each municipality is expected to derive economic benefits for having a Tri-Rail Coastal Link station located within their city.

Commuter rail service creates regional connectivity and reduces roadway congestion, especially during the peak periods of the day. Due to differences in commuting patterns, the economic benefits generated from commuter rail service vary from one location to another.

The economic analyses summarized in this 'station area profile' was conducted to help illustrate the potential positive impacts that could accrue around station areas. A variety of data sources were used, including data developed by the consultant team, State and MPO projections, third party data, and professional judgment given the team's experience with transit oriented development around the nation and in South Florida.

The analysis methodology is contained within the full report which was completed in April of 2013. National, State, and county-level data was used to understand potential growth in the region overall, while market analyses of local tax assessor data and GIS applications aided in identifying and quantifying development opportunities at the station area-level.

This 'station area profile' provides summary level data at various geography levels and culminates in estimates of potential development premiums that could be realized under a 'build scenario,' as well as other economic impacts expected to accrue.

Regional Profile (Palm Beach, Broward & Miami-Dade Counties Combined)

- Job losses from 2005 to 2010 (-527K) almost matched gains in 2000 to 2005 (555K).
- A slow recovery will continue throughout the region due to a stalled Florida construction sector, U.S. federal spending cuts and potential tax changes, State revenue limitation legislation, international political and economic instability, and continued tight credit availability which has hindered business expansion and purchases of durable goods and homes.
- Florida's economic growth is tied to population growth, which is expected to be strong, given immigration and the growing retirement–age population segment.

Regional Model Data

		2010	2015	2020	2025	2030	2035
Jobs	Total	2,851,000	3,041,000	3,233,000	3,403,000	3,595,000	3,806,000
	Growth*		1.30%	1.23%	1.03%	1.10%	1.15%
HH	Total	2,107,000	2,252,000	2,378,000	2,470,000	2,573,000	2,686,000
	Growth*		1.34%	1.09%	0.76%	0.82%	0.86%

* Average annual growth rate for the previous five-year period

Source: Florida Department of Transportation Southeast Regional Planning Model (SERPM), PB analysis

125th Street, North Miami 2 of 6

Miami-Dade County Profile

- Miami-Dade County lost slightly more jobs between 2005 and 2010 (187K) than it gained between 2000 and 2005 (171K). However, this was proportionally less than the South Florida Region as a whole (3.4% versus over 5% for the region). The County's losses were focused in construction, manufacturing, and professional and business services.
- County employment grew in the last 12 months (ending March 2013) by 10,300 jobs (0.9%) compared to 2.1% and 3.1% growth in Palm Beach and Miami-Dade, respectively.
- MPO forecasts predict that Miami-Dade County will have strong long-term population growth of over 1% annually - the highest in the region - which will support job growth through service employment, education and health care.

County and City MPO Data / PB Analysis

		2010	2015	2020	2025	2030	2035
County	Jobs	1,482,000	1,586,000	1,687,000	1,783,000	1,885,000	1,994,000
	Households	877,000	939,000	997,000	1,045,000	1,099,000	1,158,000
City	Jobs	27,500	29,100	30,700	32,100	33,700	35,300
	Households	19,900	20,400	20,900	21,300	21,700	22,200
Job Growth			2010-15	2015-20	2020-25	2025-30	2030-35
County	Annual Growth		1.37%	1.24%	1.11%	1.12%	1.13%
	% of Regional Growth		54.74%	52.60%	56.47%	53.13%	51.66%
City	Annual Growth		1.14%	1.08%	0.90%	0.98%	0.93%
	% of County Growth		1.54%	1.58%	1.46%	1.57%	1.47%
Household Growth			2010-15	2015-20	2020-25	2025-30	2030-35
County	Annual Growth		1.38%	1.21%	0.94%	1.01%	1.05%
	% of Regional Growth		42.76%	46.03%	52.17%	52.43%	52.21%
City	Annual Growth		1.14%	1.08%	0.90%	0.98%	0.93%
	% of County Growth		0.81%	0.86%	0.83%	0.74%	0.85%

Station Area Profile

Strengths

- Adequate ROW for station platform and double tacking. Limited pedestrian access.
- Development in the immediate station area includes a variety of mid to low-rise residential uses that could create ridership.

Opportunities

- A few large tracts of vacant land exist for development to the east of the station area but more commonly, small vacant parcels would need to be aggregated.
- North, along the west side of the tracks, redevelopment opportunities are present where existing (and some vacant) industrial, warehouse, automotive, and storage facilities are located.
- Johnson & Wales University (located in the northeastern quadrant of the station area) has vacant land planned for expansion.
- Area to the south of the station contains a concentration of underutilized industrial building that could be redeveloped.

Weaknesses

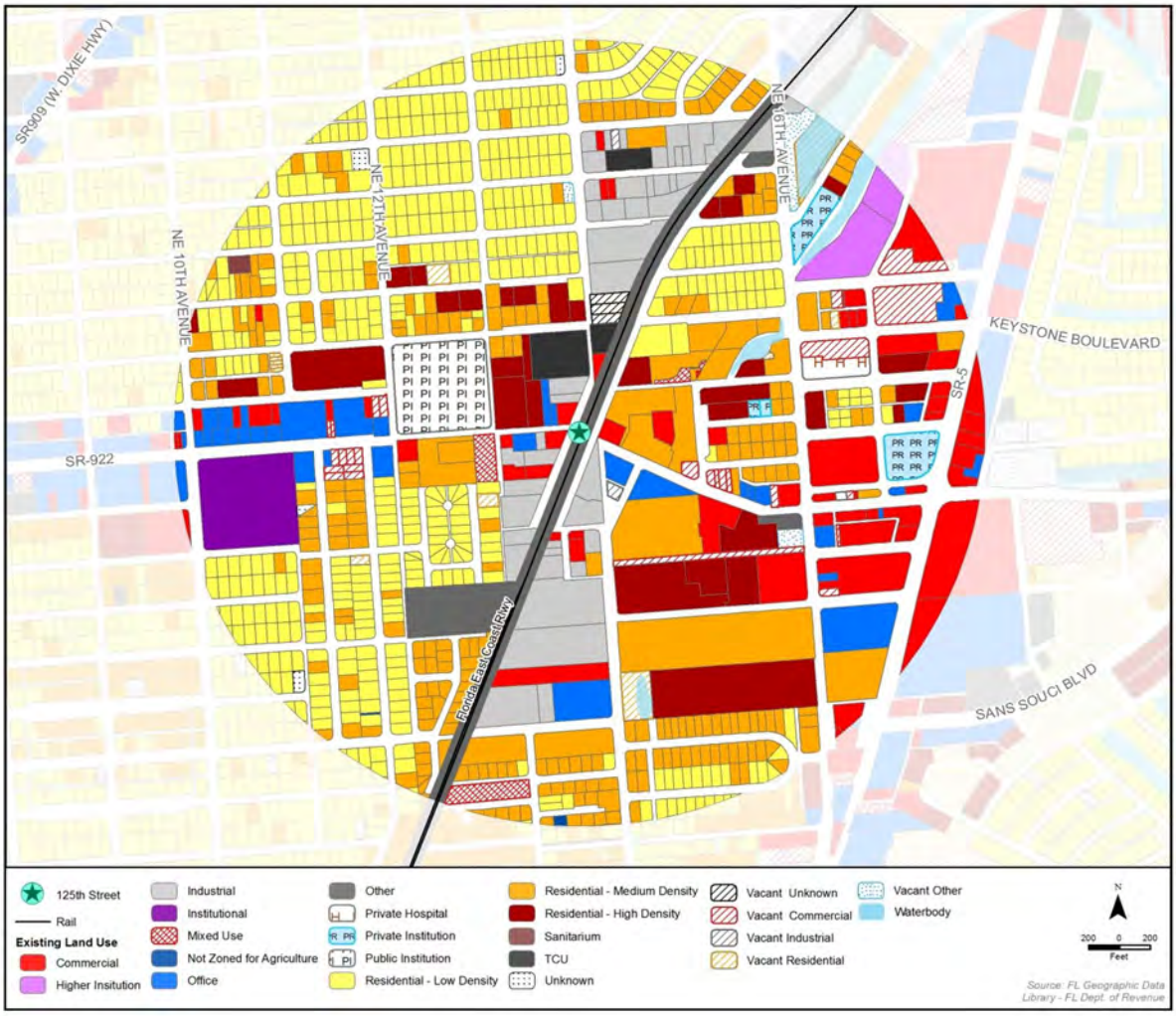
- A portion of the station area (south of 121st Street) is unincorporated Miami-Dade County. Only a weakness to the extent it complicates aggregation of parcels for redevelopment.
- Much of the northern and southwestern portions of the station area are dominated by low-density residential properties.
- No major development barriers, though the Florida Power and Light transmission facility is nearby (to the northwest of the station site) and may discourage development in that area.

Conclusions

- While the area has a good mix of land uses, with commercial along 125th Street, a broad range of residential properties, and some older industrial properties that could be redeveloped, there are no clear transit oriented development prospects.
- The station is best characterized as an origin station and could experience some redevelopment or infill of additional residential uses, however dense office development is not expected.

125th Street, North Miami

Tax Assessor Land Use Designations



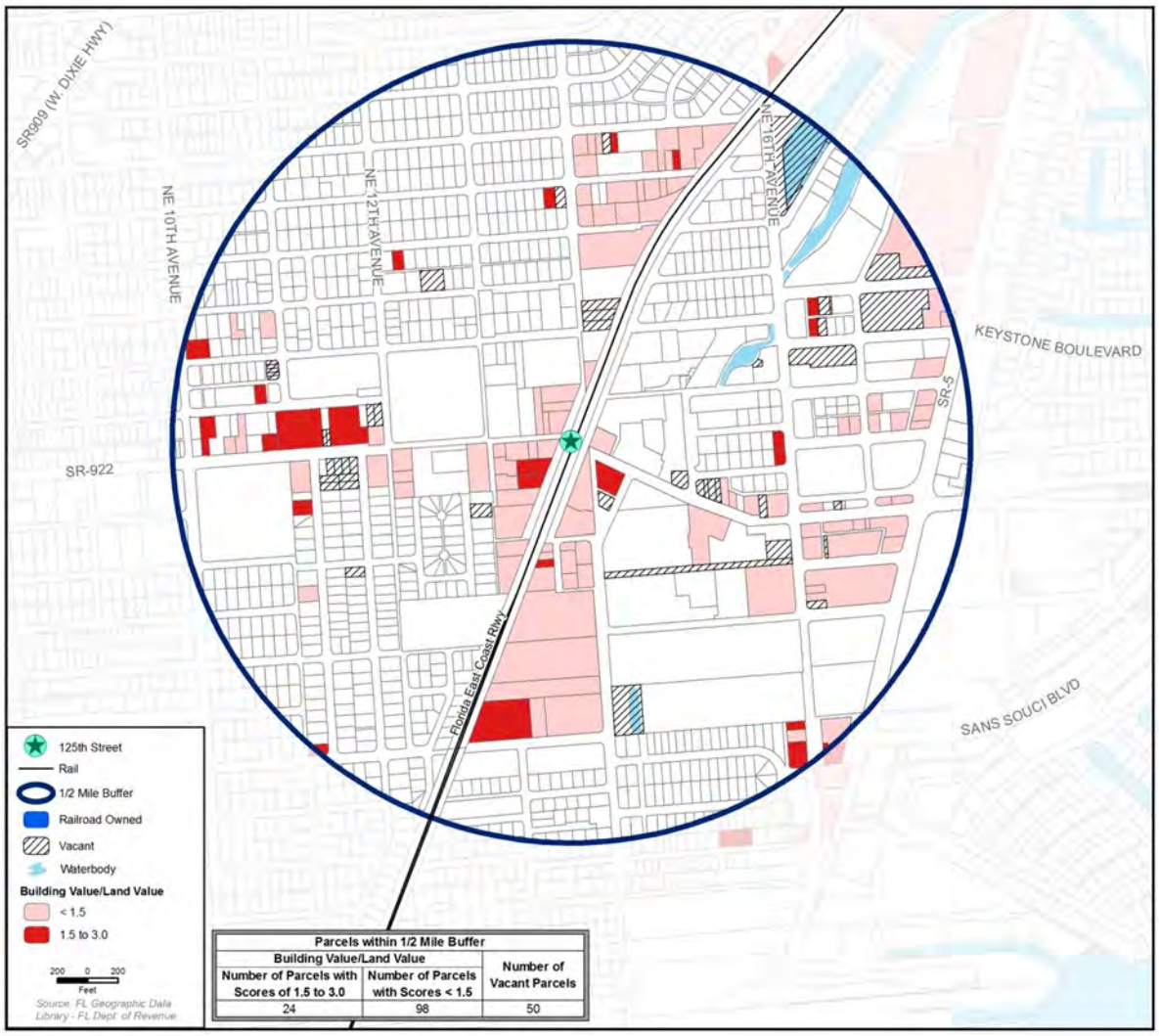
Parcel Descriptions

Existing Land Use	Parcels	Acres	Existing Land Use	Parcels	Acres
Commercial	62	35.5	Residential High Dens	33	35.1
Higher Institution	2	5.2	Residential Low Dens	535	103.7
Industrial	44	31.2	Residential Med Dens	280	88.6
Institutional	1	8.8	Sanitarium	1	0.4
Mixed Use	4	2.8	TCU	3	4.3
Not Agriculture	2	0.2	Unknown	5	0.9
Office	33	18.3	Vacant Commercial	27	8.9
Other	5	18.1	Vacant Industrial	2	0.4
Private Hospital	2	1.4	Vacant Other	3	2.1
Private Institution	4	4.1	Vacant Residential	15	4.8
Public Institution	1	8.4	Vacant Unknown	3	1.0

Note: Map represents an inventory of existing land uses as identified by data provided by the Miami-Dade County Property Appraiser.

125th Street, North Miami

Vacant and Potential Redevelopment Parcels



Vacant & Potential Underutilized Parcels

Type	Parcels	Total SF(m)
Vacant Residential	*15*	*0.2*
Vacant Nonresidential	*35*	*0.5*
Total Vacant	49	0.7
BV:LV < 1.5	98	2.5
BV:LV 1.5 – 3.0	24	0.5
Total Vacant & Underutilized	171	3.7

125th Street, North Miami

Estimated Redevelopment Capacity by Land Use

	Land Use	Estimated Gross Development 2015[1]	Estimated Gross Development 2025		Additional Development With Station
			Without Station	With Station	
Base	Residential (DUs)	3,230	3,300	3,470	170
Base	Commercial (SF)	1,844,000	2,208,000	2,542,000	334,000
High	Residential (DUs)	3,230	3,300	3,530	230
High	Commercial (SF)	1,844,000	2,208,000	2,589,000	381,000

[1] Commercial development based on 265 gross square feet per employee factor and MPO forecast 2015 employment.

Station Area Development Growth 2015 – 2025 (millions, 2012$)

	Land Use	Total Value 2015	Total Value 2025		Growth 2015 - 2025		Additional Value With Station
			Without Station	With Station	Without Station	With Station	
Base	Residential	$219.3	$224.1	$235.6	$4.8	$16.3	$11.5
Base	Commercial	$186.2	$223.0	$256.7	$36.8	$70.5	$33.7
Total Base Value		$405.5	$447.1	$492.3	$41.6	$86.8	$45.2
High	Residential	$219.3	$224.1	$239.7	$4.8	$20.4	$15.6
High	Commercial	$186.2	$223.0	$261.5	$36.8	$75.3	$38.5
Total High Value		$405.5	$447.1	$501.2	$41.6	$95.7	$54.1

Station Area Tax Generation Growth 2015 – 2025 (2012$)

	Land Use	Annual Tax Rates		Annual Revenue Increase		Total Revenue Increase
		Non-ad valorem	Ad valorem (mills)	Non-ad valorem	Ad valorem	
Base	Residential	$543.55	13.9050	$92,000	$160,000	$252,000
Base	Commercial	$1,646.28	13.9050	$55,000	$469,000	$524,000
Total Base Value				$147,000	$629,000	$776,000
High	Residential	$543.55	13.9050	$125,000	$217,000	$342,000
High	Commercial	$1,646.28	13.9050	$63,000	$535,000	$598,000
Total High Value				$188,000	$752,000	$940,000

Description of Taxes and Fees

Ad valorem taxes

Ad valorem taxes are property taxes. The "Tax Increase" figure above is derived by subtracting the Without Station scenario from the With Station scenario. Calculations for municipalities with CRAs include the County millage rate since it impacts TIF generation.

Non-ad valorem taxes

Non-ad valorem taxes include Franchise Fees, Utility Taxes, Communications Service Taxes, Stormwater Fees, Fire Fees and State Shared Revenues (residential only) for all residential units and typical commercial enterprises (10,000 square foot segments). The amounts are based on typical usage and the established rates in each municipality.

Review of Local Redevelopment Plans

The City of North Miami's 2007 Comprehensive Plan Amendments identify the potential for future expansion of the FEC corridor to accommodate passenger rail, but notes that these plans have yet to materialize. However, the Plan does identify a policy stating "prior to the establishment of passenger rail service on the FEC Railroad line, the City shall consider amendments to the Comprehensive Plan that would allow mixed use redevelopment of lands currently designated Industrial and located adjacent to the railroad." The Plan also outlines several other high-level considerations for future changes necessary to zoning policies in order to accommodate passenger rail service.

125th Street, North Miami

Detailed Project Pipeline: Projects in Zip Code Vicinity

The following projects have been identified as in planning or development within zip codes shared by the station area. The projects could be considered "competitors" to similar new development within the station area, and should be factored into future demand. *(Source: CBRE, Inc.)*

Name	Location	Type	Size (sf)	Timing	Notes
Barry University Dorm	11300 NE 2nd Ave	Dormitory	72,000	Underway	247 dormitory units
Johnson & Wales Dorm	NE 127th St & 17 Ave	Dormitory	42,500	Planning	208 dormitory units
Alta Mira Apts	12000 NE 16th Ave	Multifamily	274,238	Underway	300 multifamily ujnits
Biscayne Landing Redev	NE 137th – NE 151st	Retail	-	Pre-Planning	Mixed-use redevelopment
Whole Foods Market	12150 Biscayne Blvd	Retail	36,000	Bidding	Supermarket
Grigging Adult Center	12220 Griffing Blvd	Senior Housing	4,200	Pre-Planning	

Regional Economic Impact Overview

Metric	Total Regional Impact
Employment	5,020 jobs
Wages	$250 million
Output	$630 million

Results generated using best practices methodology prescribed in U.S. Department of Transportation TIGER Guidelines

Benefit	Monetized Value (2012 $)
Travel Time Savings	$140 million
Fuel Savings	$13 million
Vehicle Operating Cost Savings	$11 million
Reduced Emissions	$3 million
Reduced Automobile Accidents	$7 million
Total	$174 million

Station Profile Conclusions

Development

Development growth between 2015 and 2025 with the station in place is expected to outpace growth if no station or service is put in place by 170 dwelling units and 334,000 square feet of non-residential development. Under the "high" development case, 230 dwelling units and 381,000 square feet of non-residential development could be expected within the station area.

Tax Generation

The additional development resulting from the station and new service is expected to generate $776,000 in additional tax revenue for the city by 2025 (in $2012 terms). Under the "high" development case, additional annual revenue could climb to $940,000.

Economic Impact

The region will benefit significantly from this project in terms of jobs and output during construction and from productivity gains after construction. Over 5,000 temporary jobs will be created during development and construction of the project, which will immediately impact unemployment levels in all three counties.

Appendix F

Data on South Florida Water Management
District Stormwater Infrastructure

ARCH CREEK STRUCTURE

G-58

This structure is a four barreled corrugated metal pipe culvert located on Arch Creek immediately downstream from the Florida East Coast Railroad bridge.

PURPOSE

This structure maintains optimum upstream water control stages in Arch Creek; it passes the design flood (60% of the Standard Project Flood) without exceeding upstream flood design stage; and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saline intrusion during periods of high flood tides.

OPERATION

This structure will be operated to maintain headwater stage of 1.8 feet when sufficient water is available to maintain this level.

This objective will be achieved by automatic settings on #2, #3, and #4 as follows:

When the headwater elevation rises to 2.0 feet, the gate will begin to open at six inches per minute;

When the headwater elevation rises or falls to 1.8 feet, the gate will become stationary;

When the headwater elevation falls to 1.4 feet, the gate will begin to close at six inches per minute.

FLOOD DISCHARGE CHARACTERISTICS

	Design Flood
Discharge Rate	300 cfs
	60 % SPF
Headwater Elevation	1.6 feet
Tailwater Elevation	1.1 feet
Type Discharge	uncontrolled submerged

DESCRIPTION OF STRUCTURE

Type Corrugated metal pipe culverts with upstream control

Number of barrels 4

STRUCTURE 28

This structure is a reinforced concrete, gated spillway, with discharge controlled by two cable operated, vertical lift gates. Operation of the gates is automatically controlled so that the gate hydraulic operating system opens or closes the gates in accordance with the operational criteria. The structure is located in the City of Miami near the mouth of Canal 8 about a mile from the shore of Biscayne Bay.

PURPOSE

This structure maintains optimum water control stages upstream in Canal 8; it passes the design flood (100 percent of the Standard Project Flood) without exceeding upstream flood design stage, and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saline intrusion during periods of high flood tides.

OPERATION

This structure will be operated to maintain an optimum headwater elevation of 1.8 feet, when sufficient water is available to maintain this level. The automatic controls function as follows:

When the headwater elevation rises to 2.1 feet, the gates will open at six inches per minute;

When the headwater elevation rises or falls to 1.8 feet, the gates will become stationary;

When the headwater elevation falls to 1.5 feet, the gates will close at six inches per minute.

A special timing device has been installed at this site to protect manatees, during automatic gate operation. This device causes alternate gate operation. During this operation, when the upstream float sensor indicates that the gate should open, one gate opens a minimum of 2.5 feet. If this opening results in a headwater stage below the gate close level, as it often does, this gate will close. Whenever the headwater stage again rises to the open level, the other gate will open in a similar manner.

Salinity Regulation

In addition to maintaining optimum upstream fresh water control, as described above, the automatic controls on this structure have an overriding control which closes the gates, regardless of the upstream water level in the event of a high flood tide, whenever the differential between the head and tailwater pool elevations reaches 0.3 feet.

During the simultaneous occurrence of high tide and heavy rainfall in the low-lying urban areas draining into C-8, the structure control is placed on manual and the gates open whenever the headwater exceeds that of the tailwater. This action is necessary because of the very critical situation caused by the fact that a considerable urban area lies at an elevation at or very near that of the high tide.

FLOOD DISCHARGE CHARACTERISTICS

	Design
Discharge Rate	3220 cfs
	100% SPF
Headwater Elevation	2.3 feet
Tailwater Elevation	1.8 feet
Type Discharge	uncontrolled submerged

DESCRIPTION OF STRUCTURE

Type Fixed crest, reinforced concrete gate spillway

Weir Crest

Net Length 54.00 feet

Elevation -13.5 feet

Service bridge elevation 6.0 feet

Water level elevation which will by-pass structure 4.0 feet

Gates

Number 2

Size 17.5 feet high X 27.8 feet wide

Type Vertical lift

Bottom elevation of gates full open 3.5 feet

Top elevation of gates full closed 4.0 feet

Control Automatic, on-site upstream control with override differential water surface control sensed by bubbler system, and remote computer control.

Lifting mechanism

Normal power source commercial electricity

Emergency power source gasoline driven generator

Type Hoist direct drive electric motor gear, connected to gate drums

Date of Transfer: December 14, 1965

ACCESS Via private drive through Miami Shores Country Club from Grand Concourse and 8th Avenue NE in Miami Shores.

Points of possible flooding _____

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level Remote digital headwater and tailwater recorder

Gate Position Remote digital recorder