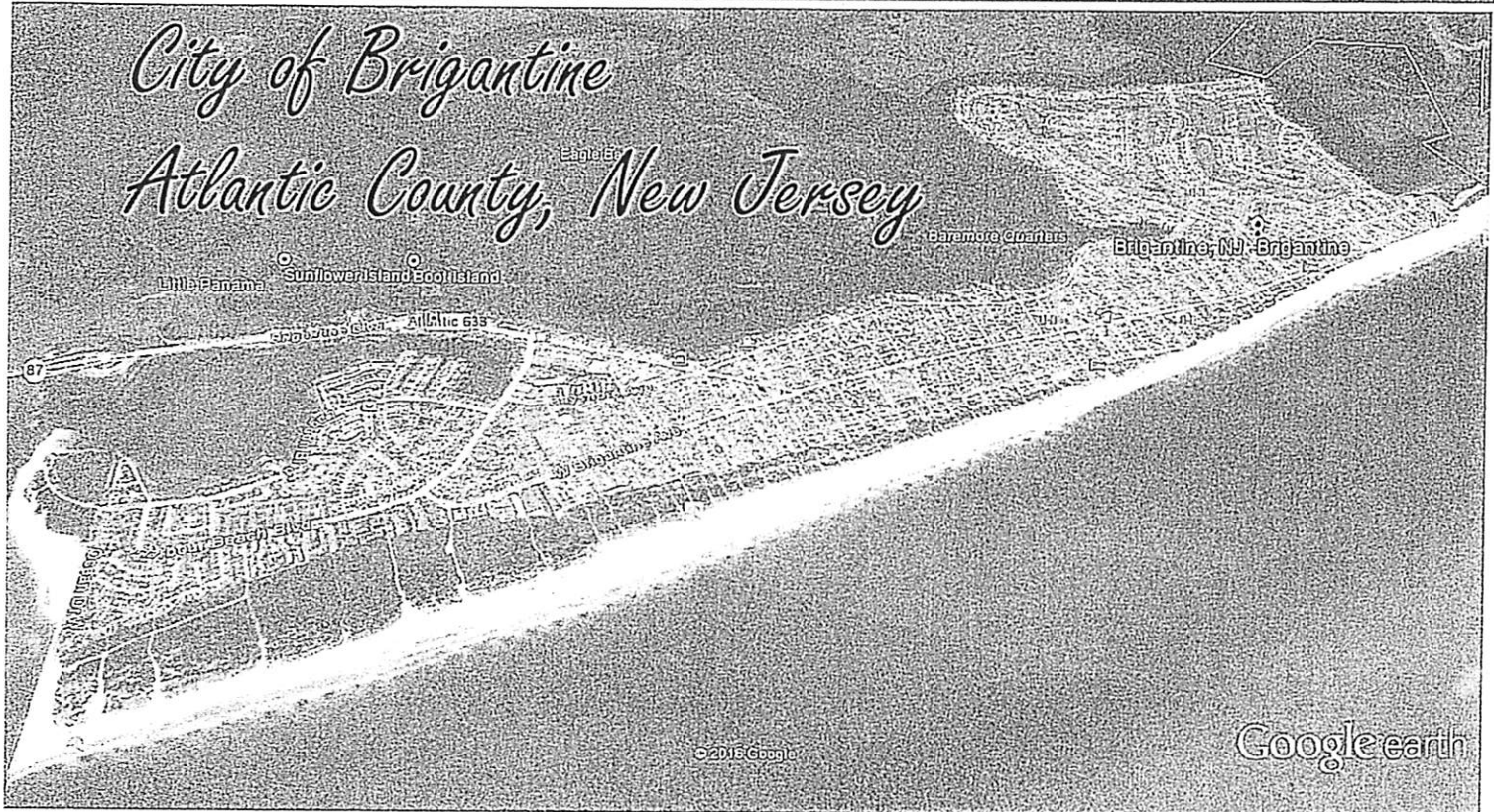


2016 Master Plan Re-examination Report



City of Brigantine
Atlantic County, New Jersey



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Atlantic County, New Jersey



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MC Project No. 15001840A



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1. INTRODUCTION

The New Jersey Municipal Land Use Law, N.J.S.A. 40:55 D-1, et seq. stipulates that each municipality in the State of New Jersey shall reexamine its Master Plan and development regulations at least every ten years. Specifically, N.J.S.A. 40:55D-89 states:

"The governing body shall, at least every ten years, provide for a general reexamination of its Master Plan and development regulations by the Planning Board which shall prepare and adopt by resolution a report on the findings of such reexamination, a copy of which report and resolution shall be sent to the County Planning Board ... [and] the municipal clerk of each adjoining municipality."

This reexamination of the City of Brigantine Master Plan conforms to the requirements of the Municipal Land Use Law and addresses the requirements of N.J.S. 40:55D-89 by including the following:

- a. The major problems and objectives relating to land development in the municipality at the time of the adoption of the last reexamination report.
- b. The extent to which such problems and objectives have been reduced or have increased subsequent to such date.
- c. The extent to which there have been significant changes in the assumptions, policies, and objectives forming the basis for such plan or regulations as last revised, with particular regard to the density and distribution of population and land uses, housing conditions, circulation, conservation of natural resources, energy conservation, collection, disposition and recycling of designated recyclable materials, and changes in State, county and municipal policies and objectives.
- d. The specific changes recommended for the master plan or development regulations, if any, including underlying objectives, policies and standards, or whether a new plan or regulations should be prepared.
- e. The recommendations of the planning board concerning the incorporation of redevelopment plans adopted pursuant to the "Local Redevelopment and Housing Law," P.L. 1992, c.79 (C.40A:12A-1, et al.) into the land use plan element of the municipal master plan, and recommended changes, if any, in the local development regulations necessary to effectuate the redevelopment plans of the municipality.

This reexamination report serves as a reexamination of the 2010 Master Plan dated February 23, 2011.

Before embarking on the statutorily required elements of the Master Plan Reexamination it is informative to present a brief overview of the conditions that were current in 2010 when the Master Plan was written in comparison to the conditions since that point in time. The most recent available data on demographic, economic and land use conditions is provided by the U.S. Census Bureau's 2010 -2014 American Community Survey 5-Year Estimates. The information will be presented before addressing the five required elements of a Reexamination Report.

1.1 BRIGANTINE PHYSICAL LAYOUT

The City of Brigantine is a southern New Jersey shore resort community, consisting of 10.36 square miles in total, of which 6.40 square miles (61.7%) is land area and the remaining 3.96 square miles (38.3%) is water. Brigantine consists of a group of islands along the Atlantic Ocean, situated just north of Atlantic City and east of Galloway Township in Atlantic County.

The most unique characteristic of the City is its approximately 3.4 mile long sand beach, which extends on the northern portion of the coast with the Forsythe Refuge. The City is laid out in a series of neighborhoods with a curvilinear circulation system in some sections and numbered blocks on the north-south gradient, incorporating public parks and open spaces throughout. Public infrastructures, including both water and sewer systems, are well integrated into the system.

1.2 ECONOMIC BACKGROUND

Throughout history, Brigantine Beach has been interlinked with the City of Atlantic City directly to the south that has provided employment and provides the sole point of vehicular access to the island via New Jersey State Route 87 (Brigantine Blvd). From the 1880s to 1940s, Atlantic City was a major east coast vacation resort, but by the 1950s Atlantic City's popularity as a resort destination began to decline. By the 1960s, the City was beset with economic and social problems common to many larger urban centers at the time.

Automobile access to Brigantine was created in the 1920s, and large-scale development was initiated by the Island Development Company, who had acquired the title to most of the island property from the Brigantine Land and Transportation Company. Brigantine grew slowly throughout these periods as a bedroom community and seasonal resort, with the permanent population steadily increasing over the decades, in particular the '50s, '60s and '70s.

In 1976, the "Atlantic City Gamble" was launched when New Jersey voters approved a referendum legalizing gambling in Atlantic City but not elsewhere in the State. The first casino, Resorts International, opened in 1978. Other casinos were soon added along the Boardwalk and later in the Marina District, for a total of eleven casinos by 2008. The number of annual visitors had grown from 700,000 in 1978, to over 35 million.

The 2008 Atlantic City Master Plan noted that: "The strength of the existing economic infrastructure should not be overlooked; in 2007, the City's tax base had skyrocketed from \$316 million in 1976 to almost \$7 billion," and Plan noted further that: "The promised economic benefits of gaming to the City, although slow to materialize, have now begun to bear fruit."

As was stated in the 2010 City of Brigantine Master Plan: Section V. Resource Inventory and Assessment, B. Regional Development, 1. Casino Development:

"A key part of the development of the casinos in the Marina District was the construction of the Atlantic City Expressway Connector, locally known as the 'The Tunnel'. The Connector now provides a direct link from the Atlantic City Expressway to the Marina District and Brigantine Island. The project also included various connections and fly-overs that connect U.S. Route 30 (White Horse Pike) with the Brigantine Bridge. This connection will provide better access to Brigantine for residents, workers, visitors and emergency vehicles." (City of Brigantine Master Plan, 2010)

Atlantic City and Brigantine continued to grow and develop until the late 2000's when the great recession had begun. In 2010, Governor Chris Christie uttered the statement that "Atlantic City is dying". In 2012, the Casino Reinvestment Development Authority "CRDA" prepared the "Tourism District Master Plan". This plan noted that:

"The city has lost thousands of jobs and millions of dollars in tax ratables in the last decade. The economic downturn in Atlantic City has claimed over 15,000 jobs in Atlantic City's casino industry."(CRDA Tourism District Master Plan, 2012)

A portion of these jobs were held by residents of Brigantine and the demographic data shows a precipitous drop in population during this period.

To add insult to injury, enter Superstorm Sandy. Superstorm Sandy came ashore on Monday, October 29, 2012 and produced storm surge and wave erosion of historic proportions. This major coastline altering event was perhaps the most destructive storm in New Jersey history. As Sandy reached landfall the storm surge raised water levels along the inlet and back-bays causing significant damage. Four years later, the Jersey Shore is still struggling to recover from the substantial damage to the coastal tourism economy.

1.3 PUBLIC INPUT

As part of the Master Plan Re-Examination process public outreach was conducted through both on line surveys and public open house meetings. Through these discussions with various portions of the local population including; builders, retiree's, active households with children, and local professionals, a general consensus was formed. While most people expressed that the City is a great place to live, there were desires to improve the experience the entry Lighthouse District in particular, and to expand multi-modal recreational opportunities (bike lanes and walkways).

2. 2016 RE-EXAMINATION GOALS AND OBJECTIVES

2.1 PRIOR GOALS AND COMMENTS

The 2010 Master Plan Re-Examination looked at the prior goals and objectives from the 1992 and 2001 Master Plans which are outlined below, and then provided a status of each of those goals. Historically, this section of the Master Plan document is used to review the five re-examination report requirements.

As stated in the 2010 Re-Examination, the majority of goals and objectives listed have either been achieved or steps have been taken to assist the City and its residents in obtaining those goals.

With the 2016 Master Plan Re-Examination in the process of development, the following listing of Goals and Actions has been augmented by the notes provided under the heading "2016 Follow Up".

It is important at this time to re-evaluate the goals, directions and results of the previous Master Plan and its subsequent re-examinations, as well as looking objectively at the current state of the City and providing new goals moving toward the future.

An example noted during the investigative portion of the Master Planning process is that the City has lost roughly a quarter of its permanent year round population, from a high of 12,500 in 2012, to a last estimate of 9,500 in 2014. This trend of decreasing permanent population on the

island affects the Goals for the 2016 Master Plan Re-Examination. For example, one of the 2010 Reexamination Report goals is:

"Encourage and promote the City of Brigantine Beach as a safe and wholesome place to raise a family that can provide good education opportunities and ample access to recreation of all types, along the Jersey shore."

Given the shift from year-round family households to second-home or retiree households, perhaps the Master Plan should look at other ways that the City can stimulate people to become year round residents.

The 1992 Brigantine Master Plan outlined the following goals and objectives and the City has taken the actions noted on each of these goals:

1. **RESIDENTIAL DEVELOPMENT** - Recognize the need to balance the previous period of residential growth with the preservation of existing neighborhoods of single family character, rather than encourage continued multi-family development throughout the City.

Action Taken:

Ordinance changes and Land Use Controls have aided the City in its effort to control the over-development of multi-family residential units on the island.

2016 Follow Up:

It seems that the conversion of multi-family and former hotels and motels into condominiums has, for the most part, been complete, and in the aftermath of Superstorm Sandy, most of the rebuilding has been single family houses.

2. **ENVIRONMENT** – Remain committed to the development and implementation of regulatory controls and design techniques, which in conjunction with State and Federal programs will preserve and protect the natural resources of the island, such as beaches, dunes and wetlands.

Action Taken:

Brigantine has continued to maintain and enforce the Development Restriction Line along the beach and dune system. The City has received grant funding to ensure that the Land Use Ordinance is in compliance with the New Jersey Department of Environmental Protection (NJDEP) and the State Plan with regard to protection of the environment and the coastal area. The City has also supported the NJDEP and the Army Corps of Engineers efforts in dredging the inter-coastal waterways and has encouraged environmentally sensitive and appropriate access to both the north and south ends of the island.

2016 Follow Up:

All of these improvements and recommendations pre-dated Superstorm Sandy. While most of the actions described above were positive in the conservation and protection aspects, the resulting damage was unforeseeable. Recommendations for further actions have been started, from assessment of the Back Bay bulkheads, to evaluation of the sole access route onto the island and options for improvements.

The open space area along the Bay frontage presently has a play area, but the plans of developing a living shoreline with passive recreation in this area are still in the planning stages.

3. FLOOD PROTECTION – Ensure continued implementation of those programs that will minimize property damage and protect the safety and welfare of its residents.

Action Taken:

The City has continued implementation of programs that can minimize the impacts of damage by floodwaters. Bulkhead and seawall ordinances have been adopted to provide better and new protection against rising tides.

2016 Follow Up:

While the armoring of the island continued over the intervening years, the impacts created by Superstorm Sandy, have led to a rethinking of the recommendations for base flood elevations for new and rebuilt structures, and a re-evaluation of bulkhead heights and stabilization along edge areas.

Resiliency Planning has also been included within the Post Sandy Planning and federal funding may be available to explore alternative methods of planning and design.

4. ECONOMICS: Encourage the development and enhancement of the defined commercial districts and programs supportive of both the daily and seasonal needs of its residents.

Action Taken:

While the development of an actual sidewalk and streetscape plan has not yet come to fruition, the City had pursued design themes and has begun to improve the Central Business Districts (CBD) with infrastructure improvements. Parking lots have been developed to ease the seasonal parking problems and several beautification projects have begun to draw more attention to the Business District. The latest attempt to assist the business community is the creation of the Business and Community Development Committee.

2016 Follow Up:

While the Central Business District Streetscape Plans are presently bid, and the proposed improvements are eminent, there does seem to be a persistent need to infuse the commercial areas of the City.

Some businesses recently upgraded their facilities in both the Central Business area and the Lighthouse District, but there still is need for planning with regard to pedestrian accessibility and circulation, appearance of area, and stability of usage, as well as safety and parking.

There does not seem to be any unifying theme or development of safe vehicular and pedestrian interface in the gateway area to the island and the core Lighthouse District, with missing segments of sidewalks, parking in difficult locations, confused traffic patterns, and disjointed bike lanes.



Figure 1: The lighthouse area continues to be in need of a more intentional approach to a more cohesive public environment to stimulate economic investment in commercial properties.

5. **TOURISM** – Recognize its attraction as a summer residence for the suburban populace of the Mid-Atlantic Region and encourage the continued development of family oriented tourism.

Action Taken:

The Business and Community Development Committee has been formed to assist in this regard. Additionally, recreation facilities for both the summer population and the year round residents have been significantly improved over the last few years. New facilities, such as the miniature golf course, the open space along the bay near the Brigantine Golf Course, and the purchase of the golf course itself are all improvements designed not only for our residents but for the tourism industry.

2016 Follow Up:

There has been discussion about working with other nearby Counties and communities in Atlantic County to create a group marketing strategy for the entire region. While Brigantine is known as a long established summer resort community, there have been recent efforts by other areas in the region to market their communities to a larger populous outside of the NY / NJ / PA areas.

Another aspect related to Tourism is the recommendation to develop Wayfinding Signage as a means of developing a consistent theme for the island while providing visitors with information, directions and historical background of Brigantine.

While Brigantine has improved, expanded and upgraded its recreation facilities and opportunities for both year round residents and family oriented tourists, there are still possibilities and improvements that need attention. The Golf Course is now protected open space and listed on the City's ROSI (NJDEP Recreation and Open Space Inventory) it is in need of improvements such as dredging of the tidal ponds and drainage improvements, in a number of areas. The planning for renovation and

expansion of the event capacity at the Club House will potentially be an important improvement to expand opportunities for everyone.

6. TRANSPORTATION – Remain committed to the maintenance and improvement of traffic movement to and from the island.

Action Taken:

Brigantine has been an integral part of the development and improvements of the Atlantic City-Brigantine Connector Project and the access from Route 30 directly to the Brigantine Bridge. The Atlantic City – Brigantine Interconnect has been completed and now not only provides better access to the Marina Casino District of Atlantic City, but it provides much needed improvement to the access to the City of Brigantine.

2016 Follow Up:

While it seems most of the emphasis over the past years and decades has been on improvements to getting people to the island safely and smoothly, the focus on Transportation now probably needs to be shifted to providing safe multi-modal circulation within the City. Planning and developing a strategy for the safe incorporation of cars, bicycles and pedestrians, all circulating within the public Rights of Way in a coordinated manner.

7. ACCESSIBILITY – Recognize its legal and social obligations under the law and participate to the fullest extent possible in implementing the Americans with Disabilities Act (ADA)

Action Taken:

Zoning and building code controls and physical improvements to all public buildings have been put in place to provide safe and easy access for those residents and visitors with disabilities. The City has continued the handicap ramp installation program and will continue this program as funding becomes available.

2016 Follow Up:

Program continues as funding becomes available.

8. SCENIC RESOURCES – Implement programs and regulatory controls designed to protect the scenic resources of the community.

Action Taken:

Zoning controls such as height restrictions and setbacks have been continually reviewed to help maintain and increase the open space, light and air surrounding the residential and commercial structures on the island. Additional controls have been added to limit the size and number of signs permitted on commercial and residential property.

2016 Follow Up:

The rebuilding associated with Superstorm Sandy has provided a response to height and Base Flood Elevations standards, and established relationships based upon these factors. Associated with this is discussion regarding side yard and front yard setbacks and access issues associated with the elevation of structures.

Another aspect of the planning process has been the desire expressed by local residents for scenic views and resources to be protected and accessible to all. The development of the waterfronts, in particular the back bay areas has provided limited public access to street ends and points of access to the bay visually in many locations.

The 2001 Brigantine Master Plan, adopted in November 28, 2001 and subsequent amendments from November 01, 2006 and January 23, 2008, states that the major problems, goals and objectives for the City of Brigantine are as follows:

1. LAND USE

- a. The 2001 Master Plan emphasized the desire to preserve existing neighborhoods of their single-family character, and to discourage duplexes and other multi-family residential development.

Action Taken:

In the 2008 Amendment, the Master Plan was modified to permit minor expansions of existing duplexes.

2016 Follow Up:

There have been no significant changes to this policy.

- b. The Master Plan suggested that the R2-A district increase its residential setback requirements to provide for additional air, light and open space in these neighborhoods.

Action Taken:

Land Use Ordinance was revised to increase setbacks to 5 and 10 feet.

2016 Follow Up:

This change continues and there have been discussions of amending setbacks on corners and alley ways.

- c. It was also felt that a general update of the Land Use Ordinance was needed to create more easily understood ordinances and regulations and to effectuate the recommendations of the Master Plan. Some of the items that needed clarification were building height, flat or partially flat roof structures, site plan submission requirements, and the need for architectural drawings when an applicant is requesting a variance.

Action Taken:

Land Use Ordinance was revised to include building height definitions, site plan submission requirements and procedures.

2016 Follow Up:

The 2016 Land Use assessment will look at all of the revisions to the ordinance over the last years and look to provide a more cohesive overview and structure.

- d. Encourage the development of Bed and Breakfast Inns by creating certain zoning districts and regulations outlining the requirements for such uses.

Action Taken:

A bed and breakfast ordinance was added to the Land Use Ordinance.

2016 Follow Up:

No changes required.

- e. Encourage a themed Central Business District. In the past, a nautical theme was suggested.

Action Taken:

The 2001 Master Plan continued to encourage a themed Central Business District (CBD). The 1992 Master Plan recommended a nautical theme for the CBD. Further discussion on the matter has continued in the 2010 Master Plan Update. This goal has been modified and those modifications will be outlined in 2010 Goals and Objectives of this document.

2016 Follow Up:

The theming and streetscape improvements are intended to be completed in the Fall of 2016, setting up a palate for future improvements in this area and other Business District areas. There has been discussion of creative wayfinding as a means to unify the various areas.

- f. Encourage more participation with the Economic Development Committee of City Council.

Action Taken:

The City has maintained its supporting position of local businesses. In 2008 the Mixed Use Committee was created to review the potential of adding a mixed use zone to the Land Development Ordinance. At the end of 2009 the Committee recommended to Council that it was not in the best interest of the City to create such an Ordinance at this time. The Mixed Use Committee has recently changed its name to Business and Community Development Committee and will continue to assist both commercial businesses and local developers to improve the City of Brigantine.

2016 Follow Up:

Business and Community Development Committee continues to assist commercial businesses and local developers who are looking to take part in improving the City of Brigantine and its image in the region.

- g. It was suggested that the City should pursue a new use for the former golf course clubhouse site. Single family homes were being discouraged at that time for the site.

Action Taken:

Since then, as part of a COAH lawsuit settlement agreement, the site has been subdivided into 10 single family dwelling lots and one open space tract that was dedicated to the City of Brigantine.

2016 Follow Up:

A playground area and dog waste station have been installed and planned improvements to the open space tract, including a living shoreline will continue as funding becomes available.

- h. Encourage and support the development of the North End of the Island as an Environmental Education Area.

Action Taken:

The City has furthered this goal by obtaining funding and developing the Observation Platform and providing support of Eco-Tourism.

2016 Follow Up:

As part of the background research for this re-examination, it was suggested that the access to the northern nature preserve be better defined and that there possibly be more activities provided in this area.

- i. Due to the significant amount of commercial uses that were being replaced by residential units; the City felt it necessary to preserve the existing commercial uses on the island. This is still a struggle on an island that has difficulty maintaining retail and commercial businesses in the community.

Action Taken:

The City first created the Mixed Use Committee that now has been renamed as the Business and Community Development Committee. It is the intent of this committee to assist the local business community in their effort to improve the local economy.

2016 Follow Up:

Understand that this committee still works toward identifying opportunities for new business enterprises, as well as working to help the existing local businesses.

It is understood that the seasonal nature of the resort visitors make it difficult for year round businesses to thrive, but there needs to be continued identification of what can make Brigantine stand out within the shore.

- j. Increase the minimum hotel room size and regulate the conversion of hotels/motels into condominiums or other types of residential dwelling units.

Action Taken:

This goal has not been addressed with any new ordinances or regulations.

2016 Follow Up:

This goal has not been addressed with any new ordinances or regulations.

- k. To better define the Hotel use and encourage the development of traditional hotels.

Action Taken:

New definitions for Hotel/Motel have been provided and the Planning Board had recently approved a new hotel at the north end of the island; however the approval has been remanded to the Board for additional review. The applicant has yet to request that the Board hear the application.

2016 Follow Up:

No change to the policy has been made.

2. ENVIRONMENT – Brigantine has continued to maintain and enforce the Development Restriction Line along the beach and dune system. The City has received grant funding to ensure that the Land Use Ordinance is in compliance with the NJDEP and the State Plan with regard to protection of the environment and the coastal area. The City has also supported the DEP and the Army Corps of Engineers efforts in dredging the intercostal waterways and has encouraged environmentally sensitive and appropriate access to both the north and south ends of the island.

Action Taken:

In an effort to maintain and preserve the islands scenic and environmentally sensitive resources, the City has been participating in the demarcation of all of the storm drains within the city with save the environment labels ("No Dumping Drains to Bay") to discourage residents and visitors from polluting the environment. This City has also instituted a regular street sweeping schedule and participates and sponsors beach clean-ups.

2016 Follow Up:

Recommend that the City continue to work to develop educational programs that help to inform the public about the fragile environment of the barrier islands and to explain what each individual can do to preserve it.

3. FLOOD PROTECTION – The City has continued implementation of programs that can minimize the impacts of damage by floodwaters. Bulkhead and seawall ordinances have been put in place to provide better and new protection against rising tides. The City has encouraged homeowners to purchase Federal Flood Insurance and informed them of the hazards of not having such insurance.

Action Taken:

In addition to continuing maintenance of the City's bulkheads and seawall, the City has encouraged homeowners to purchase Federal Flood Insurance and informed them of the hazards of not having such insurance.

2016 Follow Up:

Need to review status of reconstructive efforts for bulkheads and seawalls.

4. **ECONOMIC DEVELOPMENT** – While the development of an actual sidewalk and streetscape plan has not yet come to fruition, the City has pursued design themes and has begun to improve the Central Business District, CBDs with infrastructure improvements. Parking lots are now being developed to ease the seasonal parking problems and several beautification projects have begun to draw more attention to the Business District.

Action Taken:

The themed streetscape plan has been removed from the Master Plan. If funding for such a plan is available in the future, this goal can be revisited.

The newly named Business and Community Development Committee has been created and it is the intent of this committee to assist the local business community in their effort to improve the local economy. Issues such as zoning changes, special improvement districts, signage restrictions and community events and advertising are discussed.

Parking lots have been developed to ease the seasonal parking problems and several beautification projects have begun to draw more attention to the Business District.

2016 Follow Up:

The Central Business District is presently in the process of getting the first phase of the Streetscape Plan aimed at creating a distinct identity for the area and beautifying the business district.

5. **TOURISM** – The City has continually worked on improving its public image to attract families to the island.

Action Taken:

Recreation facilities have been improved through capital expenditures, new land obtained to create new recreation areas and the Community Education and Recreation Department is currently in the development phase a new facility located at the former St. Phillip's School Site.

2016 Follow Up:

The Community Center has been constructed on the former St. Phillip's School site offering all ages of residents and visitors access to indoor passive and active recreational opportunities. The City has continually looked to facilitate a variety of recreational opportunities for people of all ages.

6. TRANSPORTATION

Action Taken:

Brigantine has been an integral part of the development and improvements of the Tunnel Project and the access from Route 30 directly to the Brigantine Bridge. The Atlantic City – Brigantine Interconnect has been completed and now not only provides better access to the Marina Casino District of Atlantic City, but it provides much needed improvement to the access to the City of Brigantine.

2016 Follow Up:

The entrance to Brigantine was recently repaved and there have been some improvements to the area. The overall circulation system of the island has remained.

7. ACCESSIBILITY

Action Taken:

Zoning and building code controls and physical improvements to all public buildings have been put in place and maintained to provide safe and easy access for those residents and visitors with disabilities. The City has continued the handicap ramp installation program and will continue this program as funding becomes available.

2016 Follow Up:

All new facilities are compliant with the ADA accessibility guidelines and most of the curb crossing and pedestrian walkway areas of the island have been improved.

8. SCENIC RESOURCES

Action Taken:

Zoning controls such as height restrictions and setbacks have been continually reviewed to help maintain and increase the open space, light and air surrounding the residential and commercial structures on the island. Additional controls have been added to limit the size and number of signs permitted on commercial and residential property. These controls are reviewed as the community develops and adjustments are made accordingly.

2016 Follow Up:

9. There is an ongoing concern about visual access and scenic corridors on the island, and there is a continuing desire to renovate some of the less desirable views, and to possibly create consistent wayfinding for the island to create unity of signage.
- a. Support the current efforts of the Community Education and Recreation (CER) department in providing youth and adult educational and recreational opportunities.
- b. Support and help fine funding for a Youth Center that will provide supervised activities for the City's youth. Afternoon and evening programs can provide after

school activities that are better suited to today's households that have both parents working full time.

- c. Continue to upgrade and maintain the existing recreational facilities, while pursuing the development of new and improved recreational facilities and funding the recreational programs. Particular emphasis should be given to the development of a Bikeway and additional support for the Brigantine Rowing Club.
- d. Promote and preserve access to both the Bay and Atlantic Ocean.
- e. Increase public recreation including but not limited to pedestrian and bikeways, recreation fields, parks and indoor recreation facilities.

Action Taken:

The City has provided continued and expanded support of the efforts of the Community Education and Recreation (CER) Department in providing both youth and adult educational and recreational opportunities. The purchase of the former St. Phillips School and the redesign of the facility to be used as a community recreational facility has lead the latest effort to improve the City's recreation. The new Recreation Facility will provide needed facilities, staff and activities for the City's youth, adult and active adult population.

2016 Follow Up:

All of the above noted items are still relevant and as noted, the Community Education and Recreation (CER) facility has been constructed at 42nd Street. The City is in the process of developing a Recreation and Open Space plan as a standalone element. Within that plan the following recommendations have been made:

1. Enhancements to the appearance and playability of the municipally owned Golf Course
2. Upgrade fields and recreation opportunities.
3. Improved alternative transportation options for pedestrians and bicyclists
4. Improved access to north end recreation and open space areas
5. Improved Wayfinding, and Identification Signage

10. FLOOD PROTECTION - While it is evident that the City has made strong efforts to reduce the amount of damage by flood waters; it is recommended that additional measures be reviewed and possibly implemented within the Land Use Ordinance.

Action taken:

No additional ordinances have been put in place.

2016 Follow Up:

With the after effects of Superstorm Sandy, ordinances have and will be reviewed to provide as safe a building environment as possible on a barrier island.

3. DEMOGRAPHIC PROFILE

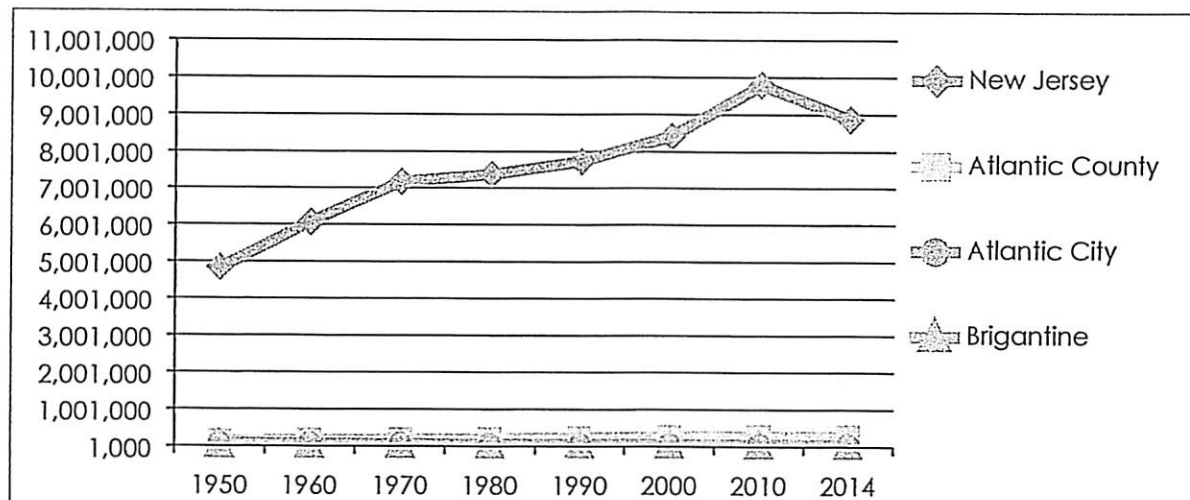
The 2010 Master Plan included a demographic profile of the City based on the 2000 Census and 2010 projections. This 2016 Master Plan Re-examination Report will take the data and information from the 2000 Census and posit it to the 2010 Census data and the 2010-2014 American Community Survey 5-Year Estimates. While the numbers evident between the 2010 and 2014 update are not significant the data indicates that there has been no upward trends as of this date.

3.1 TOTAL POPULATION

The City of Brigantine began developing in the 1950s and 1960s, growing from 400 residents in 1940 to 4,200 residents in 1960. Brigantine continued to grow steadily to a peak population of 12,594 in 2000, marking the most people permanently inhabiting the island in its history. By 2010 the City had lost a quarter of its residents due to the factors noted above. The 2010-2014 American Community Survey 5-Year Estimates for Brigantine estimate the population to be 9,420, a slight decrease since the 2010 Census. During the period between 2000 and 2010, Atlantic City experienced a 2 percent loss of population, meanwhile the County lost 9 percent and the State lost 16 percent.

HISTORIC POPULATION (1950-2014)

YEAR	BRIGANTINE		ATLANTIC CITY		ATLANTIC COUNTY		NEW JERSEY	
	Population	Change	Population	Change	Population	Change	Population	Change
1950	1,267	--	61,657	--	132,399	--	4,835,329	--
1960	4,201	+232%	59,544	-3%	160,880	+22%	6,066,782	+25%
1970	6,741	+60%	47,859	-20%	175,043	+9%	7,171,112	+18%
1980	8,318	+23%	40,199	-16%	194,119	+11%	7,365,011	+3%
1990	11,354	+36%	37,986	-6%	224,327	+16%	7,730,188	+5%
2000	12,594	+11%	40,517	+7%	252,552	+13%	8,414,350	+9%
2010	9,450	-25%	39,558	-2%	274,549	+9%	9,791,894	+16%
2014	9,420	-0%	39,521	-0%	275,325	+0%	8,874,374	-9%



The median age of Brigantine residents has steadily increased from 31.8 years of age in 1980, to 34 years in 1990, to 40.7 years old in 2000, to 50.60 years of age in 2014. This indicates that residents are aging in place and the City is becoming more popular as a retirement community. For comparison, the County and State have median age of approximately 40 years old; meaning on average the residents in Brigantine are 10 years older than the rest of the population. While the City lost 25 percent of its population between 2000 and 2014, the population that emigrated was primarily under 44 years old, while the populations 55 and older actually increased during the same period.

**COMPARISON OF AGE DISTRIBUTION IN BRIGANTINE
2000 – 2014 Census (5-Year Estimates)**

AGE DISTRIBUTION	2000 CENSUS	PERCENT OF TOTAL	2014 CENSUS	PERCENT OF TOTAL	CHANGE (+/-) (%)	
Under 5 years	701	5.6%	365	3.9%	-336	-48%
5 to 9 years	818	6.6%	368	3.9%	-450	-55%
10 to 14 years	732	5.8%	304	3.2%	-428	-58.5%
15 to 19 years	558	4.3%	506	5.4%	-52	-10%
20 to 24 years	548	4.3%	705	7.5%	157	29%
25 to 34 years	1,649	13.1%	936	9.9%	-713	-43%
35 to 44 years	2,238	17.7%	725	7.7%	-1,513	-78%
45 to 54 years	1,728	13.7%	1,547	16.4%	-181	-10.5%
55 to 64 years	1,532	12.2%	1,660	8.8%	128	8.4%
65 to 74 years	1,277	10.1%	1,406	7.3%	129	22.3%
Over 75 years	813	6.6%	898	6.6%	85	10%
TOTALS	12,594		9,420		-3,174	-25.2%

Observations:

1. The decline in the permanent population of Brigantine appears to have been greatest in the family age groups. Many of these people may have been employed in the casino industry directly across the Inlet at the Marina District. The percentage decline in the 25-43 year olds (-43%) and the 35-44 year olds (-78%), is significant for a number of reasons:
 - a. These were people in the prime of their employment working years who were most likely bringing their income on to the island from outside.
 - b. These people were also in child rearing age ranges. Losing their jobs in the casino industry made many of them relocate, thus taking the income that they would have spent on the tangible and intangibles of raising children and supporting a family, with them.
2. The related observation is that there is a noticeable decline in children of all age groups. Under 5 years (-48%), 5-9 years (-55%), 10-14 years (-58.5%), or a total of 1,214 minors. This significant change can be tied to the above decline in the 25-44 year old population, as these are the children of the families who left the island during the Casino resizing. The effect of the decline of children has a ripple effect on the entire island, for example, less school aged children means less classes, less participants in activities throughout the City, and less dollars spent locally feeding and clothing the children.

3. The demographics show an aging population, indicated by the increase in the age groups of: 55-64 years (+8.4%), 65-74 years (22.3%), and Over 75 years (10%). While the numbers are not as great as those age groups that declined, it does point to an aging population in some cases past the point of working, and living on retirement incomes. Some of this group would be people who having owned a property in Brigantine, have decided upon retirement to make it their primary residence, and in speaking with some individuals of this age group at the Open House, it would also seem that many of this group go south for the winter or travel, therefore are not in Brigantine for stretches of the year.

3.2 POPULATION DENSITY

Population density for Brigantine is listed as 1,479.5 people per square mile, according to data from the 2010 Census. The seasonal summer population for the island is around 30,000 people, significantly increasing the population density by 3 to 4 times during June, July and August, the prime vacation months.

3.3 HOUSEHOLD AND FAMILY SIZE

The total number of households in Brigantine is 4,379, with 2,612 of those being families of which 769 have children under the age of 18. Average household size is 2.15 persons per household, and the average family size is 2.64 persons.

There are approximately 1,542 school age children (from 3-18 years of age)

3.4 RACIAL COMPOSITION

The chart below is an amalgamation of information from the 2010 Master Plan, and the updated time period 2000 to 2010, for comparison purposes. What can be noticed is that as the populations grew, the percentage of Whites and Blacks remained proportional (roughly 87% of the total population), while the Asian population, which was growing in the 2000 count, contracts by 2010's census, and the Hispanic population increases in numbers and as a percentage of the whole. The Hispanics are the only group to post population growth during this period.

RACIAL COMPOSITION IN BRIGANTINE (1990 – 2014)

Race	1990		2000		2014		Population Change
	Pop.	(%)	Pop.	(%)	Pop.	(%)	(1990-2014)
White	10,609	93.4%	10,472	83.2%	7,918	84.1%	-2,691
Black	364	3.2%	496	3.9%	315	3.3%	-49
Indian (Am)	24	0.2%	23	0.2%	13	0.1%	-11
Asian	202	1.8%	720	5.7%	363	3.9%	161
Other	155	1.4%	883	7.0%	59	0.6%	-96
Hispanic	506	4.5%	458	3.6%	752	8.0%	246
Total	11,354	100%	12,594	100%	9,420	100%	-1,934

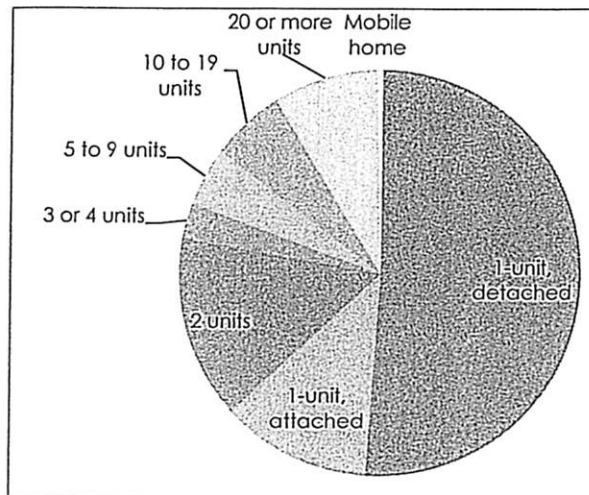
3.5 AGE OF HOUSING STOCK

The fact that the City of Brigantine Beach is a seasonal destination to some and a permanent address to others makes the data regarding housing interesting to evaluate. The total number of housing units listed is 9,386 units, of which 4,379 are listed as occupied, and 5,007 listed as vacant. The vacant classification is misleading, as the 5,007 units are most likely seasonal second residences.

Of the 9,386 units, more than 50 percent of them are single Family Detached Dwellings, while another 25 percent of the units are listed as Single Family Attached or a 2 unit structure. The remaining units are all of various multi-unit classifications with the largest grouping, 20 or more units, at 8 percent. Of the overall number of housing units, nearly 70 percent are 2 and 3 bedroom structures.

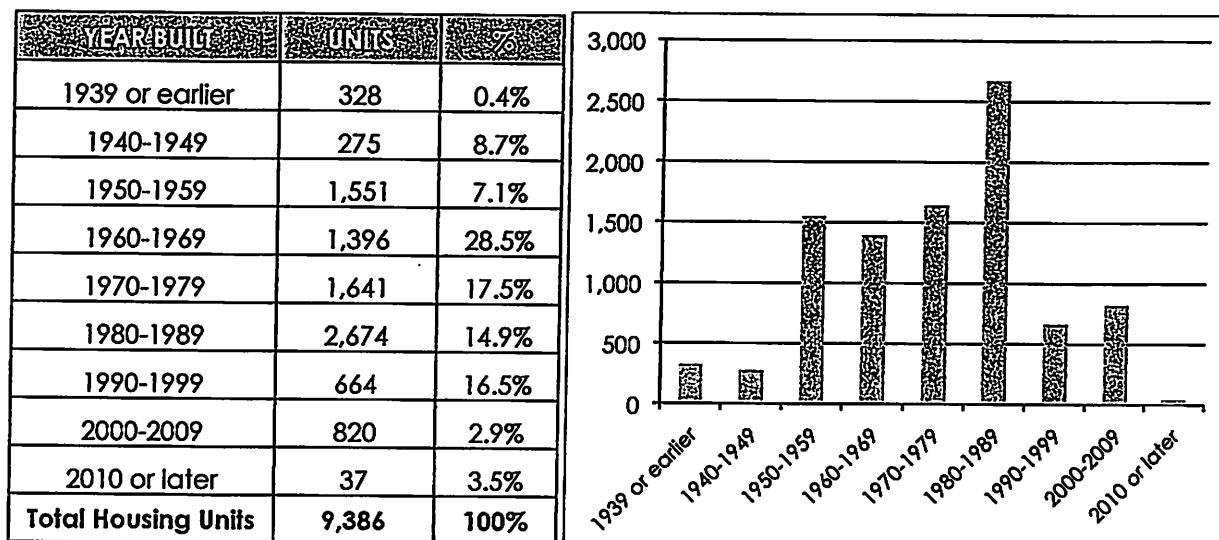
HOUSING UNITS PER STRUCTURE IN BRIGANTINE (2014)

UNITS IN STRUCTURE	UNITS	%
1-unit, detached	4,789	51.0%
1-unit, attached	1,130	12.0%
2 units	1,385	14.8%
3 or 4 units	267	2.8%
5 to 9 units	437	4.7%
10 to 19 units	554	5.9%
20 or more units	781	8.3%
Mobile home	43	0.5%
Total Housing Units	9,386	100%



As has been noted, the City of Brigantine grew steadily in units in the 1950's, 1960's and 1970's adding around 15 percent to the total housing stock each decade. The 1980's appears to be the high point in the development of the City with 2,674 units or close to 30 percent of the overall housing units being built during that era. After 1990, the construction dropped to less than 10 percent in each decade. This would seem to indicate that the City is mostly built out at this point and many of the units built are as the result of natural disasters or are infill or teardown and re-builds.

AGE OF HOUSING STOCK (2014)



3.6 EDUCATIONAL ATTAINMENT

Educational attainment derived from the 2010-2014 American Community Survey indicates that the population of Brigantine's residents 25 years and older is 7,172. The following is an overview of this data.

The majority of permanent residents have either a High School diploma with some college (3,562) or a Bachelor's College Degree (1,777). The percentage of high school graduates is around 92 percent and College graduates around 35 percent.

In almost every category the City of Brigantine is equal to National standards and above those for Atlantic County as a whole with regard to percentages for Educational Achievement.

EXAMPLES INCLUDE			
Education	Brigantine	US State	Atlantic County
High School Graduate	28%	28%	36%
Some College, No Degree	22%	21%	18%
Bachelor's Degree	24.8%	17%	16%
Graduate Degree	9.7%	10%	7%

3.7 ECONOMIC PROFILE

Employment

Private sector employment has fallen in Atlantic City, and as a result opportunities for people living in Brigantine, since 2008, with the biggest drop being within the Accommodation and Food Services sector, as can be expected due to the problems in the casino industry. Employment data from the 2007 and 2012 Economic Census showed employment levels in Accommodation and Food Services declined from 47,392 employees in 2007 to 38,593 employees in 2012. Also notable is the decline in the Real Estate, Rental and Leasing sector, which fell from 739 employees in 2007 to 475 employees in 2012, emblematic of the lackluster activity in real estate. It should be noted that the 2012 data, which is the latest U.S. Census Bureau Economic Census, predates Superstorm Sandy and the recent rash of casino closings.

The table below shows the 2014 employment statistics for Brigantine from the New Jersey Department of Labor and Workforce Development (NJDLWD), Quarterly Census of Employment and Wages (QCEW). The data indicates that there are 191 private businesses in Brigantine with an average annual employment base of 1,163 employees. As can be expected for a tourist resort community, there is a lull in employment during the 1st and 4th quarters when the tourism industries are not operating at peak. There are approximately 25 percent more jobs in the summer than in the winter months.

QUARTERLY CENSUS OF EMPLOYMENT AND WAGES (2014)

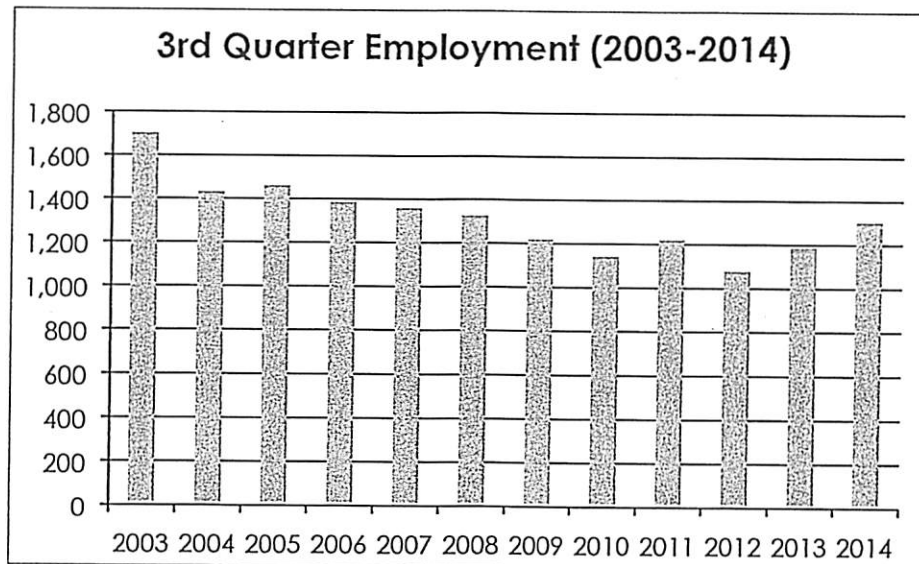
Industry	Average Units	Employment					Average Annual Wages
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Average	
Construction	36	110	121	160	163	129	\$53,487
Retail Trade	27	196	286	252	228	242	\$25,655
Finance/Insurance	5	24	26	37	20	27	\$39,759
Real Estate	7	24	24	27	23	25	\$32,351
Professional/Technical	9	20	23	13	24	21	\$50,734
Admin/Waste Remediation	9	64	74	77	67	68	\$19,766
Health/Social	17	176	180	202	199	186	\$25,857
Arts/Entertainment	12	24	66	61	45	51	\$20,295
Accommodations/Food	24	187	332	311	188	259	\$15,017
Other Services	31	112	119	120	122	115	\$20,812
PRIVATE SECTOR TOTALS	191	967	1,295	1,305	1,120	1,163	\$26,813
FEDERAL GOV'T TOTALS	2	9	9	9	9	9	\$38,602
LOCAL GOV'T TOTALS	2	306	364	362	316	328	\$66,547
LOCAL GOV'T EDUCATION	1	155	163	137	160	140	\$64,749

The NJDLWD provides QCEW data from 2003 to 2014. The table below compares the private sector business establishments, jobs, and wages for each year. The average number of private sector business establishments per year was fairly steady until about 2008, when the economy collapsed. The gain of 13 units in 2014 indicates that the economy is finally starting to recover in Brigantine, though it is still not at the level it was in 2003.

HISTORIC TRENDS OF EMPLOYMENT AND WAGES (2003-2014)

Year	Average Units	Employment					Average Annual Wages
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Average	
2003	219	1,276	1,497	1,701	1,309	1,454	\$21,497
2004	221	1,271	1,497	1,431	1,330	1,384	\$23,153
2005	214	1,232	1,413	1,461	1,252	1,353	\$26,702
2006	220	1,145	1,542	1,385	1,251	1,313	\$25,381
2007	220	1,157	1,517	1,359	1,174	1,289	\$24,568
2008	219	1,200	1,459	1,326	1,138	1,283	\$24,006
2009	204	1,051	1,274	1,219	998	1,134	\$23,961
2010	199	950	1,216	1,142	994	1,073	\$24,577
2011	186	958	1,226	1,221	1,024	1,101	\$24,895
2012	181	892	1,216	1,077	951	1,034	\$25,334
2013	180	962	1,342	1,190	1,040	1,129	\$26,321
2014	191	967	1,295	1,305	1,120	1,163	\$26,813

To analyze the condition of the tourist industry, we compare the 3rd quarter employment records for each year, as shown in the chart below. Again, the data indicates that Brigantine has been declining in summer employment since 2003 but more significantly from 2008 to 2012. The City saw summer employment growth in 2013 and 2014, but there are still 400 fewer jobs now than there were in 2003.



Income

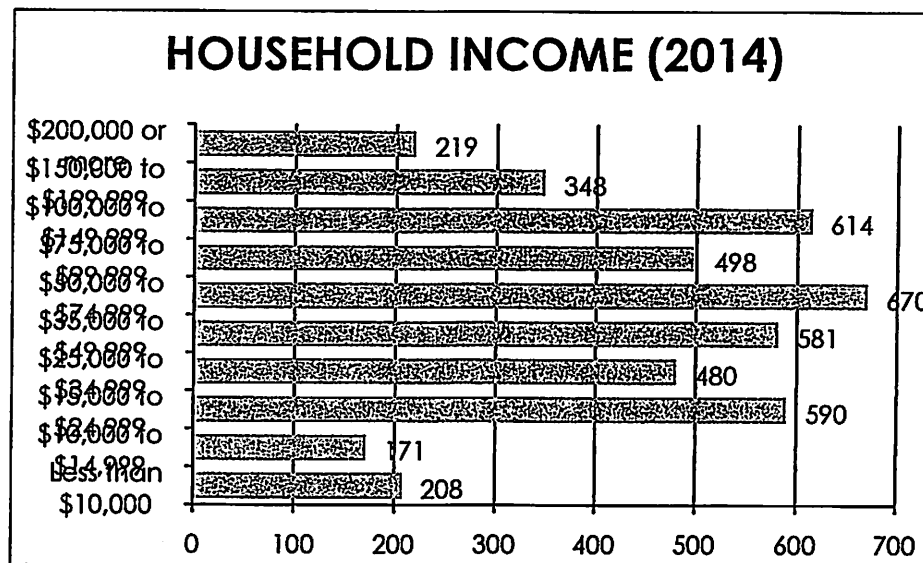
According to the 2014 American Community Survey, the City has a working age population of 8,250 people (age 16 years and older). The number of people listed in the labor force in 2010 was around 5,066 people or 61.4 percent of the total, of which 4,614 were identified as employed, and 452 or 5.5 percent unemployed.

The table below shows the employment sector breakdown of the 4,614 employed individuals. Management and service occupations are the most common among Brigantine residents. The 2014 ACS data also shows that 85 percent (3,931) of the total employed population are private sector or self-employed, while 15 percent (683) are government workers.

EMPLOYED POPULATION BY SECTOR (2014)

EMPLOYMENT SECTOR	POPULATION	PERCENT
Management, Business, Science and Arts	1,526	33%
Service Occupations	1,374	30%
Sales and Office Occupations	1,198	26%
Construction and Maintenance	257	6%
Production and Transportation	259	5%
Total Employed Population	4,614	100%

There is a relatively consistent gradient of income ranges within Brigantine, according to 2014 inflation adjusted dollars, with 10-15% of residents falling into the 7 (seven) income ranges between \$15,000 to \$25,000 and \$100,000 to \$150,000 dollars per year. The Median Household Income is \$56,310 and the Mean Household Income is \$79,090.



Roughly 90 percent of residents have Health Insurance Coverage either through private health insurance or public insurance coverage, according to the 2014 ACS data.

Real Estate Market

The following Real Estate Market Summary was taken from the website RealtyTrac at (<http://www.realtytrac.com/statsandtrends/nj/atlantic-county/brigantine>). (May 2016)

There are currently 184 properties in Brigantine, NJ that are in some stage of foreclosure (e.g. default, auction or bank owned) while the number of homes listed for sale on RealtyTrac is 498.

In March 2016, the number of properties that received a foreclosure filing in Brigantine, NJ was 23 percent lower than the previous month and 29 percent lower than the same time last year.

Home sales for February 2016 were down 45 percent compared with the previous month, and up 150 percent compared with a year ago. The median sales price of a non-distressed home

was \$250,000. The median sales price of a foreclosure home was \$210,000, or 16 percent lower than non-distressed home sales.

4 2016 GENERAL GOALS AND OBJECTIVES STATEMENT

A. The following is a list of general goals as outlined in the MLUL:

1. To encourage municipal action to guide the appropriate use or development of all lands in a manner, which will promote the public health, safety, morals and general welfare.
2. To secure safety from fire, flood, panic and other natural and manmade disasters.
3. To provide adequate light, air and open space.
4. To promote the establishment of appropriate population densities and concentrations that will contribute to the well-being of persons, neighborhoods, communities and regions and preservation of the environment.
5. To encourage the appropriate and efficient expenditure of public funds by the coordination of public development with land use policies.
6. To provide sufficient space in appropriate locations for a variety of residential, recreational, commercial and industrial uses, and open space, both public and private, according to their respective environmental requirements in order to meet the needs of all citizens.
7. To encourage the location and design of transportation routes that will promote the free flow of traffic while discouraging location of such facilities and routes, which result in congestion or blight.
8. To promote a desirable visual environment through creative development techniques and good civic design and arrangements.
9. To promote the conservation of historic sites and districts, open space, energy resources, and valuable natural resources and to prevent degradation of the environment through improper use of land.
10. To encourage adequate provision of affordable housing.
11. To promote conservation and wise use of all energy resources.
12. To promote the maximum practicable recovery and recycling of recyclable materials from municipal solid waste through the use of planning practices designed to incorporate the state Recycling Plan goals and to complement municipal recycling programs.
13. To enable municipalities the flexibility to offer alternatives to traditional development, through the use of equitable and effective planning tools including clustering, transferring development rights, and lot-size averaging in order to concentrate development in areas where growth can best be accommodated and maximized while preserving agricultural lands, open space, and historic sites.

2016 Master Plan Re-Examination and a review of the many planning documents prepared before and since reveals there are overriding themes that must be recognized and addressed:

- The economy and tourism of Brigantine is inexorably connected to Atlantic City and the County. Economy and tourism issues are generally shared across municipal boundaries in regionally in this interconnected area. The expansion of tourism increases the economy of other business sectors, and the entire region must become more tourist-friendly.
- Aesthetic treatment is needed to improve street appeal and gateways should be developed to create a "sense of arrival" and "sense of place".
- The economy needs diversification. Various educational facilities and centers of learning have been proposed in Atlantic City. Brigantine should consider opportunities to provide services associated with or supplemental to these facilities. Any potential opportunity to provide new and differing services should be welcomed with open arms, as well as other diversification initiatives.
- The waterfront is underutilized. Public access to the waterfront needs to be improved. Pedestrian trails should be located along the Bayfront at street ends and activities such as kayak and boat rentals, boat launches and fishing areas should be added.
- Better pedestrian and bicycle friendly connections between the Beach and the shopping districts are needed, and an improved retail mix should be explored in both districts.
- The City needs to attract and keep new residents.
- An analysis of community vulnerability to natural disasters has been prepared and a series of resiliency goals and objectives developed. The mitigation projects listed in the Storm Damage Mitigation Project Report dated November 21, 2012 should be carried out.

5. 2016 RESOURCE INVENTORY AND ASSESSMENT

5.1 SHORE PROTECTION

Continued improvements to the bulkhead systems throughout the island have occurred since the last Master Plan. Approximately 90 percent of the street end bulkheads have been replaced or reconstructed.

The bulkhead at the north end of Brigantine Avenue has been replaced with a seawall and concrete promenade. This structure has significantly increased the amount of storm protection for the properties in this section of the island.

In addition to these structural improvements, the City has supported and participated in several beach replenishment projects conducted by the Army Corps of Engineers.

5.2 REGIONAL DEVELOPMENT

The regional development outlook has changed substantially in the Post Superstorm Sandy and Post Casino Growth eras. There are not many large scale development projects at this point in time, and while that may change in the future, other factors are coming into play, such as the possibility of casinos in northern New Jersey.

While the regional situations have and will play a role in Brigantine's ability to grow, they have a lesser impact on Brigantine as a destination for vacationers and people looking for a good quality of life.

5.3 POTABLE WATER SUPPLY

The Brigantine Department of Public Works provides potable water via approximately 53 miles of water main. The mains vary in size from 4" to 12". The water is pumped from the Atlantic City 800-foot Sand aquifer by five wells ranging from 800 to 850 feet deep. The system also contains 439 fire hydrants and 6499 water meters. Three water towers are used to store the water. These towers have a capacity of 2,250,000 gallons.

As indicated in the previous master plan document, the City of Brigantine was permitted by the NJ Division of Water Resources to withdraw 111.6 million gallons per month (MGM) in 1991. This allocation was increased to 115 million gallons per month until June 1, 2010 when it was increased to 127.5 MGM.

6. LAND USE INVENTORY 2016

Note: Much of the information in this section is derived from the 2010 Master Plan as developed by Lance B. Landgraf, Jr., AICP, P.P. and adopted on February 23, 2011.

The Land Use Plan element of a community Master Plan is generally perceived to be the key element of the Master Plan. The Land Use Plan serves as the foundation and basis for the Zoning Ordinance. Indeed, the significance of the Land Use Plan Element is noted by the Municipal Land Use Law which states that a Master Plan shall generally comprise of at least a statement of objectives, principals, assumptions, policies and standards and a land use plan element with other elements being optional. Generally, the purpose of the Land Use Plan is to show the existing and proposed location of uses of land in the future. In the case of Brigantine, which has been mostly developed for many years, the future land use pattern can be anticipated to replicate the existing land use pattern for the most part, save for possible areas of redevelopment.

A comparison between the amounts of different land use types in the past and present can be analyzed through either a review of property tax classifications from the tax assessor's office or Land Use/Land Cover data from NJDEP based on aerial photos.

The following is a listing of Municipal Zoning Classifications for the City. A review shows that while there are five Commercial Zones and two Conservation Zones, there are ten Residential classifications.

The division of the total acreage within the various zones provides a good snapshot of Brigantine as a residentially oriented community. All of the Commercial Zones (B1, B-1A, B2, B3, and B6) together comprise only 1.5 percent (114.37 acres) of the City, with the Residential Zones (R1, R2, R-2A, R3, R-3B, R4, R5, R6, R7 and R8) covering 18 percent (1,297.15ac) of the island.

The land designated as Conservation Zone (C1 and C2), including the beach, dunes and wetland bay and inlet areas, and the Links Golf Course together make up 80 percent (5,439.66 acres) of the gross land area of Brigantine.

Brigantine Municipal Zoning Properties

Zone	Zone Description	Use	Base Lot Size	Min Lot Size	Min Density	Max Density	Revision Date	FAR	Total Acres
B1	Business*	COMMERCIAL	Various		0.00	0.00	June 1996	0.40	46.33
B-1A	Business*	COMMERCIAL	Various		0.00	0.00	June 1996	0.40	14.13
B2	Business*	COMMERCIAL	Various		0.00	0.00	June 1996	0.40	23.85
B3	Village Square*	COMMERCIAL	Various		0.00	0.00	June 1996	0.40	19.58
B6	Business*	COMMERCIAL	Various		0.00	0.00	June 1996	0.40	10.48
C1	Conservation District - Beaches, Dunes, Wet	WETLANDS			0.00	0.00	June 1996	0.00	5277.41
C2	Conservation District - Golf Courses/Countr	CONSERVATION			0.00	0.00	June 1996	0.00	162.25
R1	Residential Single Family	RESIDENTIAL	6,000 sf		7.26	7.26	June 1996	0.00	195.24
R2	Residential Single Family	RESIDENTIAL	4,500 sf		9.68	9.68	June 1996	0.00	334.99
R-2A	Residential Single Family	RESIDENTIAL	5,400 sf		8.07	8.07	June 1996	0.00	297.95
R3	Single Family Attached (Townhouse)**	RESIDENTIAL	5,400 sf	3,600 sf	8.07	12.10	June 1996	0.00	191.39
R-3B	Residential**	RESIDENTIAL	5,400 sf	4,500 sf	8.07	9.68	June 1996	0.00	21.22
R4	Residential**	RESIDENTIAL	5,400 sf	4,050 sf	8.07	10.76	June 1996	0.00	55.75
R5	Residential (Townhouse)	RESIDENTIAL	4 acres (Townhouse)		40.00	40.00	June 1996	0.00	14.47
R6	Residential	RESIDENTIAL	6,000 sf	4 acres (Townhouse)	7.26	40.00	June 1996	0.00	108.98
R7	Residential	RESIDENTIAL	6,000 sf	4 acres (Townhouse)	7.26	40.00	June 1996	0.00	50.13
R8	Residential Marine**	RESIDENTIAL	5,400 sf	4,500 sf	8.07	9.68	June 1996	0.00	27.03

The 2010 zoning updates reflect zoning changes as per revision date on the source map received from each municipality. Brigantine: 10/25/2010.

Note: For the purpose of this zoning map it is the intent that the C-1 Conservation District limit along the ocean front be consistent with the Development Restriction Line established by Ordinance #28 of 1981.

*Minimum Lot Sizes Depend on the Establishment

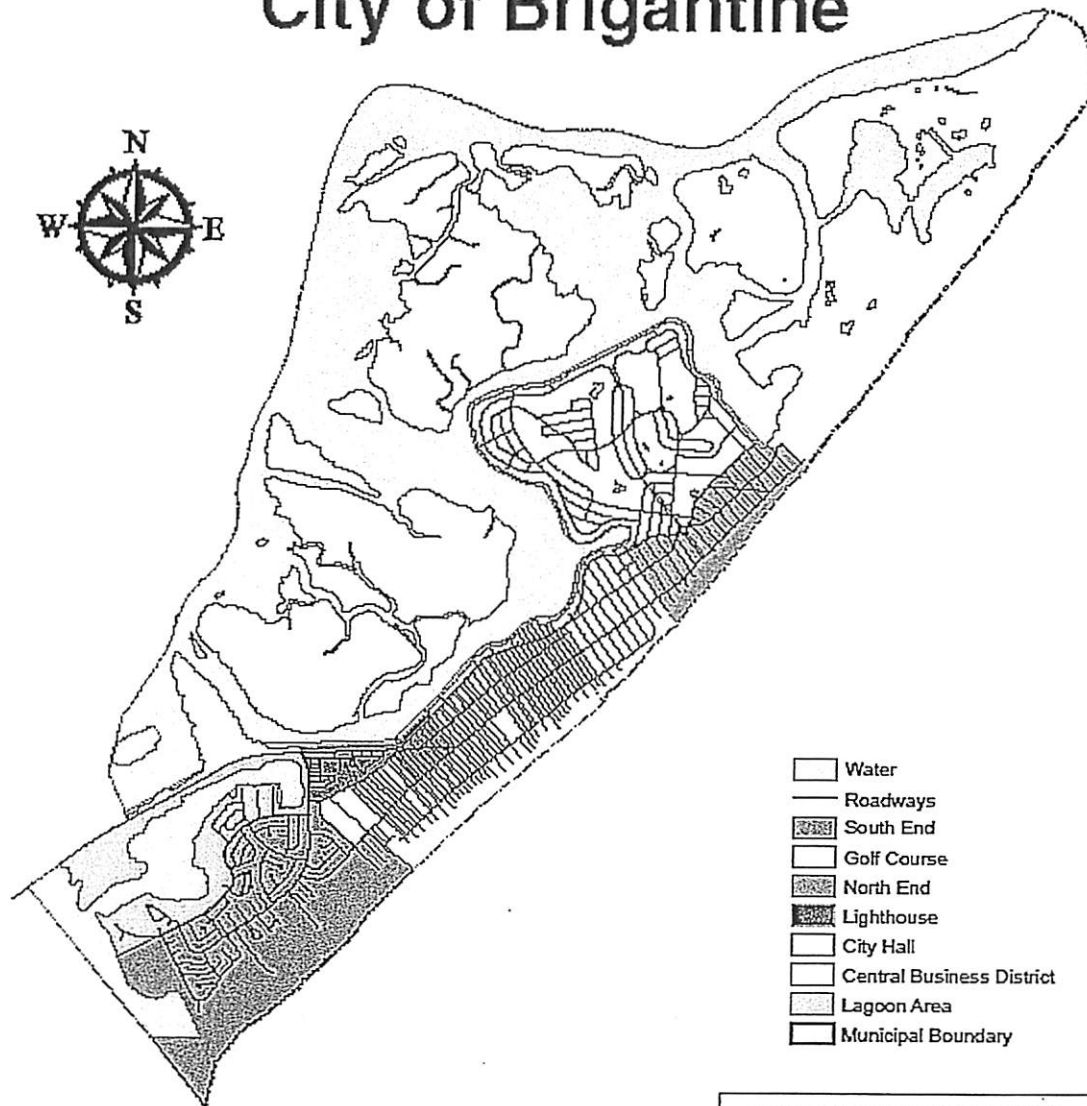
**Minimum Lot Size Based on Single One Family Housing

The R2 and R-2A Zones account for nearly half (632.94 acres) of the 1,297 acres within the Residential land use category. The R2 and R-2A are single family residential zones with a base lot size of 4,500 – 5,400 square feet, and a maximum density of 8.07 - 9.68 units per acre. This translates to roughly 10 units per acre, and is the standard range of most of the single family zones. The multifamily zones (R5, R6, and R7) have higher maximum densities, but also have minimum lot sizes generally in the 4 acre range to accommodate the larger planned developments.

6.1 HISTORIC LAND USE PATTERNS

The land use patterns of Brigantine Island have been identified as being majorly grouped into three (3) categories: Residential, Commercial, and Conservation/Recreation. The residential land uses dominate the developable land areas. The conservation/recreational land uses comprise the vast majority of the total acreage of the City's defined area, including the beach and dunes on the eastern side, the Absecon Wildlife Management Area on the western side, and the North Brigantine State Nature Area to the north.

Planning Areas Map City of Brigantine

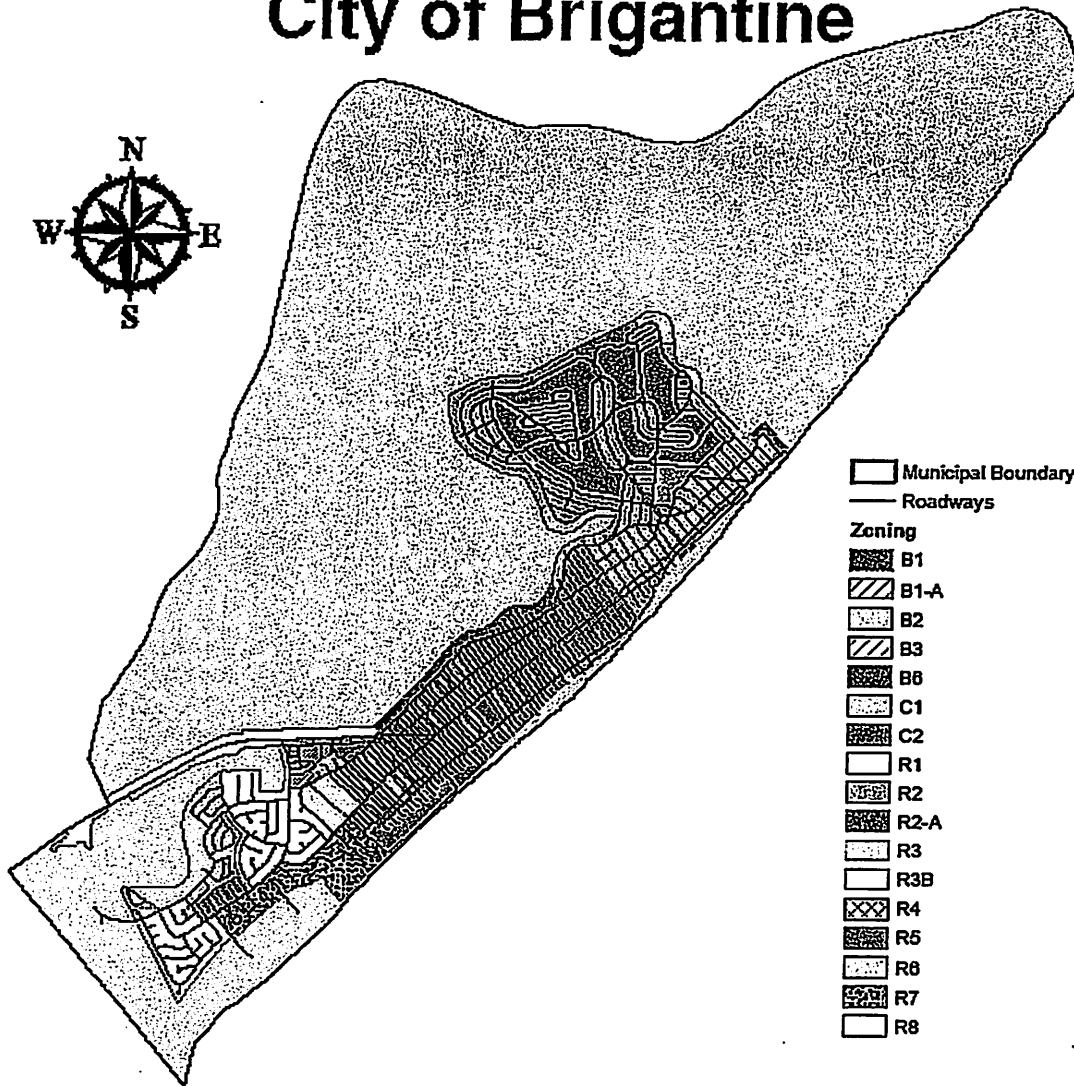


5,100 2,550 0 5,100 10,200 Feet

THIS MAP WAS PREPARED WITH THE ASSISTANCE OF THE ATLANTIC
COUNTY DEPARTMENT OF REGIONAL PLANNING & DEVELOPMENT
OFFICE OF GEOGRAPHIC INFORMATION SYSTEMS

MARATHON ENGINEERING &
ENVIRONMENTAL SERVICES, INC.
2922 ATLANTIC AVENUE
SUITE 3A
ATLANTIC CITY, N.J. 08401
P 609-437-2100
F 609-437-2101

Zoning Map City of Brigantine



5,000 2,500 0 5,000 10,000 Feet

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As illustrated on the Zoning Map and the Planning Areas, there are Residential land uses within most of the Planning Areas. These areas vary from R-6 multifamily housing in the Lagoon Area to R-2 Single Family detached dwellings around the Golf Course.

6.2 RESIDENTIAL LAND USE

The Residential Zones (R1, R2, R-2A, R3, R-3B, R4, R5, R6, R7 and R8) cover roughly 18 percent (1,297.15 acres) of the island land mass, and almost 92 percent of the developable lands. The majority of these zones are developed at this time.

Within the residential uses there are three (3) main categories.

- a. Low-Medium Density Residential (1 – 4 dwelling units)
Low-Medium Density Residential land uses are comprised of four (4) housing types. These housing types include single-family detached dwellings (SFD), duplexes (DPL), triplexes (TRI), and quadraplexes (QUAD). The majority of the housing stock in Brigantine is Low-Medium Residential density.
- b. Medium-High Density Residential (Townhouses)
Medium-High Density Residential land uses include townhouses (TWN). Medium-High Density Residential land uses account for the second largest portion of the housing stock in Brigantine.
- c. High Density Residential (Condominiums/Garden Apartments)
High Density Residential land uses include apartments, condominiums and multi-family dwellings. High Density Residential land uses in Brigantine comprise the smallest portion of the housing stock. The highest concentration of the high-density residential units can be found in the South End Planning Area (see Planning Areas map). This planning area comprises more than 55 percent of all high-density housing units.

6.3 COMMERCIAL LAND USE

The Commercial land use category (B1, B-1A, B2, and B3 Zones) account for approximately 8 percent of the developable areas of Brigantine. Accounting for only 1.5 percent of all land uses in the City of Brigantine, commercial uses can be sub-grouped into two main areas and categories.

- a. Commercial Businesses
For the purposes of the land uses inventory, the Commercial Business category includes office, restaurants and retail establishments. More than 90 percent of the businesses fall into this category. Commercial Businesses are generally found in the two Central Business Districts: the Lighthouse CBD in the northwestern portion of the island and the City Hall CBD along Brigantine Avenue.

Historically, Brigantine had commercial uses on the northern end of island from Roosevelt Boulevard to 15th Street North, but as of 2016 there is only one commercial use—the Pirate's Den Restaurant at 13th and Brigantine—remaining in this former corridor.

- i. Lighthouse CBD
The Lighthouse CBD includes the commercial strip along Atlantic Brigantine Boulevard from the Brigantine Towne Center to the retail area surrounding the lighthouse and extending down Brigantine Avenue.
- ii. City Hall CBD
The City Hall CBD includes the commercial strip along Brigantine Avenue from 15th Street South to 8th Street South, and includes municipal functions, a county library, and some open park spaces, as well as, the commercial uses on Brigantine Avenue. The Saint Thomas Roman Catholic Church is also in this CBD.

b. Marina and Waterfront Commercial (Water Dependent Businesses)

For the purposes of the land uses inventory, the Marina and Waterfront Commercial land use category has been defined to include all businesses relying on water access. Marinas and waterfront commercial businesses account for 6.5 percent of commercial uses in the City of Brigantine, excluding structures over the water (e.g. piers, docks, etc.).

6.4 CONSERVATION AND RECREATION LAND USE

The Conservation and Recreational Land Use include coastal wetlands, the Brigantine Golf Course, back bay property, waterfront property, beaches, and conservation areas. The recreational and community facilities account for approximately 3 percent of the developable land area. Active recreational facilities encompass approximately 22 acres. This land use does not include the Brigantine Golf Course and beaches). These areas have been included in the Conservation Land Use. (See Recreation and Open Space Plan, ROSI, for a complete analysis of the Conserved and Recreational land on the Island).

Coastal wetlands account for the largest land area in Brigantine. The Forsyth National Wildlife Refuge accounts for approximately 680 acres. In total, coastal wetlands occupy more than half (2,082 acres) of the wetlands area or approximately 51% (including the Forsyth National Wildlife Refuge and state-owned Marine Tidal Marsh). These lands fall under the jurisdiction of the New Jersey Department of Environmental Protection (NJDEP).

The remaining conservation areas of golf course, beaches, back bay, waterfront property, and conservation areas contain over 400 acres of protected lands within the developable portion of the City.

In total, Brigantine contains 4,089 acres of land. The developable area accounts for 1,956 acres or approximately 48 percent. This land area is located between the north end of the Absecon Inlet and extends to approximately two (2) miles south of the Brigantine Inlet.

6.5 PLANNING AREAS

To further understand development in the City of Brigantine, the City has been divided into seven planning areas, each with a distinctive land use pattern and identity. The planning areas recognize the different residential neighborhood and business district characteristics.

1. Lagoon Residential Planning Area

As one enters the City of Brigantine, the first planning area encountered is the Lagoon Residential Planning Area. The focal point of this planning area is the lagoon and St. Georges Thorofare. This district includes Low-Medium residential and Medium-High residential land uses. Along Atlantic Brigantine Boulevard, the district is marked by one- to four- family dwellings, which often have some nexus to the water. Upscale single-family dwellings characterize the man-made Sea King and Conch Lagoon neighborhoods. Townhouses dominate the final section of the Lagoon Planning Area. This section is located along Lagoon Boulevard toward the east and is the most densely developed. Exclusive of the single-family development along the lagoon on the north side, this planning area has an average density of 14 units per acre (DU/AC). The street system was developed in a curvilinear fashion parallel to the water's edge.

2. Lighthouse Central Business District Planning Area

The Lighthouse Central Business District (CBD) can be identified as the commercial district that extends from Harbor Beach Boulevard to 30th Street South along Atlantic Brigantine Boulevard. This district is bounded by the Brigantine Town Center to the west and the commercial retail center located to the east of the Brigantine Lighthouse.

The focal point for the Lighthouse CBD, namely the Brigantine Lighthouse, is located in the center of the Brigantine Circle. The older portion of this CBD surrounds the Lighthouse and contains commercial businesses and mixed land uses. While the Lighthouse acts as a visual landmark element and is part of a patchwork of public spaces in this area—including the Veterans Memorial and the triangular space with the Dolphin fountain—this area has no cohesive planning for the safe circulation of pedestrians, bicycles and automobiles.

While serving as the main hub of a spoked wheel of streets (which go to the bayside, toward the middle of the island north, and to the beach easterly) this lack of delineation and sense of safety make this area formidable. There seems to have been little planning for the integration of human scale elements, such as sidewalks. The limited pedestrian movement results in a lack of a "main street" environment.

At the opposing end of the Lighthouse CBD Planning Area is the Brigantine Town Center. The Brigantine Town Center was constructed in the early 1990s and contains 127,300 square feet of retail and office space. This shopping center has been developed in a manner consistent with many suburban strip centers, in which the shops are oriented towards the inner parking areas and not towards the pedestrian traffic along the surrounding streets.

The present visual perception of this area, from the Atlantic Brigantine Boulevard entry into the island, is a mixture of individual commercial uses along the Boulevards (such as Wawa, The Cove, and Realty offices) with no consistent streetscape, landscaping, sidewalks or bike lanes, interspersed with views of the rear service doors for the Town Center businesses, which align on the parallel Amherst Avenue.

The residential housing stock ranges from single-family to townhouses and apartments. However, residential uses are not predominant in this area.

3. South End Residential Planning Area

The South End Residential Planning Area (South End) is located on the southern end of the island between the Absecon Inlet, the Lagoon Residential Planning Area, the Central Residential Planning Area and the beach. The South End Planning Area is the most recently developed area of the City of Brigantine. Most of the development in this area has occurred over the last 30 years. Originally consisting of large lots, and zoned for both medium-high and high density residential, the South End contains the majority of the city's multi-family development. Like the Lagoon Residential Planning Area, the street pattern in this planning area developed along a curvilinear form.

The housing stock in the South End Residential Planning Area ranges from single-family dwellings to townhouses. With lot sizes ranging from 6,000 to 8,000 square feet, the Seapoint neighborhood is the least densely populated section of the South End (approximately 7.5 DU/AC units per acre). The townhouse developments along the beach are the most densely populated section of the South End and the City (approx. 43.5 DU/AC units per acre). The average density for the South End is 20 DU/AC units per acre. The bulk of the Townhouse developments along the beach were constructed during a period when the R-4 and B-4 Zones permitted hotel/motel and garden apartments.

4. Central Residential Planning Area

The Central Residential Planning Area is located between 44th Street South and 16th Street South. The Central Residential Planning Area is bounded by the beach, the South End Planning Area, the Lighthouse Central Business Planning Area, and the City Hall Central Business Planning Area. The housing stock in this planning area is primarily single-family dwellings. The development in this area is on a traditional grid pattern. The 26th Street South Recreational Complex and the 44th Street South Recreational Complex (aka Walter Bew Stadium) are located in the Central Residential Area, providing much needed active recreation for the area. Two (2) main and large recreational facilities are center to much active recreation and are located in this area, at the 26th Street South Recreational Complex, and the 44th Street South Recreational Complex or Walter Bew Stadium. The Community Center with indoor recreation and passive community engagement is also located in this area.

5. City Hall Central Business District Planning Area

The City Hall Central Business District CBD Planning Area is located between 16th Street South and 6th Street South. The City Hall CBD Planning Area is bounded by the Central Residential Planning Area and the North End Mixed Planning Area. This district is centrally located within the municipal boundary and contains the Brigantine City Hall. The land use patterns include single-family residential dwellings, a commercial spine along Brigantine Avenue, multi-family residential, and public lands. Like the Central Residential Planning Area and the North End Mixed Planning Area, the street pattern in this planning area developed along a traditional grid pattern.

The housing stock is similar to that of the Central Residential Planning Area consisting of primarily single-family dwellings. However, two exceptions to this housing pattern exist in the City Hall Central Business District Planning Area in the form of multi-family residential developments.

The heart of this planning area is the City Hall CBD spine along Brigantine Avenue. This district contains 36 retail shops and offices, and a hotel located on Brigantine Avenue. The Brigantine City Office is also located along this spine forming the westerly boundary of the CBD.

The largest building in the City is the Legacy Vacation Club Brigantine, formerly and more commonly known as the Brigantine Inn Hotel, a nine (9)-story hotel located between 14th and 15th Street South along the beachfront, with accompanying Laguna Beach Bar and Grill.

A grant has been secured for Streetscape Improvements for the City Hall CBD which will provide new sidewalks, street trees, decorative lighting, crosswalks and other amenities.

6. North End Mixed Planning Area

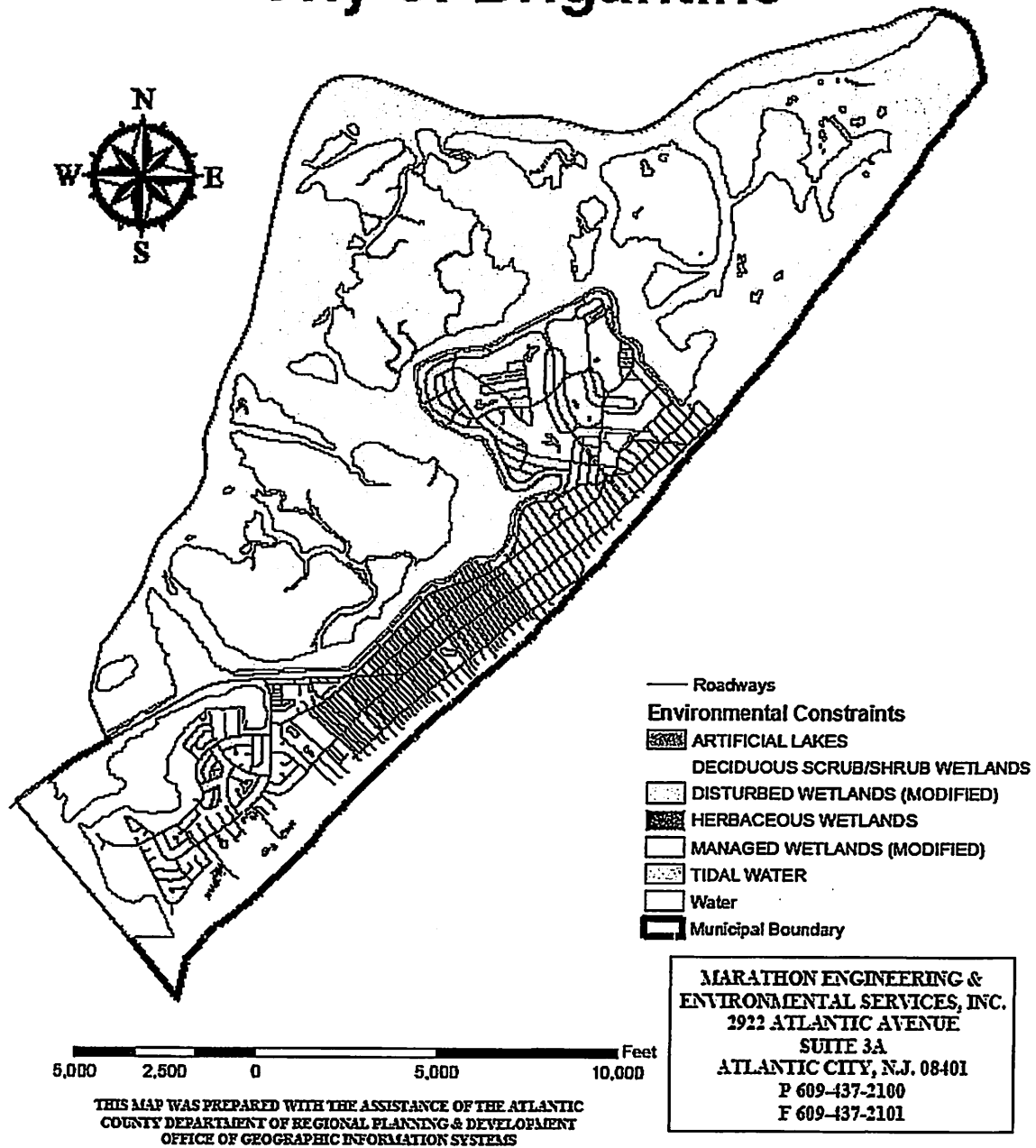
The North End Mixed Planning Area (North End) is located between 6th Street South and 15th Street North. The North End is bounded by the beach, the City Hall CBD Planning Area, and the Golf Course Residential Planning Area. The housing stock in this planning area is a mix of one- and two- family dwellings and multi-family dwellings along the beach blocks. The street network in the North End is predominantly laid out in a grid fashion. As the street system connects with the Golf Course Residential Planning Area, the straight grid is interrupted by a series of curvilinear roadways. The North End also includes areas that are environmentally sensitive and zoned for conservation.

7. Golf Course Residential Planning Area

The Golf Course Residential Planning Area (Links Golf Course) is located between 6th Street South and 12th Street North. The City Hall Central Business Planning Area, the North End Mixed Planning Area and the back bay bound the Golf Course with its focal point being the Brigantine Links Golf Course. The housing stock in this planning area is primarily comprised of single-family dwellings. The commercial uses in the Golf Course Area tend to be water related with exception of the golf course and its club house. The Brigantine North and Elementary Schools are located in the southern portion of this planning area. The development in this area is centered around the spine that is Roosevelt Boulevard, and flows out from there to encompass the 18-hole golf course in a curvilinear and meandering layout. There is a play area on the western open space area across from the golf course, and some open space along the bay's edge.

Environmental Constraints Map

City of Brigantine



6.6 RECOMMENDED FUTURE LAND USE PLAN

The City of Brigantine is to a major extent fully developed with only isolated parcels of land available for development. The focus of the recommendations for future land use patterns will concentrate on preserving the character of the individual planning areas while molding the redevelopment of the community. In essence, the residential development should "... maintain and preserve existing single-family neighborhoods;" and discourage "... multi-family development designed to attract speculative investment as a primary objective." In addition to preserving the single-family neighborhoods, the Master Plan seeks to encourage economic development and tourism.

1. Lagoon Residential Planning Area

The Lagoon Residential Planning Area contains single-family, duplex, triplex, and townhouse developments. The predominant housing stock in this planning area is duplex and triplex. Development in this planning area should remain consistent with the 1992 and 1998 Brigantine Master Plans, allowing low density residential development in the form of one-family dwellings. Duplexes are to be discouraged in this planning area. Since the 1992 Master Plan, the majority of the townhouse projects have been completed. Only those townhouse projects with remaining approved phases to be constructed shall be permitted.

The Lagoon Residential Planning Area contains the largest currently undeveloped parcel in the City, known as the "Sims Tract". It is located at the base of the bridge and has access to the water's edge both from St. Georges Thorofare and the Absecon Inlet. While being located adjacent to the water, the tract is developable as uplands.

2. Lighthouse Central Business District Planning Area

A redevelopment plan is recommended for the Lighthouse CBD to provide for mixed use development by adding residential units over first floor commercial with adequate parking should be considered.

The recommendations for the Lighthouse CBD have remained consistent with those outlined in the 1992 Master Plan. The Lighthouse Central Business District contains a mixture of uses, including commercial, retail, and residential dwellings ranging from single-family to townhouse apartments. The commercial nature of this planning area should be maintained. Residential uses should be permitted as one-family dwellings. As a conditional use, second floor apartments over the commercial uses along Atlantic Brigantine Avenue should be permitted.

3. South End Residential Planning Area

The South End Residential Planning Area (South End) contains a mixture of residential uses ranging from single-family to townhouse developments. No businesses are located in the South End. The character of the individual one- and two-family neighborhoods and medium to high density developments should be maintained.

4. Central Residential Planning Area

The Central Residential Planning Area is predominantly single-family residential character. The existing zoning controls allow one- and two-family dwellings from 44th Street South to 34th Street South and only one-family dwellings from 34th Street South to the terminus of the planning area at 15th Street South. The single family character of the Central Residential Planning Area should be preserved.

In recent years, the demand for beachfront property has increased substantially. The beachfront lots in Brigantine are typically fully developed with existing dwellings. The existing dwellings located on these lots are being removed or demolished for the construction of larger homes. Strict adherence to building height and lot coverage requirements should be required to preserve the nature of the existing neighborhoods.

5. City Hall Central Business District Planning Area

The City Hall CBD contains a centralized commercial core, extending along Brigantine Avenue, which is surrounded by a single-family residential neighborhood with pockets of multifamily developments. The existing commercial uses should be maintained and encouraged. As recommended in the Lighthouse CBD Planning Area, second floor accessory apartments should be permitted as a conditional use. The residential neighborhood should remain Low Density Residential permitting one-family dwellings. As recommended for the Central Residential Planning Area, the beachfront property will require strict adherence to building height and lot coverage requirements in order to preserve the character of the existing neighborhoods. All other higher density residential development in this planning area should be discouraged.

6. North End Mixed Planning Area

The North End Mixed Planning Area (North End) as indicated by its name contains a variety of land uses. These land uses include a mixture of one- and two-family dwellings neighborhoods, a strip of multi-family dwellings along the beach blocks, and a commercial/retail strip extending from Roosevelt Boulevard north to 15th Street North along Brigantine Avenue. The existing low density neighborhoods should be maintained. This planning area shall permit one-family residential dwellings. All other residential development shall be discouraged. The multi-family dwellings located along the beach blocks of this district should no longer be a permitted use. Development of the parcels adjoining the beach should be rezoned to permit motel/hotels uses rather than multi-family development. The development of Bed and Breakfast businesses would be a desirable use in this area.

7. Golf Course Residential Planning Area

The Golf Course Residential Planning Area (Golf Course) is principally comprised of single-family dwellings with water oriented commercial uses with the exception of the Brigantine Golf Course and one multi-family development. The existing single-family character of the neighborhoods should be preserved permitting one-family dwellings. Multi-family development should be discouraged. The existing multi-family development along Baremore Quarters shall not be expanded.

The City's K-8 Educational Schools are located in this planning zone.

The existing commercial lots that are scattered throughout this area shall be maintained and encouraged.

The existing Brigantine Links Golf Course has been protected as both recreation and open space, and is looking to renovate and expand its facilities in the near future.

The former Brigantine Country Club site, located at the north end of Roosevelt Boulevard, has been developed with a 10-lot single family residential subdivision. At present, the site improvements have been installed, and a play area has been built on the municipal section of property here.

7. MASTER PLAN COMPONENTS

7.1 HOUSING PLAN

The housing stock in the City of Brigantine is a mixture of low-medium density, medium-high density, and high density residential. The predominant housing type in the municipality is the single family detached dwelling. Over the last decade, there has been a decrease in the number of multi-family dwellings being developed in the City. The recent trend in residential development has been the rehabilitation or expansion of older single family dwellings, and conversion of duplex dwellings to single family dwellings. Presently, the land use and zoning regulations permit all three residential densities in the housing stock.

Like many communities, Brigantine's older population has continued to grow, and policies appropriate for older families should be examined in light of the City's changing demographics.

7.2 CIRCULATION PLAN

The City of Brigantine, located on an island to the north of Atlantic City, has only one access route onto the island via Brigantine Boulevard (NJSH 87). Brigantine's circulation pattern has been developed in much the same manner as other barrier islands in South Jersey, many of which only have one or two points of access to the mainland. Brigantine Boulevard connects Atlantic City's western edge Marina District to Brigantine. During summer months, this one access point is subject to high seasonal traffic volumes. Access to the City of Brigantine is gained by various state highways linking this region with Philadelphia and New York. These routes include the Atlantic City Expressway, U.S. Route 40-322 (Black Horse Pike), U.S. Route 30 (White Horse Pike), U.S. Route 9, and the Garden State Parkway.

In August of 2001, the Atlantic City Connector and Atlantic City Tunnel were opened providing improved traffic flow through that portion of Atlantic City. These improvements allow commuters uninterrupted access to the City of Brigantine. Eventually channeling traffic to Brigantine Boulevard, these highway improvements have increased the level of service to Brigantine.

Traffic conditions and access along Brigantine Boulevard should continue to be monitored as impacts of nature and development in the marina area occur.

7.3 UTILITY SERVICE PLAN

Utility services in the City of Brigantine are managed by the Brigantine Department of Public Works (DPW). The Department of Public Works is responsible for water and sewer facilities and the maintenance of the streets, recreational areas, and park and public properties. Water and sewer services are provided to the entire City by a municipally operated sanitary sewer and potable water system. (See Sections E.3. & E.4. for a description of water and sewer services).

The water system in the City of Brigantine is delivered to residents via potable wells and stored in three (3) water towers. The well system draws water from the Atlantic City 800-foot Sand aquifer. In 1991, the Atlantic County Water Supply Study (Report on Recommended Plan of Action) concluded that the "increased withdrawals from the Atlantic City 800-foot Sand aquifer should not be considered without implementing restoration measures, such as injection, resting, conservation, or monitoring." The study estimated salt water intrusion could occur in 150 years from the study date, or by year 2140. With the concern of salt water intrusion, recommendation for water conservation measures should be encouraged.

As improved water saving devices are introduced to the market, land use regulations and/or building code requirements should be updated to require more stringent water conservation strategies. Conservation measures should be encouraged at both the conveyance system and the user location, and alternative options for water intensive uses should be researched.

7.4 COMMUNITY FACILITIES PLAN

Community facilities for the City of Brigantine's governmental employees, police and fire staff, and public works employees are provided in the existing Brigantine City Hall. In 1995, City Hall was expanded to adequately house city employees. The former Central School was converted to house the Brigantine branch of the Atlantic County Library.

It is anticipated that future growth will be limited to the infill of vacant parcels, renovation and expansion of existing residences, and conversion of summer residences to year-round residences. The impact of the anticipated development will be minimal on existing community facilities.

Brigantine's Police and Fire Departments handle emergency management services. As noted in Section E.6., the City of Brigantine currently has a staff of 39 police officers and 34 firefighters. Based on a public service multiplier of 2.08 police officers per 1,000 population and 0.99 fire fighters per 1,000 residents, Brigantine should employ a minimum staff of 27 police officers and 13 firefighters. Like most seasonal resort communities, the peak season population in Brigantine can be considerably higher than its year round population. In Brigantine, the peak season population can expand the population by 180 percent to 200 percent. With the increased summer population, public service employment levels are deficient.

7.5 RECREATIONAL FACILITIES PLAN

For information on Recreation and Open Space see the newly developed Recreation and Open Space Master Plan.

7.6 CONSERVATION PLAN

In 1981, the City of Brigantine adopted the Dune Management Plan in an effort to preserve and protect the beach and reduce the loss of beach sand. The City further enhanced its policy on conserving environmentally sensitive lands in the 1992 Master Plan. In 1992, special consideration was given to ensure the protection of the beach and dune system, the back bay and wetlands system, and the golf course. The Planning Board subsequently made revisions to the land use ordinance and zoning map to enact the recommendations of the 1992 Master Plan. In addition to the measures taken by the City, further protection has been instituted by the New Jersey Department of Environmental Protection (NJDEP) (See Section I.3. for a thorough description of NJDEP Coastal Management programs).

The conservation plan adopted by the City of Brigantine should continue to protect and preserve the environmentally sensitive lands listed above. These resources attract a number of tourists to the resort community. Proper management of these resources is essential to their preservation in the future.

1. Continued monitoring of the beach and dune system is required to properly determine the extent of both accretion and erosion that may be occurring over time.
2. Access points to the beach should be monitored to identify their impact on the development of the dune system. Access roads and dune walks should be upgraded in areas of stunted dune development.

3. Waterfront design controls, such as bulkhead heights, are being evaluated in the Post Sandy Planning environment, to assess their effectiveness in protecting the residential character and water's edge environment while fostering continued residential and commercial marinas land uses along the back bays. Issues to be examined should include waterfront viewsheds, public access, parking, and intensity of marina use.

7.7 ECONOMIC DEVELOPMENT PLAN

As shown in Land Use Inventory (Section VII), two main commercial centers were identified in the City of Brigantine. These centers include the Lighthouse CBD, and the City Hall CBD. Economic development strategies should be focused in these commercial centers, along with the undeveloped north end of the island.

In the two (2) Central Business District (CBDs), the City of Brigantine should continue to encourage a themed CBD. The present Lighthouse structure provides one such theme and the City is presently developing a streetscape design for the Central City Hall CBD. A façade improvement program should also be pursued. These concepts should continue to be pursued through grants and other private and public funding methods, and improvements should be consistent and unified.

The Planning Board should prepare a uniform signage and appearance code with wayfinding and creative identification. The Chamber of Commerce and individual merchants should be sought for input. Local business owners should be made aware of possible funding programs for signage improvements.

In areas adjacent to existing commercial districts, it is recommended Bed and Breakfast Inns be permitted. The development of this type of business is sought to encourage both an economic and tourism boost to the Island. Bay front and oceanfront properties should also be considered for Bed and Breakfast type development.

Tax abatement, the redevelopment act, the abandoned properties act and other economic development tools should be considered to encourage commercial redevelopment and neighborhood enhancement.

The development of Eco-Tourism based projects, both public and private, should be encouraged. The City has worked to provide a better experience with the development of an Observation Platform that could be used in conjunction with an Environmental Education Area in the undeveloped preserved north end of the island. This area should be looked at to provide a higher visibility to Brigantines environmental consciousness.

Brigantine is on the verge of being the first Class 4 community in New Jersey in accordance with the NFIP Community Rating System. This will provide a thirty percent discount on flood insurance, a benefit that should be promoted. In addition, Brigantine has been very aggressive in upgrading its infrastructure to improve resiliency from natural disasters. Continuation of these efforts makes the island more attractive to prospective home owners.

An aggressive tourism marketing effort must be pursued with the support of the county. A rental license fee and other mechanisms should be used to establish a sustainable fund for tourism marketing.

7.8 RECYCLING PROGRAM

The City of Brigantine has developed a recycling plan to conform to the Atlantic County Recycling Plan. Recyclables, aluminum, plastic, glass, and paper products, are collected curbside for city residents. Collections are made on the first and third Tuesday of each month.

In addition to curbside collections, the City of Brigantine offers a municipal recycling collection center located at 3605 Bayshore Avenue (38th Street South and Bayshore Avenue). Deposits can be processed from 10:00 AM to 4:00 PM on Saturdays and Sundays.

The practice of recycling should be encouraged to all the residents of Brigantine –permanent, seasonal and visitors. To increase participation in the recycling program, it is imperative efforts be made to insure all residents are knowledgeable of recycling schedules. With a population burst of 80 to 100 percent in summer months, ignorance to recycling schedules at some level is inevitable.

In addition to being published on the City's website, it is recommended that the City publish the recycling schedule in the *Beachcomber* and *Brigantine Times* newspapers to educate visitors of the recycling program. Real estate offices should be provided with recycling pamphlets and encouraged to distribute them in all rental properties.

8. MASTER PLAN CONSISTENCY

8.1 ATLANTIC CITY MASTER PLAN

The City of Atlantic City Master Plan Re-examination was recently updated and approved in March 2016. The main focus of the Atlantic City Master Plan is to maintain the resort character of the city while diversifying the local economy into Education and Health Care fields to provide jobs and promote redevelopment. The Master Plan also looked at a number of public properties, such as Gardner's Basin, that could be improved as economic engines. These areas potentially relate to ideas discussed in the Brigantine Master Plan for Water Taxis and Bicycle and Pedestrian linkages. The Brigantine Master Plan has been prepared so as not to conflict with the planning goals identified in the neighboring municipality's Master Plan.

8.2 ATLANTIC COUNTY MASTER PLAN

The Brigantine Master Plan has been prepared to incorporate the goals of the Atlantic County Master Plan (ACMP), last adopted in October 2000. The Brigantine Master Plan has addressed each planning goal of the ACMP, with the exception of farmland protection which is not applicable to the City of Brigantine land uses.

8.3 COASTAL ZONE MANAGEMENT

The 1992 Brigantine Master Plan was reviewed by NJDEP for conformance with the CAFRA Coastal Zone Management (CZM) Rules. The 1992 Master Plan was identified to be in conformance to seven (7) of the eight (8) basic policies of the CZM. The Master Plan has been updated to encourage residential, commercial, and recreational mixed-use redevelopment of the developed waterfront.

8.4 STATE DEVELOPMENT AND REDEVELOPMENT PLAN

The State Development and Redevelopment Plan (SDRP) has identified the City of Brigantine as an Environmentally Sensitive/Barrier Island Planning Area with a designation of PA5B. An analysis of the Brigantine 1992 Master Plan identified a number of policies to be included in the next Master Plan update. Areas of interest to be included are historic preservation and growth management. Information to be updated includes section concerning public transportation, bay access, potable water systems, sanitary sewer systems, mitigation of natural disasters, and intergovernmental coordination. The Master Plan has been revised to address the SDRP concerning these policies.

8.5 COUNCIL ON AFFORDABLE HOUSING (COAH)

In 2004, the City of Brigantine prepared a Housing Element and Fair Share Plan (HEFSP), consistent with the Second Round Rules adopted by the New Jersey Council on Affordable Housing ("COAH") in 2002 (N.J.A.C. 5:93). The City submitted its HEFSP to COAH for Substantive Certification on September 7, 2004. However, the HEFSP was not certified by COAH.

In October of 2008, COAH adopted numerous amendments to its substantive and procedural regulations to address the Third Round fair housing requirements in New Jersey. The Third Round methodology, adopted in September 2008, required that a municipality's fair share consist of three elements: the 1) rehabilitation share, 2) any remaining Prior Round obligation that was not provided for, and 3) the Growth Share or Third Round, which is based upon one affordable housing unit for every four market-rate units built and one affordable unit for every 16 new jobs created. In addition to these new rules, COAH gave new rehabilitation, Prior Round and Third Round obligation numbers to each municipality. Additionally, the State Legislature passed Assembly Bill A-500 (P.L. 2008 c.46) that made significant changes to COAH's rules.

Subsequently, on December 8, 2008, the City adopted a new HEFSP consistent with the Third Round Rules adopted by COAH in 2004 (N.J.A.C. 5:94). The City petitioned COAH for Third Round Certification on December 30, 2008. The petition was deemed complete by COAH on February 2, 2009. Objections to the plan were received by COAH within the 60 day comment period, which ended on March 23, 2009.

In 2009, appeals were filed regarding the Revised Third Round Rules' methodology. The case worked its way through the Appellate Division and finally went before the Supreme Court. Oral argument occurred in November 2012 and an order was finally issued by the Supreme Court on September 26, 2013. The Supreme Court ruled that the key set of rules establishing the growth share methodology as the mechanism for calculating "fair shares" was inconsistent with the Fair Housing Act (FHA) and the Mount Laurel doctrine. The Supreme Court instructed COAH "to adopt new third round rules that use a methodology for determining prospective need similar to the methodologies used in the first and second rounds," within five months. In March 2014, the N.J. Supreme Court extended the deadline for adoption of rules to November 2014.

After COAH failed to promulgate its revised rules by the November 2014 deadline, the Supreme Court made a ruling on March 10, 2015, which allows for judicial review for constitutional compliance, as was the case before the FHA was enacted. The ruling allows low- and moderate-income families and their advocates to challenge exclusionary zoning in court, rather than having to wait for COAH to issue rules that may never come. It also will provide a municipality that had sought to use the FHA's mechanisms the opportunity to demonstrate constitutional compliance to a court's satisfaction before being declared noncompliant and then being subjected to the remedies available through exclusionary zoning litigation, including a builder's remedy.

The Court's implementing order did not take effect for 90 days to allow the courts to set up a system for the cases. During the first 30 days following the effective date, through June 8, 2015, judges accepted applications only from towns seeking protection from lawsuits by demonstrating compliance with COAH's guidelines. The City filed a petition to the Court for a Declaratory Judgement. The Court granted temporary immunity from builders remedy lawsuits for Brigantine City. The Court ordered that the City submit a Housing Element and Fair Share Plan to the Court on or before December 8, 2015.

The City of Brigantine can meet the need for low and moderate through rehabilitation of deteriorated or substandard units, rather than through new construction of low and moderate income housing.

8.6 STATE HIGHWAY ACCESS MANAGEMENT PLAN

The City of Brigantine contains approximately 0.3 miles of state highways. New Jersey State Highway Route 87 (NJSH #87) is the only state regulated highway in Brigantine. Properties having access to NJSH 87 are governed by the New Jersey State Highway Access Management Plan regarding access and levels of service. All development located along the state highway will require an application to the New Jersey Department of Transportation.

8.7 ATLANTIC COUNTY TRANSPORTATION AUTHORITY MASTER PLAN

The Atlantic County Master Plan has been reviewed to identify transportation goals in Atlantic County. The circulation and traffic systems in Brigantine are in conformance with the goals of the ACMP. These transportation goals have been included in Brigantine Master Plan.

9. LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN (LEED CERTIFICATION)

Part of Neighborhood Redevelopment Plans is the inclusion of a section on Leadership in Energy and Environmental Design ("LEED") that address the need for more resilient strategies for new buildings within the City. As such, the Master Plan Re-examination should include some reference to this for new development within the City.

The following is an outline of the relevant sections:

Leadership in Energy and Environmental Design ("LEED") is a recognized green building certification rating system. LEED provides third-party verification that a new or renovated building was designed and built using strategies and materials to lower a building's carbon footprint. LEED was developed by the U.S. Green Building Council and is a "voluntary rating system that encourages buildings to do better, but does not add significant cost".¹ LEED has five rating systems for multiple project types that seek to achieve LEED certification. The rating systems are:

- Building Design and Construction
- Interior Design and Construction
- Buildings Operations and Maintenance
- Neighborhood Development
- Homes

Within each rating systems there are eight main credit categories:

- Location and transportation
- Sustainable sites
- Water efficiency
- Energy and atmosphere
- Materials and resources
- Indoor environmental quality
- Innovation
- Regional priority

¹ <http://www.usgbc.org/articles/leed-facts>

LEED "provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions."² Furthermore, LEED has been constantly improving its manuals and guidelines to keep up with the latest technology and trends. Presently, there are four levels of LEED certification: Certified, Silver, Gold and Platinum.

The two rating systems that would seem to most apply to the planning areas as part of the Master Plan Re-Examination are Homes and Neighborhood Development.

9.1 LEED FOR HOMES

LEED for Homes is the certification program for single-family home design and construction. LEED-designed homes provide clean indoor air and use less energy and water, which translates to lower utility bills. Homeowners looking to rehabilitate or redevelop their damaged home can use the LEED for Homes credit system to make smart choices when it comes to water efficiency, energy usage, material selection, air quality and even rainwater management. LEED for Homes is an excellent resource for homeowners, even if they are not seeking LEED Certification.

Credits that are worth noting, which could be utilized by the residents, and specifically by homeowners during rehabilitation and new home construction, are as follows:

- Rainwater management
 - Reducing rainwater runoff is imperative both in the neighborhoods and throughout the City.
 - LEED for Homes recommends the following actions to manage rainwater:
 - Planting areas with native or adapted plant material (e.g. trees shrubs)
 - Installing a vegetated roof
 - Using permeable paving
 - Installing permanent infiltration or collection features (e.g., vegetated swale, rain garden, rainwater cistern or rain barrels to capture roof runoff)
- Low-emitting materials
 - The intent of this LEED credit is to reduce concentrations of chemical contaminants that can impact air quality.
 - The requirement includes the use of low volatile organic compound ("VOC") paints, floor materials and insulation.
- Quality views
 - Part of the allure of the seashore is that it is surrounded by water on two sides. The purpose of this LEED credit is to give building occupants a connection to the natural outdoor environment by providing quality views.
 - The requirement is to achieve a direct line of sight to the outdoors with glazing (e.g. windows and doors) for 75 percent of the regularly occupied floor area of the home.
- Green power and carbon offsets
 - LEED for Homes encourages homeowners to reduce their greenhouse gas emissions through the use of grid-source, renewable energy technologies.

² <http://www.usgbc.org/articles/about-leed>

- In order to qualify for the credits, a homeowner must engage in a contract for a minimum of five years, which provides between 50 and 100 percent of the home's energy from green power or renewable energy certificates.
- Renewable energy production
 - In order to offset the rising costs of homeownership, this LEED credit relies on the sun to power homes. Portions of Brigantine are ideally situated for both solar and wind systems, as the nature of the sea air and high wind levels limits large vegetation in what is largely a grassland (salt marsh) ecosystem. In addition, the street grid in some areas is oriented so that the long portions of the blocks face southwest (about 50 degrees west of due south), while the general lot configurations cause the long facades of buildings to be oriented at about 20 degrees east of due south. Optimal solar orientation for temperate climate zones is 17.5 degrees east of due south.³ LEED-ND Credit 10 under Green Infrastructure and Building (GIB C-10) provides for credit when the long side of the street block is 15 degrees or less east or west of due south, or if the long axis of 75 percent or greater of the buildings are 15 degrees or less east or west of due south.
 - Areas with annual average wind speeds around 6.5 meters per second and greater at an 80-m height are generally considered to have a wind resource suitable for wind energy development.
 - This credit is offered to homeowners if they meet the parameters for solar or wind energy.
- Indoor water use reduction
 - The intent of this LEED credit is to reduce indoor water consumption.
 - Homeowners can receive up to six points for this line item depending on how much they reduce their water usage.
- Daylight
 - Daylighting provides occupants with a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the tenant space
 - Daylighting is important in reinforcing circadian rhythms and reducing the use of electrical lighting.
 - The requirement is to achieve at least 55 percent daylighting for the regularly occupied floor area of the home to receive credit.
- Outdoor water use reduction
 - The intent of this LEED credit is to reduce outdoor water consumption.
 - Homeowners receive credit if they reduce exterior irrigation between 50 and 100 percent by installing plants that require no irrigation (e.g. native species) or an efficient irrigation system with a water sense feature.

9.2 LEED FOR NEIGHBORHOOD DEVELOPMENT

LEED for Neighborhood Development or LEED-ND is a certification system for a neighborhood-scale projects, and larger redevelopment areas. LEED-ND incorporates the principles of smart growth, urbanism and green building into a system for neighborhood design, which can be applied to entire neighborhoods, portions of neighborhoods or multiple neighborhoods.

³ Olgyay, Victor. (1973). *Design With Climate*. Princeton University Press. Page 61.

There are five credit categories for LEED-ND:

- Smart location and linkage
- Neighborhood pattern and design
- Green infrastructure and buildings
- Innovation and design process
- Regional priority credit

Within the categories there are a total of 12 prerequisites that are required to gain certification. One of these conditions includes "smart location and linkage", which requires the neighborhood to be served by existing water and sewer infrastructure and new development to be on infill sites, near transit, or have nearby neighborhood assets. The City as a whole was laid out with a strong street grid that provides for fundamental connectivity, measured in the number of intersections per square mile for intersecting streets, alleys and other pedestrian pathways.

Available transit is currently bus service into and out of the City. Access to rail or bus transit can be linked through the central hub in Atlantic City. The potential for water transportation has also been identified with stronger connectivity between Gardner's Basin and the Lagoon area envisioned.

In addition to the overall consistency of parts of the City with LEED-ND, homeowners can also advance the principles of LEED-ND by:

- Improving home energy performance by 5 percent for new homes or 3 percent for major building renovations.
- Reduce indoor water usage by 20 percent with water efficient toilets, faucets and showerheads.
- Reduce outdoor water use through the installation of native plants or smart irrigation systems.
- Reduce rainwater runoff.
- Design and orient new homes for maximum solar orientation.
- Utilize solar power, such as solar panels.

For more information on LEED-ND, go to <http://www.usgbc.org/articles/getting-started-nd>.

9.3 NATIVE PLANTINGS IN SHORE AREAS

Native trees that have ornamental value and are tolerant of both salt spray and salty soils include Allegheny serviceberry (*Amelancier laevis*) and American Holly (*Ilex opaca*). Some larger shade trees that are also tolerant of both salt spray and salty soils include White oak (*Quercus alba*), Post oak (*Quercus stellate*), and Sassafras (*Sassafras albidum*). More common are the native trees that are tolerant of salt spray but are intolerant of salty soils, these include Pagoda dogwood (*Cornus alternifolia*), Cockspur hawthorn (*Crataegus crusigalli*), Eastern red cedar (*Juniperus virginiana*), Pitch pine (*Pinus rigida*) and Sycamore (*Platanus occidentalis*).

Some non-native trees that are tolerant of salt spray and found commonly on seaside properties include Crab apple, Little leaf linden, Stone pine, Black pine, Mugo pine, Blue spruce, Paperbark maple and Honey locust. Some of the best native grasses that can be used for seaside plantings are American Beach Grass (*Amnophila breviligulata*), Big bluestem (*Andropogon gerardii*), and Switchgrass (*Panicum virgatum*). Some of the top non-native grasses that are tolerant of seaside conditions and that are found commonly in seaside plantings include Fescue grass and Fountain grass. The table below provides a comprehensive listing of recommended plantings for shore areas.

RECOMMENDED SHRUB PLANTING PALETTE FOR INLE AREA	
Small trees tolerant of salt spray and saline soils:	
Allegheny service-berry	(Amelanchier laevis)
Pawpaw	(Asimina triloba)
American Holly	(Ilex Opaca)
Eastern Red Cedar	(Juniperus virginiana)
Sweetbay Magnolia	(Magnolia virginiana)
Japanese Black Pine	(Pinus thunbergiana)
Willow Oak	(Quercus phellos)
American Mountain Ash	(Sorbus Americana)
Japanese Tree Lilac	(Syringa reticulata)
Fruitless Mulberry Tree	(Morus alba)
Large shrubs tolerant of salt spray and saline soils:	
Indigo bush	(Amorpha fruticosa)
Red Chokeberry	(Aronia arbutifolia)
Black Chokeberry	(Aronia melanocarpa)
Beautyberry	(Callicarpa Americana)
False Cypress	(Chamaecyparis pisifera)
Coastal sweet pepperbush	(Clethra alnifolia)
Rockspray Cotoneaster	(Cotoneaster horizontalis)
Japanese cedar	(Cryptomeria japonica)
Rose of Sharon	(Hibiscus syriacus)
Bigleaf Hydrangea	(Hydrangea macrophylla)
Inkberry	(Ilex glabra)
Common Junipers	(Juniperus communis)
Northern Bayberry	(Myrica pensylvanica)
Mock Orange	(Philadelphus coronaries)
Purple Leaf Sand Cherry	(Prunus x cisterna)
Bumalda Spirea	(Spirea x bumalda)
Lilac	(Syringa vulgaris)
Southern arrowwood	(Viburnum dentatum)

Some non-native ornamental shrubs that are tolerant of salt spray and found commonly in seaside plantings include Hydrangeas, Rose-of-Sharon, Rugosa roses, Butterfly bush, Bayberry, Potentilla, Weigelia and Pyracantha.



Dune Grasses

Some of the best native perennials that can be used for seaside plantings are Sea lavender (*Limonium carolinianum*), Seaside goldenrod (*Solidago sempervirens*), Perennial saltmarsh aster (*Symphotrichum tennifolium*), Beach Heather (*Hudsonia tomentosa*) and Beach pea (*Lathyrus japonicus* var. *maritimus*).

Prevailing winds are from the southwest in summer and from the northwest in winter.

10. RESILIENCY PLAN ELEMENT

The concept of resiliency has become part of common conversation ever since New Jersey was hit first by the winds and rain of Tropical Storm Irene in August 2011 and then coastal New Jersey was hit 14 months later by the winds and unprecedented surge of Superstorm Sandy in October 2012. Emergency readiness was sorely tested and stressed in these two major storm events and vulnerability to flooding, the lack of redundancy in the power network and gaps in our ability to communicate in a disaster were all exposed to varying degrees from Cape May to the northern tidal rivers (e.g. Hudson, Hackensack, etc.). The Post Sandy Recovery Grant Program—funded by the US Department of Housing and Urban Development (HUD) and administered in New Jersey by the Department of Community Affairs (NJDCA)—recognized that local master planning prior to Sandy had not addressed the concept of resiliency, nor was there ever a need to examine the statutory master plan elements (such as Land Use, Circulation, Housing, Utilities, Open Space & Recreation, Economic Development, etc.), through the lens of resiliency. Sandy forever changed the way that towns that it impacted will view their future.

10.1 RESILIENCY PLANNING

Resiliency planning can be summarized in four basic steps:

1. Generate awareness of coastal risk
2. Assess coastal risks and opportunities
3. Identify options or choices for addressing priority risks and vulnerabilities (short term)
4. Develop and implement an action plan to put selected options or choices into place (long term)

The Brigantine Strategic Recovery Planning Report (SRPR) summarized the vulnerability within the City's back bay areas. Because Brigantine is a barrier island and is therefore typical of an area developed on top of what was once a natural dune system, the elevations are generally higher along to the ocean and lower along the back bays. The ocean side of the island is exposed to a surge from a northeast winds, while the back bays rise up from tides hemmed in by the east winds and flood the lower elevations. These conditions occur with every northeast storm, which occur multiple times per year. They become catastrophic when there are storm surges of the size that Sandy created.

10.2 SEA LEVEL RISE AND THE FUTURE OF INFRASTRUCTURE

Sea Level Rise

The Resiliency Plans for all of Post Sandy Planning areas have been developed to deal with the immediate needs of the community, as well as to anticipate measures for improving the resiliency of existing and future development to future storm events. However, it is important to recognize that the evidence for the phenomenon of sea level rise, combined with the subsidence that is occurring along the New Jersey coastline is compelling, and that Superstorm Sandy may have been a precursor of more frequent and possibly more severe storm events to come in the future, which coupled with a rising sea level, even if only

measured in inches, may make the existing neighborhood pattern unsustainable in the most vulnerable areas.

The North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk (NACCS) was published in January 2015. The NACCS was commissioned by Congress in the Disaster Relief Appropriations Act of 2013 (P.L. 113-2, H.R. 152, 127 Stat. 4, enacted January 29, 2013). The NACCS examines present and future flood risks in the coastal areas defined by the extent of Hurricane Sandy's storm surge in New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia.⁴ The NACCS states, "In New Jersey, coastal storm risk is managed along the Atlantic Ocean coast by a number of Federal coastal storm risk management projects. However, the low-lying areas of tidal rivers, back bays, and Delaware Bay coasts have a limited number of coastal storm risk management projects."⁵

This Re-Examination Plan notes that the areas identified in the figures below show the potential impact made by the 2 foot of Sea Level Rise, 3 foot Sea Level Rise, and a 4 foot Sea Level Rise.

The "Rebuild By Design" study prepared by Princeton University for Chelsea Heights indicated that, since 1992, the tide gauge reading for Atlantic City showed a 3.3 mm/year sea level rise, but that the average over the past 100 years (century average) was 4.1 mm per year.⁶ At the more rapid rate of 4.1 mm of sea rise per year, it would take 149.25 years to reach the 2 foot level shown in Figure 3.

⁴ www.njspotlight.com, "Attention Must Be Paid to Bayside Flooding At Jersey Shore, Reports Army Corps", by Scott Gurian, January 30, 2015.) Gurian, Scott. (2015, January 30). Attention Must Be Paid to Bayside Flooding At Jersey Shore, Reports Army Corps. Retrieved from <http://www.njspotlight.com/stories/15/01/29/more-attention-must-be-paid-to-bayside-flooding-at-jersey-shore-reports-army-corps/>

⁵ IBID.

⁶ "Atlantic City Sea Level Rise Rate Below Average Since 1992", by Steven Goddard, December 19, 2014, <https://stevengoddard.wordpress.com>; Goddard, Steven. (2014, December 19). Atlantic City Sea Level Rise Rate Below Average Since 1992. Retrieved from <https://stevengoddard.wordpress.com/2014/12/19/atlantic-city-sea-level-rise-rate-below-average-since-1992/>

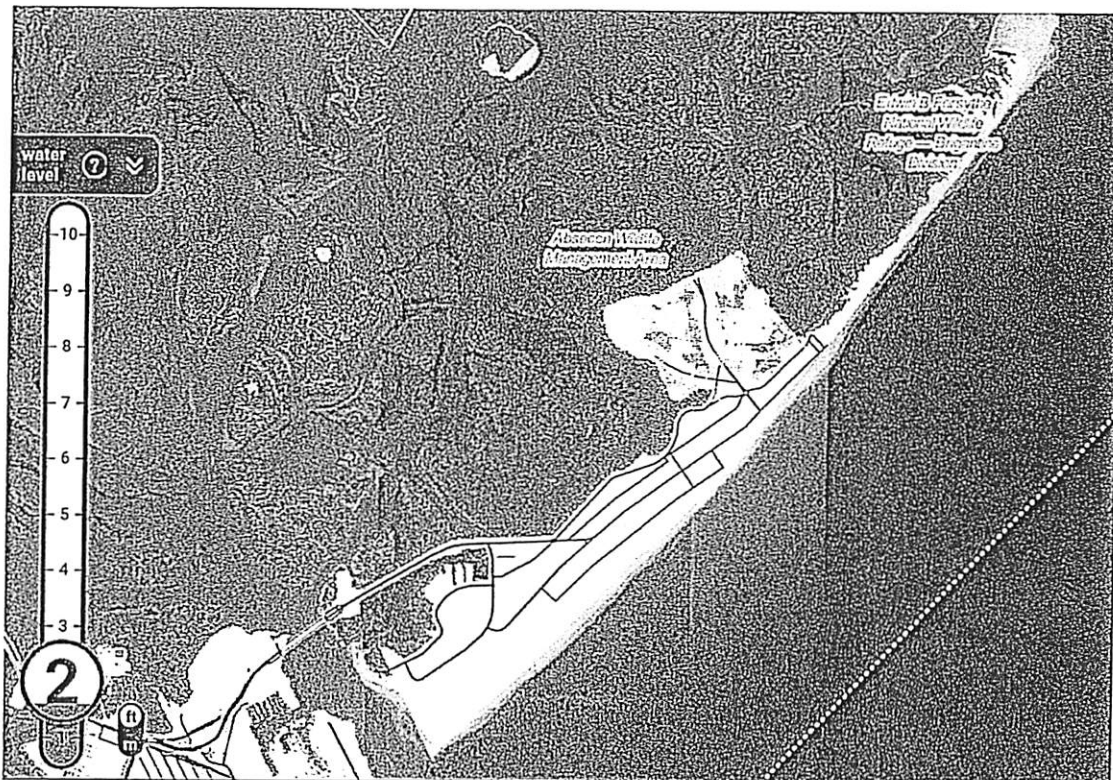


Figure 2: Map of Brigantine from www.climatecentral.org showing the impact of a 2 foot rise on storm surge when combined with a high tide such as occurred during Superstorm Sandy.

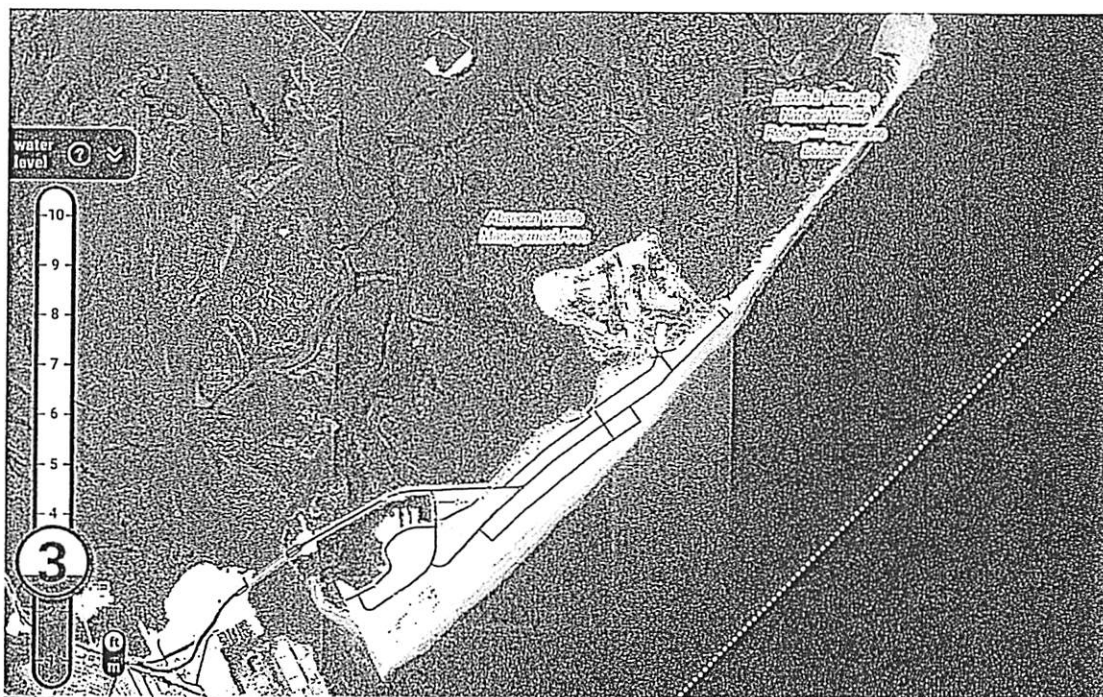


Figure 3: Map of Brigantine from www.climatecentral.org showing the impact of a 3 foot rise on storm surge when combined with a high tide such as occurred during Superstorm Sandy.

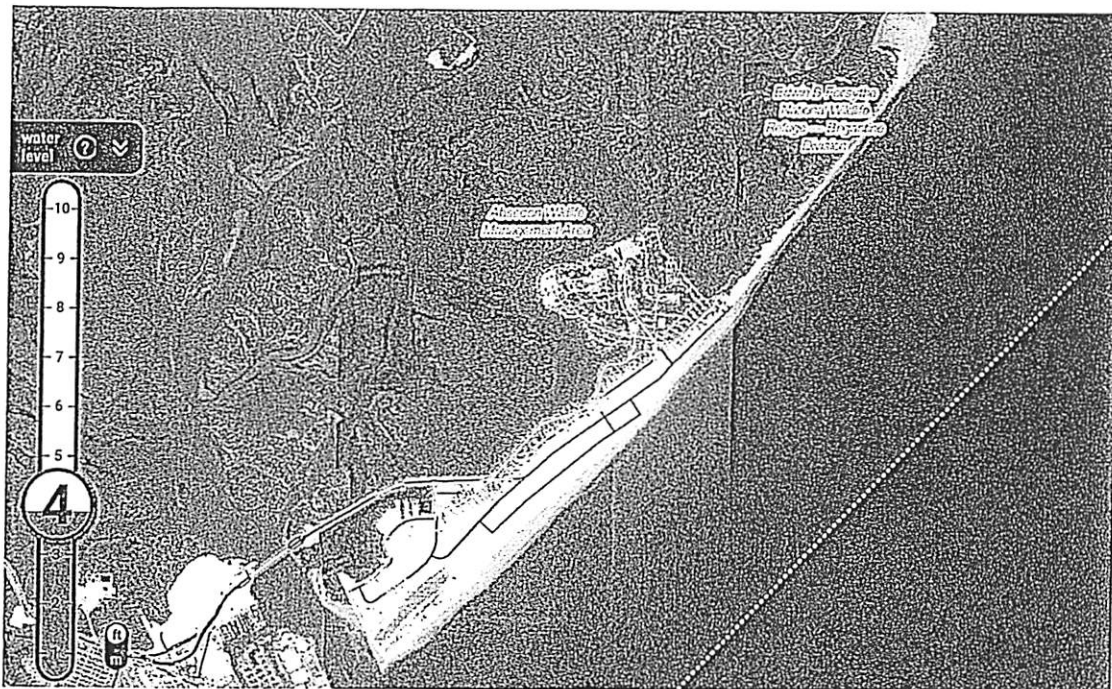


Figure 4: Map of Brigantine from www.climatecentral.org showing the impact of a 4 foot rise on storm surge when combined with a high tide such as occurred during Superstorm Sandy.



Figure 5: Detail Map of Brigantine Links Golf Course area on the northern end of the island from www.climatecentral.org showing the impact of a 3 foot rise on storm surge when combined with a high tide such as occurred during Superstorm Sandy.

Sea, Lake and Overland Surges from Hurricanes (SLOSH)

The National Weather Service has developed a computer model, known as SLOSH (Sea, Lake and Overland Surges from Hurricanes) to estimate the storm surge heights and winds resulting from hypothetical hurricanes⁷. SLOSH is best used for defining the potential flooding from storm surge for a location from a threatening hurricane, rather than as a predictor of the specific areas that will be inundated during a particular event. The maps below show the projected near worst case storm surge flooding (inundation) scenarios using the National Weather Service (NWS) SLOSH model maximum of maximums (MOMs) product for different hurricane wind categories at a high tide. The inundation projected for a Category 1 storm is comparable to the FEMA 100-year flood hazard areas. A Category 4 storm would have catastrophic flood levels throughout the City, with inundation to a level greater than 9 feet above ground level.

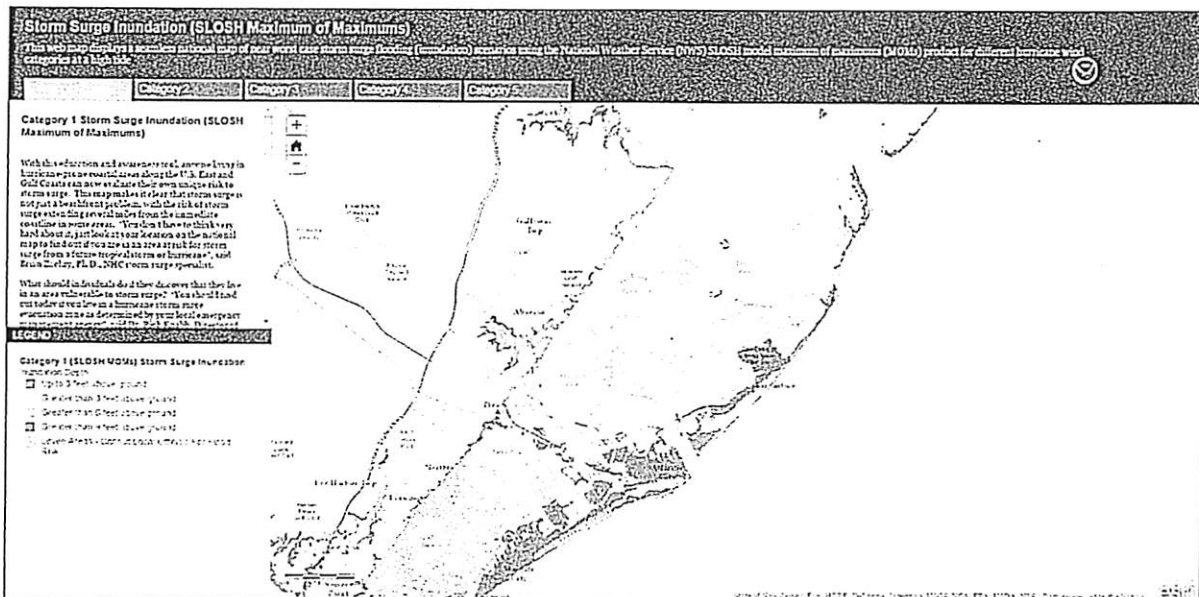


Figure 6: Projected Storm Surge Inundation from Category 1 Hurricane

7 NOAA. Storm Surge Inundation (SLOSH Maximum of Maximums). Retrieved from <http://noaa.maps.arcgis.com/apps/StorytellingTextLegend/index.html?appid=b1a20ab5eec149058bafc059635a82ee>

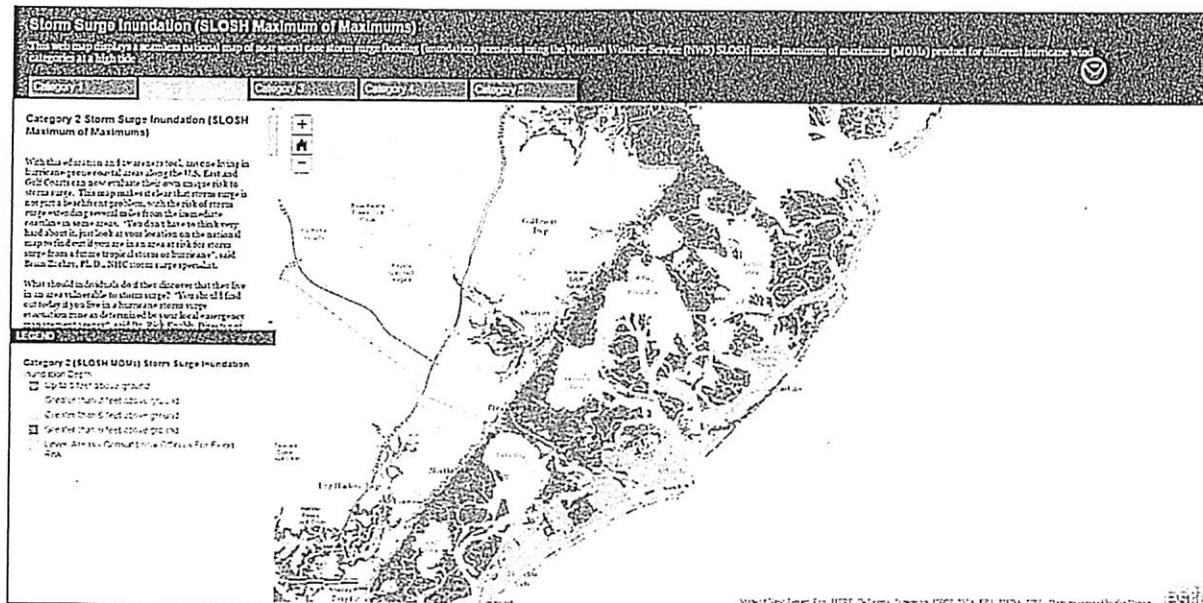


Figure 7: Projected Storm Surge Inundation from Category 2 Hurricane

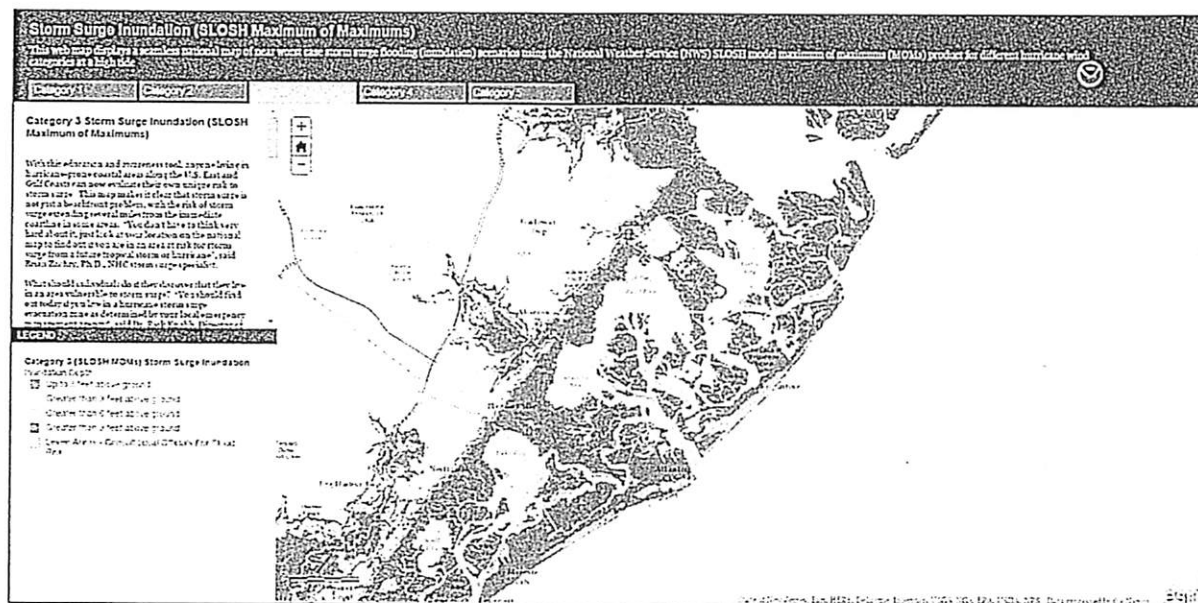


Figure 8: Projected Storm Surge Inundation from Category 3 Hurricane

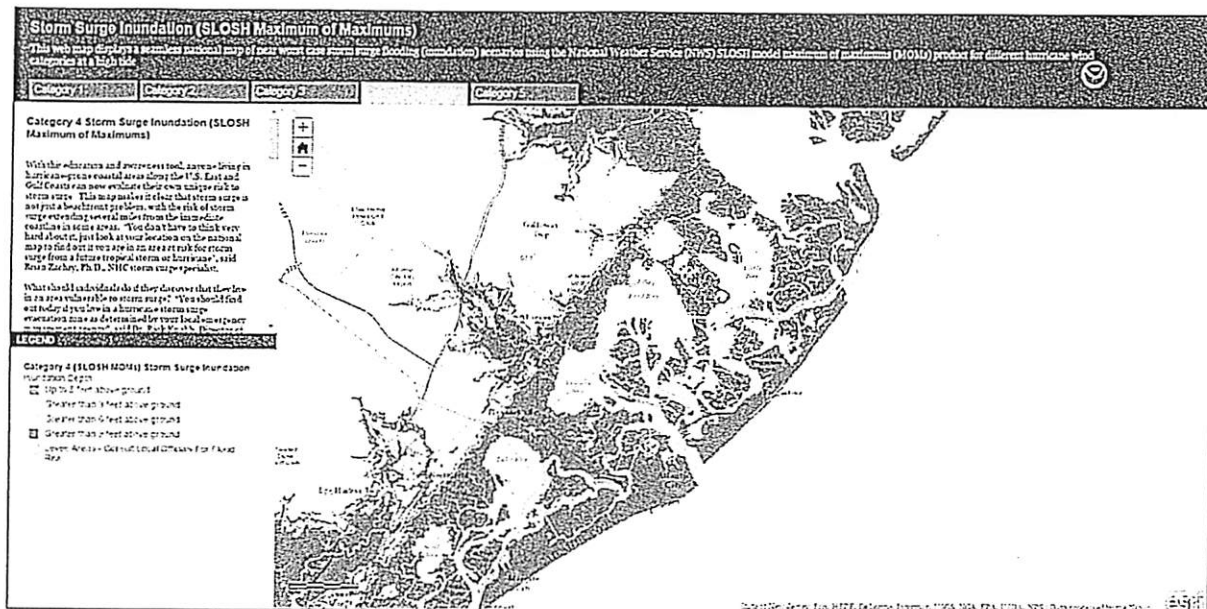


Figure 9: Projected Storm Surge Inundation from Category 4 Hurricane

10.3 RESILIENCY OBSERVATIONS

What the sea level rise mapping seems to indicate is that Brigantine will be primarily impacted by sea level rise in the northern areas of the island and, as the Figure 5 indicates, mostly in the Links Golf Course and surrounding neighborhoods. Many of the ponds associated with the course are considered tidal and an increase in sea level will only potentially exacerbate the situation, as drainage from the course will have no place to go. This potentially also provides a solution in the fact that the course could potentially be retrofitted with pumps to provide circulation.

10.4 MASTER PLAN ELEMENTS

While the city has been moving forward on protection measures associated with a number of infrastructure and planning projects—such as taking actions to continue to adhere to FEMA Base Flood Elevation (BFE) requirements for new construction (especially residential buildings) and elevating roads and improving stormwater management facilities—the resiliency in the longer term will need to continue to plan for improvements to address potential climate related changes.

A part of this has been efforts to define and expand the standards for Green Infrastructure improvements within developed areas. Below is an outline of the ideas and standards presently being utilized:

Design Standards for Green Infrastructure

As is common in most shore towns, when it rains, the volume of stormwater falling on exposed impervious surfaces and running into gutters and storm inlets overwhelms the piping system in the short term. As a result, some of this stormwater gets built up in the streets and leads to localized flooding, which is exacerbated by tidal influences on the water levels.

One of the major goals of the developing stormwater management concepts throughout the areas is an attempt to retain and/or infiltrate the first 1" inch of rainfall in the immediate area. This can be achieved by numerous methods of integrating green streets concepts into the redesign of urban corridors and spaces, and to improve infrastructure sustainability and assist

the regional utility authority in their attempt to reduce peak stormwater flows into the system. This includes using a variety of applications, from underground storage to green roof structures, to divert and reduce the volume of stormwater flowing initially into the system.

As stated earlier, the intent is to retain rather than increase stormwater runoff, thereby lessening localized flood conditions. Remediation of the site to reduce stormwater runoff and mitigate against flooding can be achieved by incorporating green infrastructure and vegetation within and around the development, including along sidewalks, rooftop gardens, green roofs and walls, decks, and in the courtyards and open spaces.

The first step is to investigate the viability to support stormwater management initiatives and techniques in conjunction with the improvements associated with redevelopment. This provides an approach that incorporates Green Street Design standards that can be fully integrated with the redesign of an entire area of the City.

The planning process must include an evaluation of the existing stormwater utilities throughout the designated area, and an evaluation of the grounds ability to store or ultimately to infiltrate runoff within the existing Right-of-Way and on adjacent properties. The use of Test Borings and percolation testing should be performed within any project area to determine both the current conditions of the subgrade material and the potential to provide storage and infiltration.

The existing conditions in many areas designated for redevelopment have little to no ability of the subgrade to provide significant storage volumes and/or infiltration. Therefore, most systems to be designed will need to provide storage volumes through alternative methods, such as green roof applications, and surface and subsurface storage systems in cisterns or stone trenches, capable of slow release of stormwater to be used for gray watering purposes or back into the system at non-peak flow times.

The following are general design criteria to be used to determine the volumes to be addressed, and the ability of an area to support Green Infrastructure and to provide for effective stormwater management.

Design Criteria and Applications

The stormwater management systems usually include different applications providing infiltration, evapotranspiration, storage and slow release. Some examples of successfully completed applications include the following:

- **Raingardens:** Diverting water, usually from a paved corridor, to a planted low area that allows for storage and infiltration. These systems typically have an overflow connection to the existing utility and are planted with native plant species.
- **Bioswales:** Directing water through a graded and planted swale, usually adjacent to a roadway, as a method to attenuate runoff and promote infiltration. The plantings are designed to promote evapotranspiration and are usually native species that require less long term maintenance and can withstand wet conditions.
- **Stormwater Trenches:** Capturing an initial 1" inch concentration of stormwater prior to entrance to a sewer system. This involves the introduction of green inlets upstream to redirect the stormwater to a series of underground stone storage trenches. The trenches are either for infiltration, if possible, or else storage with slow release. This application can be used in conjunction with planters and street trees.
- **Pervious Surfacing:** Porous concrete and pervious asphalt have been used in a range of applications, notably for surfacing of basketball courts and walking trails within recreation sites. This has evolved to development of pervious streets with stepped and terraced underground stormwater storage and slotted inlets. The idea of pervious

surfacing within streets is now being developed to use as a gutter collection system and for crosswalk areas that can infiltrate and redirect surface runoff.

Other ADA accessible porous surfacing can be used throughout the city, including safety surfacing in playground areas and the use of stone binder materials over stone base. Each of these applications provides stormwater storage as part of the design to handle runoff on site.

- Individual Infiltration Units: The design and development of individual infiltration units was created to provide point diversion of curb line runoff, and to provide a means of collection and infiltration. Each unit is placed along the curb in relation to an adjacent street tree and planting area, and the runoff is captured and fed to the root system below.
- Native Basin Plantings: Stormwater management basins have been developed with the intention of capturing runoff and providing an effective means of infiltration. In most cases, this involves the use of native wetland seeding and plantings that are particularly adapted to promoting infiltration.

Methodology

Present design standards encourage the introduction of sustainable Best Practices as to how best to intercept the initial 1" to 1 ½" of rainfall and divert it to an alternative stormwater management system that can infiltrate and/or store the potential runoff. Most approaches use a blend of best practices, such as the installation of green roof systems, porous and pervious surface systems, rain gardens incorporated into parking lots, dedicated open space areas, and bioswales integrated into streetscape designs. These practices all intercept stormwater prior to it reaching the existing inlets and stormwater systems, many of which back up during moon high tides in the lowest lying areas.

Green Infrastructure strategies should include the introduction of Green Inlets, which can capture stormwater from roads and parking lots for distribution to a trench stone or other manufactured drainage system, such as storm crates, upstream of existing City Inlets (which are connected to the citywide storm system), to divert and intercept runoff.

Resiliency Action Plan

The Action Plan for Resiliency for Brigantine combines short-term actions for protecting buildings through elevation, which occurs through the aggregated decisions of multiple property owners in a neighborhood, with moderate term actions that might involve gradual upgrading of infrastructure with Green Infrastructure best practices, and long long-term actions that anticipate the eventual impacts of Sea Level Rise sea level rise (elevating streets, raising bulkheads and protecting shorelines).

A set of specific Actions follow below:

- Work with Federal and State agencies to regularly update the City floodplain maps, with first priority being areas that are mapped as 100-year floodplain without base flood elevations established.
- Limit new development and subdivisions in any floodplain areas identified.
- Promote uses, such as open space easements, natural areas, and recreational open space to reduce impervious surfaces in floodplains.
- Reevaluate the effectiveness of the current floodplain protection regulations.

- Discourage the location of new homes and roadways in the "V" or wave velocity zone and the 100-year floodplain.
- Look into working with the County to complete a Hazard Mitigation Plan for flooding, wildfire, and other natural hazards.
- Develop and implement a Post-Disaster Recovery and Reconstruction Plan to facilitate recovery and to reduce exposure to future disasters.
- Consider amendments to the City Code that will limit impervious surfaces.
- Develop a Sea Level Rise Response Strategy (including a two-foot freeboard requirement for properties exposed to flooding, and discourage further shoreline hardening).
- Utilize the Community Vulnerability Assessment Tool, Risk and Vulnerability Assessment Tool, Hazard Assessment Tool, and HAZUS-MH to identify potential hazards, risks, and vulnerabilities and keep mapping information on file.
- Ensure the public is aware of any changes to FEMA's flood maps as they are updated and adopted, particularly any updates resulting in changes to the building requirements.
- Continue to participate in the FEMA Community Rating System (CRS). The CRS is a voluntary program for National Flood Insurance Program (NFIP) participating communities to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. The CRS has been developed to provide incentives in the form of premium discounts for communities that go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. For a community to be eligible, it must be in full compliance with the NFIP and be in the regular phase of the program. These activities and elements include public information, mapping, regulation, flood damage reduction, and warning and response initiatives. Actions under these categories are eligible for points that are added up to designate where the community is "rated" according to class rankings of 10 through 1. Brigantine is currently rated as a Class 5 community.
- Work to become designated as a "Storm Ready Community" by the National Weather Service. The National Weather Service has created a community preparedness program to assist towns as they develop plans for a wide variety of severe weather events. This program provides guidance on hazardous weather identification, warning systems, and creating -public readiness.

Resiliency as an Economic Development Strategy

The Brigantine area has been hit hard by the combined impact of the economic contraction of the gaming industry in Atlantic City and the damage from Superstorm Sandy. The City needs to plan for a future that can combine resiliency as a part of the local economy. While the City presently houses the Mammal Stranding Center, and has a good sense of the historical development of the island through the Historical Society, this period of the community's history is tied to the effects of climate change and how to address this relative to the future.

Appendix A

Authorizing Resolutions

Resolution No. XX-2016, Month XX, 2016

Resolution No. XXX-2016, Month XX, 2016

Appendix C

Photos