

Toms River Sustainability and Resiliency Master Plan Update



Sustainability and Resiliency Master Plan Update

Township of Toms River
Ocean County, New Jersey

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INTRODUCTION

Sustainability and Resiliency Master Plan Update

The Need to Plan for Resilient and Sustainable Development in Toms River

In the face of proven vulnerability to natural hazards, municipalities, counties, and other regional entities in New Jersey are introducing resiliency and sustainability measures into community development practices. The need for resiliency planning was driven home forcefully by Superstorm Sandy and the tremendous damage to homes, utilities, public spaces and other community facilities sustained during the storm. Toms River was particularly affected, classified as the fifth-worst impacted municipality in the State.¹ Impacts from the storm were detailed in the Township's 2014 Strategic Recovery Planning Report (SRPR), including:

- Damage to more than 6,500 homes on the barrier island communities and 4,000 homes in mainland Toms River (particularly around Silver Bay, Fischer Boulevard and Dillon's Creek, Downtown Toms River, and other bay- and river-front areas);
- Demolition of 1,292 homes and commercial spaces from October 2012 to April 2014 (1,232 single-family dwellings, 54 multi-family residences, and 6 commercial buildings);
- Classification of 3,795 properties as "substantially damaged homes";
- A loss of over \$2 billion in assessed value from 9,972 impacted properties (24.1% of all parcels);
- The receipt of \$16.8 million in FEMA public assistance dollars (the second highest of all New Jersey municipalities)

Looking to the future, coastal communities like Toms River are particularly concerned with the implications of climate change and sea level rise, and the long-term effects of human development and high-impact lifestyles on the environment. The SRPR and the Township's 2016 Community Vulnerability Assessment estimates potential impacts from natural hazards, including:

Critical facilities vulnerability:

- Seven facilities vulnerable to wildfire;
- Nine facilities located in the 100-year floodplain; and
- Three facilities inundated and two facilities isolated with a 3-foot rise in sea level

Parcels vulnerable to hazard exposure:

- 75 at risk from coastal erosion (total property value of \$11,182,500);
- 506 Repetitive Flood Loss properties (total property value of \$42,697,318); and
- 18,744 located in the Special Flood Hazard Area, also known as the 100-year floodplain (total property value of \$2,383,138,638)

1. Rutgers University's Sand Community Hardship Index from
"The Impact of Superstorm Sandy on New Jersey Towns and Households."

Estimated damage to property based on potential storm wave heights:

Wave Attack Scenarios	
Wave Height	Total Damage (Structural + Content)
1 ft	\$ 6,249,829
2 ft	\$ 18,684,938
3 ft	\$ 39,912,507
5 ft	\$ 107,711,597
10 ft	\$ 272,790,860

Estimated damage to property from potential sea level rise inundation:

Estimated Damage (properties with at least 10% inundation)		
Year	Sea Level Rise Value	Total Damage
2030	+ 0.8 ft	\$ 30,130,300
2050	+ 1.5 ft	\$ 96,232,900
2100	+ 3.5 ft	\$ 1,893,878,500

Estimated Damage (building fully or partially inundated)		
Sea Level Rise Value	Number of Buildings	Total Damage
+ 0.8 ft	16	\$ 5,013,900
+ 1.5 ft	71	\$ 25,975,900
+ 3.5 ft	4,346	\$ 1,351,939,700

Estimated damage from the 100-year flood event under sea level rise conditions:

Estimated Damage					
Year	Sea Level Rise Value	Buildings Impacted	Structural Damage	Content Damage	Total Damage
2015	-	11,539	\$ 55,138,360	\$ 63,432,517	\$ 118,570,878
2030	+ 0.8 ft	12,293	\$ 74,819,132	\$ 67,517,739	\$ 142,336,872
2050	+ 1.5 ft	12,812	\$ 90,308,086	\$ 71,037,858	\$ 161,345,945
2100	+ 3.5 ft	13,890	\$ 136,330,009	\$ 85,967,385	\$ 222,297,394

In addition to the environmental hazards discussed above, episodes of social and economic instability, exemplified by the Great Recession, have shown that communities must also anticipate and address vulnerabilities in socio-economic institutions. Resiliency and sustainability planning aims to make communities less susceptible to these types of environmental and socio-economic shocks.

The Concept of Resiliency

Resiliency is defined as “the capacity of a system to withstand disturbance while still retaining its fundamental structure, function, and internal feedbacks.”² Resilient ecosystems are characterized by a complex diversity of species, flexible generalists, and multiple redundancies. When diversity is eroded and vital systems functions are lost or are performed by a single species, an ecosystem is rendered “inflexibly brittle.”³ Though it may appear stable for long periods of time, this type of system is not able to rebound from external shocks, and will transition instead to a new steady state which may be hostile to many forms of life.

The Concept of Sustainability

Sustainability is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”⁴ Achieving sustainability is commonly conceived of as requiring actions that balance environmental, economic, and social needs. The “three pillars of sustainability,” as they are known, imply that in order to meet present needs without sacrificing the needs of future populations, human development and activity must (1) occur within the means of existing natural resources, (2) maintain economic productivity, and (3) create contexts conducive to social well-being and equity.⁵

Supporting Community Resiliency & Sustainability through Land Development Practices

Land use planning and land development policies play a key role in advancing resiliency and sustainability within Toms River. Development policies and regulations mediate the natural and built environments. They can divide land uses into cordoned-off monocultures or allow for a mixture of uses that promote complex, diverse, multi-modal communities. They can permit development without reference to the surrounding environment, or calibrate development to expand within limits of surrounding environmentally sensitive areas and encourage low-impact design working with instead of against natural processes.

A resilient community has a diversity of development and housing stock to accommodate a full range of different household types, with a pattern of development that anticipates natural hazards, able to withstand both physical shocks to property and infrastructure from environmental hazards, as well as shocks to other social institutions such as general economic downturn or rapid demographic shifts (population increase, for example, or changes within the age structure). The number and variety of mixed-use areas ensures that should one portion of the Township be affected by damages, other areas continue to

2. Brian Walker and David Salt, *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*, Washington DC: Island Press, 2006. Quoted by William Rees, “Thinking ‘Resilience,’” *Post Carbon Reader*, March 21, 2011.

3. William Rees, “Thinking ‘Resilience,’” *Post Carbon Reader*, March 21, 2011.

4. United Nations World Commission on Environment and Development, 1987.

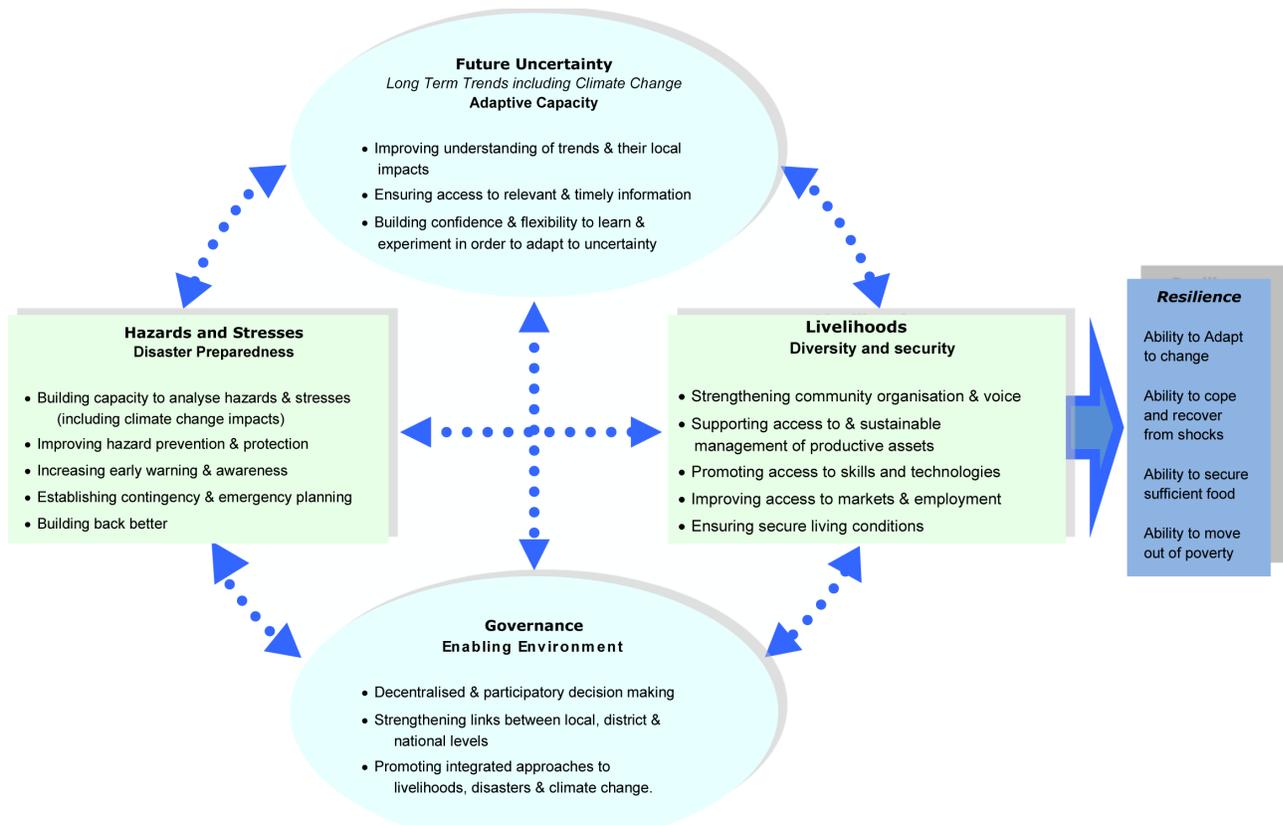
5. Circular Ecology, *Sustainability and Sustainable Development*, Available: www.circularrecology.com, accessed August 28, 2016.

provide vital functions such as housing and shopping until recovery occurs. The inclusion of transportation routes with multi-modal paths, public transportation, and alternate routes similarly provides a range of circulation options, an example of multiple redundancies that will preserve movement throughout the Township if service should be interrupted in specific areas or for specific modes. A resilient community has a diversified economy that will continue to function at a baseline level should one industry temporarily or permanently fail due to downturn or disaster. Redundancies in utilities and infrastructure ensure that a community is not without vital services for long periods of time in the aftermath of a shock.

The following principles of resiliency thinking (drawn from the work of ecological economist William Rees) can also be applied to community development patterns:

- Human enterprise is structurally and functionally inseparable from nature. Development patterns must work within the bounds of the natural environment and, wherever possible, work with and accommodate natural processes through environmentally-sensitive site design and development siting.
- Socio-ecosystems are constantly changing in response to internal and external forces and these changes are not linear or predictable. Communities must regulate development in view of an extended time-horizon, establishing development areas and preparing now for potential hazards, shocks, or environmental changes that will occur years into the future.

Graphical representation of community resiliency ^a

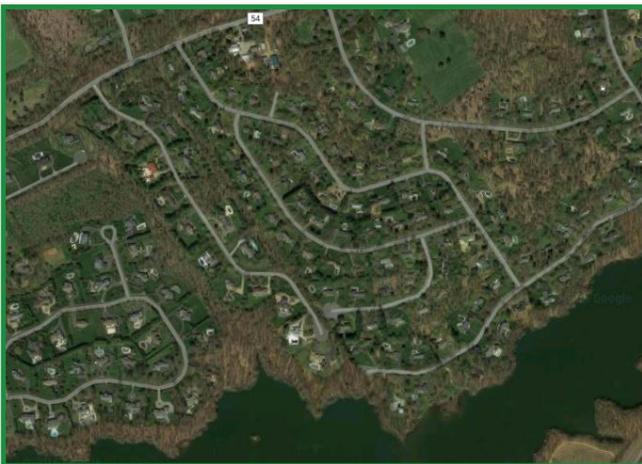


- Under sufficient stress, critical systems variables may flip into a different regime or alternate steady state. In terms of land use planning, this represents a situation in which external shocks damage a community so thoroughly that it is not able to recover to a pre-disaster conditions.
- Desired socio-ecological systems are characterized by high resilience and are able to resist external disturbance and continue to provide goods and services essential for a satisfactory quality of life. In terms of land use planning, the goal is to create a diverse, flexible and redundant pattern of community development, infrastructure, and social institutions that anticipate, can accommodate, and can recover from shocks.

A sustainable community balances the needs of the current population while also preserving existing community assets and planning for growth that will stand the test of environmental and man-made shocks, so that future generations continue to experience a high quality of life. In addition to balancing the needs of present and future populations, a sustainable community harmonizes the current needs of the local environment, economy, and society. A sustainable town protects its environmental resources and preserves ecosystem functions while also providing for a diversity of employment opportunities and ensuring that households of different family structures, incomes, ages, cultural backgrounds, education levels, etc., can find a place within the community.

The planning field is grappling with and has arrived at many strategies for translating these principles into on-the-ground development regulations that will usher communities toward more resilient patterns of development.

Sustainable Development involves moving from inefficient sprawling, single-use areas to denser, interconnected mixed-use patterns of settlement.⁹



Source: Google Earth

Purpose of this Plan

At present, Toms River's existing planning documents and development regulations contain only a limited number of objectives and land development policies explicitly or implicitly related to resiliency and sustainability. Many studies related to environmental, economic, and social resiliency in Toms River have been completed since Superstorm Sandy hit in 2012 with the intention of laying the foundation for incorporating resiliency and sustainability mechanisms into plans and policies, including:

- Toms River Strategic Recovery Planning Report (2014)
- Ocean County Hazard Mitigation Plan (2014)
- Toms River Getting To Resiliency Report (2015)
- Downtown Neighborhood Circulation Plan (2016)
- Post-Sandy Capital Improvement Plan (2016)
- Toms River Township Hazard Mitigation Plan (2016)
- Community Vulnerability Assessment (2016)
- Ortley Beach Neighborhood Plan (2016)
- Route 37 Corridor Economic Vision Plan (2013)
- Municipal Public Access Plan (2016)

This document serves as a Master Plan Update with the key focus of translating the findings and recommendations of the studies and plans listed above into updated Master Plan policies and development regulations. It combines the Township-specific content of these reports with broader general trends in environmental and planning policy to arrive at a set of additional goals related to resiliency and sustainability for each element of the 2006 Toms River Master Plan,⁶ including Land Use, Circulation, Utility Service, Conservation, Open Space and Recreation, Recycling, Energy Conservation, Economic Development, and Community Facilities.

The report takes the general framework of a Master Plan Reexamination Report in accordance with NJSA 40:55D-89, considering:

- A.** Objectives at the time of the last Master Plan related to resiliency and sustainability;
- B.** The status of objectives related to resiliency and sustainability provided in 2006 and extent to which problems have increased or been reduced;
- C.** New information related to sustainability and resiliency issues proffered in recent Township studies and plans, and changes in general assumptions related to resiliency and sustainability issues; and
- D.** New recommendations related to sustainability and resiliency in recent studies and plans, and any other possible related recommendations.

The Report is structured topically by Master Plan element. Each element contains sections A through D as listed above, which mainly focus on additional planning goals and objectives, followed by a set of proposed land development regulations. The summary and suggested plan and code amendments provided in the report will propel the Township towards a realization of resilient and sustainable development outcomes.

6. Updated through 2009.

LAND USE ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan included 19 land use objectives. As pointed out in the Strategic Recovery Planning Report, none of these objectives would support municipal resiliency planning needs related to future storm mitigation or post-storm recovery. Several, however, are related to sustainability objectives, including the following:

1. Continue to use practical and flexible development controls in order to gain open space, conserve the natural landscape and protect the environmentally sensitive areas of the Township.
2. Relate future residential growth to municipal infrastructure.
3. Provide for the Township's fair share of low-and-moderate-income housing as set forth in the Housing Element and Fair Share Compliance Plan adopted in November 2005.
4. Promote redevelopment of the Ciba-Geigy property, portions of Downtown Toms River between Huddy Park and the Parkway, and Route 37 between Fischer Boulevard and the bridge.
5. Encourage cluster development in order to preserve large tracts of land.
6. Establish a transfer of development rights or similar zoning technique to direct growth to centers and preserve open space in environmentally sensitive areas.
7. Achieve regional coastal center designation for Toms River Center.
8. Achieve center designations for other locations in the Township that meet the criteria for centers in the State Development and Redevelopment Plan as coordinated through the New Jersey Office of Smart Growth.
9. Maintain the rural character of North Dover and Pleasant Plains.

Section B: Status of Sustainability/Resiliency Issues and Recommendations

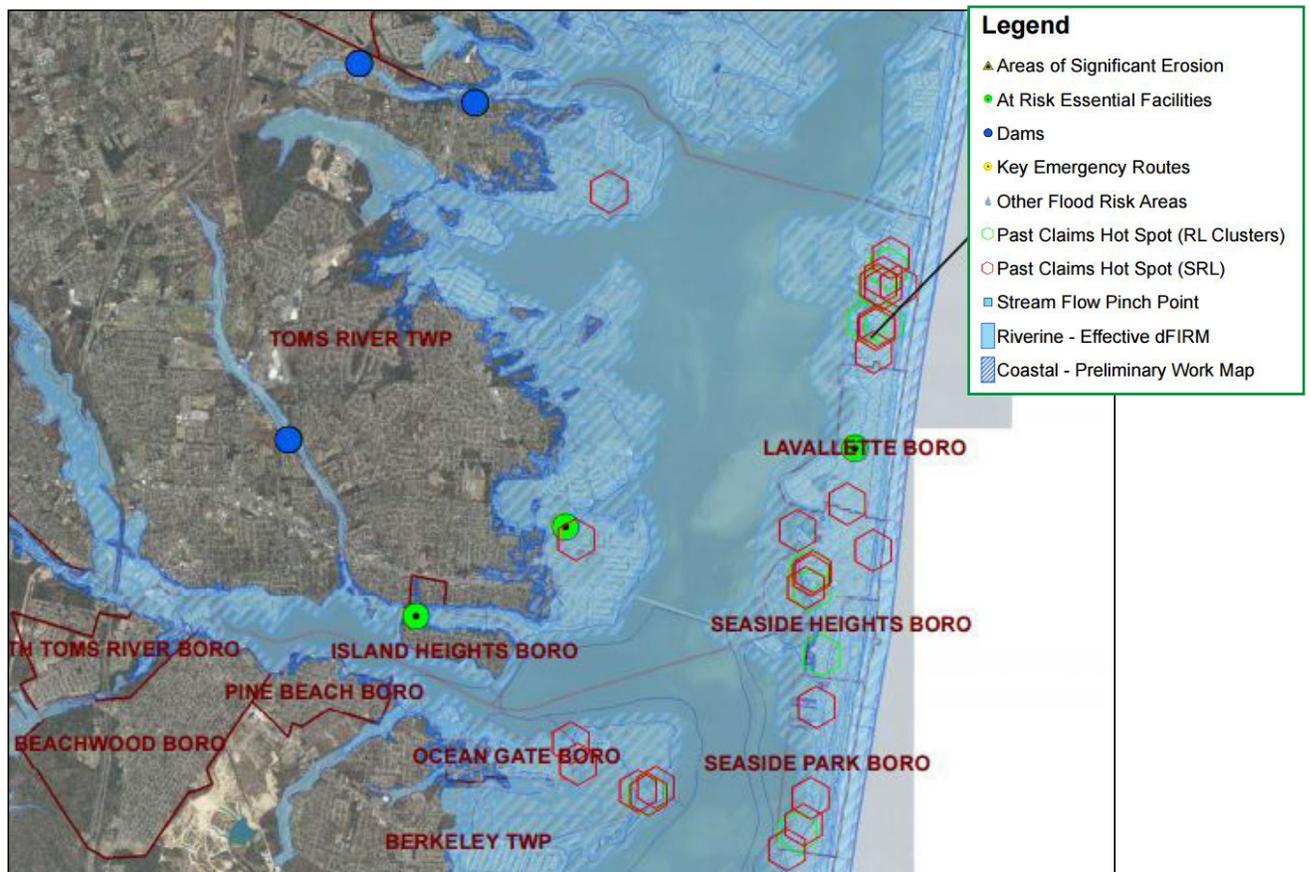
The nine objectives listed above are related to sustainability by catalyzing the efficient use of land resources, and are still valid pursuits for the Township. Flexible development, cluster development, and transfer of development rights programs are all geared toward achieving compact development patterns, as are the plans for obtaining center designations within the Township.

In keeping with the State Development and Redevelopment Plan, the objectives also promote smart and efficient siting of municipal infrastructure, building off of existing residential areas. The redevelopment of the Ciba-Geigy property after remediation efforts end will active a large portion of the Township that is currently unavailable for development. It represents a site that, with no existing development, can be designed from the start as a mixed-use, compact, sustainable site. Additionally, the objective to provide for affordable housing creates a sustainable community from the perspective of both economic development and equitable access to housing.

Section C: New Information and Changes in Assumptions

As with all the elements listed below, the biggest changes in land management and community planning assumptions were created by Superstorm Sandy. Beyond sustainability issues, coastal municipalities and municipalities containing significant bodies of water saw the ramifications of storm action on residences, infrastructure, and community facilities located within the floodplain. None of the land use objectives in the Toms River 2006 Master Plan address land development from a resiliency perspective. In some cases, repeated property losses in some neighborhoods might signal the need to limit future development or scale back existing development through buy-out programs. In any event, the design and construction of buildings at high risk to storm damage should anticipate potential flooding and storm action.

Land use regulations and zoning district standards in Toms River may also be augmented toward higher densities in keeping with the recommendations included in the Phase 1 Redevelopment Plan for downtown Toms River, plans for Transit Oriented Development near the bus station, the creation of new centers and cores through the Township's recent Plan Endorsement activities, and the findings of other neighborhood and redevelopment plans.



Depiction of Repetitive Loss and Severe Repetitive Loss properties in Toms River as tracked by FEMA⁶. Instituting land use controls that can mitigate property damage in these areas is a priority.

Section D: Suggested Additional or Amended Goals and Objectives

1. Implement the recommendations for land use changes and land use regulation provided by the 2014 Strategic Planning Recovery Report that are not yet implemented, including the following:
 - Elevate all substantially damaged homes to mitigate impact of flood related hazards in accordance with the Township Hazard Mitigation Plan.
 - Continue to participate in the National Flood Insurance Program to support proactive floodplain management that will protect property from flood-related hazards, clearly inform property owners about the risks of being in and near the Special Flood Hazard Area, and promote flood insurance.
 - Continue to enforce building codes to require building, renovations, and re-building that meets or exceeds the Uniform Construction Code thus protecting homes from risk related to hazards including flooding, fire, wind, earthquake, and winter storm.
 - Continue participation in the Community Rating System program and consider upgrading to the next class level to complete proactive floodplain management and assist residents with flood insurance costs.
 - The Township has added Floor Area Ratio as a required zoning standard for zones located on the barrier island to prevent overbuilding. The Township should continue this work by reviewing other zoning provisions to ensure that zoning reflects existing conditions to reduce number of variance requests.
 - Add standards specific to reducing and/or intercepting stormwater runoff by incentivizing the use of rain barrels and other viable methods of stormwater capture in the waterfront neighborhoods.
 - Differentiate flood-mitigation building design standards such as skirting of pilings, use of decks, parking under elevated homes, etc., by lot sizes on the mainland, bayside, lagoon, and barrier island communities.
2. Create Redevelopment Plans with appropriate land use standards and bulk standards for mixed-use, compact development for the Ciba-Geigy site and the Route 37 Area in Need of Redevelopment (Coates Pointe).
3. Amend the Phase 1 Waterfront Redevelopment Plan in accordance with the findings of the Downtown Circulation Neighborhood Plan so that it can be adopted with its suite of land use, bulk, and design changes for the Downtown area.
4. The development of a Transfer of Development Credits (TDC) program has been a land use goal of the Township for a number of years. The program should be developed, and expanded to include a plan for rezoning upland properties to accommodate possible shifts of residents away from high risk flood zones. The flood zone areas would be the "sending" areas of the TDC program, while the upland areas would be the "receiving" zone. The Township would have to account for



Rendering of potential new design standards for the Coates Pointe Redevelopment Area ^d. While designated an area in need of redevelopment, a redevelopment plan has yet to be adopted.

value differences, since land in high risk flood areas tend to be higher in value than inland properties. The Township could implement this recommendation with an overlay zone for both the receiving and sending areas.

5. Identify long-term inundation caused by sea level rise as a hazard in municipal plans and consider disclosing hazard risks to potential buyers or developers.
6. Use land use standards as a means for achieving the objectives of the Township's 2016 Smart Growth Plan for establishing Transit Oriented Development (TOD) and/or a Transit Improvement District in the Downtown Toms River Regional Center by amending the R-50 zone within ½ mile of the train station for higher-density multi-family housing. TOD's around bus stations are recommended to have a minimum density of 8 units to the acre. At present, the R-50 zone permits only single-family dwellings.

ECONOMIC PLAN ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan included eight economic development objectives, five of which are related to sustainability and resiliency:

1. Promote jobs and activities for the Township's large senior population.
2. Develop additional jobs for the Township's large professional population to encourage people to live and work in Dover Township.
3. Encourage new businesses to establish in the Township.
4. Capitalize on mixed-use redevelopment and revitalization of areas that are becoming obsolescent.
5. Create new employment centers to reduce the number of residents who have to leave the county to find employment, and by so doing to reduce reliance on the congested regional highway system.

Additionally, the Economic Plan Element contains four relevant recommendations:

1. Encourage new mixed-use nodes and centers with commercial in close proximity to residential uses.
2. Provide jobs/activities for large senior and professional populations.
3. Plan for the future development of industrial parks.
4. Develop biking and walking trails and greenways throughout the Township that connect park system with existing neighborhoods and the downtown.

Section B: Status of Sustainability/Resiliency Issues and Recommendations

All five objectives and four recommendations remain valid and would contribute to community economic sustainability and resiliency. Promoting additional jobs for seniors and professionals within the Township and encouraging the establishment of new businesses will help to expand and diversify the Township's economic base, leaving it less vulnerable to collapse with the downturn of a single particular industry.

Capitalizing on mixed-use redevelopment and revitalization of areas for economic purposes will site new establishments within existing development rather than creating a sprawl of new commercial buildings. Finally, creating new employment centers so that residents can work where they live will cut down on the length of commutes and, therefore, the impact of greenhouse gas emissions from vehicles.

Section C: New Information and Changes in Assumptions

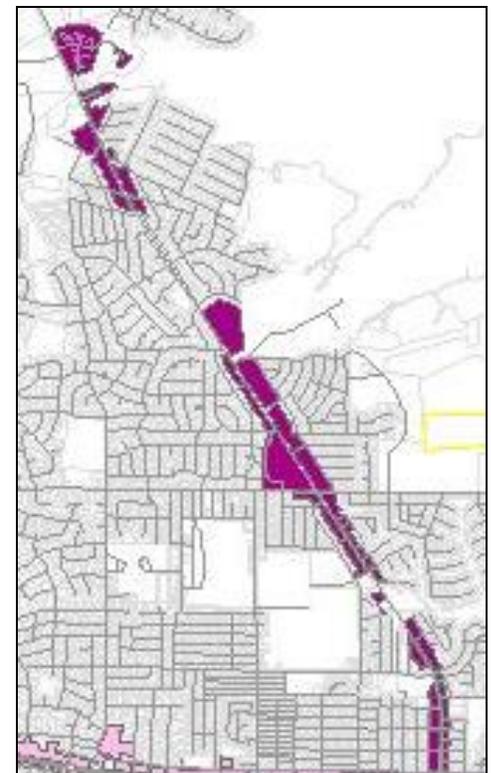
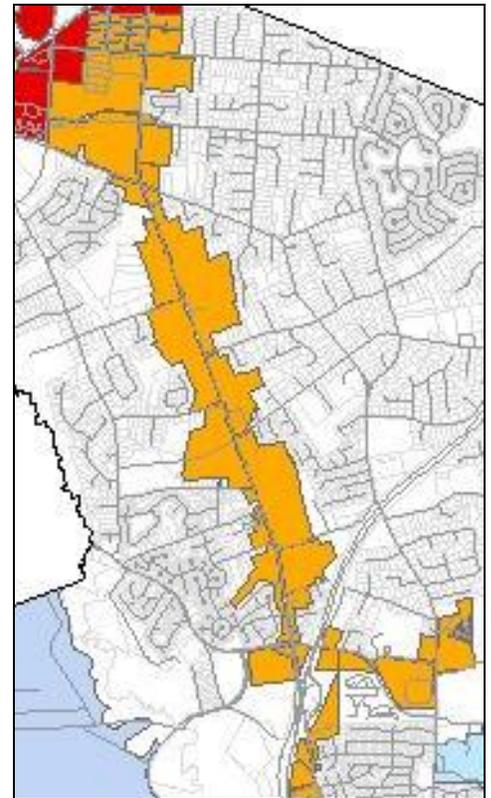
A number of events and general trends present significant changes to the assumptions, policies, and objectives upon which the Master Plan's goals and recommendations for economic development are based.

The Great Recession of 2008 had dire economic consequences. The number of total primary jobs within the Monmouth-Ocean County MSA declined, with a loss of nearly three percent of the full-time workforce (equivalent to over 10,000 jobs) between 2007 and 2009. Although primary jobs did grow between 2009 and 2011, a considerable gap remains relative to pre-crisis levels. In 2013, high unemployment began to trend downwards, but some of this is attributable to a declining labor force rather than job creation. The effects of the great recession underscored the need to diversify the region's economic base, making it more resilient and less susceptible to downturns.

Superstorm Sandy had a tremendous impact on Toms River for all property types. The Township's ratable base suffered over \$2 billion in losses, of which approximately 56% has been recovered as of January 1, 2016. The effects of the storm reinforced the need for a diversified economy in Toms River that expands beyond shore tourism. A secondary hardship created by the storm was a long-term loss of power. Participants in the Township's SRPR planning process reported that the prolonged power outage caused substantial product loss and employee wage loss.

Since 2006, new high-growth industries have emerged. The 2012 New Jersey State Strategic Plan identifies Green Energy and Economy, Tourism, and Food Production and Processing as potential growth opportunities for New Jersey.

At present, economic growth areas within Toms River are being formally designated as new centers and cores through the State



Top to bottom: Fischer Boulevard Highway Core, and Route 9 Highway Core.⁶ Visioning processes for each of these corridors, similar to the Route 37 Economic Corridor Vision Plan, should be pursued as a means of comprehensive planning for future development.

Plan Endorsement process. Economic development should radiate outward from these designated areas with infill and repurposing of existing underutilized properties, in line with smart growth and sustainability principles.

After the inaction of the past 15 years, the need for affordable housing throughout New Jersey has emerged as a priority issue. Affordable housing and economic development are two intertwined issues. In order to achieve the goal of providing opportunities for residents to work where they live, the range of local housing options must be affordable to households of varying income levels. As economic development occurs, there will be a need for new affordable workforce housing.

Remediation of the Ciba-Geigy site has progressed. Soil remediation is now complete (though ground water remediation will continue for decades). Large portions of the 1,200 acre site (about 860 acres) were



never affected by contamination. Enough on-site clean-up has occurred that attention should now move to planning for redevelopment and utilization of the site.

Additionally, the Township's 2013 Route 37 Corridor Vision Plan provides further information that serves as a basis for resilient and sustainable economic planning. As reported in the Plan, indicators for wage rate, population growth, and community patterns combine to illustrate that while demand for high-skilled jobs is poised to increase, opportunities for such work remain stagnant. Ocean County has the second highest job deficit in the State. In September of 2015 according to the New Jersey Department of Labor there were 265,400 Ocean County residents in the labor force as compared to 137,523 employed by the private sector jobs located in the County. In addition, Ocean County has the second lowest weekly private sector wage rate.



Solar panels and wind turbine factories are part of the green technology industry.^f

The County's largest and fastest growing age group is 25-44 year-olds, which will increase the demand for high-salary jobs. However, Ocean County has the second lowest weekly wage rate in the State and the highest commuter rate, which is due to the insufficient number of higher skilled jobs at the local level.

Focusing on the 6-mile stretch of Route 37 between the Garden State Parkway in Toms River and the Joint Base in Lakehurst, the Plan seeks to establish a high-tech corridor that better utilizes existing assets and links technology-oriented, high-wage, skilled employment with mixed-use development and local residential communities. High-tech clusters in Health and Wellness, Green Technology, Military Technology and Research and Development are envisioned.

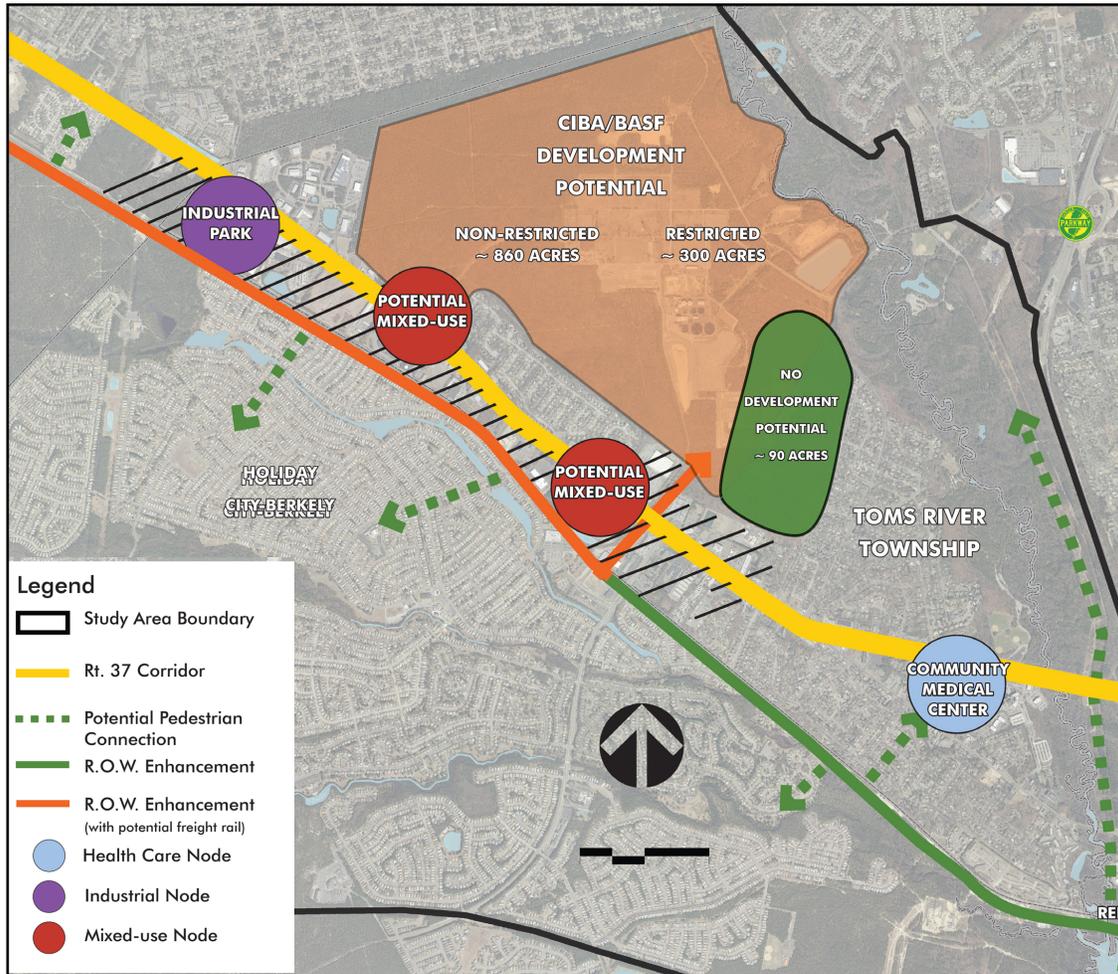
Section D: Suggested Additional or Amended Goals and Objectives

The five objectives and four recommendations for sustainable/resilient economic development in the 2006 Master Plan discussed above remain valid. Given the changes in assumptions and the planning studies completed since 2006, the following new objectives and recommendations are suggested to enhance community economic resiliency and sustainability:

1. Implement recommendations and conduct recommended studies provided in the Route 37 Economic Corridor Vision Plan related to sustainability/resiliency, stated as the following:
 - Inventory existing commercial and office space;
 - Develop a Sustainable Corridor with green tech, infrastructure, and industry employers;
 - Explore "greyfield" redevelopment for repurposed mixed use properties;
 - Explore market interest in green technologies campus;
 - Develop an eco-tourism and "gateway" to Pinelands and the Shore Plan;
 - Provide more workforce housing;
 - Create diversity of housing types;
 - Study feasibility of changes to age-restrictions in vacant age-restricted housing;
 - Study greenway connecting Barnegat Branch Trail to Rt. 37, Downtown, and riverfront;
 - Study multimodal road/trail along rail right of way into Downtown;
 - Develop Ocean County College specialized training for health, green industry, and tech;
 - Conduct detailed market analysis for potential users of the CIBA/BASF site;
 - Create a Redevelopment Plan for the property; and
 - Explore a portion of the CIBA/BASF site for wildlife refuge.

2. Perform a similar visioning process as the Route 37 Economic Corridor Vision Plan for the other corridors that are proposed for core designation in the Smart Growth Plan, including Route 70, Route 9, Fischer Boulevard, and Hooper Avenue to further diversify the local economy and promote anti-sprawl, infill development.

3. Implement economic development strategies relevant to economic sustainability in Toms River included in Ocean County's 2011 Comprehensive Plan, including:
 - Further diversify the education opportunities at high schools, vocational technical schools and colleges. Provide more job training and incorporation of more four-year degree options.
 - Green technology facilities should be located along highway corridors or within one of the existing industrial parks, such as the one located off of Route 37 in Toms River to provide services such as manufacturing and supplying products used to treat deteriorated ecosystems, solar panels, wind turbines, building materials and other new technologies.
 - A portion of the Route 37 corridor in Toms River should be considered as a "federal technology corridor" due to its close proximity to the Lakehurst Annex of the Joint Maguire Base. Specifically, the Ciba-Geigy property, a 1,200 acre property, should be considered to be reused and repurposed as a site for a Federal Technology Corridor.
 - Implement the Ocean County Barnegat Branch Trail, which will eventually extend from downtown Toms River to the historic town of Barnegat, promoting connections between recreation and commercial centers.
 - Toms River and South Toms River should form a partnership to redevelop and promote the riverfront area with business and recreational uses that enhance the area as a regional attraction.
4. Capitalize on the growth of green and sustainable industries such as green energy technology, eco-tourism, health care, and food production and processing, and develop these within the Township.
5. Prioritize the redevelopment of the Ciba-Geigy site as a mixed-use economic center.
6. Make the provision of workforce and affordable housing in mixed-used areas near growing employment centers, such as the Route 37 corridor, a priority.
7. Work with Ocean County to preserve remaining farmland in the Township to continue this industry and support connections between local food production and food consumption, especially those properties targeted for preservation within the County Agricultural Development Area (food production and processing has been identified by the State as a potential growth sector).



Excerpt from the 2013 Route 37 Economic Corridor Vision Plan.⁹ Shows development potential of the Ciba-Geigy Site and connection with neighboring industrial areas, Route 37, and rail.

8. Institute a Buy Local Program to incentivize shopping locally and a Green Business Recognition Program to highlight the efforts of businesses that use sustainable sourcing, purchasing, recycling, or other sustainable practices (both programs are action items eligible for Sustainable Jersey points). Brick Township's Buy Local program serves as an example that Toms River could emulate and adjust to its own needs.

9. Study the potential for developing a micro-grid system that can service downtown Toms River with power in the event of a long-term outage to avoid economic losses (see the Energy Conservation Element, Section C for a description of the micro-grid system).

COMMUNITY FACILITIES ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan included eleven community facilities objectives. None of the community facilities objectives relate directly to sustainability or resiliency. Six of the eleven objectives are indirectly related to resiliency, or require only minor modifications to incorporate resiliency planning principles:

1. Update the equipment used by emergency personnel.
2. Meet or exceed all State and Federal requirements for the number of emergency personnel.
3. Continue to renew the Township's infrastructure.
4. Encourage strategic location of emergency facilities and traffic routes that provide fast and easy maneuverability to all areas of the Township.
5. Ensure the expansion of community facilities to account for current and future growth
6. Continue to provide high quality civic, library, medical and other community facilities to meet the broad ranging needs of the municipality.

Additionally, the Community Facilities Element contains three relevant recommendations:

1. Install traffic lights with battery backup, particularly at highly trafficked intersections such as Route 37 and Route 166, Hooper Avenue and Route 37, Fischer Boulevard and Hooper Avenue, and Bay Avenue and Hooper Avenue.
2. Utilize modern emergency service technology. The following technology upgrades should be investigated:
 - Upgrade existing Computer Aided Dispatching (CAD) program;
 - Establish WI-FI wireless communication for the entire municipality;
 - Upgrade video capabilities; and
 - Include GIS mapping as a standard tool for all Municipal departments.
3. Require sidewalks and curbing in all new construction and renovation projects on public streets.

Section B: Status of Sustainability/Resiliency Issues and Recommendations

The three recommendations and six objectives listed above remain valid, but some require slight amendments to fit into the framework of resiliency and sustainability planning. Community facilities generally include the following establishments:

- Emergency services (police stations, fire stations, EMT facilities, hospitals, emergency call centers, emergency management centers, places of last resort)
- Schools
- Community meeting places (public shelters, municipal buildings, places of worship, libraries)
- Facilities with high concentrations of sensitive populations (nursing home)

As evidenced in the list above, community facilities provide vital public services or otherwise represent investments in community quality of life. The connection between resiliency and community facilities is two-fold. First, many community facilities exist specifically to provide a service related to emergency response. Second, community facilities, like every type of structure, are potentially vulnerable to impacts from storm surge and other natural hazards. Community goals should include the preparation of plans for utilizing these facilities to their fullest potential during an emergency situation, while also protecting the facilities themselves from hazard damage so that operations are not interrupted at the very time they are most needed.



Toms River Municipal Building^h

In terms of sustainability objectives, a salient issue surrounding community facilities is access. Facilities such as libraries and schools should have a spatial distribution and operations that allow equitable access for the entire Township population. Proximity to residential neighborhoods can promote non-motorized transportation to and from facilities, promoting physical activity and decreasing vehicular emissions and roadway congestion.



Dover Beach EMSⁱ

Adequate equipment and emergency personnel is certainly needed to establish a resilient community capable of responding to disaster. However, objectives for updating equipment and meeting emergency personnel requirements should be developed into more specific goals in the context of a Township Hazard Mitigation Plan (currently being developed).

Renewing Township infrastructure will maintain access to community facilities, and provide for reliable evacuation routes and quick response times for emergency vehicles. However, the concept of selecting strategic locations for community facilities must be expanded beyond maneuverability to include criteria for siting facilities outside high-risk environmental hazard areas.

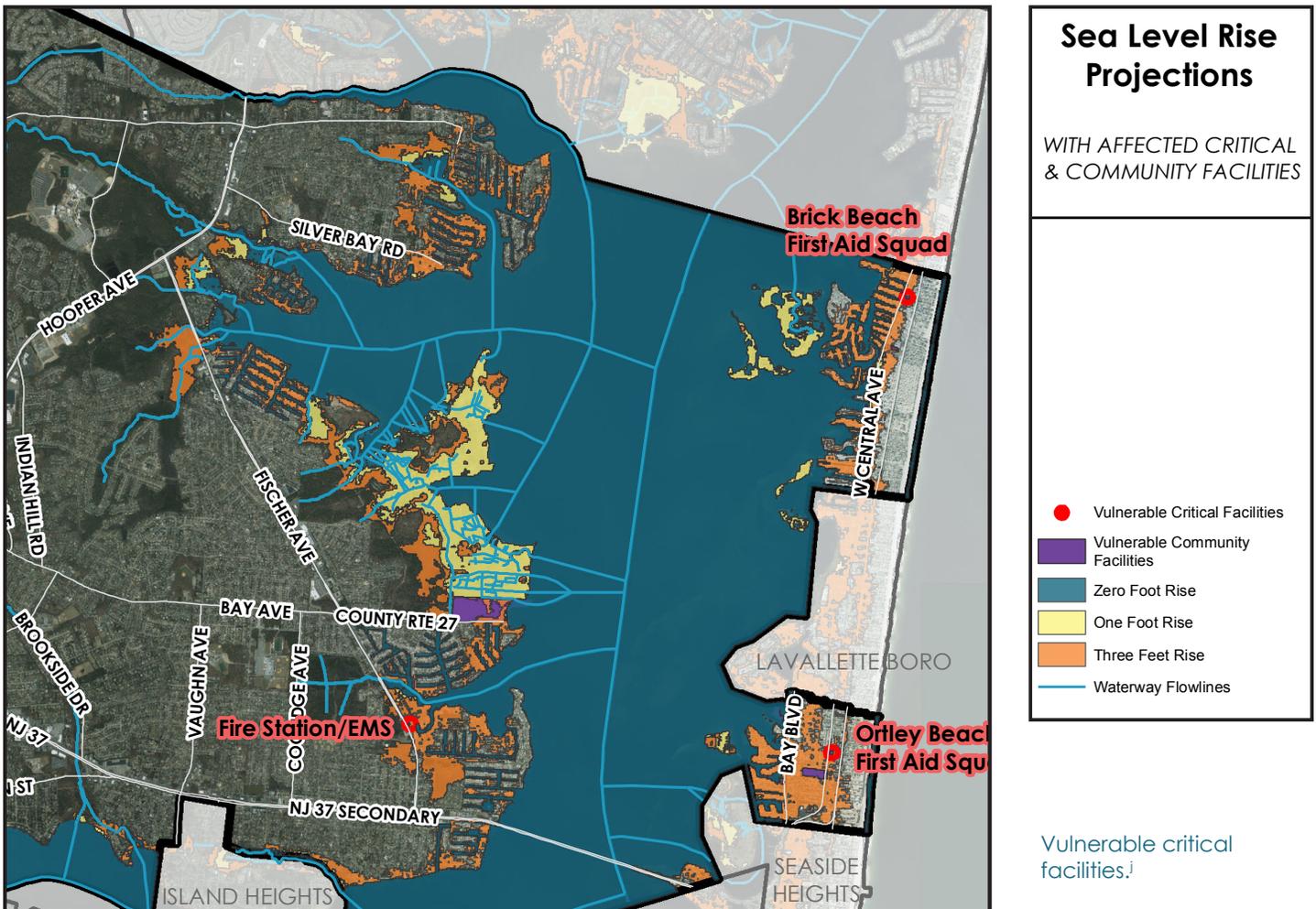
Expanding community facilities in keeping with future population growth and maintaining quality civic institutions to meet the broad needs of the municipality are valid goals that can be paired with the sustainability objective of expanding access by siting new facilities within walking or biking distance of residential neighborhoods.

Section C: New Information and Changes in Assumptions

The focus on making community facilities more resilient to natural disasters largely emanates from the Township's experience of Superstorm Sandy. A number of studies have documented the Storm's effects on community facilities. The 2016 Downtown Circulation Neighborhood Plan, focusing on mobility in downtown Toms River, reports storm surge flooding and failure of Water Street, a designated Coastal Evacuation Route intended to serve as a means of egress during emergency events.

During the public outreach events associated with the preparation of the Township SRPR, residents reported water issues in several community facilities, including the Fire Department on Water Street and the downtown Post Office. Residents also expressed concern over community facility emergency operations during Sandy, including:

- Exclusion of non-Township residents who needed aid from Toms River's two shelters;
- Need for better means of distributing information during a power outage;
- Need for places to stay and places to obtain fuel; and
- Need for handicapped equipment in shelters



In terms of planning for future events, the Ocean County Hazard Mitigation Plan (2014) analyzed 164 critical facilities in Toms River and found that seven facilities are vulnerable to wildfires and nine are located in the Special Flood Hazard Area. Three facilities may be permanently inundated and two isolated in the event of a three-foot sea level rise. The 2016 Toms River Community Vulnerability Assessment also mapped critical facility inundation under different storm and sea level rise conditions, with the following facility impacts:

Critical Facility Vulnerability	
Conditions	Impacted / Inundated Facilities
Current 100-Year Flood	Dover-Brick First Aid Squad Ortley Beach First Aid Squad First Station/EMS – Fischer Boulevard East Dover County Building* – Cattus Island Park County Building – Parks and Recreation Toms River Fire Station #2
Sea Level Rise of 0.8 ft (2030)	None
100-Year Flood in 2030	All those impacted in current 100-year flood East Dover First Aid Squad
Sea Level Rise of 1.5 ft (2050)	County Building – Cattus Island Park County Building – Parks and Recreation
100-Year Flood in 2050	All those impacted in 2030 100-year flood Ocean Beach Volunteer Fire Station (Kittiwake Avenue)
Sea Level Rise of 3.5 ft (2100)	All those impacted by 1.5 ft rise Dover-Brick First Aid Squad Ortley Beach First Aid Squad First Station/EMS – Fischer Boulevard East Dover
100-Year Flood in 2100	All those impacted in 2050 100-year flood Silver Bay Elementary School

**Note that the Township does not have jurisdiction over flood-proofing County buildings.*

Section D: Suggested Additional or Amended Goals and Objectives

The three community facilities recommendations are still valid resiliency goals. The six objectives should be amended as follows (new text italicized):

1. Update the equipment used by emergency personnel *in accordance with the Township's Post-Sandy Capital Improvement Plan and Hazard Mitigation Plan.*
2. Meet or exceed all State and Federal requirements for the number of emergency personnel *in accordance with the Township's Hazard Mitigation Plan.*
3. Continue to renew the Township's infrastructure, *prioritizing work on infrastructure that requires elevation in order to operate during flood events.*
4. Encourage strategic location of emergency facilities and traffic routes that provide fast and easy maneuverability to all areas of the Township.

5. Ensure the expansion of community facilities to account for current and future growth, *siting facilities within walkable/bikeable distances from population centers to expand equitable access and non-motorized trips.*
6. Continue to provide high quality civic, library, medical and other community facilities to meet the broad ranging needs of the municipality.

The following new objectives and recommendations are suggested to incorporate resiliency and sustainability into planning for new community facilities:

1. Locate all new community facilities outside of the 100-year floodplain, areas anticipated to inundate with a 3.5-foot sea level rise, and facilities that would be impacted during the 100-year floodplain given a 3.5-foot sea level rise.
2. Relocate mainland community facilities located in the environmental hazard areas listed above, including the following facilities:
 - First Station/EMS – Fischer Boulevard East Dover
 - Toms River Fire Station #2
 - East Dover First Aid Squad
 - Silver Bay Elementary School
 - Downtown Post Office*

**note that the Township has offered a site located outside of the Flood Prone area to the Post Office, which was declined at this time. Mail was damaged during Sandy due to flooding. The Township should continue to coordinate with the US Post Master and encourage relocation of the Post Office.*

3. Community facilities serving an emergency response function on the barrier island communities cannot be moved outside storm flood hazard areas and still provide rapid response services. The critical community facilities located on the barrier



Silver Bay Elementary School (above) and the East Dover First Aid Squae building (below) would both be impacted by strom events under condition of sea level rise.^k



islands should therefore be elevated and otherwise upgraded to best withstand storm damage in their current locations, including:

- Dover-Brick First Aid Squad
 - Ortley Beach First Aid Squad
4. Implement strategies relevant to the resiliency of community facilities in Toms River included in Ocean County's 2014 Hazard Mitigation Plan, including:
 - Purchase and maintain generators for Toms River Regional Schools to continue critical community services during utility interruptions and storm events, so that they can also and function as emergency shelter.
 5. Implement recommendations related to community facilities and emergency management procedures in the 2015 "Getting to Resilience" Report, all of which can also be used to earn additional points for the NFIP CRS rating program, including:
 - Develop a pre-flood plan for public information projects that will be implemented during and after a flood;
 - Create and maintain a Flood Information section of the Township website through the Public Program for Information (PPI);
 - Work with Ocean County and neighboring municipalities to expand sheltering options;
 - Work to be designated as a StormReady Community by the National Weather Service;
 - Formalize emergency management cooperative efforts between neighboring municipalities;
 - Update the Evacuation Plan to include more information;
 - Consider creating a Township specific Continuity of Operations Plan;
 6. Implement community facilities improvement recommendations in the Township's 2016 Hazard Mitigation Plan, including: build an Emergency Management / EMS Center off site on Church Road.

Existing Development Regulations:

348-5.30: Floodplain Management

This ordinance requires non-residential structures, including community facilities, to have the lowest floor, including basements, "elevated to or above the base flood level or, together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy."

313-16, 17, 18: Food Damage Prevention

Establishes rules for the elevation, flood-proofing, and construction methods of non-residential structures in the Special Flood Hazard Area and Coastal High-Hazard Area.

RECYCLING ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan includes the following four objectives related to recycling, an inherently sustainable activity:

1. Curb illegal dumping.
2. Continue to increase recycling awareness to reach a 75% recycling rate of Toms River Township's municipal solid waste stream.
3. Consider the utilization of trash incinerators.
4. Continue to improve coordination with the Ocean County recycling program.

Additionally, the Recycling Element contains seven recommendations:

1. Implement curb-side chipping to send chips directly to the recycling center and avoid landfill fees.
2. Provide more efficient transportation of leaves to the leaf-composting site. The Township should coordinate with Ocean County to provide biodegradable leaf bags that can be sealed by property owners and then emptied at the recycling center.
3. Increase awareness of Freon recycling procedures by providing property owners with a list of certified technicians.
4. Eliminate grass clippings from the solid waste stream by allowing grass clippings to be recycled at the leaf garden.
5. Develop a fee-based permit for dropping material off at the recycling center for businesses. (Residents should continue to have the opportunity to drop off recyclable materials that are not picked up curbside at no charge.)
6. Prepare additional studies to improve solid waste removal:
 - Study the possible use of trash incinerators to produce electricity.
 - Look into the possibility of a future transfer station to move trash when it has to be hauled further away once the landfill is completely utilized.
 - Investigate the possibility of excavating the existing capped landfill to remove recycling materials to allow additional space.
7. Increase overall recycling awareness through school programs, advertisements, home mailings and displays at public events.



Ocean County Recycling Facility¹

Section B: Status of Sustainability/Resiliency Issues and Recommendations

The four objectives and seven recommendations listed above remain valid. Recycling programs fit squarely in the arena of sustainability initiatives, lessening the environmental impact of human consumption and waste disposal. Recycling removes categories of goods from municipal solid waste streams, diverting these materials from landfills. Recycling can also contribute to economic sustainability, using old goods as the input for new products.

As noted in the 2006 Master Plan, Toms River has a robust mandatory recycling program, requiring residents to recycle the following products:

- Aluminum cans
- Asphalt
- Batteries
- Bricks
- Cement blocks
- Concrete
- Corrugated cardboard
- Ferrous containers
- Ferrous scraps
- Glass containers
- HDPE containers
- Leaves
- Mixed paper
- Motor oil
- Newspaper
- Stumps, tree trunks, brush
- Tires off rims
- Electronics
- White Goods

The 2006 objectives and recommendations seek to increase overall recycling rates, bolster the effectiveness of the recycling program by coordinating with other levels of government, expand the range of recycled products, increase participation through education, make it easier for residents to recycle, and consider additional strategies to reduce the solid waste stream that complement recycling efforts.



Toms River Recycling Center on Church Road.^m

Section C: New Information and Changes in Assumptions

Some of the recommendations from 2006 were developed in anticipation of the Ocean County Landfill reaching full capacity in the year 2016. The time horizon for the landfill has been revised. Officials now expect the facility to operate into the 2030s before filling to capacity. However, preparing additional studies on waste-to-energy facilities, locating transfer stations, and excavating recyclable materials from the Township's capped landfill should be retained as ways of preparing for the eventual limit of the Ocean County Landfill.

Many municipalities take direction for their own local recycling goals from State and County objectives. At the time of the 2006 Toms River Master Plan, New Jersey's 2005 Municipal Solid Waste Plan had the goal of eliminating 50% of the solid waste stream by diversion through recycling, and Ocean County's goal was set at 60% reduction. The County Plan continues to be amended and the State Plan was updated in 2006, both goal levels remain constant. Toms River's 2006 goal of reaching a 75% recycling rate continues to exceed both of these standards.

Outside of New Jersey, larger discussions and trends are occurring in municipal recycling. Relevant to a couple of the 2006 Master Plan recommendations, there is continued disagreement over energy-to-waste programs. Waste-to-energy facilities, which burn trash and harness high heat to create electricity, are popular in Europe and Asia with a growing usage in the US. The conversion of waste-to-energy as an alternative to landfilling does have environmental benefit. Waste-to-energy facilities create carbon emissions, but reduce methane emissions that emanate from landfills in large quantities (methane is a much more potent greenhouse gas than carbon).

On the other hand, the incineration process does produce harmful metal byproducts. Even when scrubbed and released at levels deemed safe under state and federal standards, the emission of such byproducts in Toms River, a Township that continues to struggle with a legacy of serious environmental contamination, gives pause to this idea. The recommendation as worded in 2006, that the Township should study the possibility of waste-to-energy facilities remains valid. Careful consideration should be given to this issue, with time on the side of the Township now that the Ocean County Landfill capacity has been revised.

The fastest growing trend in municipal solid waste management is the separate collection and processing of food waste and other organics. Communities across the country are embracing this "final frontier" of recycling, offering curbside collection of food waste. Large cities like San Francisco, Seattle, San Antonio, and



Bins from the New York City Food and Yard Waste Curbside Collection Pilot Program.ⁿ

New York City are moving forward with pilot programs and mandatory collection. Food scraps and other organic materials such as grass clippings are collected in a separate bin and transported to composting plants for processing and resale as fertilizer. In Europe, the process of anaerobic digestion takes collecting food waste a step further, converting these material into biogas for generating electricity.

Section D: Suggested Additional or Amended Goals and Objectives

The four objectives and seven recommendations for recycling in Toms River are still valid sustainability goals and should be retained. Keeping with larger trends, the following new objectives and recommendations are suggested:

1. Create a pilot program in one of the Township's neighborhoods to begin implementing a food scraps and yard waste curb-side collection program.
2. Implement Sustainable Jersey Action Items related to waste management, including:

- Recycling for bulky rigid plastics, carpet and foam padding, and shrink wrap
- Hold a community paper shredding day
- Institute a construction and demolition waste recycling ordinance
- Develop a municipal backyard composting program (possibly drawing on the Ocean County composting demonstration site)
- Become an EPA WasteWise Partner
- Execute a reusable bag education program



Guide to recycling organics.^o

3. Explore the possibility of establishing a composting plant on the former Ciba-Geigy site. The Route 37 Economic Corridor Vision Plan envisions redeveloping the site with high-tech green energy industries. The cutting-edge methods for converting organic waste into energy is an example of one such technology that could be pursued in a green energy industry campus.
4. Develop creative events for item-specific recycling during holidays and other times at which large portions of the community are disposing of similar products. For example, some communities, like Centreville, VA and Ronks, PA hold Pumpkin Madness / Smashing Pumpkins festivals in partnership with local farms as a fun way to encourage disposal of jack-o-lanterns after Halloween. Advertise such events that already occur in the Township, such as the annual reuse of Christmas trees for beach and dune maintenance during winter months to prevent beach erosion and encourage dune growth.

Existing Development Regulations:

442-10 thru 442-18: Recycling

This ordinance requires mandatory separation of the recycling material listed above in Section B. It is also mandatory for all persons who are owners, tenants, or occupants of residential and nonresidential premises, including retail and other commercial locations, as well as government, schools and other institutional locations, to separate designated recyclable materials from all solid waste. Fines for not complying are set at \$100 minimum, with the code Enforcement Official, Director of Public Works, Housing Office, and Ocean County Department of Health authorized to perform inspections.

Proposed Development Regulations:

Construction and Demolition Waste Recycling Ordinance

A Construction and Demolition Waste Ordinance requires a certain percentage of debris generated from construction projects to be diverted from landfill disposal and managed through recycling options. The Township of Woolwich enacted this type of ordinance in 2007, which requires the preparation of a Waste Management Plan for new construction projects, and a diversion rate of 65% of total construction and demolition debris.



Innovative and fun recycling events for organic waste.^P

UTILITY SERVICE ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan included eight utility service objectives, five of which are related to sustainability and resiliency:

1. Test private wells for water quality and, where feasible, utilize water supply system to diminish reliance on private wells.
2. Develop a list of mitigation projects for groundwater recharge, stormwater quantity control and stormwater quality control in accordance with the Municipal Stormwater Management Plan.
3. Require developers to contribute to or complete a mitigating alternative that clearly offsets the effect on groundwater recharge, stormwater quantity control and/or stormwater quality control that was created by the granting of a variance or exemption.
4. Require developers to provide funding or partial funding for environmental enhancement projects that have been identified on the Township mitigation project list or towards the development of a regional stormwater management plan.
5. Revitalize the Township's Water Advisory Task Force.

Additionally, the Utility Service Element contains four relevant recommendations:

1. Develop a plan to periodically test the Township's remaining private wells for pollution.
2. Provide for the alleviation of existing stormwater management and flooding problems through the implementation of both structural and nonstructural Best Management Practices on new developments and incorporating these principles when retrofitting existing stormwater basins.
3. Continue to improve and expand the existing resource recycling programs.
4. Designate a Township Department to review all water quality tests.

Section B: Status of Sustainability/Resiliency Issues and Recommendations

All five objectives and four recommendations remain valid and would contribute to community sustainability and resiliency. Goals centered on well water testing target environmental and human health issues. While remediation of contaminated groundwater is ongoing, the Township's most recent Natural Resource Inventory identifies 14 active Groundwater Classification Exception Areas within Toms River, nine of which carry Well Restriction Area designations on potable water usage. There are also ten Currently Known Extents of Groundwater Contamination. Portions of the Township receive water from private wells. The Township encourages all locations to connect to public water, but should continue to perform ongoing well testing until private well usage ends.

Groundwater recharge and stormwater control are significant drivers of community resiliency in the event of heavy rain or flooding. Municipalities on waterways and otherwise vulnerable to flooding are increasingly looking to green infrastructure techniques such as bioswales, rain barrels, and other runoff interception strategies to contain water from storm events, and protect waterways from pollution transported through runoff.

Areas of Toms River experience chronic flooding during average stormwater events due to inadequate drainage facilities. During the public outreach process of preparing the Township's Strategic Recovery Planning Report in 2014, concern about chronic flooding in low lying areas due to poor stormwater drainage was voiced at every public meeting. The 2008/2009 Municipal Stormwater Management Plan states that the Planning Board, Environmental Commission, and Township Engineer should develop a list of mitigation projects. Specifically, the list would include mitigation projects for groundwater recharge, mitigation projects for stormwater quantity control and mitigation projects for stormwater quality control.



Flash flooding from an afternoon storm affected Route 37 from Vaughn Avenue to the Mathis Bridge in May 2015.⁹



Section C: New Information and Changes in Assumptions

Superstorm Sandy had a tremendous impact on Toms River, including the water, electric, and other utilities that provide vital services to Township residents. Damage to the American Water Company's water supply infrastructure on the barrier island communities required the replacement of 3,000 feet of water main piping along Fort Avenue, Fielder Avenue, and Ninth Avenue between Route 35 and Ocean Avenue. The proper functioning and improvement of stormwater infiltration systems has emerged as a high-priority goal for municipalities facing flooding and other hazards from extreme weather events. Reports contemplating resiliency, mitigation and preparedness, including the 2015 SRPR and the Ocean County Hazard Mitigation Plan, have developed recommendations for fortifying stormwater utility infrastructure.

The SRPR also notes the 2006 Utility Element's recommendation that flooding be addressed through both structural and non-structural best management practices. Structural practices include site-specific, engineered "grey" and "green" infrastructure solutions for water movement and storage such as drywells, drainage basin, bio-retention swales, constructed wetlands, and pervious pavements. Non-structural practices involve Township-wide development and site planning policies that limit impervious surface, protect natural drainage areas, limit soil compaction, and otherwise encourage low-impact development. The Township revised its Stormwater Management Control ordinance in compliance with these recommendations. However, green infrastructure elements are not specifically emphasized as an option in the ordinance.

The 2006 Utility Service Element did not provide much information or goals related to energy service. Electricity is provided by JCP&L. There are six energy substations located through the Township. Two of these substations, located on Kittiwake and Washington Streets have been recently improved with wet-proofing mechanisms to make them more resilient to future storms. Two of the remaining four, at 2114 Route 37 East and 322 West Water Street, appear to be located in or around the floodplain and should be prioritized for water-proofing.

Utility entities themselves are pursuing programs for incorporating resiliency measures into their systems. SUEZ, the water purveyor for mainland Toms River, has adopted the US EPA Climate Resiliency Evaluation and Awareness Tool, a climate risk assessment and planning application for water, wastewater and stormwater utilities, for the Toms River location. The Township should work with entities pursuing these resiliency programs, and suggest that other municipal and non-municipal utility authorities evaluate the usefulness of these programs for their purposes.

The New Jersey Department of Environmental Protection has developed a Ten-point Comprehensive Plan of Action for the Barnegat Bay. Two points, Fund Stormwater Runoff Mitigation Projects and Require Post-Construction Soil Restoration, have implications for utilities.



Bioswales are an example of green infrastructure that can slow and retain runoff, and filter water to reduce pollutants.

Section D: Suggested Additional or Amended Goals and Objectives

The five objectives and four recommendations for sustainable/resilient utility systems in the 2006 Master Plan discussed above remain valid. Given the changes in assumptions and the planning studies completed since 2006, the following new objectives and recommendations are suggested:

1. Implement the Overall Township Infrastructure Strategy articulated in the 2016 Smart Growth Plan, stated as:

- Maintain existing water, sewer and storm water systems through a regular maintenance schedule
- In areas where appropriate consider green infrastructure to reduce runoff entering existing storm water infrastructure
- Replace aging storm water, water and sewer infrastructure as needed.
- Continue to map and monitor well-head protection areas.
- Connect the Route 37 Redevelopment Area to water infrastructure and if needed replace aging sewer and storm water infrastructure.



This rain barrel intercepts runoff while also serving as an attractive outdoor landscaping element.⁵

2. Prioritize the extension of public water and sewer infrastructure to those areas within cores and centers identified in the 2016 Smart Growth Plan, particularly the Route 37 East Highway Core, which contains the Coates Point Redevelopment Area.
3. Implement the 2014 SRPR's recommendation to mitigate stormwater infrastructure issues, stated as:
- Address storm sewer infrastructure with continued drainage issues, and use the upgrades as an opportunity to incorporate bio-retention design techniques that can mitigate nitrate pollution within Barnegat Bay.
4. Implement recommendations of the Ocean County Hazard Mitigation Plan related to utilities in Toms River, stated as:
- Complete the US Army Corps of Engineers Dune and Beach Replenishment project.
 - Flood-proof four TRMUA facilities.
5. Update the list of mitigation projects for groundwater recharge, stormwater quantity control and stormwater quality control on an annual basis.

6. Incorporate the findings and recommendations of the Township Hazard Mitigation Plan and Post-Sandy Capital Improvement Plan when these documents are finalized as related to utilities and infrastructure, including
 - Complete structure rehabilitations to TRMUA's largest pump station building.
 - Routinely vacuum inlets that are prone to flooding to remove leaves during the fall.
7. Reduce impervious surface in each sub-watershed within Toms River by 10% by undertaking the site identification and retrofitting process described in Rutgers University's Green Infrastructure Guidance Manual for New Jersey (2015).
8. Create community programs to provide education and physical materials (such as rain barrels) that homeowners can implement on their own property to improve stormwater infiltration, building off the work of organizations such as the Ocean County Soil Conservation District's Soil Health Improvement Project.
9. Incentivize the use of vegetative green infrastructure techniques, such as bioswales and rain gardens, which provide multiple benefits at once, including stormwater runoff retention, reduced heat island effects, and improved air quality.
10. Work with utilities to institute resiliency programs and streamline the application process for resiliency-related utility projects such as the elevation of substations, etc.

Existing Development Regulations:

348-8.28.1 Stormwater Management Control

The stormwater management control ordinance includes provisions for groundwater recharge through nonstructural and structural Best Management Practices.

Proposed Development Regulations:

Amendment to 348-8.28.1 Stormwater Management Control

The stormwater management control ordinance could be amended to include more specific language communicating the Township's preference for stormwater capture through green infrastructure techniques when such techniques are as effective as grey infrastructure solutions.

ENERGY CONSERVATION ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan includes the following three objectives related to energy conservation, an inherently sustainable activity:

1. Educate the public about alternative energy choices.
2. Encourage solar energy utilization.
3. Implement energy efficient land use and design standards.

Additionally, the Energy Conservation Element contains seven recommendations:

1. Encourage cluster development, mixed-use development and infill development.
2. Implement energy sufficient design standards for capturing solar energy, landscaping, biking and walking, improving public transportation.
3. Provide consumer education.
4. All efforts at energy reduction should be explored when constructing, maintaining or retrofitting public facilities.
5. Introduce a Township energy coordinator and establish an energy efficient rating system.
6. New requirements for development applications to include a plan and statement regarding how energy conservation will be addressed in the proposed project, and incentives for cluster, mixed-use and other energy efficient land uses and designs.
7. Encourage LEED Certified Buildings.

Section B: Status of Sustainability/Resiliency Issues and Recommendations

The three objectives and seven recommendations listed above remain valid. The Township's energy conservation mechanisms are framed as sustainability initiatives, curbing energy usage in a range of contexts, from home heating and lighting to vehicular fuel.

The 2006 objectives and recommendations seek to expand the use of alternative energy sources such as solar, increase participation through education, prioritize conservation by creating a dedicated energy coordinator and making the public sector a leader in energy reduction, and promote development practices and patterns that by their physical and spatial nature reduce energy-intensive transportation usage.

While the focus on sustainability is well founded, the 2006 Master Plan misses the opportunity to address energy from the standpoint of community resiliency. Such an approach would advocate energy conservation while also establishing strategies for adding redundancies and contingencies to the energy network that can power the Township through utility interruptions inflicted by natural disaster.

Section C: New Information and Changes in Assumptions

As with many other sections of the Master Plan, the effects of Superstorm Sandy caused the Township to reconsider energy from a resiliency perspective. After the storm, parts of the Township were without power for nine days. The Rutgers Sandy Impact Index available through the New Jersey Data Bank estimated lost wages of \$33,134,400. As mentioned in the Economic Development section, residents identified economic losses from the loss of electrical and other utilities as particularly damaging. Commercial centers, like critical community facilities, require backup power sources in order to avoid similar long-term power interruptions on the main grid.

One potential solution to vulnerable power networks being explored and instituted nationally are micro grids. A micro grid is a discrete energy system consisting of distributed energy sources and loads that are capable of operating in parallel with, or independently from, the main power grid. They service single buildings or smaller areas of communities. During an environmental crisis, an interruption in the main grid can affect everyone. A micro grid can break off and operate on its own using local energy generation during emergency situations when the main grid is damaged. A micro grid can be powered by generators, batteries, and/or renewable resources like solar panels. The redundancy created by the dual operations of the main grid and micro grid makes connected portions of the Township more resilient.

Many of the 2006 Energy Conservation objectives and recommendations have been echoed in subsequent plans. The 2016 Ortleigh Beach Neighborhood Plan includes a section on encouraging the implementation of projects that meet the LEED for Homes and LEED for Neighborhood Development certification standards. Some of the LEED credit categories pertain to energy conservation through use of renewable energy sources, daylighting designs, and building orientation capitalizing on the natural



Above, an exemplar LEED-ND area is shown, providing a walkable and energy efficient community design.¹ At right, downtown Toms River has the potential to build on existing development patterns to create similarly efficient places.



position of the sun. The 2012 downtown Phase 1 Waterfront Redevelopment Plan (yet to be formally adopted) makes it possible to grant limited density bonuses for development that incorporates LEED credits into the design. The 2016 Smart Growth Plan furthers the objectives and recommendations related to energy efficient development pattern standards, using centers, nodes and cores intended to develop through infill projects and other compact forms of construction.

Section D: Suggested Additional or Amended Goals and Objectives

The three objectives and seven recommendations for energy conservation in Toms River are still valid sustainability goals and should be retained. With the intent of adding energy resiliency considerations into Township policy, the following new objectives and recommendations are suggested:

1. Establish a series of micro grids that can power the downtown commercial center and other commercial nodes within the Township in order to avoid the economic fallout and wage losses from long periods without power.
2. Create an elevated solar panel canopy structure over the parking aisles at the Township park-and-ride, provided that the elevation could overcome potential flooding risks. This renewable energy source could be part of the downtown micro grid.
3. The Township should act as a leader in community energy conservations efforts, reducing energy usage in municipal buildings and vehicle fleets. Relevant Sustainable Jersey Actions items that the Township should pursue include:
 - Municipal Energy Tracking and Management
 - Municipal Energy Audit
 - Municipal Sustainable Energy Transition Plan
 - High Performance Building Portfolio with the Energy Start tracking tool
4. Implement other Sustainable Jersey Energy Efficiency Action Items, including:
 - Create an outreach program to local businesses to encourage participation in the State's Direct Install program, which helps small businesses pay for 70% of the cost of making their buildings more energy efficient.
 - Home performance with Energy Start program.

Existing Development Regulations:

No development regulations pertain to energy efficiency.

Proposed Development Regulations:

The Township could consider adding a clause to the land development ordinance granting a height or flexible setback bonus over zone limits when projects are LEED certified, including provisions for energy efficiency and alternative energy in redevelopment areas and/or proposed centers.



A solar canopy such as the one on Rutgers Livingston campus, pictured above, could become part of a micro grid system.¹¹

CONSERVATION, OPEN SPACE, AND RECREATION ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan includes 13 objectives related to Conservation, Open Space, and Recreation, seven of which are related to sustainability:

1. Preserve the Township's vast natural resources by restoring, maintaining, protecting and enhancing vital wetlands, waterways and forested areas.
2. Provide sufficient active and passive recreational facilities for the existing and future populations, and update the implementation strategy in the Recreation and Open Space Facilities Plan.
3. Link parkland, open space and community facilities.
4. Identify environmental constraints throughout the Township and continue to prohibit development in environmentally sensitive regions.
5. Utilize either a Transfer of Development Rights (TOR) program or noncontiguous cluster program, with incentives designed to preserve open space, including environmentally sensitive areas.
6. Develop a comprehensive environmental education program.
7. Form a cooperative/joint venture with surrounding municipalities for the purchase, maintenance, use and preservation of beach maintenance equipment and replenishment of beachfront in order to cut costs and promote harmony by uniform cleaning and preservation of the beachfront and bay front beaches.



Active and passive recreational facility in Toms River.^v

Additionally, the Conservation, Open Space, and Recreation Element contains 15 recommendations, seven of which are related to sustainability:

1. Apply open space and recreation requirements and standards to all new residential development projects that require developers to incorporate open space and recreational facilities within new residential developments.
2. Seek to maintain and improve water quality through regulation and management of the Township's watershed areas.
3. Establish a Transfer of Development Rights Program to preserve environmentally sensitive areas of the Township. In particular, the Township should seek to conserve the vacant parcels along the Riverine Corridor and in the Barnegat Bay Estuary by designating them as sending areas in an established Transfer of Development Rights (TDR) Program.
4. Locate park and other recreation areas in proximity to schools and residential neighborhoods to provide safe and convenient access for residents. Any additional land acquisitions that are suggested based on deficiencies in certain neighborhoods should be prioritized based on these site location standards.
5. Increase recreational opportunities for the Township's large senior population. Facilities in close proximity and easily accessible to senior neighborhoods and the municipal Senior Center on Garfield Avenue are recommended.
6. Develop a system of greenways to connect residential areas, parks and other recreational sites. The Riverine Corridor in particular is an ideal location for a greenway.
7. Implement Stream Corridor Protection Plans.

Section B: Status of Sustainability/Resiliency Issues and Recommendations

The seven objectives and seven recommendations listed above remain valid. As an element partially dedicated to the conservation of land and natural resources, the 2006 Element addresses environmental sustainability issues. The objectives and recommendations for preserving natural resources, clustering development, improving water quality, and limiting development in environmentally sensitive areas all seek to protect the natural environment.

The element also encourages sustainable and equitable development of new recreation facilities that meet the needs of an expanding population, are located in proximity to residential populations, and are accessible by multi-modal, non-motorized forms of transportation. As with other elements, although sustainability themes are present, there are no objectives or recommendations that tie open space, recreation, or conservation to resiliency issues or practices.

Section C: New Information and Changes in Assumptions

The Township has developed an updated Conservation, Recreation and Open Space Element, anticipated for adoption in October 2016. This Element documents the changes in assumptions related to open space and recreation planning since 2006, including the following:

With an emphasis on post-Sandy resiliency planning, communities are analyzing their existing land use patterns and development regulations in the context of their unique environmental conditions and susceptibility to natural hazards such as flooding, wave action, hurricane winds, and other potential threats to life and property. The goal of these efforts is to create land use policy that respects the realities of local natural features, so that the natural and built environments work in concert to minimize the impacts of storms and other emergency events. Toms River can use the deliberate siting of open space and conservation properties as a tool for bolstering resiliency, while the placement of improved recreation facilities should, like all other forms of development, respect environmental constraints and anticipate potential impacts from environmental hazards.

Since 2006, local sustainability planning efforts have been supported by an expanding array of state-level initiatives. Some major initiatives include the establishment of the Sustainable Jersey program in 2009 and the 10-point Comprehensive Action Plan to address the ecological health of Barnegat Bay watershed. County acquisition programs such as the Ocean County Natural Lands Trust continue to support local land preservation. Toms River can draw on these larger state- and county-level programs to further local sustainability and land preservation goals.



The Brown Woods property (block 705, lot 1 as indicated on the sign) is an example of a waterfront access point requiring improvement. Kayak launching is permitted at this publicly-owned site, but there is no indication of this fact.^v

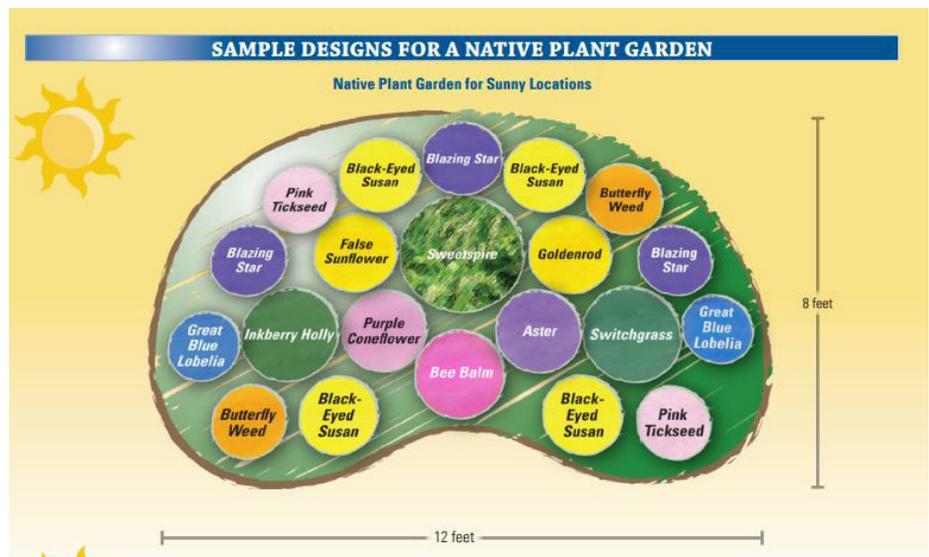
Toms River has joined a growing number of coastal communities that are intent on expanding public access to tidal water bodies, providing more opportunities for aquatic recreation. The Township has prepared a Municipal Public Access Plan that, following NJDEP guidelines, inventories existing physical and visual access points to tidal waterways, and develops goals for new and improved public access locations.

The Municipal Public Access Plan is a mechanism for enacting the Public Trust Doctrine, which maintains the public's right to access waters and shorelines as a common resource based on the unique recreational and economic value inherent to these aquatic features. The Toms River Conservation, Recreation, and Open Space element reflects the renewed prioritization of public waterfront access, especially in its goals and objectives for active and passive recreation.

Section D: Suggested Additional or Amended Goals and Objectives

The new Conservation, Recreation and Open Space Element includes 11 objectives and 26 recommendations. Nine of the objectives and 15 of the recommendations are centered on sustainability and resiliency goals, including the following:

1. Provide adequate recreational facilities for current and future populations so that all residents fall within the geographic service area of a parkland, and so that all population segments have recreation options suited to their age, ability, and preferences.
2. Expand public access to the waterfront and recreational use of Toms River's waterways.
3. Create a system of greenways and bicycle-pedestrian linkages between recreation and open space areas, residential neighborhoods, community facilities, and economic centers.
4. Protect investments in recreation facilities and infrastructure in light of risks from natural hazards like flooding and sea level rise.
5. Use practical and flexible development controls in order to gain open space, conserve the natural landscape and protect the environmentally sensitive areas of the Township.
6. Continue to limit or prohibit development in environmentally sensitive regions such as wetlands, floodplains, areas likely to be affected by storm surge and sea level rise, and endangered species habitats as identified in the Toms River Natural Resource Inventory (2015), adopted by the Planning Board as part of this Element.
7. Preserve additional conservation lands in environmentally sensitive areas to assist with the mitigation of storm events and bolster the resiliency of the Township in the face of natural hazards.
8. Create land development regulations that maintain and improve water quality through regulation and management of Township's watershed areas and controls on impervious coverage.
9. Protect the Township from future hazards to the extent possible by implementing engineered projects and green infrastructure treatments within parkland areas.



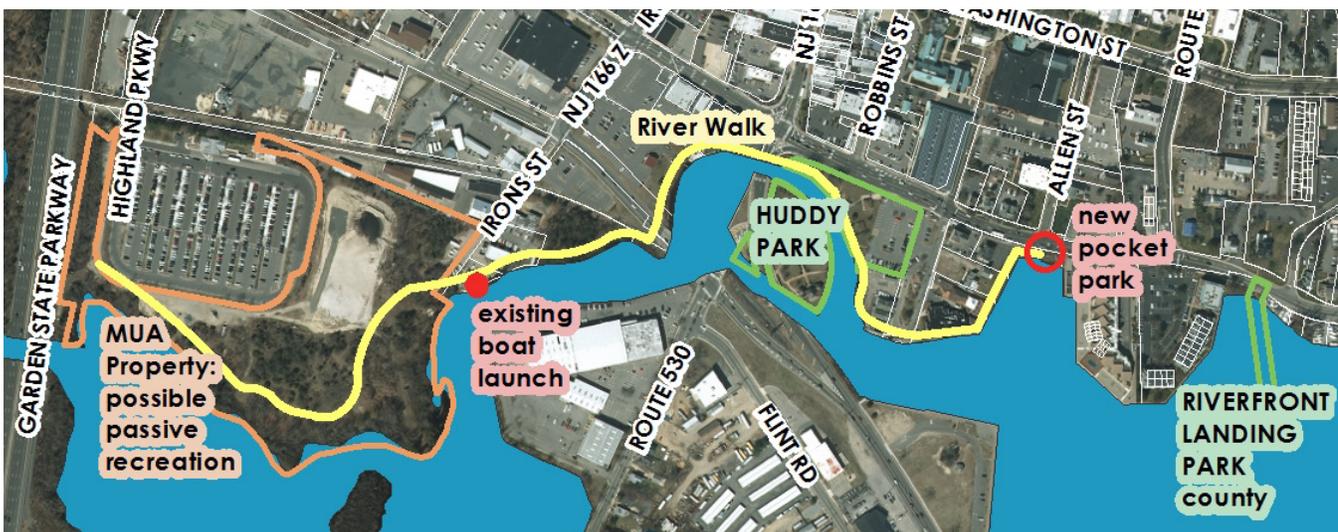
New parks could include native plant demonstration gardens.^w

Recreation Recommendations

1. Provide new recreational facilities, particularly in the northwestern portion of the Township and in the barrier island communities which are currently underserved.
2. Develop a portion of the property in block 171 currently in the process of being purchased with community gardens and a native plant demonstration garden (similar to that which exists in Jakes Branch County Park).
3. Implement the recommendations for expanding public access to the waterfront provided in the Toms River Municipal Public Access Plan (2015).
4. Implement planned greenway and trail projects.
5. Site new active, infrastructure- and equipment-heavy recreation facilities inland, out of the Special Flood Hazard Area and any areas anticipated to be inundated by a one to three foot rise in sea level.
6. Expand available recreational facilities through enhance coordination with Toms River Board of Education for use of fields and facilities by executing MOUs that outline public usage.

Conservation & Open Space Recommendations

1. Prioritize the acquisition of properties for conservation located in the 100-year floodplain, especially those which are large and adjacent to existing open space and conservation properties.
2. Extend the proposal in the 2012 Phase 1 Waterfront Development Plan to require Runoff Mitigation Plans for an new development, which show stormwater management design elements in line with non-structural Best Management Practices, such as swales, green roofs, or other permeable areas



Proposed Riverwalk*

for infiltration and mechanisms to direct runoff to permeable areas or reuse containment vessels.

3. Protect water resources from pollution by reducing existing impervious surfaces that transport runoff. The Township can utilize the process outlined in the New Jersey Green Infrastructure Guidance Manual.
4. Accomplish the Army Corps of Engineer's Dune System for the protection of barrier island communities.
5. Pursue Sustainable Jersey Action items related to open space, conservation, and natural resources. Achieve Bronze Level certification.
6. Coordinate with local environmental groups to support the Barnegat Bay Ten-Point Action Plan's program to acquire conservation land in the watershed, institute public education campaigns, and fund stormwater runoff mitigation projects.
7. Pursue actions related to open space that will elevate the Township's CRS rating for the National Flood Insurance Program, such as items 420 (open space preservation) and 450 (stormwater management).
8. Implement conservation measures included in the Ocean County Long-Term Recovery Plan (2015), including:
 - Study the feasibility of a Living Shorelines projects in areas of low wave energy without intense boat traffic, including the identification of potential funding sources for a Living Shorelines Plan.



Ongoing US Army Corps of Engineers Shoreline Protection Project.¹⁷

Existing Development Regulations:

Open Space Tax

The Township has an Open Space fund that is financed through an open space tax, whereby 1.5 cents of every tax dollar is reserved for open space purchases.

348-5.13 Preservation of Natural Features

This section of the land development ordinance requires the preservation of flood hazard areas, wetlands, trees, slopes over 10%, waterways, lands with seasonal high-water table of less than two feet (i.e. Berryland and Atsion soils).

348-8.9 Cluster Development Regulations

Currently, this section of the Township's Land Use and Development Regulations encourages land preservation by requiring proposed common or public open space areas provided in conjunction with application for development to be provided at a rate of at least 20% of the tracts of land. Open space areas are to prioritize environmentally sensitive lands for preservation.

Stormwater Management Control Ordinance

The stormwater management ordinance policy statement encourages the use of non-structural techniques such as environmentally-sensitive site design and source control to stem flood waters, improve groundwater recharge, and reduce pollutants.

Proposed Development Regulations:

Updated Cluster Development Regulations

There are plans to amend the cluster ordinance to increase the requirement to 50% for development in the R/C-3, R-400C, and R-800 land use zones.

313: Updated Flood Damage Prevention Ordinance

The Flood Damage Prevention Ordinance should be updated to refer to FEMA Preliminary FIRMs for Ocean County released March 28, 2014 and change Chapter 348 sections that refer to flood management. The Township could also consider changing the wording to "best available data" for flood-management related ordinances, so that ordinances are always up-to-date with new map releases (though it should be specified whether "preliminary" data qualifies as best available data).

CIRCULATION ELEMENT

Sustainability and Resiliency Master Plan Update

Section A: Objectives and Recommendations from 2006 Master Plan

The 2006 Master Plan included seven circulation objectives, one of which relates to sustainability and resiliency:

1. Support rail transportation.

Additionally, the Circulation Element contains eight additional objectives, 10 circulation development policies, and 24 specific projects. Relevant objectives, policies and projects are:

Objectives

1. Encourage the further development and use of mass transit and provide better information on available transit service.
2. Promote the introduction of rail passenger service to Ocean County through connection to the northeast corridor at Monmouth Junction.
3. Coordinate Transportation Planning with the need for compliance with Federal Clean Air Act of 1990.
4. Encourage enhanced safety for pedestrian and bicycle traffic through improved design elements and set aside projects.

Policies

1. Site plan submissions should be designed in such a manner that the streets between subdivisions are connected for reasons of emergency access and improved vehicular, pedestrian and bicycle circulation.
2. The extension of streets through environmentally sensitive areas should be avoided in the Township's plan due to the need to preserve these areas and the likelihood that such extensions would not receive the required local, State and Federal approvals.



Toms River Park and Ride, a popular means of commuting by bus.^z



Plans for connecting rail passenger service to Ocean County are still valid.^{aa}

3. Future sidewalk construction should occur 1-foot from the outside edge of the right-of-way with a minimum 3 ~foot setback from the street curb line to limit the negative impact on existing sidewalks caused by street widening programs. It is recommended that curbs and sidewalks be installed throughout the Township to encourage safe pedestrian traffic flows.
4. Site plan ordinances and completion checklists should be amended to require that future development applications require submission of a traffic impact report, particularly for commercial and larger residential developments.

Specific Projects

1. Investigate appropriate measures on Route 35 to improve the safety for pedestrian crossings, such as enhanced signage, crosswalk/geometric treatments and traffic pedestrian signals.
2. Additional pedestrian crossing signs and permanent chain link fence for median strip at: Charles Street area for both directions, Vaughn Avenue to Washington Street and Washington Street to Brookside Drive.

Section B: Status of Sustainability/Resiliency Issues and Recommendations

All four objectives and six policies/projects remain valid and would further the establishment of a sustainable and resilient circulation network in Toms River. Hallmarks of sustainable and resilient transportation planning include:

- (1) The creation of networks that support multi-modal transit options inclusive of cars, public transit, bicycles, and pedestrians;
- (2) The minimization of the usage of cars in favor of public transit and non-motorized transportation options to reduce greenhouse gas emissions, and;
- (3) The reconstruction of transportation infrastructure to elevate or otherwise protect portions vulnerable to flooding and other natural disasters.

The objectives and policies listed above fall into these three categories of actions. However, more can be done to directly address resiliency and sustainability issues in planning specific changes to the Township's circulation network.

Section C: New Information and Changes in Assumptions

Superstorm Sandy affected roads in the Township, flooding those in the lagoon, Bayfront and coastal areas. Several studies documented areas impacted by flood, including the following:

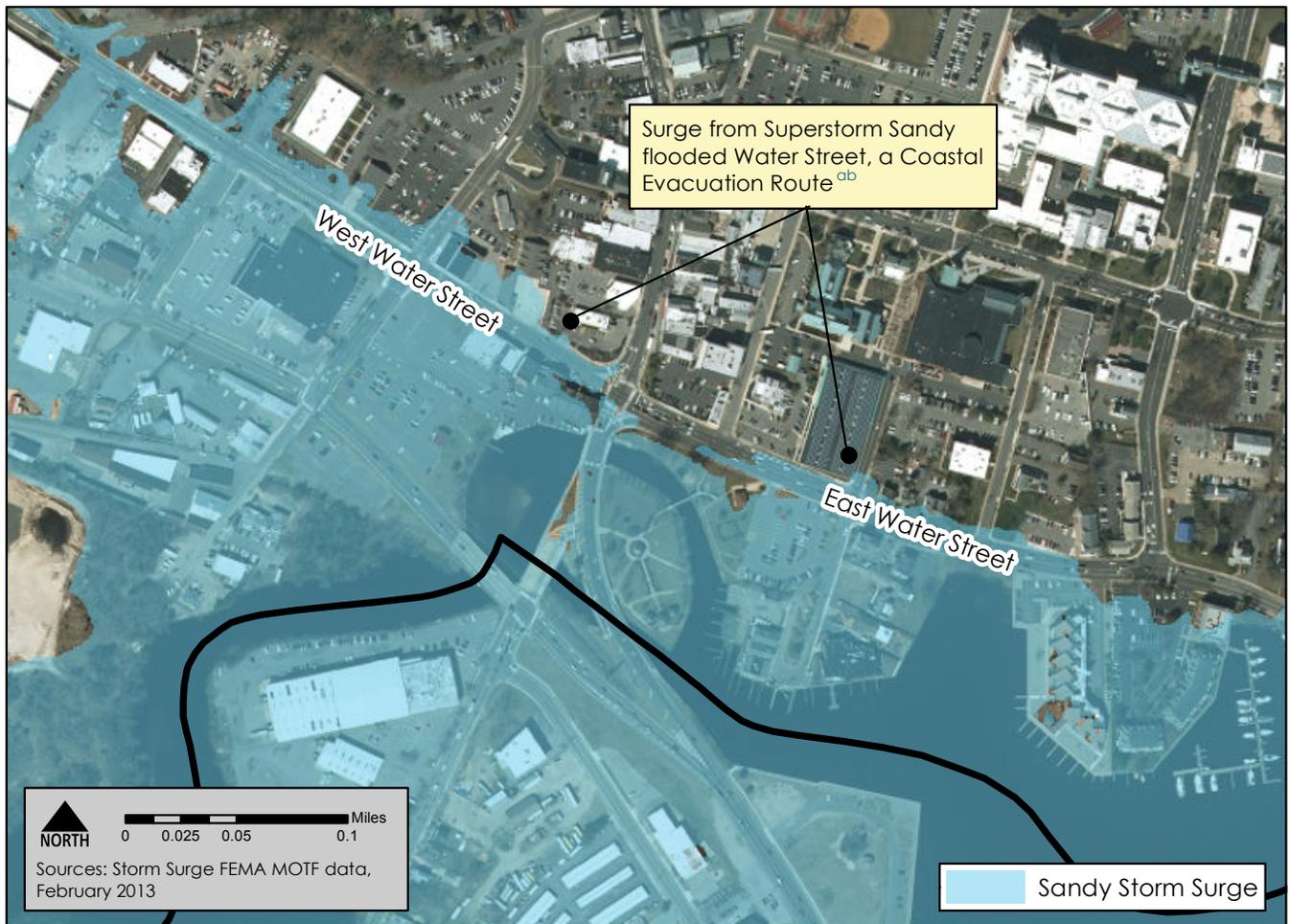
- Sections of Fischer Boulevard
- Barrier island roads
- Silver Bay Road to intersection Vincent Street
- Garfield Avenue from Delaware Avenue to Forest Grove Avenue
- Route 37 from the bay to Lloyd Road
- Riviera Avenue north to Bryant Avenue
- East Water Street and Horner Street, East Water and North Main Street, Irons Street and Herflicker Boulevard, and Irons Street and West Water Street intersections
- West Water Street from North Main Street to Lien Street
- Windsor Avenue
- Bayview Drive
- Wave Way and Green Island Road
- South Shore Drive
- Bay Avenue
- Hooper Avenue from Fisher Boulevard to Silver Bay Road

Of particular concern was the flooding of the Township's Coastal Evacuation Route along Water Street in the downtown area. The Township's Strategic Recovery Planning Report recommends raising major roadways to address flooding issues from storms (as well as regularly-occurring drainage issues), though the specification of which roadways is not provided.

The 2016 Township Smart Growth Plan notes that Toms River does not have a passenger rail line, with public transportation limited to local bus service through Ocean Ride and express bus service to New York City that is heavily used. Plans for the introduction of rail passenger service are under consideration. The proposed MOM-Monmouth Ocean Middlesex line is one possibility. Another potential rail project, supported by Ocean County, is a Lakehurst to Monmouth Junction rail alignment, which would connect with the Northeast Corridor line. Recent years have seen growth in Transit Oriented Development (TOD) planning, which seeks to build residential and commercial communities in close proximity to transportation hubs. With the widely-used bus terminal at the Toms River park-n-ride the downtown area is poised for such TOD development.

The 2016 Downtown Neighborhood Circulation Plan reiterates the difficulty of promoting bicycle and pedestrian usage while intersections continue to exhibit dangerous conditions such as unfavorable signaling for pedestrian, poor visibility, and high traffic volume. While on-road bicycle and pedestrian routing continues to be a challenge, planning for off-road greenways and trails is moving forward. The 2016 Conservation, Recreation and Open Space Element describes planned trails and connections in Toms River.

Expanding westward from the potential TOD planning in the downtown area, the Township's 2013 Route 37 Economic Corridor Vision Plan considers the transformation of Route 37 into a multi-modal transit corridor, to be developed in concert with the activation of the former Ciba-Geigy site. The path, which could



include Bus Rapid Transit in the former Toms River Branch rail right-of-way, would connect residences along Route 37 with a new high-tech industrial park. In many areas, the Route 37 right-of-way is larger than 100 feet, creating opportunities for a road diet that replaces portions of the cartway dedicated to automobile uses with dedicated lanes for bicycles or transit.

Section D: Suggested Additional or Amended Goals and Objectives

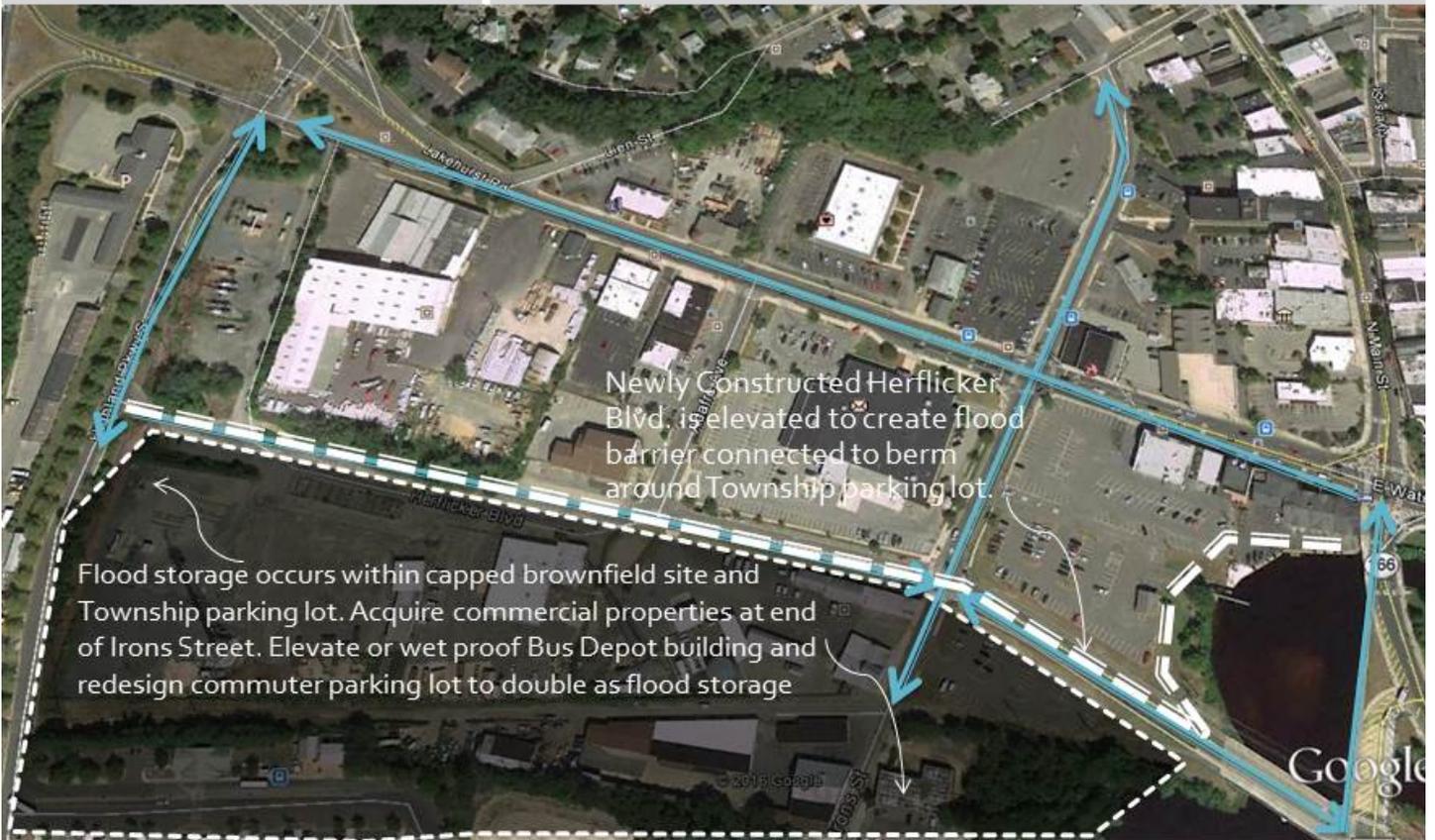
The four objectives and six policies/projects recommendations for sustainable/resilient circulation in the 2006 Master Plan discussed above remain valid. Given the changes in assumptions and the planning studies completed since 2006, the following new objectives and recommendations are suggested to enhance community economic resiliency and sustainability:

1. Implement circulation recommendations and conduct recommended studies provided in the 2016 Smart Growth Plan, stated as the following:
 - Support the connection of Toms River and Lakewood to North Jersey via a train line (MOM line) or other alternative.

- Support, fund and provide technical assistance to designate downtown Toms River as a Transit Oriented Development.
 - Create a Transportation Improvement District and improve pedestrian and bicycle connections in the Downtown Toms River Regional Center.
 - Continue to encourage the installation of sidewalks to accommodate pedestrians in all highway Cores.
 - Implement recommendations outlined in the Toms River Hazard Mitigation Plan to address flooding on Fischer Boulevard.
2. Implement circulation recommendations provided in the 2014 Strategic Recovery Planning Report, stated as the following:
- Raise major roadways. This was a desired project expressed at all three public open house meetings based on experiences during Sandy of roads being blocked, as well as long term experiences with flooding of low-lying roads in lagoon neighborhoods on both east and west shores of Barnegat Bay during “moon high tides” due to obsolete drainage facilities.
3. Implement recommendations and conduct recommended studies provided in the Route 37 Economic Corridor Vision Plan related to circulation on Route 37, stated as the following:
- Study greenway connecting Barnegat Branch Trail to Rt. 37, Downtown and riverfront areas.
 - Study multimodal road/trail along rail right of way into Downtown.
 - Develop alternate bike network for corridor and region.
4. Implement circulation recommendations provided in the 2016 Downtown Circulation Neighborhood Plan, stated as the following:
- Herflicker Boulevard Reconstruction “Loop” scenario, which would reduce traffic backup and pressures in the downtown area.
 - Implement intersection improvements to better accommodate pedestrians.
 - Use reconstruction of Herflicker Boulevard as a resiliency measure to protect downtown Toms River from flooding by elevating the portion of the roadway between Irons Street and Highland Parkway. This elevated roadway would be connected to berm around the Township parking lot.
 - Create detention basins and flood storage in the area between the proposed multi-use trail and Herflicker Boulevard on the New Jersey natural Gas site.

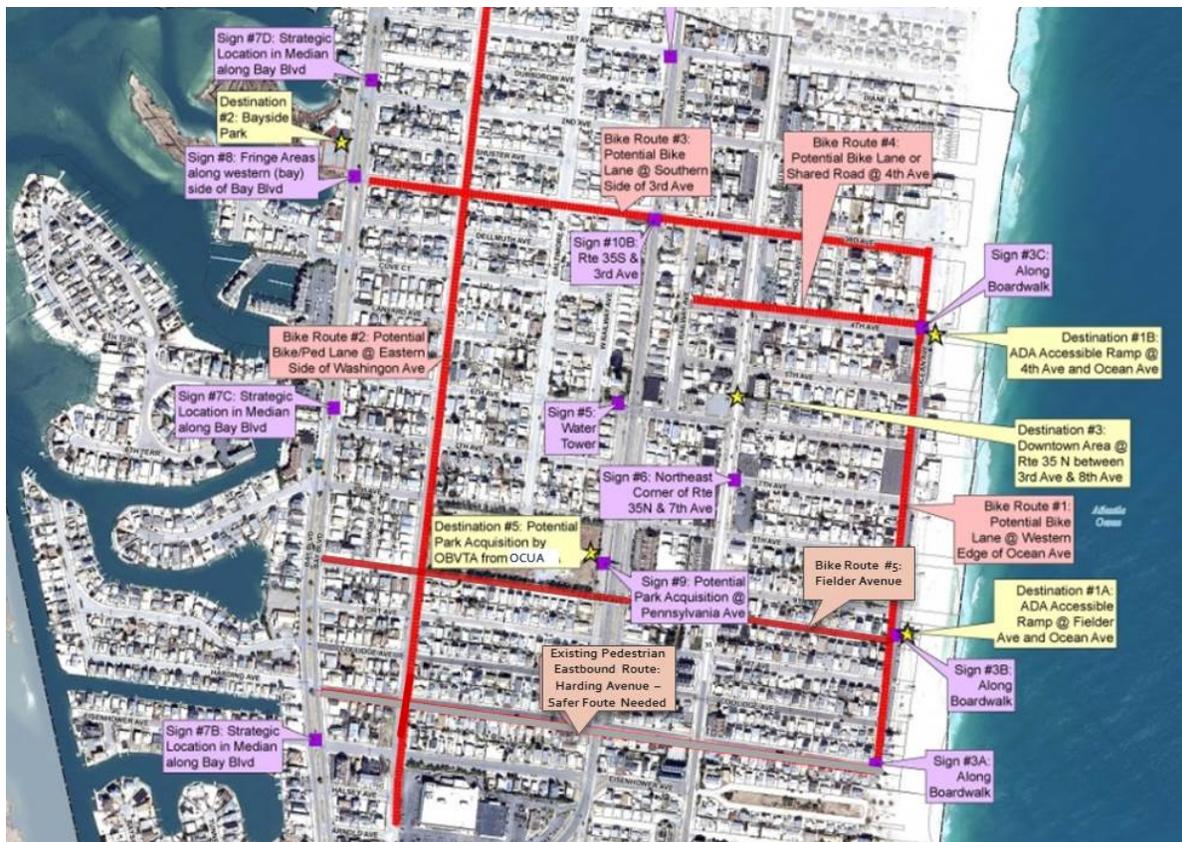
Flood Mitigation and
Emergency Response
Applications

THE "LOOP"



Excerpt from the Toms River Downtown Neighborhood Circulation Plan (2016), showing proposed changes to the downtown transportation network.^{ac}

5. Implement the circulation recommendations in the 2011 Pedestrian and Bicycle Mobility Report.
6. Implement trail and greenway recommendations provided in the 2016 Conservation, Recreation and Open Space Element, stated as the following:
 - Coordinate with South Toms River and Ocean County to accomplish the construction of the northern-most section of the Barnegat Branch Trail (BBT).
 - Study the merits of routing the final section of the BBT along Herflicker Boulevard versus through the TRMUA property scheduled for use as conservation and passive recreation land.
 - Develop a phasing plan for the construction of the 1.2-mile connector between the terminus of the BBT and Winding River Park along the JCP&L utility easement, including necessary pedestrian bridges over the Toms River and Route 37.
 - Implement the bike path plan envisioned in the Ortley Beach Neighborhood Plan.
 - Study potential trail routes for connecting Winding River Park and Riverwood Park.
 - Participate in discussions and plans if development of the River to Bay Greenway or Golden Triangle Trail progress to ensure that these paths intersect with the network of trails through Toms River.



Proposed bike lane corridors on Ortley Beach, excerpted from the 2016 Ortley Beach Neighborhood Plan.^{ad}

7. Implement circulation recommendations provided in the 2016 Ortley Beach Neighborhood Plan, stated as the following:
 - Implement proposed bike route, including two north-south routes would run along Washington Avenue and Ocean Avenue, two east-west routes along Fielder Avenue and 3rd Avenue, and one east-west spur from Ocean Avenue west along 4th Avenue.
 - Add bike racks to the business district and community destination points.
8. Require greener parking lots, with expanded landscaping, tree cover, and permeable pavement requirements.
9. Implement Sustainable Jersey Actions related to circulation, including:
 - Adopt a complete streets policy
 - Create a bicycle and Pedestrian Plan
 - Create a Safe Routes to School program
10. Implement circulation recommendations in the Township's 2016 Hazard Mitigation Plan, including:
 - Pilot programs to elevate Bay Breeze Road, Creek Road, Pumpshire Road, Sea Breeze Drive, and Washington Avenue.
 - Install traffic light backup switch and socket connectors for generator plug-in, prioritizing the set of specific intersections listed in the Hazard Mitigation Plan.
11. Implement circulation plans in the Ocean County Long-Term Recovery Plan (2015), including:
 - Coordinate with the County to study the feasibility of a water taxi/ferry route to move people across Barnegat Bay, both for everyday commuting purposes and during emergency mandatory evacuations.



New York City water taxi^{oe}

Proposed Development Regulations:

Transit-Oriented Development Supportive Zoning

Areas around the Downtown where Transit Oriented Development is envisioned should have zoning standards reflective of higher density development, with a minimum net residential density of 8 dwelling units/acre (amended to 15 dwelling units/acre should a rail station come about); a minimum FAR of 2.0 for non-residential development, and minimum building height of at least 3.5 stories in a significant portion of the district.

END NOTES

Sustainability and Resiliency Master Plan Update

Image sources

- a. Graphic of the Vulnerability to Resilience Framework (V2R) created by Practical Action, The Schumacher Centre, Bourton on Dunsmore, Rugby, CV23 9QZ, UK.
- b. Google Earth.
- c. Repetitive Loss and Severe Repetitive Loss properties in Toms River, created by FEMA Region II in the context of its *Areas of Mitigation Interest* tool, depicting local features that impact flood risk, identifying areas with a history of flood claims, structures that contribute to flooding problems such as undersized culvers, and areas undergoing land use change and development.
- d. Fall 2013 Bloustein School of Planning and Public Policy Studio project, overseen by Fred Heyer and Susan Gruel of Heyer, Gruel & Associates.
- e. Proposed highway cores, Toms River 2016 Smart Growth Plan, prepared by Toms River Township.
- f. bspq.com.au (solar factory picture), and Sean Gallup, Getty Images Europe (wind turbine).
- g. Excerpt from the 2015 Route 37 Economic Corridor Vision Plan, prepared by Together North Jersey as a Local Demonstration Project. The Project team included NJ TRANSIT, Looney Ricks Kiss, Vanasse Hangen Brustlin, Inc., 4Ward Planning, and Mercer Planning Associates.
- h. patch.com
- i. Google Maps, July 2014.
- j. Heyer, Gruel and Associates original map. Produced November 2015 as part of the Toms River Natural Resource Inventory.
- k. Google Earth.
- l. Benjamin R Harvey Co.
- m. Google Street View screen capture. July 2014.
- n. NYC Department of Sanitation website.
- o. Thinklink.com, <https://www.thinglink.com/scene/512653498483998722>.
- p. Pictures of Pumpkin Madness event at Cherry Crest Farms, 150 Cherry Hill Rd, Ronks PA.
- q. Asbury Park Press / Kerri Konsella (above) and CBS New York / Martha Olansen (below).
- r. Photo of bioswale from the National Association of City Transportation Officials
- s. Photo of rain barrel from Rain Barrels R Us Clawson, MI.

- t. LEED-ND photograph from the TCRPC Regional Planning Commission, <http://www.tcrpc-pa.org/leed-nd/>.
- u. Photo from the Daily Targum article *Rutgers taps solar power as viable alternative energy source*, by Mary Ellen Cagnassola, 14 April 2015, with photo by Edwin Gano.
- v. Photos by Heyer, Gruel and Associates.
- w. Barnegat Bay Partnership.
- x. Map by Heyer, Gruel and Associates. August 2016, for the Open Space, Conservation, and Recreation Element.
- y. United States Army Corps of Engineers, 2002.
- z. arewethereyettravelblog.com.
- aa. Asbury Park Press, Bob Beilk.
- ab. Map by Heyer, Gruel and Associates. October 2016.
- ac. The Downtown Neighborhood Circulation Plan, 2016, prepared by Maser Consulting.
- ad. Ortleigh Beach Neighborhood Plan, 2016, prepared by Maser Consulting.
- ae. <http://www.eastriverferry.com/erf-eastriverferrynews/>.