



Appendix 5: Township of Edison

The Township of Edison participated in the 2015 Middlesex County Hazard Mitigation Plan (HMP) update. This appendix includes the locally-specific information about the Township. The following sections detail the planning process and participants; the current population, building stock, and land development trends; hazards that specific to the Township and corresponding risk assessments; the Township’s mitigation strategy, and a local capability assessment.

1. Plan Development

On February 10, 2015, the Business Administrator signed an “Intent to Participate” letter and assigned a point of contact for the HMP update. The Acting Township Engineer was assigned to the project, but when the plan update began, it was determined that the OEM coordinator would take the lead. There was a personnel change in this position during the planning process. The OEM Coordinators worked with other municipal employees, consultants, volunteers, and other stakeholders through the formation of a Local Planning Committee, as listed below. The local planning committee filled out the municipal worksheets included in Appendix E and worked to gather the necessary information to support the plan update.

In addition to the worksheets, the 2013 Edison Master Plan and the Township’s codified ordinances were used in this plan update.

Table 5-1: Township of Edison Local Planning Committee Members

Name	Title	Organization
Courtney Dill	Purchasing Clerk	Township of Edison
Andy Toth	Fire Captain	Township of Edison
Maureen Ruane	Business Administrator	Township of Edison
Mark Kataryniack	Engineer	Township of Edison
Tommy Elmira	Sewer Supervisor	Township of Edison



2. Community Profile

2.1 Physical Location

The Township of Edison has a total area of 30.64 square miles and is located in the northern portion of Middlesex County, New Jersey. Edison Township completely encircles Metuchen Borough and is bordered by Piscataway Township, South Plainfield and Highland Park to the west and Woodbridge to the east. Edison is bordered by the Raritan River to the south, with New Brunswick, East Brunswick and Sayreville across the river. Clark and Scotch Plains border Edison to the north in Union County.

Edison is a large municipality, geographically, and as a result has a number of major transportation routes passing through the Township. These include I-287, the New Jersey Turnpike, Route 1, Route 27, Route 440, as well as the Exit 10 interchange on the NJ Turnpike. County routes also comprise a major element of Edison's transportation network. NJ Transit and private bus companies operate in Edison, and there is a railroad station in South Edison that serves NJ Transit and Amtrak on the Northeast Corridor Line.

There are two major medical facilities in Edison: John F. Kennedy Medical Center (498 beds) and Roosevelt Care Center (a hospice and subacute rehabilitation and care facility). The New Jersey Exposition and Convention Center is located in Edison, a 155,277 square foot convention facility.

2.1.1 Hydrography and Hydrology

Edison Township is a large municipality within the Raritan Basin. The headwaters for a few of the major rivers and streams within the region originate in Edison, including the Bound Brook, the Robinson's Branch, the South Branch of the Rahway River, the Ambrose Brook, and the Mill Brook. The Mill Brook drains directly into the Raritan River, which runs along Edison's southern border. The Raritan is tidally influenced through this area. A small section of the Mill Brook is also tidally influenced just upstream of the confluence with the Raritan.

2.2 History and Governance

The Township of Edison was formally incorporated on March 17, 1870 as Raritan Township and was renamed Edison Township November 10, 1954. The Township is governed under the Mayor-Council form of government, and has an elected Mayor and seven Council members, all elected at large. The Mayor is elected directly to a four-year term of office. Town Council members are elected to serve four-year terms on a staggered basis, with three or four seats coming up for election every other year. The Township Council holds monthly meetings open to the public where it discusses legislation under consideration.



2.3 Demographics

2.3.1 Population Trends

According to the U.S. Census Bureau, the population in 2010 was 99,967.¹ This is a 2.3% increase from 2000. The Township of Edison has a population density of 3,339 persons per square mile. It is the 15th densest municipality within the County. Edison has a significantly large Asian population, to include Asian Indian and Chinese ethnicities. A summary of major population and household characteristics may be found in the following tables.

Table 5-2: Township of Edison Population Summary Estimates (2010 Census)²

Population	Quantity	Percent of Municipal Population
Total Population	99,967	100
Median Age	38.1	N/A
17 years and under	22,659	22.7
65 years and over	12,625	12.6
Race		
White	44,084	44.1
Black/African-American	7,046	7.0
Native American/Alaskan Native	229	0.2
Asian	43,177	43.2
Note: Asian Indian	28,286	28.3
Note: Chinese	7,915	7.9
Native Hawaiian/Pacific Islander	36	0.0
Other Race (unspecified)	2,718	2.7
Two or More Races	2,677	2.7
Hispanic or Latino	8,112	8.1

Population statistics may further reveal potential vulnerabilities in the community. The following table details the distribution of two groups included in vulnerable population analyses (children and the elderly) according to household description. Residents living alone, particularly the elderly, may have fewer coping mechanisms and resource than those in household groups, therefore may constitute a demographic that could require assistance in mitigating their vulnerability.

Table 5-3: Township of Edison Household Characteristics Summary Estimates (2010 Census)³

Households	Quantity	Percent of Total
Total Households	34,972	100.0
Family Households (related)	26,514	75.8
Family Households w children under 18	12,745	36.4
Non-Family Households (unrelated)	8,458	24.2

¹ U.S. Bureau of the Census. American Fact Finder "Edison Township, NJ". <http://factfinder.census.gov/>. Retrieved 9/8/15.

² Ibid.

³ Ibid.



Households	Quantity	Percent of Total
Non-Family Households, living alone	7,125	20.4
Non-Family Households, living alone Male over 65 years	691	2.0
Non-Family Households, living alone Female over 65 years	2,057	5.9

2.3.2 Vulnerable Populations

Vulnerable populations include those groups that may require special assistance, considerations, accommodation or other needs during emergency events to facilitate their effective and safe compliance with emergency instructions. This includes, but is not limited to, those individuals needing mobility assistance (strollers, wheelchairs, etc.), those with financial needs (cannot afford hotel rooms, food, necessities, during evacuation periods, etc.), those requiring translation or interpretation services to understand emergency information (non-English-speaking populations, Deaf and hard of hearing), persons considered legal minors, those persons with cognitive impairments, persons with specialized medical needs (electric dependent equipment, refrigerated medications, use of Personal Assistants for routine and basic care, medical transportation needs, etc.), and populations with social disadvantages other needs that may require unique considerations during emergency events.

Identifiable vulnerable populations in Edison include (but may not be limited to) the following:

Table 5-4: Township of Edison Vulnerable Population Estimates (2010)

Population Type	Population Estimate (2010 Census) ⁴
Under 5 years of age	6,422
Under 18 years of age	22,659
Over 65 years of age	12,625
Limited English Proficiency (LEP)	18,555 (equals 19.8 % of population over 5 years old)
Institutionalized	1,147
Living in Group Quarters	817

In addition to these statistics, approximately 6.1 % of the population lives below the poverty line. The mean household income is \$111,792, with the per capita income at approximately \$39,054 (2013 estimates).⁵

⁴ Ibid.

⁵ U.S. Bureau of the Census. American Fact Finder "Edison Township, NJ". <http://factfinder.census.gov/>. Retrieved 9/8/15.



2.4 Land Use and Development

The Township of Edison is large municipality that extends north from the banks of the Raritan River to the northern border of the County. It surrounds the Borough of Metuchen, which sits close to the center of Edison. It is a developed community with established land uses, though less than 74 percent of the Township is classified as Urban by the 2012 NJDEP Land Use/Land Cover data. The 2012 NJDEP Land Use/Land Cover data shows that Edison has had relatively static land use and land cover trends for the past 10 years.

The non-urban land in the Township is largely wetlands and forested land. There is not a lot of agriculture within the Township. The wetland areas are adjacent to the Raritan River and surrounding the headwaters to the Bound Brook and the Robinsons Branch of the Rahway River. The remaining forested land is largely contained in preserved areas and parks.

Table 5-5: Township of Edison Land Cover Summary

Land Cover Class	Percent of Total Land ⁶	2002 (acres)	2007 (acres)	2012 (acres)	Percent Change ⁷
Agriculture	0.12%	31.47	27.15	23.57	-25.08%
Barren Land	2.18%	391.38	452.75	426.88	9.07%
Forest	7.10%	1577.94	1439.92	1393.21	-11.71%
Urban	73.51%	14100.90	14292.79	14417.14	2.24%
Water	2.54%	450.29	481.51	497.36	10.45%
Wetlands	14.55%	3059.38	2917.23	2853.19	-6.74%

2.4.1 Open Space

The Township of Edison has approximately 1500 acres of open space. Over 37 percent of this land is within the Special Flood Hazard Area. This means that over 22 percent of the flood hazard area in the Township has been dedicated to open space.

2.4.2 Buildings and Development

The Township of Edison is comprised of distinct neighborhoods, which includes a mix of industrial, commercial, and residential areas. According to the 2013 American Community Survey (ACS), approximately 60 percent of the houses in the Township were built before 1979. Only 5.5 percent of the houses were built between 2000 and 2010.

⁶ Percent based on acres of land in 2012

⁷ Change is calculated between 2002 and 2012



Table 5-6: Township of Edison Housing Statistics

Housing Characteristics	Estimate
Total Occupied Housing Units	37,724
Percent Owner-occupied	63.8
Percent Renter-occupied	36.2
Percent built after 2000	5.5
Percent built before 1979	59.6

2.4.3 Recent and Expected Development

The Township of Edison has reported no major developments since 2010. North Edison is largely built-out, with most projects including small subdivisions of a parcel into 3-4 single-family homes. There has been, and will continue to be some expansion expected in Raritan Center. The Township recently underwent a vacant land analysis which illustrates that the land is largely built-out. The Township has protections in place to prevent large-scale development of remaining wetland and environmentally constrained areas.



2.5 Critical Facilities and Infrastructure

2.5.1 Essential Facilities

The Township offers a number of public facilities and services for its residents. Edison has a municipal complex, a police department, paid and volunteer fire companies, emergency services, animal shelter, three libraries, a senior center, and two community centers. The Township is working to install transfer switches on all essential facilities to be compatible for mobile generators as needed.

2.5.2 Transportation

Edison's development has been largely due to its position near several significant transportation routes. The connection between Route 287 and the NJ Turnpike occurs in Edison. Additionally, Routes 1 and 27 span across the Township. There are a number of County roads within the Township that connect Edison to adjacent municipalities.

2.5.3 Critical Utilities and Infrastructure

The Township is within the PSE&G service area for both gas and electric. The Township reports that service is usually reliable, except in severe storm events. Water service is provided to the Township by Middlesex Water Company and NJ American Water. The MCUA manages the wastewater from the Township, but Edison maintains the sewer infrastructure. The Township is currently working on addressing infiltration and inflow issues (I/I), as well as hardening a pump station to improve service during storm events.



3. Hazard Identification and Risk Assessment

This section describes the natural hazards and risks that can affect Township of Edison. Like all the other municipalities in Middlesex County, Edison is potentially subject to the effects of all the hazards that are considered in this mitigation plan. However, only a few of these hazards have significant impacts that are unique to the community. The remaining hazards are discussed in detail in the County part of this mitigation plan. FEMA mitigation planning guidance requires that County mitigation plans include a risk assessment section that “assess[es] each jurisdiction’s risks where there vary from the risks facing the entire planning area” (44CFR 201.6 (c) (2) (iii)). Because the Middlesex County HMP update includes separate appendices for each municipality, this requirement is met in the appendices, while risks that affect the entire County uniformly are discussed in the County part of the HMP.

3.1 Background and Hazard Rankings

One of the first steps in developing jurisdictional appendices was for participating municipalities to review and prioritize the hazards that can affect them. This was done based on how often a hazard has occurred, how significant effects have been in the past, the difficulty and cost of recovering from such events. Municipalities ranked the list of hazards as high, medium, low, or no concern.

Table 5-7 shows community hazard rankings. To the extent possible, the level of discussion and detail about specific hazards in this section are based on these rankings. However, in many cases there is insufficient hazard information available at the level of the jurisdiction to allow detailed discussion or risk estimates. For some hazards there is limited jurisdiction-level tabular data included in the County portion of the HMP, and users should refer to those subsections for more detail. The hazards marked with asterisks in the table above are included in this appendix; the others are included in the County portion of this HMP, but not discussed in detail here.

Table 5-7
Township of Edison
Hazard Identification and Prioritization

Hazard	Priority
Coastal Erosion	NA
Dam/Levee Failure	L
Drought	L
Earthquakes	L
Extremely High Temps	M
Extremely Low Temps	M
Floods	M
Hurricanes/Tropical Storms	M
Nor’easters	M
Power Outages	M
Severe Weather	M
Hazardous Substances	H
Wildfire	L
Winter Storm	M



3.2 Flood Hazard

3.2.1 Type, Location, and Extent

The Township of Edison is located in north-central Middlesex County. In addition to the Raritan River, which forms Edison’s southern border, there are several relatively streams in the interior of the jurisdiction as well. These include Robinson’s Branch, which is part of a minor network on streams in the north-central part of Edison (ultimately draining to the Rahway River, to the north); Bound Brook, which occupies part of western Edison (running through Dismal Swamp Preserve); and the south branch of the Rahway River, which is found in the east-central part of the jurisdiction. Most of the floodplain in Edison is in its southern area, adjacent to the Raritan. The area is largely undeveloped, and is mostly marshland. There are some business and light industrial land uses nearby.

One of the best resources for determining flood risk in a jurisdiction is Flood Insurance Rate Maps (FIRMs), which are produced by FEMA. The FIRM is the official map of a community on which FEMA has delineated both the special flood hazard areas (1% annual chance of flooding) and the risk premium zones applicable to the jurisdiction.⁸ At the time the Middlesex County HMP was being updated, the effective FIRM for the Township of Edison is dated July 6, 2010. While the effective FIRM is the approved map and is used for regulatory purposes, the Middlesex County hazard mitigation plan update was developed in 2015, and the best available flood mapping at that time was the FEMA revised Preliminary Flood Map (released on January 30, 2015). This map is shown below in Figure 5-1. A large percentage of floodplain is adjacent to the Raritan, with the remainder related to Bound Brook and the south branch of the Rahway.

As shown in Table 5-8 below, Edison is geographically a large jurisdiction (compared to others in Middlesex County), with a fairly significant area in the 100-year floodplain. However, a very small percentage of parcels in the jurisdiction have their geographic centers (centroids) in the floodplain.

Table 5-8
Floodplain and Parcel Data for Edison Township
 (Source: FEMA Region II, Coastal Analysis and Mapping, Preliminary FIRM, January 2015)

Data Type	Value
Jurisdiction area in square miles	30.64
Square miles within 100-year floodplain	4.74
Jurisdiction area within 100-year floodplain	15.48%
Number of parcels in jurisdiction	36,891
Number of parcels with centroids within 100-year floodplain	551
Parcels with centroids within 100-year floodplain	1.49%

⁸ FEMA online - Floodplain Management. Flood Insurance Rate Map (FIRM) definition



[Note: the table refers to centroids, which are the geographic center of a parcel. This is a better indicator of flood exposure than simple intersection with the floodplain, although it does not necessarily mean that any structures or infrastructure are within the boundaries of the Special Flood Hazard Area].

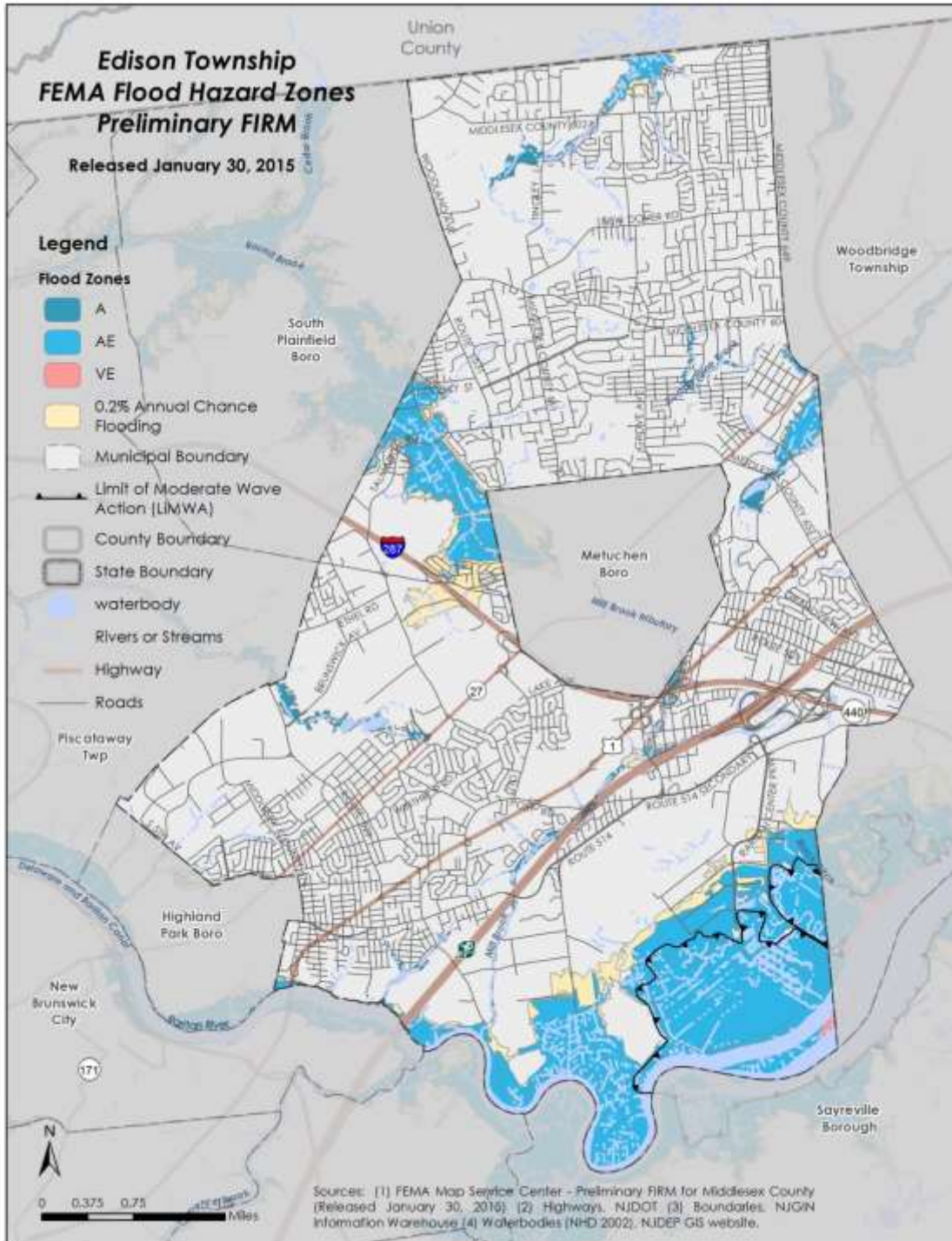
Current FEMA guidance uses the term *extent* as analogous to potential severity. The extent of the flood hazard in Edison is on the order of one to three feet (the latter for the properties that are at the lowest elevations) in events that cause overbank flooding on the Raritan or during extreme rain events.

3.2.2 Previous Occurrences and the Probability of Future Floods

Most of the floods that have affected Edison are related to two major storms, as discussed above.



Figure 5-1
Edison Township portion of FEMA Revised Preliminary Flood Insurance Rate Map
 (Source: FEMA Region II, Coastal Analysis and Mapping, Preliminary FIRM, January 2015)





3.2.3 Flood Impacts and Vulnerabilities to Flooding

**Table 5-9
 NFIP Policies and Claims**

Number of Parcels:	
Edison:	6,802
Middlesex County:	283,276
Number of Policies In-Force:	
Edison:	351
Middlesex County:	4,489
Number of Claims:	
Edison:	107
Middlesex County:	3,478
Total Paid Claims	
Edison:	\$8,393,667
Middlesex County:	\$109,727,837
Repetitive Loss (RL) Properties:	
Edison:	7
Middlesex County:	429
Total Building (RL)	
Edison:	\$292,641
Middlesex County:	\$44,015,885
Total Contents (RL)	
Edison:	\$45,496
Middlesex County:	\$5,106,609
Number of Claims (RL)	
Dunellen:	18
Middlesex County:	1,322
Average Claim (RL)	
Dunellen:	\$18,795
Middlesex County:	\$37,158

The impacts from past floods in this jurisdiction have not been especially severe compared to many other jurisdictions with more development in the floodplain. Many of the flood insurance claims in Edison are related to Tropical Storm Irene (2011) and Hurricane Sandy (2012). Although the community has some NFIP Repetitive Loss properties, given the size of the community and the number of parcels, the vulnerabilities here are relatively minor.

3.2.4 National Flood Insurance Program and Repetitive Loss Properties

To provide a sense of the flood risk in a community it is also beneficial to summarize the policies in force and claims statistics from the National Flood Insurance Program (NFIP). There is a discussion of the NFIP in the County section of this hazard mitigation plan. The Township of Edison has been a member of the NFIP since 1982.

FEMA NFIP statistics indicate that as of February 2015, federal flood insurance policies were in-force on 351 properties in Edison. Between 1978 and 2015, there have been a total of 107 NFIP insurance claims in Edison with a total claims value of \$8,393,667. ⁹ Table 5-9 compares the number of policies in-force and paid claims in the jurisdiction. The table shows that Edison Township comprises 7.8% of the NFIP policies in-force in Middlesex County. Notably, the average NFIP claim in Edison (\$78,445) is more than twice that of the overall County, which is \$31,549. A review of the NFIP claims records shows that this high average is because of large claims for non-residential properties adjacent to the Raritan, mainly during Irene and Sandy.

Edison Township is not presently a member of the Community Rating System (CRS), a voluntary program for communities participating in the NFIP. The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. For CRS participating communities, flood insurance premium rates are discounted in

⁹ FEMA – Policy and Claim Statistics for Flood Insurance



increments of 5% based on creditable activities.¹⁰ CRS communities are ranked between 1 and 10, with Class 1 communities receiving a 45% premium discount.

It should be noted that NFIP claims are not a direct or completely accurate proxy for flood risk in a community. The data does not include flood damages to structures that had no flood insurance. Also, in some cases, structures or contents may have been underinsured. The NFIP claims data also does not include any damages to public facilities, which may be insured via other means (such as self-insurance or non-FEMA policies); such damages may also be addressed through other federal programs such as FEMA’s Public Assistance Program. Figure 5-2 shows all NFIP claims in Edison Township between 1978 and 2015.

3.2.5 Flood Risk to Repetitive Loss Properties in Edison

FEMA requires a discussion of NFIP Repetitive Loss and Severe Repetitive flood loss statistics in hazard mitigation plans. A repetitive loss property is a structure covered by a contract for flood insurance made available under the NFIP that has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25% of market value of the structure at the time of each such flood event. (Note that the data about Repetitive Loss properties in this subsection are based on the previous definition. Under the revised definition, Middlesex County has 47 RL properties, and Edison has 1.)

The flood risk assessment in this section is based in part on analysis of NFIP data on repetitive flood loss properties. As of February 2015, Middlesex County had 429 such properties based on a query of the FEMA BureauNet NFIP interface. Of this total, seven properties were located within Edison; this comprises 1.6 percent of the County total. The seven repetitive loss properties in Edison were responsible for a total of 18 insurance claims, totaling \$338,137. Table 5-9 provides summary repetitive loss statistics for the community.

Table 5-10 provides a comparison of the residential repetitive loss claims for Middlesex County and Edison. The data suggests that although Edison has specific areas that are floodprone, that damages are generally limited to major events with relatively low probabilities.

Table 5-10
Repetitive Loss Statistics in Edison Township and Middlesex County
 (Source: FEMA National Flood Insurance Program, February 2015)

City/County Name	Properties	Total Building	Total Contents	Total Losses	# of Claims	Average Claim
Edison Township	7	\$292,641	\$45,496	\$338,137	18	\$18,785
Middlesex County	429	\$44,015,885	\$5,106,609	\$49,122,494	1,322	\$37,158

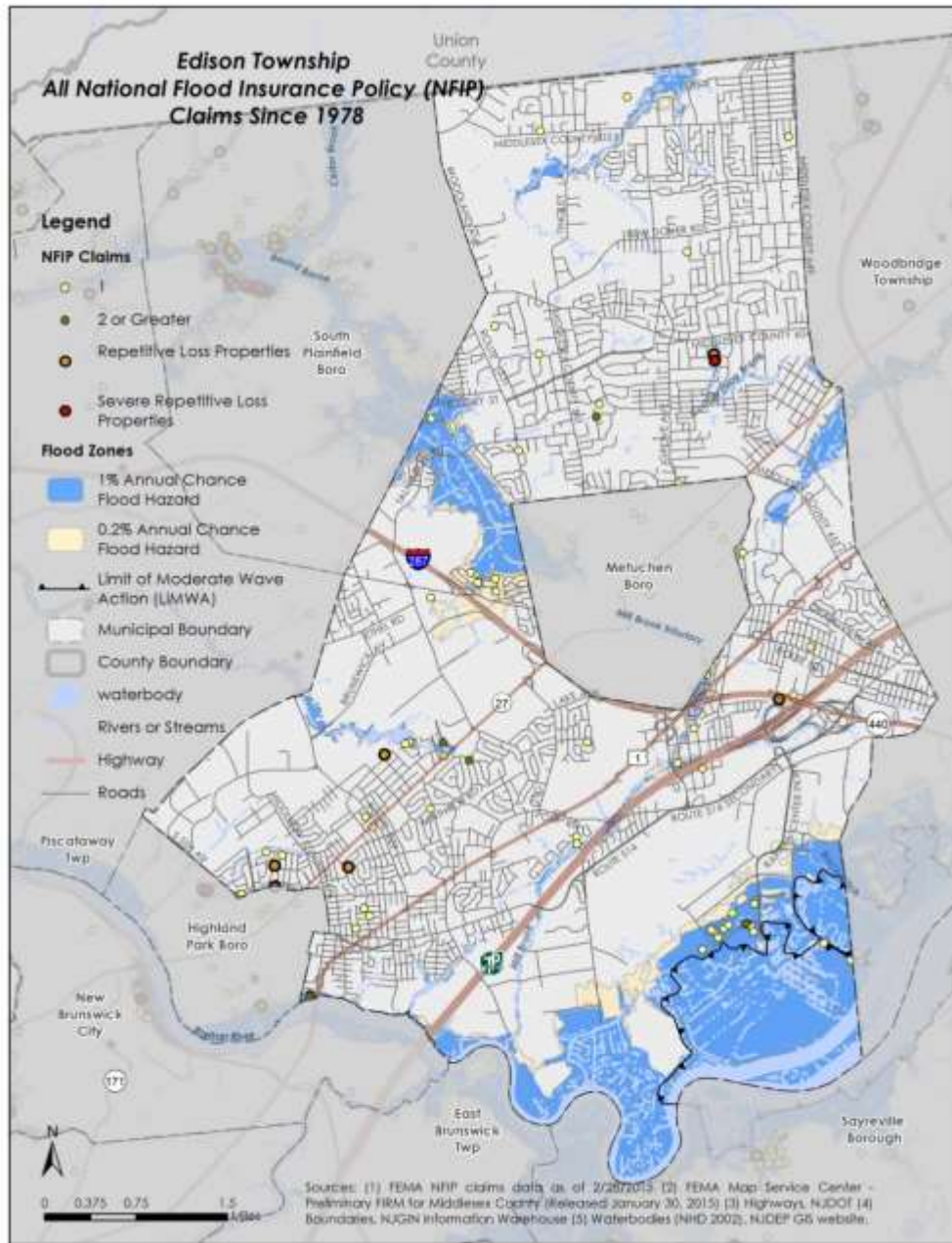
¹⁰ FEMA – Community Rating System (CRS).



3.2.6 Flood Risk to Severe Repetitive Loss Properties in Edison Township

The definition of Severe Repetitive Flood Loss (SRL) is included in the County portion of this mitigation plan. As of February 2015, there were no SRL properties in Edison Township.

Figure 5-2
Map of NFIP Claims in the Township of Edison (1978 to 2015),
Including Repetitive Loss and Severe Repetitive Loss Properties
 (Source: FEMA National Flood Insurance Program, February 2015)



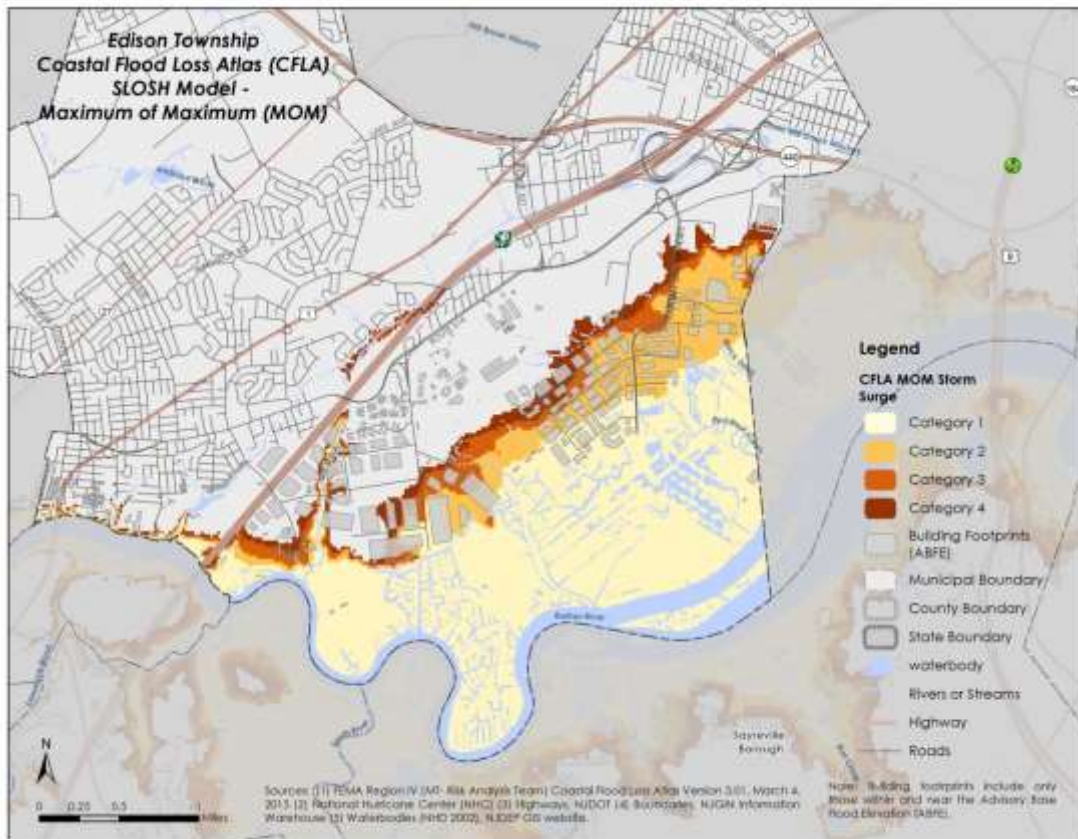


3.2.7 Storm Surge Hazard

Of the 24 jurisdictions in Middlesex County, 13 have some risk from storm surge. Edison Township is among these, due its exposure to overbank flooding from the Raritan River. Most of the areas that appear to be at the most risk are non-residential in nature. However, as shown below, significant areas of the jurisdiction are at risk from storm surges related to more significant events. In Edison overbank flooding is substantially the same regardless of whether surge or other weather events cause it. However, it is useful to discuss statistics that are clearly related to surge. Various studies and GIS analysis provide information about the jurisdiction’s exposure to various levels of storm surge.

Figure 5-3 is a map of storm surge zones 1 through 4 in Edison Township. The map was created using FEMA/CFLA data and overlaying it with topographic GIS information to show areas potential inundated by various surge categories. There is more information about this process in the County part of this mitigation plan. Unlike some other Middlesex communities adjacent to the Raritan and Rahway Rivers, Edison’s flood risks in more severe events (Categories 2-4) is mostly limited to areas with less residential development.

Figure 5-3
Map of Storm Surge Zones, Categories 1-4, Township of Edison





SLOSH inundation zones from the FEMA Coastal Flood Loss Atlas (CFLA) were used to complete the storm surge vulnerability assessment for Edison. The initial analysis included calculating the land area and parcels within Categories 1 - 4 for the jurisdiction. This portion of the risk assessment approach matches the vulnerability assessment completed for the State of New Jersey 2014 Hazard Mitigation Plan. Knowing the land area within each zone can help determine the overall impact to buildings and other infrastructure in the region as a result of storm surge. Table 5-11 provides background data.

Table 5-11
Storm Surge Exposure Statistics for the Township of Edison

Storm Surge Category	Square Miles Impacted	Parcels Exposed
1	3.51	245
2	4.29	293
3	4.66	337
4	5.11	381

There is no reliable open-source information that allows assignment of specific probabilities to surge categories, so certain assumptions must be made in order to complete a risk assessment. The next table shows the assumptions used in a simple risk calculation for storm surge.

Table 5-12
Flood Risk in Storm Surge Scenarios, Township of Edison

Data Type	Value
Structures per parcel	1
Structure replacement value/s.f.	\$150
Contents replacement value/s.f.	\$75
Assumed square footage of average structure	2,000

The risk assessment is then based on FEMA depth-damage functions, i.e. indications of the percentage damage at a given flood depth for structure and contents. The main section of the mitigation plan includes a detailed description of the methodology. The results are intended only to provide a general sense of potential losses.

Table 5-13
Deterministic Surge Scenarios, Edison Township

	Category 1	Category 2	Category 3	Category 4
Assumed annual probability	2%	1%	0.5%	0.1%
Assumed flood depth	1	2	3	4
Number of parcels impacted	245	293	337	381
Scenario risk	\$31,972,500	\$38,236,500	\$43,978,500	\$49,720,500
Annual risk	\$639,450	\$382,365	\$219,893	\$49,721
100-year risk	\$9,124,952	\$5,456,349	\$3,137,866	\$709,512



The risk assessment is then based on FEMA depth-damage functions, i.e. indications of the percentage damage at a given flood depth for structure and contents. The main section of the mitigation plan includes a detailed description of the methodology. The results are intended only to provide a general sense of potential losses.

3.3 Hurricanes and Tropical Storms

Based on input from the hazard ranking process, Edison considers hurricanes and tropical storms significant hazards, and thus there is a short discussion in the present subsection.

Wind Risk Estimates

There are three significant hazards related to hurricanes, tropical storms, and to a lesser extent, nor'easters. These are: floods, storm surge, and high winds. Both floods and storm surge are addressed in the flood section of the present municipal appendix, as well as the County section of the hazard mitigation plan update. This subsection provides a preliminary quantification of hurricane wind risk based that was generated by FEMA's HAZUS-MH software (version 2.1, 2014). The calculations in Table 5-14 show a range of loss categories across the top row versus "occupancy classes" on the first column. The occupancy classes are various land uses that are represented in HAZUS. The last two columns indicate the projected 50-year and 100-year risks, i.e. the total amount of damage over those planning horizons. The figures are based on annualizing losses, then discounting them to present value using the software. There is more detailed information about the calculations and County-wide results in the main section of this HMP update.

FEMA Project Worksheets from Tropical Storm Irene and Hurricane Sandy

Following many natural disasters, FEMA engineers and field teams complete formal assessments of damage to community assets, and document these in project worksheets (PWs). The PWs are the basis of FEMA Public Assistance grants for repairs. There are seven categories of damage, indicated by the letters A through G. These are: A – debris removal; B – emergency protective measures; C – roads and bridges; D – water control facilities; E – public buildings; F – utilities, and; G – recreational facilities/other. The categories and amounts of the PWs are listed in Table 5-16 below for Tropical Storm Irene and Hurricane Sandy. Note that in some cases there are multiple different organizations in a community that are applicants for FEMA Public Assistance. In order to simplify the table, the PW amounts for all applicants in a community are combined.



Table 5-14
Probabilistic Wind Risk in Edison, 50- and 100-year Planning Horizons
(Source: FEMA, HAZUS-MH version 2.1)

Occupancy Class	Total SF	Building Damages	Contents Damages	Inventory Loss	Relocation Cost	Business Income Loss	Rental Loss	Lost Wages
Residential	47,302,541	\$1,047,154	\$260,907	\$0	\$62,920	\$205	\$35,555	\$484
Commercial	38,451,172	\$348,771	\$150,230	\$3,395	\$55,494	\$30,116	\$31,965	\$22,398
Industrial	5,649,425	\$41,343	\$29,658	\$4,071	\$2,851	\$488	\$496	\$784
Agricultural	214,527	\$1,565	\$790	\$96	\$242	\$15	\$10	\$6
Religious	523,523	\$4,789	\$1,707	\$0	\$666	\$342	\$59	\$805
Government	3,008,450	\$18,259	\$7,953	\$0	\$4,285	\$264	\$1,452	\$7,266
Education	1,108,119	\$7,815	\$3,784	\$0	\$1,467	\$378	\$85	\$889
Totals	96,257,757	\$1,469,696	\$455,029	\$7,562	\$127,925	\$31,809	\$69,620	\$32,633

Table 5-15
Probabilistic Wind Risk in Edison, 50- and 100-year Planning Horizons
(Source: FEMA, HAZUS-MH version 2.1)

Occupancy Class	Total Annualized Loss	50-year Risk	100-year Risk
Residential	\$1,407,226	\$19,421,123	\$20,079,705
Commercial	\$642,369	\$8,865,333	\$9,165,962
Industrial	\$79,691	\$1,099,818	\$1,137,113
Agricultural	\$2,724	\$37,595	\$38,869
Religious	\$8,368	\$115,488	\$119,405
Government	\$39,479	\$544,845	\$563,321
Education	\$14,417	\$198,973	\$205,721
Totals	\$2,194,274	\$30,283,176	\$31,310,096

Table 5-16
FEMA Public Assistance Expenditures in Tropical Storm Irene and Hurricane Sandy, by Category
(Source: FEMA Region II, Public Assistance)

Event Name/Public Assistance Category	A	B	C	D	E	F	G	Total
Tropical Storm Irene	\$94,751	\$166,749	\$0	\$0	\$59,437	\$0	\$0	\$320,938
Hurricane Sandy	\$504,956	\$312,054	\$0	\$0	\$63,384	\$0	\$0	\$925,295
Total	\$599,708	\$478,803	\$0	\$0	\$122,821	\$0	\$0	\$1,246,232



4. Capability Assessment

Each community within the planning area has a unique set of capabilities and priorities that affect its mitigation strategy. The following tables detail the capabilities assessed for the Township of Edison during this plan update.

4.1.1 Planning and Regulatory

Tool / Program (code, ordinance, plan)	(Yes/No)	Code Citation and Comments
Master Plan	Y	
Capital Improvements Plan	Y	
Floodplain Management / Basin Plan	Y	
Stormwater Management Plan	Y	
Open Space Plan	Y	
Stream Corridor Management Plan	Y	
Watershed Management or Protection Plan	Y	
Economic Development Plan	Y	
Comprehensive Emergency Management Plan	-	
Emergency Operation Plan	Y	
Post-Disaster Recovery Plan	-	
Transportation Plan	Y	
Strategic Recovery Planning Report	-	
Zoning Ordinance	Y	
Subdivision Ordinance	Y	
NFIP: Cumulative Substantial Damages	-	
Growth Management Ordinances	Draft	
Site Plan Review Requirements	Y	
Stormwater Management Ordinance	Y	
Municipal Separate Storm Sewer System (MS4)	Y	
Combined Sewer Overflows (CSO)	-	
Natural Hazard Ordinance	-	
Post-Disaster Recovery Ordinance	-	
Real Estate Disclosure Requirement	-	
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Y	Steep slopes

4.1.2 Staff/Personnel

Resources	Is this in place? (Y/N)	Department/ Agency/Position
Planning Board	Y	
Mitigation Planning Committee	-	
Environmental Board/Commission	Y	
Open Space Board/Committee	Y	
Economic Development Commission/Committee	-	
Maintenance Programs to Reduce Risk	Y	
Mutual Aid Agreements	Y	
Planner(s) or Engineer(s) with knowledge of land development and land management practices	Y	



Resources	Is this in place? (Y/N)	Department/ Agency/Position
Engineer(s) or Professional(s) trained in construction practices related to buildings and/or infrastructure	Y	
Planners or engineers on staff with a strong understanding of natural hazards	Y	
NFIP Floodplain Administrator	Y	
Surveyors	N	
GIS layers and maps	N	
Personnel trained in GIS	Y	
Personnel trained in HAZUS	-	
Emergency Manager	Y	
Grant Writer	Y	
Staff with expertise in cost/benefit analysis	Y	
Professionals trained in conducting damage assessments	Y	

4.1.3 Education/Outreach and Community Classifications

Program	Do you Participate in/Use this Program (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	-		
Building Code Effectiveness Grading Schedule (BCEGS)	-		
Public Protection (ISO Fire Protection Classes 1 to 10)	-		
Storm Ready	-		
Firewise	-		
Disaster/Safety Programs in/for Schools	Y		
Organizations with Mitigation Focus (advocacy group, non-government)	-		
Public Education Program/Outreach (through website, social media)	Y		
Public-Private Partnerships	Y		

4.1.4 Fiscal Capabilities

	Yes/No
Do you have a line item in your operating budget for mitigation project funding?	Y
If no, will you look at mitigation actions when allocating funding in the future?	-
Do you have a line item in the Capital Improvement Budget for mitigation project funding?	Y
Have you provided funding for mitigation projects identified in the hazard mitigation plan?	Y
Does your town have the authority to Levy Taxes for specific purposes?	Y
Does your town have user fees for water, sewer, gas or electric service?	Y
Do you impose impact Fees for homebuyers or developers of new development/homes?	N
Does your community have an open space acquisition fund?	N
Do you use bonds to finance projects (general obligation bonds, special tax bonds, private activity bonds)	Y



5. Mitigation Strategy

This section describes what projects, initiatives, and other actions the Township has undertaken or plans to implement to reduce risk and loss within its jurisdiction. This includes the status of previously identified actions and any other projects that have been completed since the 2010 Plan was adopted. The additional actions were determined by the LPC based on self-determined priorities and experience.

5.1 Past Mitigation Actions

The table below lists the mitigation projects and actions that were included in the original 2010 Plan.

Mitigation Action	Responsible Party	Status
Edison 1: Storm Water Management (5 pumping stations)	Municipal Public Works Department	Ongoing project to harden pump stations
Edison 2: Check valves for sanitation system (non-maintenance-related costs only)	Municipal Public Works Department (sewer)	Project is underway.
Edison 3: Storm Water piping capacity increase	Municipal Public Works Department (sewer)	The Public Works Department is investigating drainage and maintenance improvements.
Edison 4: Building Code update	Municipal Code Enforcement	This is not the responsibility of the Municipality. All municipalities adopt the State Building Code.



5.2 Proposed Mitigation Actions

The table below details the mitigation initiatives the Township of Edison would like to pursue to minimize future effects of hazard events. These actions have been determined through a local assessment of current risk and needs. The LPC met with the Plan Consultant to review all hazard and risk assessment data and evaluate the strategy. These initiatives are dependent upon funding and may change based on municipal priorities and future hazard events.

For each new mitigation action, the Township has ranked as ‘High’, ‘Medium’, or ‘Low’, based on the evaluation criteria outlined in Section 5.

Proposed Action	Anticipated Benefits	Responsible Party	Funding or Implementation Mechanism	Timeline	Priority
Elevate/acquire repetitive loss properties	Reduce property loss in repetitive flood areas	OEM/ Engineering	Grants	1-3 years	High
Reduce infiltration/inflow through sewer system	Reduce load on system to minimize back-ups	DPW	Capital Funds	Ongoing	Medium
Bring inlets and stormwater drainage along roadways into compliance	Improve drainage and reduce localized flooding	Engineering	Capital Funds/Grants	1-3 years	Medium
Harden pump stations	Keep all pump stations online throughout hazard events	DPW	Capital Funds	1-5 years	High
Provide backup power to critical facilities through transfer switches and generators	Ensure back-up power and continued operation of critical services.	OEM	Grants	1-5 years	High



6. Plan Implementation

The LPC shall document, as needed and appropriate:

- Hazard events and losses in Edison and the effects that mitigation actions have had on impacts and losses,
- Progress on the implementation of mitigation actions, including efforts to obtain outside funding for projects,
- Any obstacles or impediments to the implementation of actions,
- Additional mitigation actions believed to be appropriate and feasible,
- All public and stakeholder input and comment on the Plan that has been received by the Township.
- Copies of any grant applications filed on behalf of the Township

Continued Public Input

The Township of Edison is committed to incorporating public input into its ongoing hazard mitigation planning. The public will have an opportunity to comment on the Plan prior to any changes and during the 5-year plan update. The annual progress reports will be posted on the County mitigation website in addition to the adopted Plan.

All public comments and input on the plan will be recorded and addressed, as appropriate. Opportunity to comment on the plan will be provided directly through the County's website. Public comments can also be submitted in writing to the County's HMP Coordinator. All public comments shall be addressed to: Middlesex County Office of Emergency Management c/o All Hazards Pre-disaster Mitigation Plan Coordinator, 1001 Fire Academy Drive, Sayreville, NJ 08872.

The Township of Edison's LPC shall ensure that:

- Copies of the latest approved Plan are available for review at Township Hall along with instructions to facilitate public input and comment on the Plan.
- Public notices are made as appropriate to inform the public of the availability of the Plan, particularly during Plan update cycles.
- For minor changes to this appendix, the Township of Edison will post a notice on the Township's website and invite the public to review and comment.
- For major changes involving Township Council approval, the Township will use its standard public notice procedures inviting the public to review the document and provide feedback.

Plan Adoption

On [insert date] Middlesex County submitted the initial draft of the 2015 Plan Update to NJOEM for review and comment. After addressing NJOEM comments in the document, the HMP was resubmitted



for final consideration and approval by NJOEM and FEMA. FEMA approved the plan on [insert date], and the Plan update was forwarded to the Middlesex County Board of Chosen Freeholders for adoption, which occurred on [insert date].

The Township Council approved the plan on [insert date]. The Township resolution for adoption is provided below, the County's adoption resolution is provided as Appendix F of the 2014 HMP update. Following adoption, the plan update was resubmitted to FEMA for final approval, which occurred on [insert date]. The FEMA approval letter is included as Appendix G.

Plan Maintenance

The Township of Edison will review this Appendix of the County's hazard mitigation plan appendix each year and give the County's HMP Coordinator an annual progress report. The OEM Coordinator is responsible for convening the LPC, initiating the plan review, and submitting the annual progress report. The LPC may use worksheets #1 and #3 in the FEMA 386-4 guidance document, to facilitate the review and progress report. FEMA guidance worksheets are provided in Appendix H. Local progress reports shall be provided to the County HMP Coordinator at least two weeks prior to the annual plan review meeting.

Additionally, the LPC will convene and review the plan when major hazard events impact the jurisdiction, potentially yielding opportunities for mitigation grant funding, or when new information suggests that plan elements do not accurately reflect the community's risk or its mitigation priorities.

If necessary, the OEM Coordinator will convene a meeting of the LPC to review and approve all changes. The Township retains the discretion to implement minor changes to the document without formal procedures involving the Township Council subject to local policies and regulations.

In addition to the annual progress report, the Township of Edison will provide Middlesex County with a copy of the written notice of any changes to the jurisdictional appendix at the time such changes are implemented.