



Appendix 3: Borough of Dunellen

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

1. Plan Development

On March 5th, 2015, the Borough Administrator signed an “Intent to Participate” letter and assigned a point of contact for the HMP update. The OEM Coordinator 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.

Table 3-1
Borough of Dunellen Local Planning Committee Members

Name	Title	Organization
Jeanne Wessel	OEM Coordinator	Borough of Dunellen
William Robins	Administrator	Borough of Dunellen
Chief Jeff Nelson	Chief of Police	Borough of Dunellen
Lt. Daniel Smith	Lieutenant of Police	Borough of Dunellen



2. Community Profile

2.1 Physical Location

The Borough of Dunellen has a total area of 1.05 square miles and is located on the norther border of Middlesex County, New Jersey. It is bordered by Piscataway Township and the Borough of Middlesex, as well as Plainfield City (Union County) and Green Brook Township (Somerset County). Primary transportation routes include the New Jersey Transit Raritan Valley rail line, which bisects the borough, and the Dunellen train station. NJ Transit provides bus service in the municipality. No major highways transit Dunellen

2.1.1 Hydrography and Hydrology

The Borough of Dunellen is located within the Green Brook watershed within the Raritan Basin. The Borough's northeastern border is coincident with the Green Brook. The Bonygutt Brook, a tributary of the Green Brook, flows from Piscataway Township through the Borough before reaching the Green Brook in Middlesex Borough.

2.2 History and Governance

The Borough of Dunellen was formally incorporated on October 28, 1887, having been formed from the Piscataway Township, based on the area around the railway station. Dunellen is governed under the Borough form of government, and has an elected Mayor and six Council members. The Mayor is elected directly to a four-year term of office. Town Council members are elected to serve three-year terms on a staggered basis, with two seats coming up for election every year. The Borough 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 7,227.¹ This is a 5.9% increase from 2000. The Borough of Dunellen has a population density of 6,894.8 persons per square mile. It is the 4th densest municipality within the County. A summary of major population and household characteristics may be found in the following tables.

Table 3-2: Borough of Dunellen Population Summary Estimates (2010 Census)²

Population	Quantity	Percent of Municipal Population
Total Population	7,227	100
Median Age	37.1	N/A
17 years and under	1,715	23.7
65 years and over	307	4.2

¹ U.S. Bureau of the Census. American Fact Finder “Dunellen Borough, NJ”. <http://factfinder.census.gov/>. Retrieved 9/8/15.

² Ibid.



Population	Quantity	Percent of Municipal Population
Race		
White	5,309	75.3
Black/African-American	623	8.6
Native American/Alaskan Native	19	0.3
Asian	326	4.5
Native Hawaiian/Pacific Islander	4	0.1
Other Race (unspecified)	699	9.7
Two or More Races	247	3.4
Hispanic or Latino	1,933	26.7

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 3-3: Borough of Dunellen
Household Characteristics Summary Estimates (2010 Census) ³**

Households	Quantity	Percent of Total
Total Households	2,566	100
Family Households (related)	1,764	68.7
Family Households w children under 18	847	33.0
Non-Family Households (unrelated)	802	31.3
Non-Family Households, living alone	640	24.9
Non-Family Households, living alone Male over 65 years	67	2.6
Non-Family Households, living alone Female over 65 years	115	4.5

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.

³ Ibid.



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

Table 3-4: Borough of Dunellen Vulnerable Population Estimates (2010)

Population Type	Population Estimate (2010 Census) ⁴
Under 5 years of age	452
Under 18 years of age	1,715
Over 65 years of age	307
Limited English Proficiency (LEP)	988 (equals 14.8% of population over 5 years old)
Institutionalized	0
Living in Group Quarters	11

In addition to these statistics, approximately 6.5% of the population lives below the poverty line. The mean household income is \$89,250, with the per capita income at approximately \$33,049 (2013 estimates).⁵

2.4 Land Use and Development

The Borough of Dunellen strives to minimize the risk to person and property within the municipality. For this reason the Borough has regulations and policies in place to limit development in floodprone, environmentally sensitive, and high-risk areas. Since the 2010 Hazard plan Dunellen has experienced minimal development. The only major development that has occurred within the Borough since 2010 was a light industrial project off of South Washington Street. The project is still in development, it is not located within the Special Flood Hazard Area.

Dunellen is a densely developed residential community, with nearly 94 percent of its 2,769 square miles of land area classified as urban/developed. The Land Use/Land Cover data shows that there has been a dramatic decrease in the percent change of forest, wetlands, and barren land. However, the actual acres that have changed between 2002 and 2012 are very small. The Borough has lost approximately 2 acres of forest during this 10 year period.

Table 3-5: Borough of Dunellen Land Cover Summary

Land Cover Class	Percent of Total Land ⁶	2002 (acres)	2007 (acres)	2012 (acres)	Percent Change ⁷
Agriculture	0	0	0	0	0
Barren Land	0.13%	1.32	1.18	0.87	-34.38%
Forest	0.52%	6.49	3.65	3.56	-45.19%
Urban	93.84%	632.55	637.63	638.10	0.88%
Water	0.40%	2.69	2.71	2.72	1.12%
Wetlands	5.11%	36.92	34.80	34.73	-5.94%

⁴ Ibid.

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

⁶ Percent based on acres of land in 2012

⁷ Change is calculated between 2002 and 2012



Nearly 86 percent of the parcels within Dunellen are classified as residential based on tax assessment data. According to the 2011 Master Plan, the most prominent residential land use is the single family detached dwelling, with approximately 80 percent of the total residential land uses. The typical lot size is 7,500 square feet. Second to this is the two-family homes, which comprises 17 percent of the existing housing stock. The Master Plan suggests that this may be a result of intensification in the density in single family residential areas.

2.4.1 Open Space

The Borough of Dunellen is largely developed. At present, the Borough has approximately 43 acres of preserved open space. The Master Plan states that continuing to preserve the remaining open land within the Borough is a high priority. Over half of the open space in the Borough (54 percent) is within the Special Flood Hazard Area (SFHA). Approximately 12 percent of the Borough’s SFHA is preserved.

2.4.2 Buildings and Development

Dunellen's history is centered around the development of the railroad line through the Borough. The 2013 American Community Survey estimates that the Borough's housing stock is older, with over 88 percent of the houses having been built before 1979. Less than 3 percent were built between 2000 and 2010, which is the third lowest percentage in the County. The 2013 ACS estimates that nearly 94 percent of the Borough's housing units are occupied.

The Borough reported only one major development between 2010 and this plan update. The project, located on South Washington, is still in the design phase but is expected to be a mixed use project. It is near the mapped floodzones, but it not anticipated that this project will be located in the Special Flood Hazard Area.

Table 3-6: Borough of Dunellen Housing Statistics

Housing Characteristics	Estimate
Total Occupied Housing Units	2,610
Percent Owner-occupied	75.4
Percent Renter-occupied	24.6
Percent built after 2000	2.5
Percent built before 1979	88

2.4.3 Recent and Expected Development

Project Name	Type	Number of Structures	Locations	Known Hazards	Description/Status
	Light industrial		South Washington	None anticipated	For mixed use



2.5 Critical Facilities and Infrastructure

2.5.1 Essential Facilities

The Borough of Dunellen's public facilities include the municipal building, library, rescue squad, fire department, public works, and the parking authority. The Police Department and Emergency Operations Center are operated out of the Municipal Building.

2.5.2 Transportation

The passenger rail line runs through the center of the Borough. State Route 28 parallels the railroad through most of town. Perpendicular to these routes, Route 529/Washington Ave, provides access to Route 22 and surrounding roads.

2.5.3 Critical Utilities and Infrastructure

The Borough of Dunellen is serviced by New Jersey American Water for its public water supply. PSE&G is the Borough's supplier of electricity and natural gas. The Borough reports that it experiences disruptions in service during severe storms and disaster events. There used to be periodic disruptions in service during high temperatures, due to increased loading on the system, but those issues seemed to have been resolved by the utility company. The Borough is responsible for the operation and maintenance of its sanitary sewer system, which discharges into the Plainfield Regional Sewerage Authority System. The Borough recognizes that infiltration and inflow are a concern for its system, given its age. The 2011 Master Plan details that the Borough routinely inspects and performs preventative maintenance on the system. The Borough has started replacing manhole covers in floodprone areas to reduce infiltration.



3. Hazard Identification and Risk Assessment

This section describes the natural hazards and risks that can affect the Borough of Dunellen. Like all the other municipalities in Middlesex County, Dunellen 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.

Table 3-8
Borough of Dunellen
Hazard Identification and Prioritization

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

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 3-8 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.

The Borough ranked Extreme Low and High Temperatures as low, though there is recognized concern that these hazards are significant when there are power outages. This is also true for Winter Storms, which may cause hazardous conditions and power outages.



3.2 Flood Hazard

3.2.1 Type, Location, and Extent

The Borough of Dunellen is located in the far northwest corner of Middlesex County, and is one of the County’s smallest jurisdictions. There are two primary potential sources of flooding. First is Green Brook, which comprises the northwestern border of Dunellen. Second is Bonygutt Brook, which crosses the southern part of the jurisdiction and drains into Green Brook. In spite of its small area, Dunellen has a significant history of flooding and flood insurance claims, as discussed in the subsections below.

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. At the time the Middlesex County HMP was being updated, the effective FIRM for the Borough of Dunellen 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 3-1. It shows extensive areas of floodplain around both Bonygutt Brook and Green Brook.

As shown in Table 3-9 below, a major contributing factor to the flood risk is that a relatively large percentage of the jurisdiction is within the floodplain, and there is development in a significant part of those areas – the geographic centroids of more than 23 percent of the parcels in the jurisdiction are within the boundary of the 100-year floodplain.

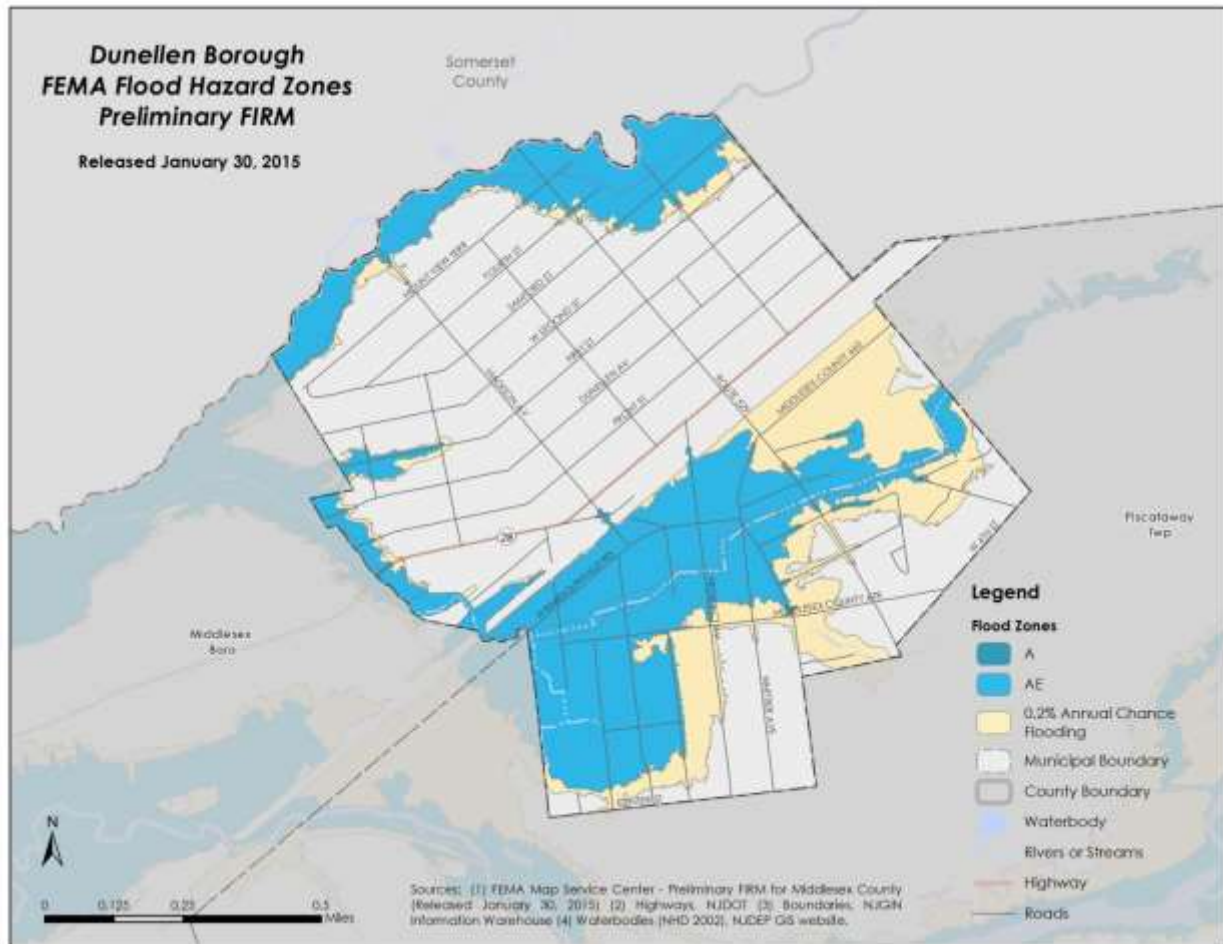
Table 3-9
Floodplain and Parcel Data for the Borough of Dunellen
(Source: FEMA Region II, Coastal Analysis and Mapping, Preliminary FIRM, January 2015)

Data Type	Value
Jurisdiction area in square miles	1.06
Square miles within 100-year floodplain	0.30
Jurisdiction area within 100-year floodplain	27.85%
Number of parcels in jurisdiction	2,189
Number of parcels with centroids within 100-year floodplain	508
Parcels with centroids within 100-year floodplain	23.21%

[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].



Figure 3-1
Dunellen portion of FEMA Revised Preliminary Flood Insurance Rate Map
(Source: FEMA Region II, Coastal Analysis and Mapping, Preliminary FIRM, January 2015)



Current FEMA guidance uses the term *extent* as analogous to potential severity. The extent of the flood hazard in Dunellen appears to vary considerably among the several floodprone areas in the jurisdiction. As discussed elsewhere, certain areas on Front Street (south-central Dunellen) and Jackson Street (northwest) appear to have the potential for depths of several feet of flooding during more severe events. There are many flood insurance claims in other areas, but these are small relative to Jackson and Front Streets, suggesting lower flood depths in most cases. The flooding on Jackson Street is related to overbank events from Green Brook. The Borough has attempted to appeal the previous mapping of these flood hazards.

3.2.2 Previous Occurrences and the Probability of Future Floods

Flooding in this community is from several sources, as discussed immediately above. A review of NFIP flood insurance claims shows that somewhat less than half the overall claims in the community were related to Tropical Storm Irene (2011), and the remainder is spread across many events. There are very few claims related to Sandy. Absent specific actions to increase drainage in the central part of the jurisdiction (and overbank flooding in the northwest part), the probability of future floods is probably



about the same as it has been in the past.

Table 3-10
NFIP Policies and Claims

Number of Parcels:	
Dunellen:	2,189
Middlesex County:	283,276
Number of Policies In-Force:	
Dunellen:	321
Middlesex County:	4,489
Number of Claims:	
Dunellen:	224
Middlesex County:	3,478
Total Paid Claims	
Dunellen:	\$2,292,027
Middlesex County:	\$109,727,837

3.2.3 Flood Impacts and Vulnerabilities to Flooding

The impacts from past floods in this jurisdiction have been significant. The numbers and magnitude of flood insurance claims suggest a high level of flood vulnerability in fairly large areas in central, northwest and southwest Dunellen.

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 Borough of Dunellen has been a member of the NFIP since 1977.

FEMA NFIP statistics indicate that as of February 2015, federal flood insurance policies were in-force on 321 properties in Dunellen. Between 1978 and 2015, there have been a total of 224 NFIP insurance claims in the Borough, with a total claims value of \$2,292,027.⁸ Table 3-10 compares the number of policies in-force and paid claims in the jurisdiction. The table shows that the Borough of Dunellen comprises 6.4% of the NFIP policies in-force in Middlesex County.

The Borough of Dunellen 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 increments of 5% based on creditable activities.⁹ 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.

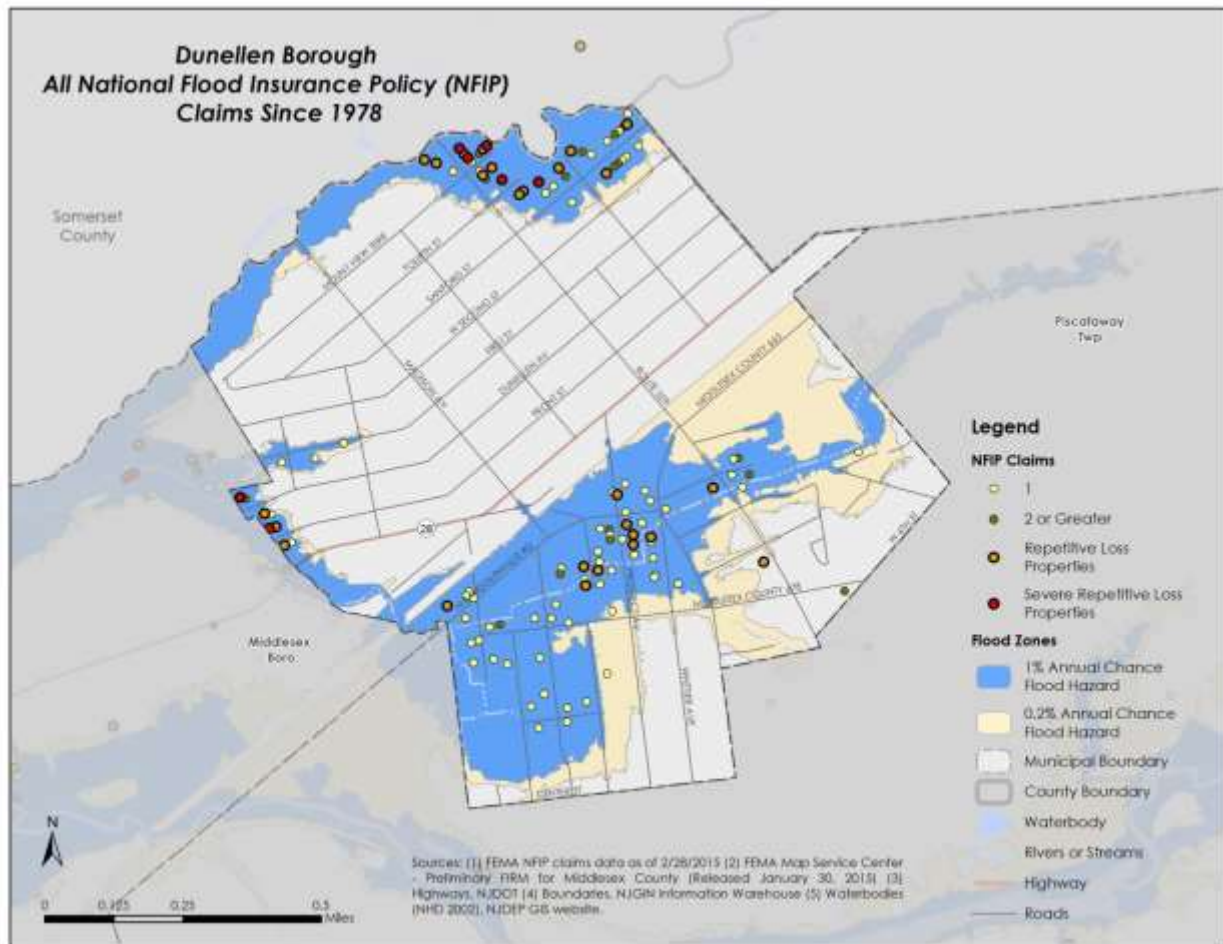
⁸ FEMA – Policy and Claim Statistics for Flood Insurance

⁹ FEMA – Community Rating System (CRS).



Figure 3-2 shows all NFIP claims in Dunellen between 1978 and 2015. Note the dense concentrations of claims in three distinct areas of the jurisdiction.

Figure 3-2
Map of NFIP Claims in the Borough of Dunellen (1978 to 2015),
Including Repetitive Loss and Severe Repetitive Loss Properties
(Source: FEMA National Flood Insurance Program, February 2015)



3.2.5 Flood Risk to Repetitive Loss Properties in Dunellen

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 Dunellen has two RL properties.)



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. Table 3-11 provides a comparison of the residential repetitive loss claims for Middlesex County and Dunellen. The tables below include the number of repetitive loss properties, building and contents damages, the total number of claims, and the average claim amounts.

The 31 repetitive loss properties in Dunellen were responsible for a total of 98 insurance claims, totaling \$1,453,220. Table 3-11 provides summary repetitive loss statistics for the community. Notably, the jurisdiction comprises only 0.33% of the total land area in the County, but 7.4% of the repetitive flood insurance claims. The average RL claim, however, is less than half the Countywide average, suggesting fairly frequent but relatively low-depth floods.

Table 3-11
Repetitive Loss Statistics in the Borough of Dunellen 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
Borough of Dunellen	31	\$1,323,433	\$129,787	\$1,453,220	98	\$14,829
Middlesex County	429	\$44,015,885	\$5,106,609	\$49,122,494	1,322	\$37,158

The next table shows the streets in Dunellen with the most insurance claims. For reasons of confidentiality, this mitigation plan does not show specific addresses.

Table 3-12
Streets in the Borough of Dunellen with Highest Numbers and Amounts of NFIP Claims
(Repetitive Loss Properties)
(Source: FEMA National Flood Insurance Program, February 2015)

Street Name	Building	Contents	Total	# Claims	Average
4th Street	\$100,942	\$1,295	\$102,237	10	\$10,224
Front Street	\$323,766	\$52,080	\$375,846	13	\$28,911
Jackson Avenue	\$267,324	\$23,044	\$290,367	11	\$26,397
Mountain View Terrace	\$144,255	\$34,040	\$178,295	10	\$17,829
Prospect Avenue	\$58,595	\$736	\$59,332	9	\$6,592
North Washington Avenue	\$155,978	\$10,923	\$166,902	15	\$11,127

The next table provides the results of a simple risk projection for repetitive loss properties. This is done by annualizing past insurance claims and using this as the basis for estimating future losses. This method employs standard FEMA statistical techniques, and may be used for developing a sense of flood risk, i.e. total future losses over the 100-year planning horizon. The results below should be considered general and preliminary. It is possible to complete more accurate risk assessments for specific projects using FEMA software and methodologies, combined with information about sites and facilities.



Table 3-13
100-Year Risk Projection for NFIP Repetitive Loss Properties in the Borough of Dunellen

Data	Value
Period in years	21
Number of claims	146
Average claims per year	6.95
Total value of claims	\$5,555,225
Average value of claims per year	\$264,535
Projected risk, 100-year horizon	\$3,774,908

3.2.6 Flood Risk to Severe Repetitive Loss Properties in Dunellen

The definition of Severe Repetitive Flood Loss is included in the County portion of this mitigation plan. As of February 2014, Dunellen had 10 properties that fall under this definition, and all of Middlesex County had 112. (Note that under the revised definition of Severe Repetitive Loss, the County now has 106 such properties, and Dunellen, eight.) Table 3-14 provides basic information about the SRL properties in this jurisdiction. SRL properties are also shown graphically in Figure 3-2.

Table 3-14
Statistics on NFIP Severe Repetitive Loss Properties in the Borough of Dunellen
(Source: FEMA National Flood Insurance Program, February 2015)

City/County Name	Properties	Total Building	Total Contents	Total Losses	# of Claims	Average Claim
Borough of Dunellen	10	\$654,012	\$83,698	\$737,710	44	\$16,766
Middlesex County	112	\$16,236,097	\$1,045,153	\$17,281,250	541	\$31,943

The next table shows the results of a simple risk (future losses) projection for severe repetitive loss properties. This is done by annualizing past losses and using this as the basis for estimating future losses. This method uses standard FEMA techniques, and may be used for developing a sense of flood risk. The results below should be considered general and preliminary. It is possible to complete more accurate risk assessments for specific projects using FEMA software and methodologies.

Table 3-15
100-Year Risk Projection for NFIP Severe Repetitive Loss Properties in the Borough of Dunellen

Data	Value
Period in years	16
Number of claims	44
Average claims per year	2.75
Total value of claims	\$737,710
Average value of claims per year	\$46,107
Projected risk, 100-year horizon	\$657,945



3.3 Hurricanes and Tropical Storms

Based on input from the hazard ranking process, Dunellen 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 3-17 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 3-19 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 3-17
Probabilistic Wind Risk in Dunellen, 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	1,028,377	\$5,549	\$2,613	\$124	\$891	\$476	\$447	\$578
Commercial	145,488	\$653	\$431	\$58	\$46	\$8	\$7	\$13
Industrial	5,553	\$31	\$16	\$2	\$5	\$0	\$0	\$0
Agricultural	81,623	\$565	\$196	\$0	\$76	\$43	\$7	\$102
Religious	16,047	\$96	\$54	\$0	\$19	\$1	\$3	\$149
Government	33,300	\$177	\$72	\$0	\$31	\$8	\$1	\$19
Education	23,885,722	\$642,847	\$208,956	\$0	\$38,026	\$87	\$15,415	\$204
Totals	25,196,110	\$649,918	\$212,337	\$184	\$39,094	\$623	\$15,880	\$1,064

Table 3-18
Probabilistic Wind Risk in Dunellen, 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	\$10,678	\$147,366	\$152,364
Commercial	\$1,215	\$16,766	\$17,335
Industrial	\$54	\$749	\$774
Agricultural	\$989	\$13,652	\$14,115
Religious	\$321	\$4,431	\$4,582
Government	\$308	\$4,246	\$4,390
Education	\$905,534	\$12,497,275	\$12,921,065
Totals	\$919,099	\$12,684,486	\$13,114,624

Table 3-19
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	\$152,102	\$29,851	\$0	\$0	\$3,947	\$0		\$185,900
Hurricane Sandy	\$258,103	\$115,454	\$0	\$0	\$0	\$0	\$44,901	\$418,457
Total	\$410,205	\$145,304	\$0	\$0	\$3,947	\$0	\$44,901	\$604,357



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 Borough of Dunellen during this plan update.

4.1.1 Planning and Regulatory

Tool / Program (code, ordinance, plan)	(Yes/No)	Code Citation and Comments
Master Plan	Y	2013
Capital Improvements Plan	N	Budget
Floodplain Management / Basin Plan	N	
Stormwater Management Plan	Y	State
Open Space Plan	N	
Stream Corridor Management Plan	N	As needed; railroad culvert is notable
Watershed Management or Protection Plan	N	
Economic Development Plan	N	
Comprehensive Emergency Management Plan	N	
Emergency Operation Plan	Y	2014 reapproved
Post-Disaster Recovery Plan	N	
Transportation Plan	N	
Strategic Recovery Planning Report	N	
Zoning Ordinance	Y	
Subdivision Ordinance	Y	
NFIP: Cumulative Substantial Damages	Y	
Growth Management Ordinances	N	
Site Plan Review Requirements	Y	
Stormwater Management Ordinance	Y	
Municipal Separate Storm Sewer System (MS4)	Y	Credit for stormwater reports
Combined Sewer Overflows (CSO)	N	
Natural Hazard Ordinance	N	
Post-Disaster Recovery Ordinance	N	
Real Estate Disclosure Requirement	N	
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	N	

4.1.2 Staff/Personnel

Resources	Is this in place? (Y/N)	Department/ Agency/Position
Planning Board	Y	
Mitigation Planning Committee	N	
Environmental Board/Commission	N	
Open Space Board/Committee	N	
Economic Development Commission/Committee	Y	Transit Village/Committee for downtown management
Maintenance Programs to Reduce Risk	Y	
Mutual Aid Agreements	Y	Piscataway, Middlesex, Middlesex County



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

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)	N		
Building Code Effectiveness Grading Schedule (BCEGS)	N		
Public Protection (ISO Fire Protection Classes 1 to 10)	N		
Storm Ready	N		
Firewise	N		
Disaster/Safety Programs in/for Schools	N		
Organizations with Mitigation Focus (advocacy group, non-government)	N		
Public Education Program/Outreach (through website, social media)	N		
Public-Private Partnerships	Y (Economic Development)		



4.1.4 Fiscal Capabilities

	Yes/No
Do you have a line item in your operating budget for mitigation project funding?	N
If no, will you look at mitigation actions when allocating funding in the future?	N
Do you have a line item in the Capital Improvement Budget for mitigation project funding?	N
Have you provided funding for mitigation projects identified in the hazard mitigation plan?	N
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?	
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)	



5. Mitigation Strategy

This section describes what projects, initiatives, and other actions the Borough 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. The actions marked with ~~strike through~~ are no longer priorities for the Borough as indicated below.

Mitigation Action	Responsible Party	Status	Review Comments
Dunellen 1: Flood water management South side	Engineering Department	The Borough has a 3-4 drainage projects underway.	Keep as future action
Dunellen 2: Public awareness program on local TV channel for hazard safety	Dunellen OEM	Do not have channel	
Dunellen 3: Code update	Building Department of each jurisdiction	This is outside of the jurisdiction's responsibility. They adopt the State's building code.	
Dunellen 4: Property acquisition/elevation of 3 repetitive loss properties located on Mountain View Terrace	Dunellen OEM	These actions have not been completed due to lack of resources.	This action has been replaced with actions below.
Dunellen 5: Property acquisition/elevation of 2 repetitive loss properties located on 4th Street.	Dunellen OEM	These actions have not been completed due to lack of resources.	This action has been replaced with actions below.
Dunellen 6: Property acquisition/elevation of 3 repetitive loss properties located on Jackson Ave.	Dunellen OEM	These actions have not been completed due to lack of resources.	This action has been replaced with actions below.
Dunellen 7: Property acquisition/elevation of 4 repetitive loss properties located on N. Washington Ave.	Dunellen OEM	These actions have not been completed due to lack of resources.	This action has been replaced with actions below.



Mitigation Action	Responsible Party	Status	Review Comments
Dunellen 8: Property acquisition/elevation of 2 repetitive loss properties located on Front Street.	Dunellen OEM	These actions have not been completed due to lack of resources.	This action has been replaced with actions below.

5.2 Proposed Mitigation Actions

The table below details the mitigation initiatives the Borough of Dunellen 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 Borough 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
Pursue CRS application	Reduced flood insurance premiums for businesses and residents	OEM Coordinator with significant support from County	County support/current staffing	1-2 years	Medium
Develop a shelter-in place or emergency response needs list	To allow efficient response during hazard events	OEM Coordinator	Current Staffing	1-3 years	High
Training and equipment for swiftwater rescue	Protect and train responders to Borough’s hazardous conditions during severe storm events	OEM	Grants	1-3 years	High
Support repetitive and severe repetitive loss residents in elevation and acquisition projects.	Reduce repetitive loss and at-risk properties within the Borough	Administration	State and federal funding	2-5 years	High



Desnagging of Bonygutt Brook	Improved flows through the Borough	DPW	Capital Funds	1-3 years	High
Ensure power duplicity at all critical facilities and utilities	Allow for continued operation of critical municipal services during and after a hazard event	OEM	Grants	2-5 years	Medium

6. Plan Implementation

The LPC shall document, as needed and appropriate:

- Hazard events and losses in Dunellen 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 Borough.
- Copies of any grant applications filed on behalf of the Borough

Continued Public Input

The Borough of Dunellen 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 Borough of Dunellen’s LPC shall ensure that:

- Copies of the latest approved Plan are available for review at Borough 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 Borough of Dunellen will post a notice on the Borough's website and invite the public to review and comment.
- For major changes involving Borough Council approval, the Borough 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 Borough Council approved the plan on [insert date]. The Borough 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 Borough of Dunellen 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 Emergency Management 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 Emergency Management Coordinator will convene a meeting of the LPC to review and approve all changes. The Borough retains the discretion to implement minor changes to the document without formal procedures involving the Borough Council subject to local policies and regulations.

In addition to the annual progress report, the Borough of Dunellen 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.