



Appendix 11: City of Plainfield

This appendix is part of the 2016 Union County Hazard Mitigation Plan (HMP) update, and includes only jurisdiction-specific information about the City of Plainfield, which is one of the 20 municipalities within Union County that is participating in the plan update. Union County led the planning process and outreach for this update. For a detailed description of the planning process and the public outreach efforts for this update, see Section 3 of the 2016 HMP.

1. Planning Process and Participation

The County formed a Steering Committee, which was responsible for key decisions during the plan update. This committee sent a letter to the Mayor of each municipality within the County. The Mayors and local officials selected a single individual to represent the town in the broader process. This person was the point of contact for the plan update, but worked with other municipal employees, consultants, volunteers, and other stakeholders throughout the planning process. This collection of participants, considered the local planning committee, is listed below. The committee was responsible for various decisions that informed the development of this appendix, including: prioritizing the natural hazards that can affect the community, reviewing and prioritizing the mitigation action, and informing community leaders about the status of the County mitigation plan update, including this appendix.

Table 11-1
Local Planning Committee (Source: City of Plainfield)

| Name | Title | Organization |
|---------------|---------------------------------------|--------------------------------------|
| Bernard Blake | Deputy OEM Coordinator | City of Plainfield |
| Eric Watson | Director of Public Works | City of Plainfield |
| Carl Riley | Director of Public Affairs And Safety | City of Plainfield |
| Frank Tidwell | Fire Chief | City of Plainfield |
| Wendell Bibbs | City Engineer | Remington Vernick & Arango Engineers |



2. Community Profile

The City of Plainfield has a total area of 6.034 Square miles and is located in the southwestern corner of Union County, adjacent to Somerset County. Major transportation routes include Route 28.

As of 2010, the population of Plainfield was estimated at 49,808 people, compared to 47,829 in the 2000 Census. This is an increase of 3.97% during the last ten-year period. Figure 11-1 is a map of the City of Plainfield. See Section 3 of the 2014 Plan update for a map of Union County.

Originally land occupied by the Watchungs of the Lenape Tribe, the land currently known as Plainfield was later occupied by settlers for farming and mill works. An original site in what is now Plainfield was referred to as “Milltown”, and there was a militia post in the area during the Revolutionary War. In the early 1800’s, the Village of Plainfield, named for the flat land it occupied, included mills, hatters, and an insurance company along with other local enterprises to support the community.¹ Following the completion of the railroad, Plainfield continued to grow, and became a Township in 1847, a Village in 1867 and finally, a City on April 2, 1869.

Plainfield government is structured with a Mayor and a seven-member City Council. Terms are four years each, and Plainfield’s four wards have one seat up for election each year, with the remaining three seats serving at-large.

2.1 Land Use and Development

Plainfield is a densely developed community, with 93.85 percent of its 5.96 square miles of land area classified as urban/developed. Over 83 percent of the parcels within Plainfield are classified as residential, based on tax assessment data. Between 2004 and 2012, 87 building permits were issued for residential homes within the City. This is 1.06 percent of the total building permits issued for Union County during this time period. All (100%) of these permits were for 1- and 2-family homes. Plainfield has a population density of 8357 people per square mile. The 2010 census estimates that 50 percent of the housing within the City was renter-occupied, higher than the County average of 30.5 percent renter-occupied properties.

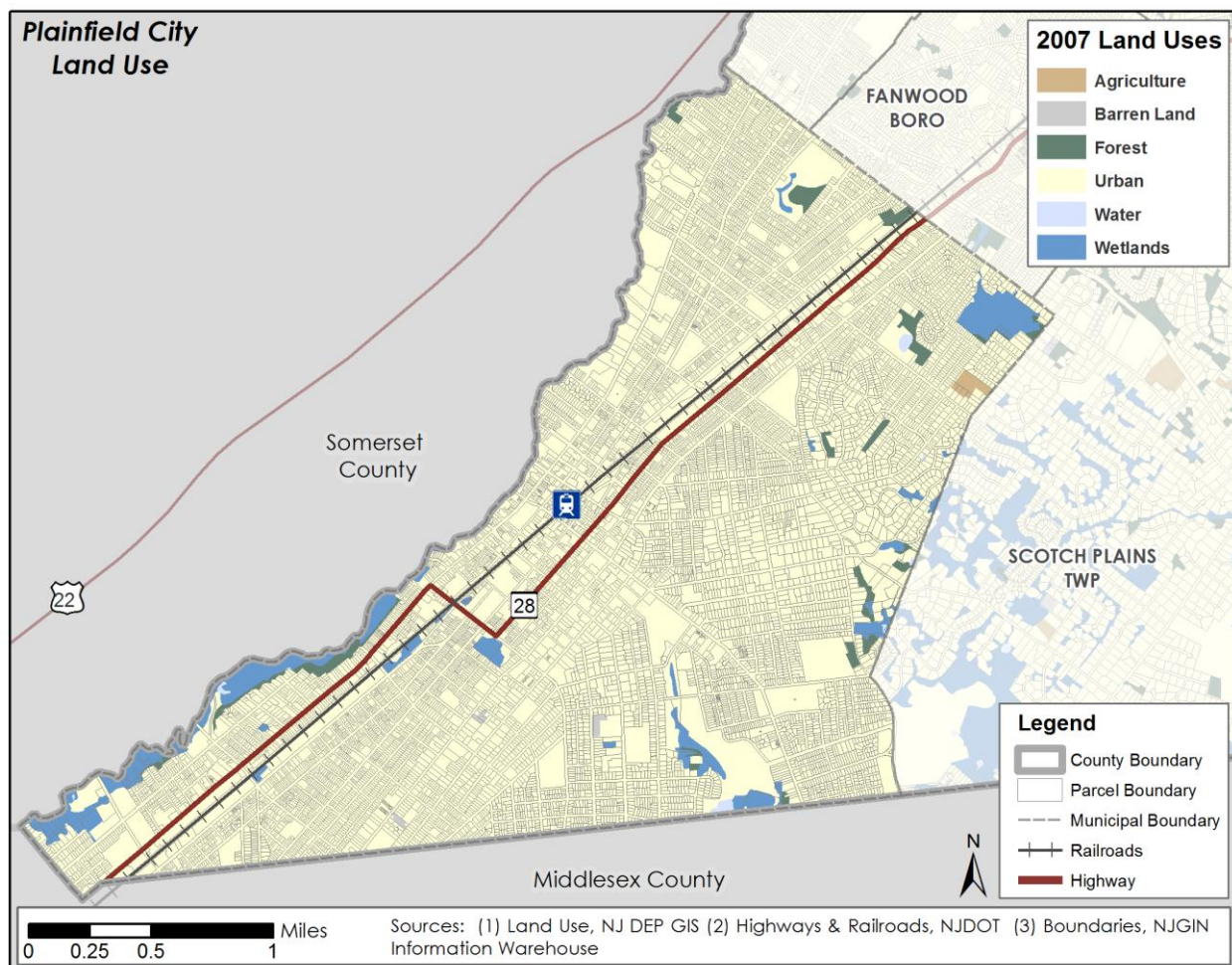
¹ “Plainfield, Past and Present”. <http://www.westfieldnj.com/whs/history/Countries/UnionCounty/plainfield.htm>



Table 11-2
Land Use/Land Cover Trends (NJDEP GIS, 2007)

| Land Cover Class | 2002 (acres) | 2007 (acres) | Percent Change | Percent of Total Land ² |
|------------------|--------------|--------------|----------------|------------------------------------|
| Agriculture | 7.45 | 6.45 | -13.45% | 0.17% |
| Barren Land | 1.90 | 4.67 | 146.12% | 0.12% |
| Forest | 53.72 | 54.33 | 1.14% | 1.42% |
| Urban | 3587.99 | 3585.50 | -0.07% | 93.85% |
| Water | 16.45 | 17.63 | 7.15% | 0.46% |
| Wetlands | 151.56 | 150.50 | -0.70% | 3.94% |

Figure 11-1
Land Use/Land Cover Map City of New Providence



² Uses the 2007 land cover values



3. Hazard Identification and Risk Assessment

This section of the Plainfield mitigation plan appendix describes the natural hazards and risks that can affect the community. It should be noted that -- in accordance with FEMA requirements -- only the hazards with aspects that are unique to the community (versus the County as a whole) are included in detail in this appendix.

3.1 Background and Hazard Rankings

Like all the other jurisdictions in Union County, the City of Plainfield is potentially subject to the effects of all the hazards that are considered in this mitigation plan. However, the majority of these hazards have minimal impacts on the area, and are discussed in detail in the County part of the 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 Union County HMP update includes separate appendices for each jurisdiction, this requirement is met in the appendices, while risks that affect the entire County uniformly are discussed in the County part of the HMP.

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. Jurisdictions ranked the list of hazards as either high, medium, low, or no concern.

Table 11-3 shows Plainfield’s hazard rankings. The level of discussion and detail about specific hazards in this section are based on these rankings. Hazards that are ranked *high* include the most detail, and to the extent possible include probabilistic assessments of risk, i.e. likely future damages in the community based on the likelihood of occurrence. Hazards that are ranked *medium* have less detail and may in some cases refer to the main part of the county mitigation plan; they usually do not have

Table 11-3
City of Plainfield Hazard Identification and Prioritization

| Hazard | Priority |
|---------------------------------|-----------------|
| Extreme temperature – cold | High |
| Flood | High |
| Severe storm – lightning | High |
| Severe storm – winter weather | High |
| Extreme temperature – heat | Med |
| Hazmat release – fixed site | Med |
| Hazmat release – transportation | Med |
| Ice storm | Med |
| Straight-line winds | Med |
| Dam failure | Low |
| Drought | Low |
| Earthquake / Geological | Low |
| Erosion | Low |
| Hail | Low |
| High wind – tornado | Low |
| Landslide (non-seismic) | Low |
| Storm surge | Low |
| Wildfire | Low |

**Only the hazards ranked high and medium are analyzed in this appendix*



probabilistic risk assessments, although potential future losses are discussed based on best available data. Hazards ranked *low* and *none* are not addressed in this jurisdictional appendix because they are discussed in the County part of the HMP, and there are no significant differences in risk between the County and the municipality.

3.2 Winter Weather Hazard in the Community

Because the hazards severe storm – winter weather, ice storms and extreme temperatures – cold are closely related, they are combined in this subsection of the appendix. Severe storms and winter weather risks are discussed in detail in Section 4 of the County portion of this mitigation plan. There are no significant differences in the type, location or extent of this hazard between the County and City of Plainfield, and there are no aspects of the hazard that are unique to this jurisdiction.

3.2.1 Previous Occurrences and the Probability of Future Occurrences

Previous occurrences of the severe storm-winter weather/ice storm/extreme temperature - cold hazards are discussed in detail in the County portion of this hazard mitigation plan (see Section 4), and for reasons of brevity are not repeated here. There are no meaningful differences between the County as a whole versus City of Plainfield with regard to occurrences or the future probability of these hazards.

3.2.2 Severe Storm – Winter Weather Impacts and Vulnerabilities to the Hazard

The impacts from these three hazards in City of Plainfield are substantially similar to the County as a whole, and include lost productivity, traffic accidents, downed trees (and related power losses), medical events (such as heart attacks), and hypothermia (which rarely causes any significant or long-term problems). The community has no unique or pronounced vulnerabilities to these hazards. Like most established communities, over time City of Plainfield has adapted its systems and infrastructure to minimize the effects of cold weather and associated meteorological effects. In rare cases, buildings may experience structural problems due to snow loads, and public or private infrastructure may fail due to freezing. However, these problems are usually minor and are addressed by private citizens (through their own work, or via insurance proceeds) or by the government in the case of infrastructure.

Perhaps the most significant potential impacts of winter weather are traffic accidents (with related injuries and fatalities), and power losses from ice and downed trees. For the most part, damage to vehicles is addressed via private insurance, records of which are proprietary. However, there are national statistics regarding injuries and deaths related to such weather. Local values for injuries and deaths can be deduced from national statistics. Figures for City of Plainfield are displayed in the table below. Refer to the County portion of this mitigation plan for source citations and an explanation of the methodology.



**Table 11-4: Winter Storm-related Risks
(traffic injuries and fatalities),
City of Plainfield 50- and 100-year Planning Horizons**

| | Injuries (combined) | Deaths |
|---------------------------------|---------------------|--------------|
| Snow/sleet | \$6,840,918 | \$776,864 |
| Icy pavement | \$5,322,286 | \$585,931 |
| Snow/sleet | \$5,130,069 | \$516,226 |
| Total annual risk (all hazards) | \$17,293,274 | \$1,879,021 |
| 50-year risk | \$238,647,182 | \$25,930,494 |
| 100-year risk | \$246,775,021 | \$26,813,634 |

An additional source of risk from cold and winter weather is hypothermia deaths. Although the risk from this hazard is relatively small, it can nevertheless be calculated by deduction from national statistics. Annual deaths nationwide were obtained from a U.S. Centers for Disease Control report (National Health Statistics Reports, Deaths Attributed to Heat, Cold and Other Weather Events in the United States, 2006-2010).

**Table 11-5
Risks from Hypothermia City of Plainfield
Annually and 50- and 100-year Planning Horizons**

| 2010 Population | % of US | Annual Death \$ | 50-year Horizon | 100-year Horizon |
|-----------------|---------|-----------------|-----------------|------------------|
| 49,808 | 0.0158% | \$1,344,005 | \$18,547,274 | \$19,178,957 |

3.3 Flood Hazard

3.3.1 Type, Location and Extent

As shown in Figure 11-2 below, the three flood zones in City of Plainfield are concentrated around major flooding sources: Green Brook, Cedar Brook, and Branch 22 of Robinsons Branch. Green Brook constitutes the western boundary of the City. It has a relatively narrow floodplain in its southern section, while in its northern reach, it has a very wide floodplain that eventually spreads out as shallow flooding zone all the way to the Conrail railroad tracks. The Cedar Brook seems to be a major source of flooding, although its original dry weather flow path is diverted through the underground tunnel under the City center. During flood events, this flow partially reverts to its original path and its zone of shallow flooding joins the one of the Green Brook. The overground flow continues in southward direction and eventually joins the underground discharge at the Cedar Brook tunnel outflow below the Plainfield High School. The third source of flooding is located in the northeastern corner of the City, where Branch 22 of Robinsons Branch flows in southward directions and has a relatively wide floodplain. All of the above flood sources seem to be affecting numerous properties. Also, flooding occurs to a few additional

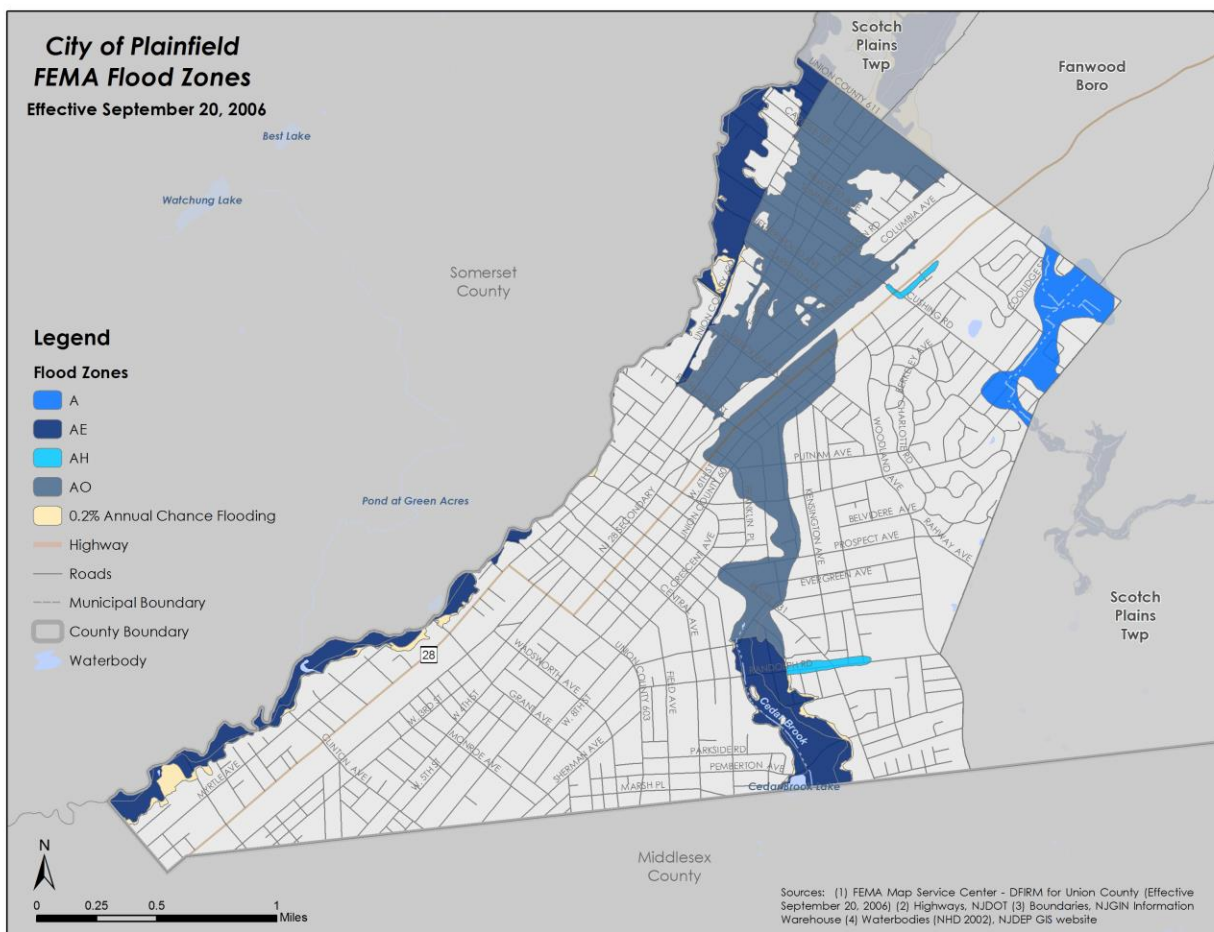


individual properties outside of the SFHA (particularly within Wards 1 and 3) as a result of drainage problems along smaller, unnamed streams and drainage channels.

The high number of flood insurance claims (748) and the relatively low amount of the claims (\$4,973) in Plainfield suggests a relatively high level of vulnerability to floods in this community, in terms of the numbers of claims versus the overall number of parcels (10,585) but not in terms of the presumed severity of flooding based on the claims amounts.

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.³ The effective FIRM date for Union County is September 20th, 2006 and is shown in Figure 11-2.

Figure 11-2
Effective FIRM City of Plainfield





Current FEMA guidance uses the term *extent* as analogous to potential severity. Compared to most other jurisdictions in Union County, Plainfield has few flooding sources, but relatively large area of floodplain. Although it is difficult to deduce potential severity accurately, it is safe to assume that the extent of flooding in Plainfield is relatively low; in more severe events such as tropical cyclones and nor'easters some areas along the upper reach of Green Brook, along Cedar Brook and section of Branch 22 within the City can expect to have more severe flooding.

Table 11-6 shows the number of parcels in The City of Plainfield with at least 60% of their area in the 100-year (1% annual) and 500-year (0.2% annual) floodplain. Although these figures offer some insight into the flood hazard in this jurisdiction, they are not particularly reliable as a risk indicator because in many cases structures and infrastructure (where the risk-producing impacts occur) are not located in the specific areas that are in the floodplain.

Table 11-6
Flood-prone Properties

| Flood hazard area | Number of Parcels |
|----------------------------|-------------------|
| 100-year (1%) floodplain | 2,089 |
| 500-year (0.2%) floodplain | 12 |

3.3.2 Previous Occurrences and the Probability of Future Floods

Minor flooding occurs in the City of Plainfield at least annually, although the severity of these frequent events is not significant. As discussed in the main (County) section of the mitigation plan, more significant events like tropical cyclones and nor'easters occur every few years (section citation to main plan), and can result in significant flooding. Notwithstanding the potential effects of climate change on weather patterns, the City can probably expect to experience some level of flooding every year or two, with more significant events happening every five to ten years on average. A basic review of NFIP claims for Plainfield shows a wide range of claims dates, with high concentrations related to the remnants of Hurricane Floyd in 1999, Nor'easter of 2007 and Hurricane Irene in 2011. The main County HMP includes more information about events that have impacted this area, in particular the problems with overland flow and underground diversion of Cedar Brook.

3.3.3 Flood Impacts and Vulnerability to Flooding



**Table 11-7
NFIP Policies and Claims**

| | |
|-------------------------------------|--------------|
| Number of Parcels: | |
| Plainfield: | 10,585 |
| Union County: | 147,302 |
| Number of Policies In-Force: | |
| Plainfield: | 1,392 |
| Union County: | 6,009 |
| Number of Claims: | |
| Plainfield: | 748 |
| Union County: | 5,560 |
| Total Paid Claims | |
| Plainfield: | \$3,719,615 |
| Union County: | \$96,782,279 |
| Repetitive Loss Properties: | |
| Plainfield: | 79 |
| Union County: | 707 |
| Total Building | |
| Plainfield: | \$1,610,476 |
| Union County: | \$16,597,500 |
| Total Contents | |
| Plainfield: | \$134,473 |
| Union County: | \$3,787,671 |
| Number of Claims | |
| Plainfield: | 198 |
| Union County: | 2,061 |
| Average Claim | |
| Plainfield: | \$8,813 |
| Union County: | \$9,891 |

As discussed elsewhere, flood impacts in Plainfield City are widespread, but not very high, based on various metrics such as NFIP claims, FEMA PA Program Project Worksheets, and the known history of flooding. There is no history of flood damage to critical facilities and infrastructure. The most vulnerable parts of the community are those that are in or adjacent to the floodplains of the Green Brook River and Cedar Brook, including large swaths of shallow flooding flood zone (AO zone) in central parts of the City. Although the majority of flood insurance claims in this community are not categorized as repetitive losses, there are nevertheless a significant number of repetitive claims on properties north of Route 28 in the wide floodplains of Green Brook and Cedar Brook. There are additional clusters of flood insurance claims along the Plainfield-Scotch Plains, along Branch 22. As shown in Table 11-7, the jurisdiction has had 748 NFIP claims since 1978, the third highest number compared to other jurisdictions in Union County. The average amount of claims is relatively low at \$4,973, compared to the County average of \$17,407.

3.3.4 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). The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the federal government will make flood insurance available within the

community as a financial protection against flood losses. The City of Plainfield has been a member of the NFIP since 1971.

FEMA NFIP statistics indicate that as of February 2014, federal flood insurance policies were in-force on 1,392 properties in the City of Plainfield. This represents a dollar value of property and contents coverage totaling \$302,471,800. Between 1978 and 2014, there have been a total of 748 NFIP



insurance claims in the City of Plainfield with a total claims value of \$3,719,615. Table 11-7 compares the number of policies in-force and paid claims in the jurisdiction. The Table shows that Plainfield comprises 22.9% of the NFIP policies in-force in Union County.

The City of Plainfield is a member of FEMA's Community Rating System (CRS), a voluntary program for communities participating in the NFIP. The CRS is an 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. CRS communities are ranked between 1 and 10, with Class 1 communities receiving a 45% premium discount. Plainfield has been a member of CRS since 1992, and is current a class 10R community (rescinded). The City is interested in pursuing an application for the program; this is reflected in their new mitigation actions.

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.

FEMA requires a discussion of NFIP Repetitive Loss and Severe Repetitive flood loss statistics in hazard mitigation plans. The NFIP defines *repetitive loss* properties as those with two or more claims of more than \$1,000 each during any rolling ten-year period.

The flood risk assessment method is based on analysis of NFIP data on repetitive flood loss properties. The NFIP defines repetitive loss (RL) properties as those that have received at least two NFIP insurance payments of more than \$1,000 each in any rolling ten-year period. As of February 2014, Union County had 707 such properties based on a query of the FEMA BureauNet NFIP interface. Of this total, 79 were located within Plainfield; this comprises roughly 11% of the County total. Table 11-8 provides a comparison of the residential repetitive loss claims for Union County and The City of Plainfield. The tables below include the number of repetitive loss properties, building and contents damages, the total number of claims, and the average claim amounts. These properties are also shown in Figure 11-3 above.

In general, the RL claims can be broken down by focusing on specific areas in the jurisdiction where flood losses are concentrated. For the reasons of practicality, the areas of concentration are defined as streets with three or more repetitive loss properties. Table 11-8 provides a summary of the streets with the most cumulative repetitive loss flood insurance claims in Plainfield. The table includes the building, contents, and total claims data for the properties. Address data about individual sites is omitted for reasons of confidentiality.



Table 11-8
Repetitive Loss Areas, City of Plainfield

| Street Name | # Claims | Average |
|-------------------|----------|----------|
| Netherwood Avenue | 30 | \$10,727 |
| George Street | 15 | \$8,302 |
| Carlisle Terrace | 11 | \$11,321 |
| Wiley Avenue | 8 | \$10,877 |
| East Front Street | 8 | \$7,176 |
| St. Marys Avenue | 6 | \$8,979 |
| Watson Avenue | 9 | \$5,723 |
| Inwood Place | 9 | \$5,453 |
| Johnson Avenue | 12 | \$3,657 |
| Birch Avenue | 7 | \$5,119 |
| Sumner Avenue | 6 | \$4,831 |

3.3.5 Flood Risk to Repetitive Loss Properties in Plainfield

Residential flood risk is calculated by a simple methodology that uses the FEMA default present-value coefficients from the benefit-cost analysis software modules. To perform this calculation, the flood insurance claims data were reviewed to determine an approximate period over which the claims occurred. This method should be used only for very general estimates of flood risk because the NFIP data represents only part of the flood losses in any jurisdiction. This is because there are always properties that are uninsured or under-insured. Most of the flood claims in the most recent query occurred between 1996 and 2011, a period of 16 years.

As shown in Table 11-9, there have been 79 flood insurance claims in the 16-year period, for an average number of claims per year of 4.9. Based on a 100-year horizon and a present value coefficient of 14.27 (the coefficient for 100 years using the mandatory OMB discount rate of 7.0 percent), the projected flood risk to these properties is \$1,556,276. It must be understood that individuals can obtain and cancel flood insurance policies, and the flood hazard depends on many variables, including the weather, so this projection is simply an estimate of potential damages. Nevertheless, it offers a useful metric that can be used in assessing the potential cost effectiveness of mitigation actions, although in this case, site-specific loss estimates are fairly small, meaning that the amount of grant funds that could be expended on projects will probably be limited.



Table 11-9: Projected 100-year Flood based on Past Flood Insurance Claims

| Data | Value |
|---|--------------------|
| Period in years | 16 |
| Number of claims | 79 |
| Average claims per year | 4.9 |
| Total value of claims | \$1,744,949 |
| Average value of claims per year | \$109,059 |
| Projected risk, 100-year horizon | \$1,556,276 |

3.3.6 Flood Risk to Severe Repetitive Loss Properties in Plainfield

The definition of Severe Repetitive Flood Loss is included in the County portion of this mitigation plan. As of February 2014, Plainfield has two (2) severe repetitive flood loss properties. Table 11-10 summarizes information about the SRL properties in Plainfield. Data for this limited number of properties is insufficient to perform a meaningful risk assessment.

**Table 11-10
Summary of NFIP Severe Repetitive Loss Statistics, Plainfield City**

| | Properties | Total Building | Total Contents | Total Losses | # Claims | Average Claim |
|-----------------|------------|----------------|----------------|--------------|----------|---------------|
| Plainfield City | 2 | \$134,906 | \$33,498 | \$168,404 | 10 | \$16840 |

3.4 Lightning

3.4.1 Type, Location and Extent of the Lightning Hazard in the Community

Lightning weather risks are discussed in detail in Section 4 of the County portion of this mitigation plan. There are no significant differences in the type, location or extent of this hazard between the County and City of Plainfield, and there are no aspects of the hazard that are unique to this jurisdiction.

3.4.2 Previous Lightning Occurrences and the Probability of Future Occurrences

Previous **occurrences** of the lightning hazard are discussed in detail in the County portion of this hazard mitigation plan (see Section 4), and for reasons of brevity are not repeated here. There are no meaningful differences between the County as a whole versus City of Plainfield with regard to occurrences or the **future probability** of this hazard.

3.4.3 Impacts on the Community, and Community Vulnerabilities to the Hazard

Lightning **impacts** in City of Plainfield are substantially similar to the County as a whole. These include occasional impacts on electrical systems, and (very infrequently) damage to structures. The most common impact is damage to trees. The community has no unique or pronounced **vulnerabilities** to lightning, but it is possible to complete a basic quantitative estimate of potential risks from lightning



deaths and damages based on open source information found in a publication entitled *Lightning Fires and Lightning Strikes* (Marty Ahrens, June 2013; National Fire Protection Association, Fire Analysis and Research Division). The County portion of this hazard mitigation plan includes citations and further discussion of the methodology and figures (See Section 4). The table below provides estimated risks in City of Plainfield from lightning deaths and damages based on statistics described in this publication.

Table 11-11
Lightning-related Risks, City of Plainfield
Annual, 50- and 100-year Planning Horizons

| Horizon | Deaths | Damages |
|---------------|-----------|-----------|
| Annual risk | \$27,577 | \$17,763 |
| 50-year risk | \$380,559 | \$245,134 |
| 100-year risk | \$393,520 | \$253,482 |

3.5 Extreme Temperature – Heat

3.5.1 Type, Location and Extent in the Community

Heat risks are discussed in detail in Section 4 of the County portion of this mitigation plan. There are no significant differences in the type, location or extent of this hazard between the County and City of Plainfield, and there are no aspects of the hazard that are unique to this jurisdiction.

3.5.2 Previous Heat Occurrences and the Probability of Future Occurrences

Previous **occurrences** of the heat hazard are discussed in detail in the County portion of this hazard mitigation plan (see Section 4), and for reasons of brevity are not repeated here. There are no meaningful differences between the County as a whole versus City of Plainfield with regard to occurrences or the **future probability** of this hazard.

3.5.3 Impacts on the Community, and Community Vulnerabilities to the Hazard

Heat **impacts** in City of Plainfield are substantially similar to the County as a whole. There are various potential impacts from this hazard, including stresses on electrical systems, damage to infrastructure such as roads, and illness/death. There are no reliable data related to the first two effects, but there is some information related to deaths from heat-related hazards from a U.S. Centers for Disease Control report (National Health Statistics Reports, *Deaths Attributed to Heat, Cold and Other Weather Events in the United States, 2006-2010.*). As explained in the County portion of this mitigation plan, national-level data about such deaths were scaled to the local level by population.



Table 11-12
Heat-related Risks, City of Plainfield
Annual, 50- and 100-year Planning Horizons

| Horizon | Damages |
|---------------|-------------|
| Annual risk | \$480,868 |
| 50-year risk | \$6,635,977 |
| 100-year risk | \$6,861,985 |

3.6 Hazardous Materials Releases – Fixed Sites and Transportation

The main section of this hazard mitigation plan includes more details about the hazardous materials hazards in the County as a whole, although by their nature such events are non-probabilistic. As such, it is impossible to estimate risk with any accuracy whatsoever. Hazardous materials releases are included in this appendix because the County required that it remain on the list of hazards, and City of Plainfield indicated it as a hazard of high or medium concern. However, for reasons of security and a lack of open-source information, this subsection is necessarily short and very general.

This mitigation plan is a public document, and as such does not include any descriptions specific enough that they could be used for malicious purposes. As part of this HMP update, the planning team queried the New Jersey Department of Environmental Protection Right to Know database. The database includes reports of hazardous materials spills, listing their location, date of occurrence and the type of material. The database was queried from January 2000 to the present day. Results are a combination of occurrences on fixed sites and those related to transportation. For City of Plainfield these tended to be in five categories: soil contamination, underground tanks (presumably leakage), illegal dumping, improper storage/disposal, abandoned containers.

3.6.1 Fixed Sites

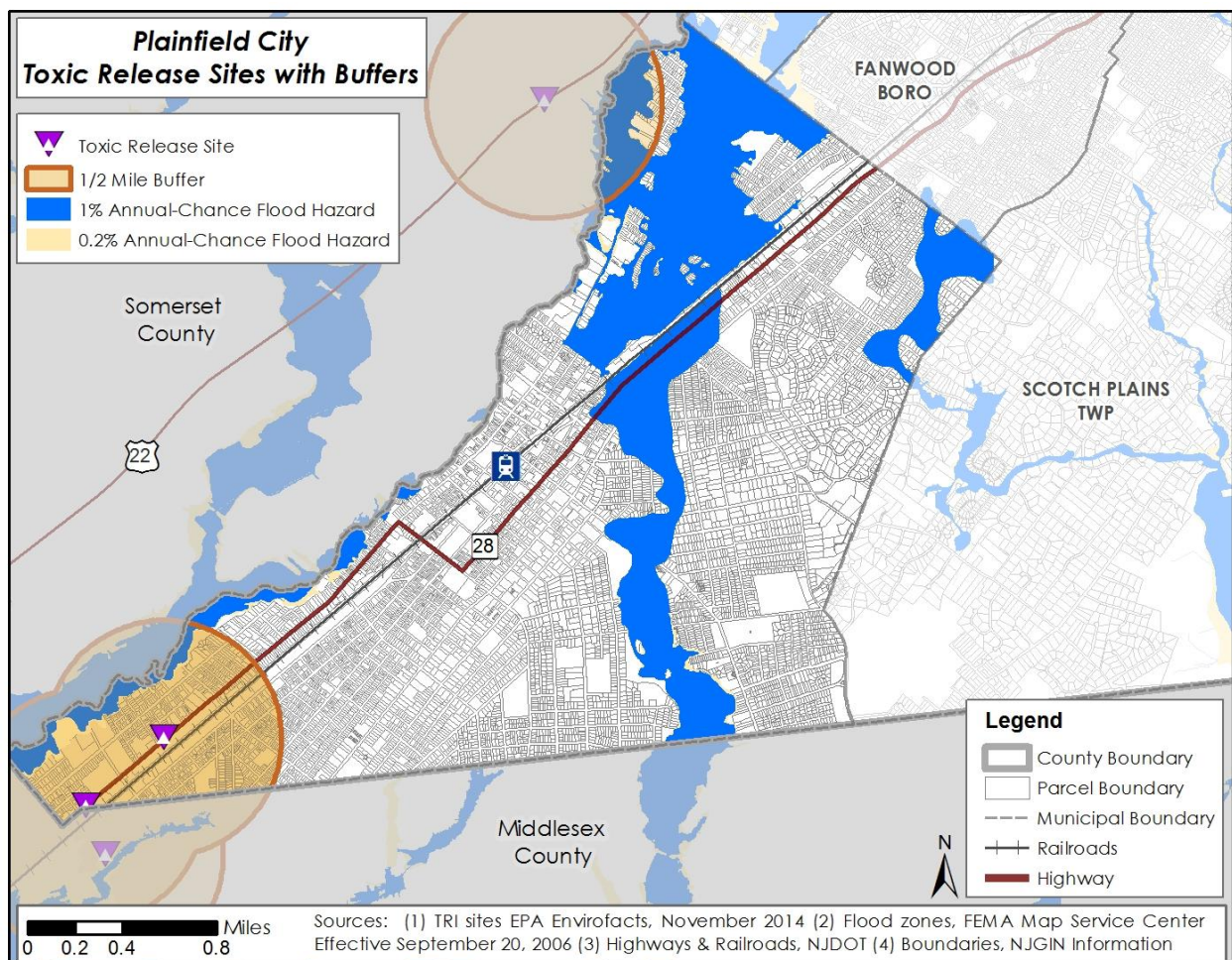
The US Environmental Protection Agency maintains a database of toxic releases by site. The database is known as the Toxic Release Inventory (TRI), and provides basic information about the locations, types and amounts of releases of hazardous materials. This is explained in detail in the County section of this mitigation plan. Union County has 138 such sites, two of which are in City of Plainfield (and additional two on the outside within half-mile buffer). The following graphic shows the TRI sites in an around the jurisdiction, with a half-mile buffer depicted. This does not suggest a specific level of increased risk within the buffer, however, as the potential for exposure and possible effects are dependent on many factors, most of which are not explained in this appendix.



3.6.2 Transportation

Because of the large presence of the chemical and oil industries in eastern New Jersey, many major transportation routes and rail lines carry a high volume of hazardous materials, many of which could cause damage, death and injury to Union County under some circumstances. As noted, there are few open sources of information about the materials that are transported on these routes, the routes themselves, or the carriers' schedules. For more information contact the New Jersey State Department of Environmental Protection or local Emergency Management offices.

Figure 11-3
Map of Toxic Release Inventory Sites





3.7 Straight Line Wind Hazard

3.7.1 Type, Location, and Extent

The high wind – straight-line wind hazard (including type, location and extent) is uniform across Union County, and is discussed in detail in the County portion of this mitigation plan (see Section 4). For reasons of brevity these details are not repeated here. There are no wind hazards that are unique to City of Plainfield.

3.7.1 Previous Occurrences and the Probability of Future Occurrences

Previously occurrences and the probability of future events are the same for City of Plainfield as for Union County. Refer to Section 4 for that information at a County level.

3.7.2 Straight Line Wind Impacts and Vulnerabilities to the Hazard

City of Plainfield is a typical residential community, predominated by balloon-frame and unreinforced masonry residential structures, the majority of which have gable or hip roofs. As discussed in the County part of the plan, wind profiles in this area of the country indicate a relatively low potential for severe events, and adequate construction techniques and building codes have generally sufficed to keep risks low. There are two main sources of potential wind damage in such communities: (1) structural damage to residential and non-residential buildings, and (2) power losses, mainly due to trees falling on above-ground lines. There are established methodologies for completing general risk assessments for these hazards. These are explained in detail in the County portion of the plan (see Section 4). Table 11-13 below summarizes annual straight-line wind risks and cumulative risks over 50- and 100-year planning horizons in City of Plainfield. Risks are in seven discreet categories: building damages, contents damages, inventory loss, relocation costs, business income lost, rental income lost and wages lost.



**Table 11-13: Straight-line Wind Risks for Range of Loss Types,
City of Plainfield
Annualized and 50- and 100-year Planning Horizons**

| Occupancy Class | Total SF | Total Annualized Damages | 50-year Risk | 100-year Risk |
|-----------------|-------------------|--------------------------|--------------------|--------------------|
| Residential | 19,822,298 | \$368,711 | \$5,088,583 | \$5,261,140 |
| Commercial | 4,141,911 | \$41,053 | \$566,571 | \$585,784 |
| Industrial | 1,384,833 | \$13,817 | \$190,690 | \$197,157 |
| Agricultural | 38,478 | \$389 | \$5,366 | \$5,548 |
| Religious | 590,132 | \$6,374 | \$87,970 | \$90,953 |
| Government | 127,903 | \$1,722 | \$23,771 | \$24,577 |
| Education | 882,943 | \$8,780 | \$121,174 | \$125,283 |
| Total | 26,988,499 | \$440,847 | \$6,084,126 | \$6,290,442 |

The next table shows power loss risks in City of Plainfield, again annualized and for 50- and 100-year planning horizons. The methodology for these calculations (and additional jurisdiction-level data) can be found in Section 4 of the County plan.

**Table 11-14
Straight-line Wind Risks for Power Losses,
City of Plainfield, Annualized and 50- and 100-year Planning Horizons**

| Period | Risk Value |
|---------------------------|-------------|
| Annual | \$513,600 |
| 50-year planning horizon | \$7,088,063 |
| 100-year planning horizon | \$7,328,687 |



3.7 Critical Facilities

Three elementary schools and the High School within the City are located within the Special Flood Hazard Area. These facilities are owned and managed by the Plainfield Public School District. The City does not have ownership authority over these facilities.

| Building | Address |
|------------------------------------|----------------------------------|
| Plainfield Sta. | |
| Hubbard M.S. | 661 W 8 th St. |
| Cook Sch. | 739 Leland Ave. |
| Emerson Sch. | 305 Emerson Ave. |
| Woodland Sch. | 730 Central St. |
| Barlow Sch. | 801-823 East Front Street |
| Evergreen Sch. | 1033 Evergreen Ave. |
| Maxon M.S. | 920 E 7 th St. |
| Jefferson Sch. | 1200 Myrtle St. |
| Kings Temple Sch. | 121-123 New St |
| Plainfield H.S. | 950 Park Ave. |
| Cedarbrook Sch. | 1049 Central Ave. |
| Stillman Sch. | 201 W 4 th St |
| Koinonia Acad. | 1040 Plainfield Ave. |
| Clinton Sch. | 1302 West 4 th Street |
| Washington Sch. | 427 Darrow Ave. |
| Police H.Q. | 200 E 4 th St. |
| City Hall | 515 Watchung Ave |
| Public Library | 800 Park Avenue |
| Fire Station – 3 Engine Station | 1015 South Ave |
| Fire Station -4 Engine Station | 1145 W. 3 rd St |
| Fire Station – H.Q. | 315 Central St. |
| Union County Social Services | Madison and W. Second St. |
| U.C. College | 232 East Second Street |
| Queen City Academy | 815 W. 7 th St. |
| Main P.O. 07060 | 201 Watchung Ave. |
| Covenant Manor – Senior Residence | 623 East Front Street |
| Cedar Brook Apartments | 1272 Park Avenue |
| Richmond Towers | 510-520 East Front Street |
| Senior Building | 400 East Front Street |
| Plainfield Tower West | 601 West 7 th Street |
| Neighborhood Health Service Center | 1700 Myrtle Avenue |



4. City of Plainfield Mitigation Strategy

This section contains goals, objectives, and action items for the City of Plainfield, as part of the Union County Plan Update. The goals are similar to the goals outlined in the County plan, but the objectives are adjusted for the jurisdiction. The definitions for these terms can be found in Section 6 of the Union County Plan Update.

4.1 Goals

- Goal 1: Improve **LOCAL KNOWLEDGE** about the potential impacts of hazards, and the identification of specific measures that can be taken to reduce their impacts
- Goal 2: Improve **DATA COLLECTION, USE, AND SHARING** to reduce the impacts of hazards
- Goal 3: Improve **CAPABILITIES, COORDINATION, AND OPPORTUNITIES** to plan and implement risk reduction projects, programs, and activities
- Goal 4: Pursue a range of **MITIGATION OPPORTUNITIES**, including addressing NFIP repetitive and severe repetitive loss properties, and reducing risk to public properties and infrastructure

4.2 Objectives

- Objective 1.A: Increase risk awareness among officials and citizens.
- Objective 1.B: Maintain and improve jurisdiction-level awareness regarding funding opportunities for mitigation, including that provided by FEMA and other federal and State agencies.
- Objective 2.A: Improve the availability and accuracy of risk- and mitigation-related data at the local level, as the basis for planning and development of risk-reduction activities.
- Objective 2.B: Ensure that government officials and local practitioners have accurate and current information about best practices for hazard mitigation planning, project identification, and implementation.
- Objective 2.C: Develop and maintain detailed data about critical facilities, as the basis for risk assessment and development of mitigation options.
- Objective 3.A: Continue support of hazard mitigation planning, project identification, and implementation at the municipal level.
- Objective 3.B: Continue close coordination with the County in a range of risk-related areas, such as FEMA programs, mitigation planning, development of hazard mitigation projects, etc.
- Objective 3.C: Increase property owner participation in the National Flood Insurance Program.
- Objective 3.D: Implement activities to improve the community's CRS rating.
- Objective 3.E: Work towards increasing the integration of mitigation principles and activities in a range of local regulations, plans, ordinances and activities.
- Objective 3.F: Maintain and improve coordination with surrounding communities with regard to understanding and reducing risks.
- Objective 4.A: Facilitate development and timely submittal of project applications meeting state and federal guidelines for funding (1) for RL and SRL properties and (2) for hardening/retrofitting infrastructure that is at the highest risk.
- Objective 4.B: Maintain and enhance local planning and regulatory standards related to future development and investments.



4.3 Mitigation Strategy

4.3.1 Existing Mitigation Actions

The table below lists prioritized mitigation projects and actions identified by the City of Plainfield.

| Mitigation Action, Program, or Project | Hazard | Priority | Implementation Mechanism | Responsible Party | Target Start Date | Project Duration | Estimated Cost | Current Status |
|--|--------|----------|--|---------------------------|-------------------|------------------|----------------|---|
| Storm-water management system upgrade and improvement including retention basins, along Leland Avenue, Netherwood Avenue, Farraget Avenue, Raymond Avenue, Milton Place, , Rose Street, 1200 Block of Arlington Avenue, Stelle Avenue, 500 North Block Avenue. | Flood | High | Floodplain Management/ City Capital Improvement Plan (CIP) | Plainfield DPW | Summer 2014 | 1-2 years | \$400,000 | Since project initiated in the summer of 2014, catch basins have been updated along Leland Avenue. Currently replacing the Raymond Ave. Bridge. |
| Stream bank stabilization and augmentation of Cedar Brook to protect Apartment complexes at Rose and Randolph Road. | Flood | High | Floodplain Management/CIP | Plainfield OEM & Engineer | | 1-2 years | \$500,000 | Currently no funding source identified |
| Flood proofing for four apartment complexes located within the SFHA. These include the Richmond Tower Apartments, Cedar Brook Apartments, and Covenant Manor. | Flood | High | Capital Improvement | Plainfield OEM | | 2-3 Years | \$320,000 | Currently no funding source identified |



| Mitigation Action, Program, or Project | Hazard | Priority | Implementation Mechanism | Responsible Party | Target Start Date | Project Duration | Estimated Cost | Current Status |
|---|-------------|----------|---------------------------|--|-------------------|------------------|--------------------|--|
| Backup power/bury lines for Fire Station on Central Avenue | All-Hazards | Low | FEMA HMGP grant (DR-4086) | Plainfield DPW | 2015 | One Year | \$315,000 | HMGP grant submitted in March 2014. Currently under review with NJOEM. |
| Backup power/ bury lines for Fire Station at Bergen and 3 rd | All-Hazards | Low | Capital Improvement | Plainfield DPW | 2016 | One Year | \$500,000 | Currently no funding source identified |
| Backup power/bury lines for Fire Station at South Avenue and Belvedere | All-Hazards | Low | Capital Improvement | Plainfield DPW | 2017 | One Year | \$500,000 | Currently no funding source identified |
| Dredging/cleaning of the Greenbrook/Cedar Brook | Flood | Low | Floodplain Management | Plainfield DPW | June, 2014 | 1-2 Years | \$3.5 million | County started project in summer 2014. |
| Flood proofing of 8 Repetitive Loss properties on St Mary's Ave, Carlisle Terrace, and George Street. | Flood | High | Capital Improvement | Plainfield OEM | 2017 | 1 year | \$100,000 per unit | Currently no funding source identified |
| Elevation/Acquisition of 2 Repetitive Loss properties on Inwood Place. | Flood | High | Capital Improvement | Plainfield OEM | 2017 | 1 year | \$1.4 million | Currently no funding source identified |
| Elevation/Acquisition of 3 Repetitive Loss properties on Johnston Ave. | Flood | High | Capital Improvement | Plainfield OEM | 2017 | 1 year | \$600,000 | Currently no funding source identified |
| Elevation/Acquisition of 5 Repetitive Loss properties on Netherwood Ave. | Flood | High | Capital Improvement | Plainfield OEM | 2017 | 1 year | \$1.5 million | Currently no funding source identified |
| Conduct all-hazards public education and outreach program for hazard mitigation and preparedness. | All | High | Emergency Management | OEM Coordinator, in coordination with County OEM | 2017 | One Year | Staff Time | Developed CERT team and visited senior residences to educate about hazards. Additional outreach ongoing. |



4.3.2 New Mitigation Actions

| Mitigation Action, Program, or Project | Hazard | Priority | Implementation Mechanism | Responsible Party | Target Start Date | Project Duration | Estimated Cost |
|---|-------------|----------|--------------------------|---|-------------------|------------------|----------------------------------|
| Tree trimming and removal program to remove trees and limbs near power lines | High Wind | Low | Capital Improvement | Public Works | 2016 | 1-2 years | \$500,000 |
| Install emergency generator at Warming Centers (Welcome Center) at two locations. YMCA – 518 Watchung Senior Citizens Building - 400 East Front St. | All-Hazards | Medium | CIP | OEM Coordinator | 2016 | 1-2 years | \$1.2 Million |
| Re-join CRS program | Flood | Medium | Existing resources | OEM Coordinator/ Inspections Department (NFIP Administrator) | 2016 | 1-2 years | Minimal resources and staff time |



4.4 Capability Assessment

As part of this plan update each town self-assessed their existing planning and regulatory tools, communication and emergency response capabilities, staff and personnel, and their capabilities to leverage municipal funds to achieve hazard mitigation planning objectives. This capability assessment should be updated as part of the ongoing maintenance process.

4.4.1 Planning and Regulatory

| Tool | City Has (y/n) |
|--|----------------|
| Zoning Ordinance | Y |
| Subdivision Ordinance | Y |
| Flood Damage Prevention Ordinance (per NFIP) | Y |
| Special Purpose Ordinances (e.g. wetlands, critical or sensitive areas) | N |
| Stormwater Management Plan/Ordinance | Y |
| Comprehensive Plan / Master Plan | Y |
| Capital Improvements Plan | Y |
| Site Plan Review Requirements | Y |
| Habitat Conservation Plan | N |
| Economic Development Plan | N |
| Local EOP | Y |
| Continuity of Operations Plan | N |
| Post Disaster Recovery Plan or Ordinance | Y |
| Wildfire Protection Plan | N |
| Real Estate Disclosure req. | N |
| Other (e.g. steep slope ordinance, local waterfront revitalization plan) | Y |
| Freeboard | Y |
| Cumulative Substantial Damages | Y |
| Shoreline Management Plan | N |

4.4.2 Communication and Emergency Response

| | Does the Borough have this (y/n) |
|---------------------------------|----------------------------------|
| Outdoor warning system | N |
| Nixle | Y |
| Auto-Dialer/Reverse 911/Emailer | Y |
| Social Media | Y |
| Website Updates | Y |
| Other Emergency Communications | Y |
| Mutual Aid Agreements | Y |
| Emergency Operations Center | Y |
| Evacuation Vehicles | Y |
| Swift-water rescue | N |
| Shallow water boats | N |



4.4.3 Staff/Personnel

| | Does this City have this expertise on staff? |
|---|--|
| Staff with expertise or training in benefit/cost analysis | Y (RVA) |
| Grant Writer(s) | Y (RVA) |
| Emergency Manager | Y |
| Professionals trained in conducting damage assessments | Y (RVA) |
| Scientist familiar with natural hazards in the municipality. | Y (RVA) |
| Personnel skilled or trained in "GIS" applications | Y (RVA) |
| Surveyor(s) | Y (RVA) |
| NFIP Floodplain Administrator | Y (RVA) |
| Planner(s) or Engineer(s) with knowledge of land development and land management practices | Y (RVA) |
| Engineer(s) or Professional(s) trained in construction practices related to buildings and/or infrastructure | Y(RVA) |

4.4.4 Fiscal Capabilities

| Fiscal Mechanism | Does the City have this capability? |
|--|-------------------------------------|
| Community development Block Grants (CDBG) | Y |
| Capital Improvements Project Funding | Y |
| Authority to Levy Taxes for specific purposes | N |
| User fees for water, sewer, gas or electric service | N |
| Impact Fees for homebuyers or developers of new development/homes | Y |
| Incur debt through general obligation bonds | N |
| Incur debt through special tax bonds | N |
| Incur debt through private activity bonds | N |
| Withhold public expenditures in hazard-prone areas mitigation grant programs | N |



5. Plan Maintenance and Adoption

5.1 Plan Maintenance

The City of Plainfield 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 G. 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 City retains the discretion to implement minor changes to the document without formal procedures involving the City Council subject to local policies and regulations.

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

The LPC shall document, as needed and appropriate:

- Hazard events and losses in Plainfield 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,
- Any changes to local capabilities,
- Efforts to integrate the information included in this plan into other local planning mechanisms including, but not limited to, the comprehensive plan, capital improvement planning, budgeting, zoning amendments, and variance approvals,
- All public and stakeholder input and comment on the Plan that has been received by the City.
- Copies of any grant applications filed on behalf of the City



5.1.2 Continued Public Input

The City of Plainfield 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. The City will place a link to the plan on the municipal website.

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: Union County Office of Emergency Management c/o All Hazards Pre-disaster Mitigation Plan Coordinator 300 North Ave East, Westfield, NJ 07090.

The City of Plainfield's LPC shall ensure that:

- Copies of the latest approved Plan are available for review at City 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 City of Plainfield will post a notice on the City's website and invite the public to review and comment.
- For major changes involving City Council approval, the City will use its standard public notice procedures inviting the public to review the document and provide feedback.

5.2 Plan Integration

The Hazard Mitigation Plan is a critical tool to help identify vulnerabilities and develop specific projects to reduce studied risk within the jurisdiction. However, it is not the only tool that may help minimize the impact of future hazard events on the people, infrastructure, and economy in the community. Using the data included in this Plan update to inform future updates of its Comprehensive Plan, Capital Improvement Planning and annual budget, stormwater management, zoning and code updates, and variance and subdivision applications will improve the resiliency of the community and reduce future risk to persons and property. All efforts to integrate the plan into other local mechanisms can be reported to the Plan Coordinator at each annual update.

5.3 Plan Adoption

On [insert date] Union County submitted the initial draft of the 2016 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 Union County Board of Chosen Freeholders for adoption, which occurred on [insert date].



The City Council approved the plan on [insert date]. The City's resolution for adoption and the County's adoption resolution are provided as Appendix E of the 2016 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 D.