

# Municipal Climate Resilience Planning Guide

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## Intro

This planning guide was developed to assist New Jersey municipalities in complying with recent amendments to the Municipal Land Use Law (MLUL) for creating a climate change hazard vulnerability assessment, policy statement and resilience strategies to manage climate-related risks. Where indicated, the guide expands upon the MLUL requirements outlined herein, by providing best practices towards the development of a robust climate resiliency strategy. It includes both information and links to the New Jersey Department of Environmental Protection's (DEP) Local Planning for Climate Change Toolkit to help municipalities meet their obligations under the MLUL, as well as new climate resilience requirements for municipalities interested in pursuing or renewing petitions for Plan Endorsement by the State Planning Commission.



## Complying with the MLUL requirements

In recognition of the critical need for climate science to inform land use planning, on February 4, 2021, Governor Murphy signed into [law P.L. 2021, c6](#), amending the MLUL. Effective immediately, municipalities are required to incorporate a climate change-related hazard vulnerability assessment into any Master Plan Land Use Element adopted after the signing.

According to the law, the vulnerability assessments must rely on the most recent natural hazard projections and best available science provided by the NJ Department of Environmental Protection (DEP) (<https://www.nj.gov/dep/climatechange/>).

Municipalities must also consider environmental effects associated with climate change, including, but not limited to, extreme weather, temperature, drought, fire, flooding and sea-level rise; and contain measures to mitigate reasonably anticipated natural hazards, such as coastal storms, shoreline erosion, flooding, storm surge, and wind.

Communities that utilize the information provided here with links to DEP's [Local Planning for Climate Change Toolkit](#) will help municipalities meet their obligations for the new MLUL requirements and the climate resilience-related Plan Endorsement requirements adopted by the State Planning Commission in October 2020.

## What the law specifically requires:

1. Municipalities to analyze current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards;
2. Include a build-out analysis of future residential, commercial, industrial, and other development in the municipality, and an assessment of the threats and vulnerabilities identified above related to that development;
3. Identify critical facilities, utilities, roadways, and other infrastructure that is necessary for evacuation purposes and sustaining quality of life during a natural disaster, to be maintained at all times in an operational state;
4. Analyze the potential impact of natural hazards on relevant components and elements of the master plan;
5. Provide strategies and design standards that may be implemented to reduce or avoid risks associated with natural hazards;
6. Include a specific policy statement on the consistency, coordination, and integration of the climate-change related hazard vulnerability assessment with certain other plans adopted by the municipality; and
7. Rely on the most recent natural hazard projections and best available science provided by the New Jersey DEP.

The changes to the MLUL build upon numerous efforts under Governor Murphy that have established New Jersey as a national leader in reducing and responding to climate change, including the 2021 release of the [Climate Change Resilience Strategy](#), the 2020 release of the [NJ Scientific Report on Climate Change](#), the [NJ Global Warming Response Act 80X50 Report](#), New Jersey's 2019 re-entry into the Regional Greenhouse Gas Initiative, and aggressive actions to [electrify the transportation sector](#), the largest source of greenhouse gas emissions in the state.

### Local Planning for Climate Change Toolkit

In June 2021, DEP released a new [Local Planning for Climate Change Toolkit](#) to help municipal and county governments take actions to protect their communities from adverse climate impacts through sustainable land use planning. The toolkit was developed as part of Resilient NJ, DEP's local government resilience planning assistance program.

The Toolkit guides municipalities through the process of creating a climate change-related hazard vulnerability assessment and developing local climate resilience strategies as now required by the MLUL.

The Toolkit is also designed to assist communities through a robust public process that will set a clear vision appropriate for each community. It stresses the importance of assessing needs and integrating voices of socially vulnerable populations to ensure that resilience measures are equitable in their consideration and impact.

[Click here](#) for DEP's Toolkit at-a-glance.

New Jersey defines "climate resilience" as the ability of social and ecological systems to absorb and adapt to shocks and stresses resulting from a changing climate, while becoming better positioned to respond in the future.

## Conducting a vulnerability assessment

Vulnerability is the extent to which people, places, systems, or things are prone to, or are unable to cope with, adverse impacts of climate change. Conducting a Hazard Vulnerability Assessment is the first step in creating local climate resiliency strategies to manage those risks and support initiatives designed to protect the community from disaster and enhance operational responses. The process involves assessing vulnerable areas, critical facilities, assets, and infrastructure to map a municipality's current vulnerability/risk to climate-related hazards, including extreme weather, temperature, fire, flooding and sea level rise scenarios with considerations for forecasted future conditions. The assessment will enhance preparedness, risk reduction and avoidance, informing land use planning decisions, including for evacuation and for sustaining municipal operability and quality of life during and immediately following a natural disaster.

## Steps to determine vulnerability

### STEP I – INITIATE & ENGAGE

Use [Build the Team](#) to establish project leadership, build a diverse [Planning Team](#), identify stakeholders, and establish advisory committees. A strong team and robust community engagement with stakeholders and the public, including socially vulnerable populations, are critical to a successful strategy. For more information on expanding representation in planning visit the [Equitable Community Resilience Evaluation Toolkit](#) and take the self-guided [A Seat at the Table online training](#).

### STEP II – GATHER PLANS & DATA

Understand the best available science to plan for climate impacts such as increased temperatures, shifts in precipitation, rising sea levels, fire, and drought. Gather local and county plans, hazard mitigation plans, those that address transportation and water infrastructure, and applicable projects such as stormwater and flood control.

STEP III – CONDUCT a BUILDOUT & CAPACITY ANALYSIS: Based on current zoning and anticipated population growth as outlined [here](#), using the ANJEC's model.

### STEP IV – IDENTIFY & PRIORITIZE ASSETS

As outlined [here](#), identify buildings, infrastructure, and places that are essential during a crisis, but also cultural, historic and environmental resources, organizations, services, events, or populations that are of intrinsic importance, define the municipality or region as a desirable community and destination. To meet the minimum requirements of the MLUL, municipalities should use the FEMA's [Community Lifelines](#) approach to identify critical facilities, utilities, roadways, and other key business and community support mechanisms that are necessary for evacuation purposes and for sustaining quality of life during a natural disaster that, when stabilized, enable all other aspects of society.

- Consideration of impacts to [socially vulnerable populations and public health impacts](#), i.e., those prone to negative health, financial, and housing impacts from natural disasters – especially those with limited mobility, finances, health and/or who experience language barriers, are also critical components of a comprehensive vulnerability assessment. These populations can have difficulty recovering from such events, may often face barriers to participating in traditional public meetings, and are generally underrepresented in municipal decision-making.
- If applicable, consideration of impacts to designated Environmental Justice [Overburdened Communities](#) (OBC) similar to the above concerns, but with particular consideration where an OBC is subject to disproportionate environmental and public health stressor levels as determined by the DEP or through conducting a Disproportionate Impact Analysis.
- If applicable, work with water purveyor(s) to perform a detailed vulnerability assessment of the infrastructure that serves the town, including any public potable water wells and pump stations located in the flood zone and determine their specific vulnerability to flooding events. Perform a similar analysis for private wells and both inform the owners of their vulnerability.
- If applicable, work with the sewer utility to identify any treatment plant, pump stations, or outfalls in the flood zone and determine their specific vulnerability to flooding event.

## STEP V – VISUALIZE VULNERABILITY

Online tools such as the [NJ Flood Mapper](#) and [NJ Forest Adapt](#) provide data to visualize a town’s exposure to flooding, increasing heat, and impacts to the landscape. Compare the geographic extent of flooding to identified assets, areas of future development, and the location of socially vulnerable populations. The NJ Flood Mapper Tool is an interactive GIS system designed to provide visual representations of FEMA's 100-year floodplain for both inland and coastal flooding and different sea level rise scenarios, and includes the ability for users to add in custom GIS data layers from external map services. Also use the [NJ Adapt Municipal Snapshots](#) for a summary of the community’s exposure to natural hazards, including FEMA 100-year and 500-year flood zone impacts for NJ's coastal and inland communities.

## STEP VI – ASSESS YOUR VULNERABILITY

Use the [Vulnerability Assessment Matrix](#) to assess and rank the risk of each asset under different climate-related hazards. The matrix is a qualitative self-assessment tool to help a municipality begin to think critically about the vulnerability of its assets.

## STEP VII - GETTING TO RESILIENCE

With the information gathered from conducting the Vulnerability Assessment, use the [Getting to Resilience](#) (GTR) tool to further assess a town's readiness to deal with flooding situations. The GTR tool allows communities to assess how prepared they are for flooding, coastal storms and sea-level rise. It includes assessing risk and vulnerability, engaging the public effectively, modifying land-use ordinances, taking steps to increase disaster preparedness and recovery, and implementing hazard mitigation strategies. The process can be completed either as a municipal self-assessment or using a facilitator. Together, the NJ Flood Mapper and GTR Tools provide local decision-makers a wealth of information about the current and future resiliency of their communities. By using these tools, leaders can identify means and implement strategies to improve their resilience and protect public health through existing planning, disaster preparedness, programming, and implementation mechanisms.

## Develop a Resilience Strategy

### Recommended municipal best practices

With the information obtained from completing a vulnerability assessment, communities should consider developing a Resilience Strategy to address vulnerable areas and risk in a comprehensive fashion. At a minimum, the MLUL requires municipalities to “provide strategies and design standards that may be implemented to reduce or avoid risks associated with natural hazards.” As an adopted component of the land use plan, a comprehensive Resilience Strategy provides the basis and guidance for the implementation of land use planning strategies and actions, including zoning, design standards, site plan/review standards, and ordinances, that together, seek to reduce and avoid risks associated with climate-related hazards. This includes integrating the information derived from the assessment with other relevant components and elements of the master plan, including analysis of the potential impact of natural hazards on them.

Decisions by local governments about zoning, redevelopment, housing, open space, and capital investment will have dramatic implications for the vulnerability of the natural and built environments. Integrating climate change considerations and resiliency adaptations into these decisions and all planning efforts will put a community on track to resilience by making sure investments made today withstand the conditions of tomorrow and make it easier to adapt as the climate continues to change.

The specific actions that each municipality takes will vary depending on the extent and scale of identified areas, affected populations and assets determined to be vulnerable to climate-related risks. Before finalizing the Resilience Strategy, a municipality should evaluate the selected actions to make sure that they meet the requirements of the MLUL, as well as that of the entire community, including vulnerable populations. The DEP will provide additional technical assistance as needed during the development and implementation of the Resiliency Strategy.

### Center-based development and smart growth

Community resilience is also furthered by promoting compact, mixed-use future development and redevelopment outside of vulnerable areas. The New Jersey Office of Planning Advocacy (OPA) encourages municipalities to create neighborhood, town, or urban centers and cores that are pedestrian-friendly and composed of mixed-use buildings with diverse housing, professional office space, retail shops and restaurants away from areas vulnerable to climate impacts. Compact and vertically-scaled mixed-

use development, especially near transit hubs, reduces impacts on watersheds and environmentally sensitive areas by concentrating development. This development pattern also creates a sense of place, resulting in higher social resilience, health and wellbeing.

### Municipal best practices for a Resilience Strategy should also:

- Establish planning policies, land use controls, design standards and other measures that may be implemented over time to reduce or avoid risks associated with natural hazards, that discourage and where appropriate, prohibit non-resilient-related investments, development and infrastructure improvements in vulnerable areas that would exacerbate flooding, fire, and other risks due to their location, proposed intensity or design. Communities can regulate or prohibit development in vulnerable areas using zoning, subdivision, and site-plan regulations, and/or special overlay districts that specify conditions for use and development in order to prevent or reduce future losses.
- Evaluate, identify and prioritize needed or planned critical resilience infrastructure, future projects and enhancements, as well as climate-ready retrofits to existing assets - particularly for flood mitigation and evacuation purposes.
- Develop specific actions to be applied to any areas, resources, buildings and infrastructure identified as being vulnerable to extreme weather, flooding, or other hazards, including planning projects that help protect and support the community at large (e.g., redevelop, retrofit, elevate, replace or relocate existing structures and infrastructure to reduce risk of disruptions). Examples include limiting new buildings and/or fill in the floodplain and protect existing floodplain development by floodproofing, elevation, or minor flood control projects.
- Account for future extreme weather, such as excessive heat events, fires, floods and sea level rise, in land use planning (e.g., zoning ordinances) to protect public health (e.g., mitigation of urban heat island effects) and safety, infrastructure and encourage or require climate-resilient development and redevelopment as necessary.
- Develop an implementation schedule that identifies non-local assistance/resources needed, and measurable outcomes (e.g., completion of a plan, securing sources of funding, updating ordinances).
- Work with the [Blue Acres program](#) to mitigate flood prone, severe loss, and severe repetitive loss properties.
- Participate in the [National Flood Insurance Program Community Rating System](#). CRS is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the NFIP. Residents of municipalities participating in the [CRS program](#) can receive up to a 45% flood insurance premium rate reduction. [Click here](#) for list of eligible communities. Contact the [NJ NFIP Coordinator](#) for assistance.
- Address climate resilience by pursuing certification through Sustainable NJ at: <https://www.sustainablejersey.com/>

### Implementing best practices through Plan Endorsement

Municipalities can also meet and exceed the new climate resilience requirements of the MLUL, by pursuing or renewing petitions for Plan Endorsement by the State Planning Commission (SPC). Plan Endorsement is a voluntary review process with specific requirements designed to ensure consistency in achieving the goals and policies of the State Plan. The endorsement process expands upon the minimum requirements of the MLUL, by incorporating several planning priorities of increased State emphasis, including enhanced measures to address climate resilience, Greenhouse Gas emissions reduction, smart growth, sustainability, environmental justice and social equity.

As required under the MLUL, municipalities pursuing Plan Endorsement, must also evaluate and address local climate change impacts. As part of a 3 Step Climate Resilience Planning process required for Plan Endorsement, a participating municipality must assess vulnerable areas, critical assets and infrastructure, and demonstrate that it is taking steps to minimize future asset exposure by implementing changes to zoning, land development requirements or other methods identified in coordination with the DEP that will depend on the municipality's development and/or redevelopment plans and existing ordinances. Subsequent to Plan Endorsement by the SPC, the municipality must develop and adopt a Local Resilience Strategy that will address how to avoid or minimize the threats to identified vulnerable areas in a comprehensive fashion. Upon endorsement, the municipality may be entitled to financial and other incentives such as enhanced scoring for grant funding, low-interest loans, technical assistance, and coordinated regulatory review among the State agencies that will assist in making its endorsed plan a reality.

For more information on the Office of Planning Advocacy, [Click Here](#). For more information on Plan Endorsement, [Click Here](#).

## Other resources for developing a local Resilience Strategy

### RESOURCES FOR RESILIENCE ACTIONS

- [Resilient NJ: Local Planning for Climate Change Toolkit](#), NJDEP
- [Resilient NJ: Toolkit Resilience Library](#), NJDDEP
- [Policy Buy-In for Buyouts: The Case for Managed Retreat from Flood Zones](#), Lincoln Institute of Land Policy
- [Mitigating Hazards through Land Use Solutions Workshop](#), NJDEP/FEMA
- [NJ Stormwater Best Management Practices Manual](#), NJDEP
- [Stormwater Infrastructure Toolkit](#), NJDEP
- [New Jersey Mitigation Resource Guide](#), FEMA
- [New Jersey Developers Green Infrastructure Guide 2.0](#), NJ Future
- [Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities](#), FEMA
- [Living Shorelines Engineering Guidelines](#), Stevens Institute of Technology
- [Community Resilience Planning Guide for Building and Infrastructure Systems](#), NIST
- [FEMA Flood Map Service Center: Search by address](#)
- [Using Demonstration Storms to Prepare for Extreme Rainfall](#)
- [Extreme Rainfall Analyses Can Point to Right Size for Culverts](#)
- [Combined Sewer Overflow \(CSO\) information](#), NJDEP

### RESILIENCE PLANNING CASE STUDIES

- [Sustainable & Resilient Coastal Communities: A Comprehensive Coastal Hazard Mitigation Strategy](#), NJ Future
- [New Jersey Fostering Regional Adaptation Through Municipal Economic Scenarios](#), NJDEP
- [Local Options/Local Actions: Resilience Strategies Case Studies](#), NJ Future
- [Hazard Mitigation Assistance Mitigation Action Portfolio](#), FEMA
- [South Ironbound Resiliency Action Plan](#) (Newark)
- [New Jersey Coastal Community Resilience Demonstration Project](#), NJ Sea Grant
- [Hoboken Resilient Buildings Design Guidelines](#)
- [Hoboken Green Infrastructure Strategic Plan](#)

### GEOGRAPHIC CONSIDERATIONS

- For more information on resilience in coastal communities, e.g., Barrier Islands or municipalities within the Coastal Zone, [Click Here](#), NOAA U.S. Climate Resilience Toolkit.
- For more information specific to inland, non-tidal or communities in non-coastal areas, [Click Here](#), NOAA U.S. Climate Resilience Toolkit.

For information about wildfires in NJ, [Click Here](#), NJDEP

For more information contact:

Office of Planning Advocacy

609-292-7156 (office)

<https://nj.gov/state/planning/index.shtml>

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