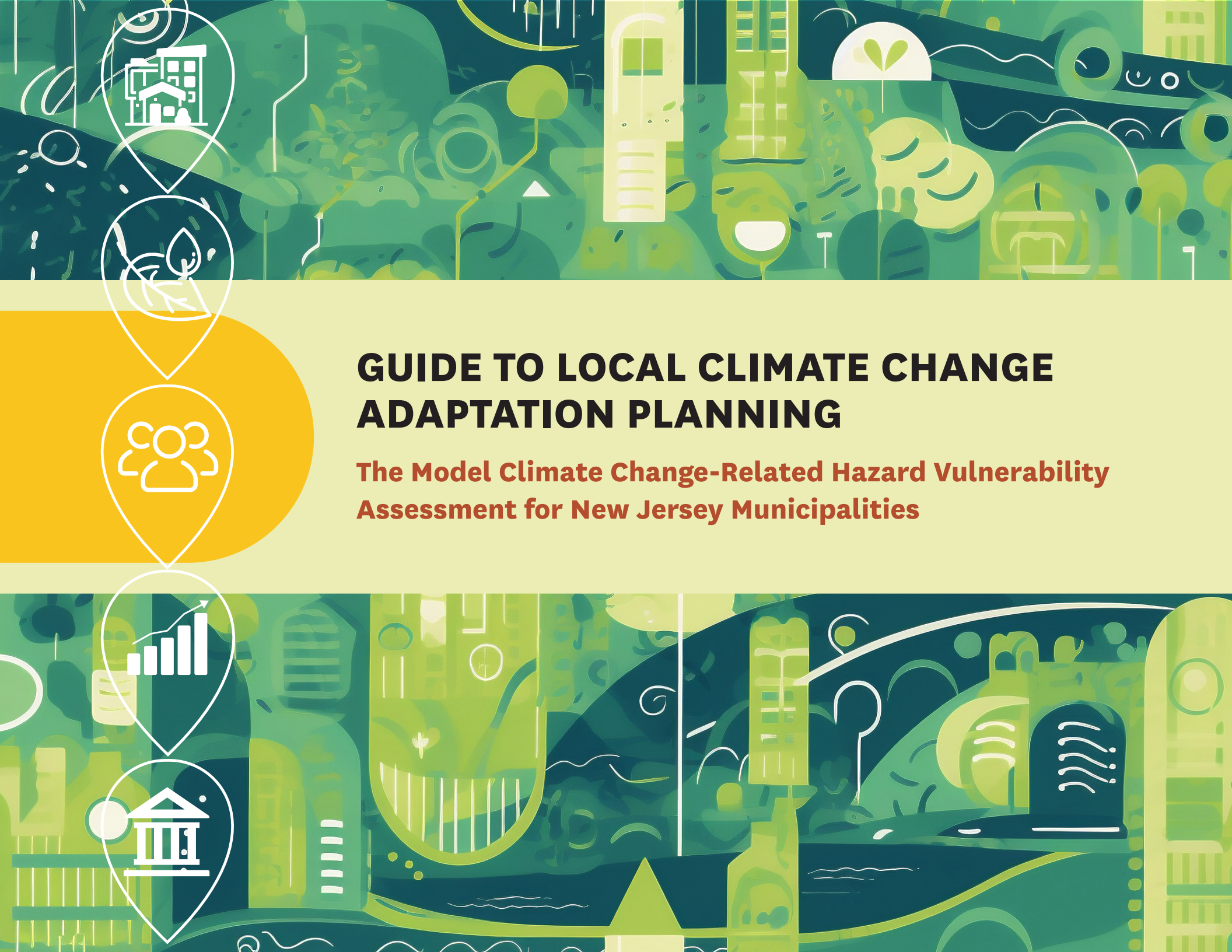
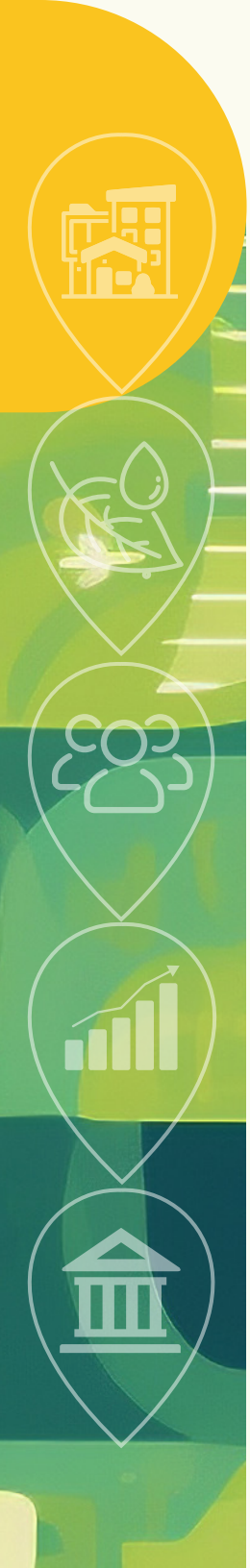


GUIDE TO LOCAL CLIMATE CHANGE ADAPTATION PLANNING

The Model Climate Change-Related Hazard Vulnerability Assessment for New Jersey Municipalities



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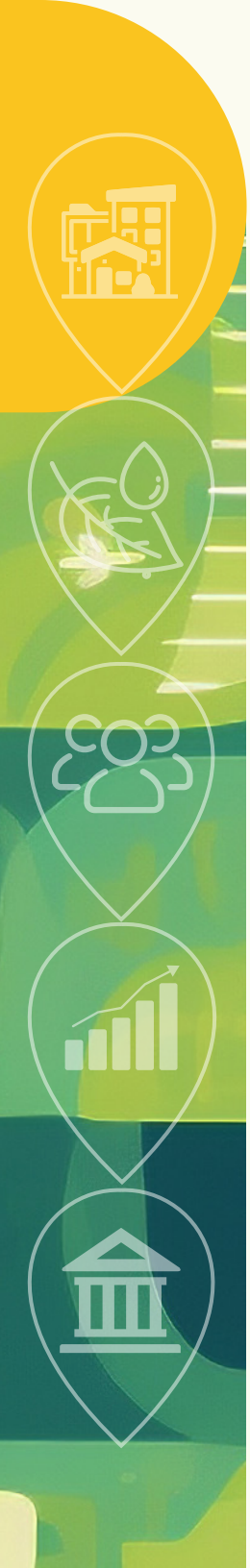

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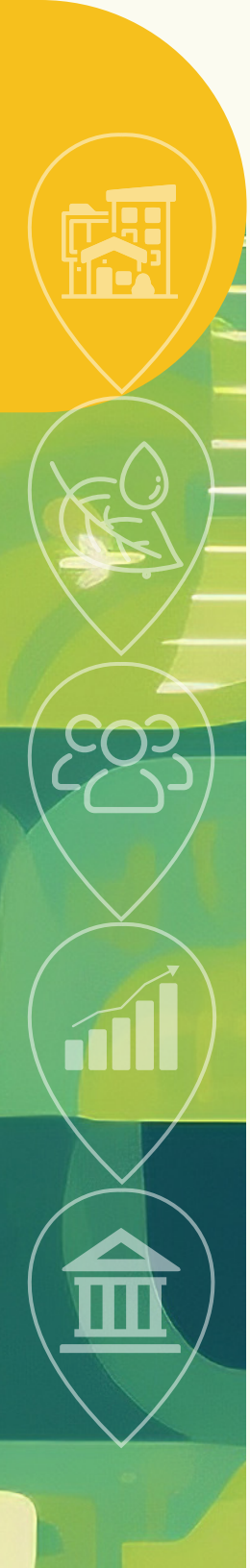

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2. Template 1.1 Climate Planning Lead Position
3. Template 1.1 CCRHVA
4. Link to: Esri's GIS for Climate Resilience ArcGIS Tutorial Series
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6. Link to: NJ Climate Change Resource Center Climate Dashboard
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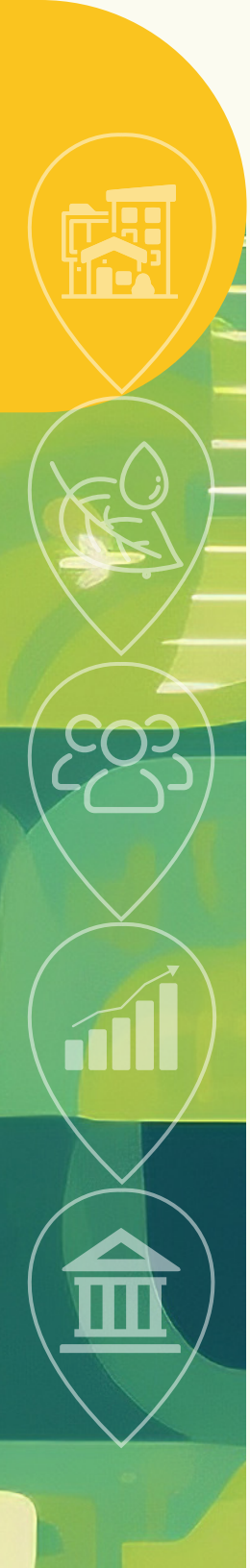


GLOSSARY OF TERMS

Adaptation: Making changes to behaviors, systems, and environments in order to adjust to climate change. For municipalities, adaptation actions involve governance and can include changes to policies, regulations, operational procedures, and practices.

Adaptive Capacity: The extent to which people or systems can learn from and adjust to climate variability and extremes to cope effectively with the changes and uncertainties associated with climate change and address the causes and the impacts of climate hazards.

CCRHVA: A Climate Change-Related Hazard Vulnerability Assessment, which is outlined in the Municipal Land Use Law annotated statute, NJSA 40:55D-28(b)(2)(h), and required in the Land Use Plan Element of any municipal master plan adopted after February 4, 2021. It is a process to identify how climate hazards affect a municipality.

Climate Hazard: A climate change-related hazard, as per NJSA 40:55D-28(b)(2)(h), including, but not limited to increased temperatures, drought, flooding, hurricanes, and sea-level rise. Climate hazards are environmental conditions, trends, or events that may cause damage and loss and come about due to the effects of a changing global climate, or global temperature and precipitation patterns observed and projected over several decades.

Climate Impact: The effect of one or more climate hazards on people, environments, and systems. Current and projected climate impacts from climate hazards are analyzed in a climate change-related hazard vulnerability assessment based on exposure, sensitivity, and adaptive capacity.

Climate Ready: The ability of people and systems to iteratively and continuously build capacity to cope with climate change and variability, make proactive decisions informed by climate change-related data, swiftly respond to natural hazard events, and take advantage of opportunities and pursue goals that advance social and environmental sustainability in the context of climate variability and uncertainties.

Exposure: The extent people, places, or systems are touched by, or in contact with, a given climate hazard. Exposure relates to the simultaneous presence of a hazard and an asset or feature.

MLUL: New Jersey Municipal Land Use Law

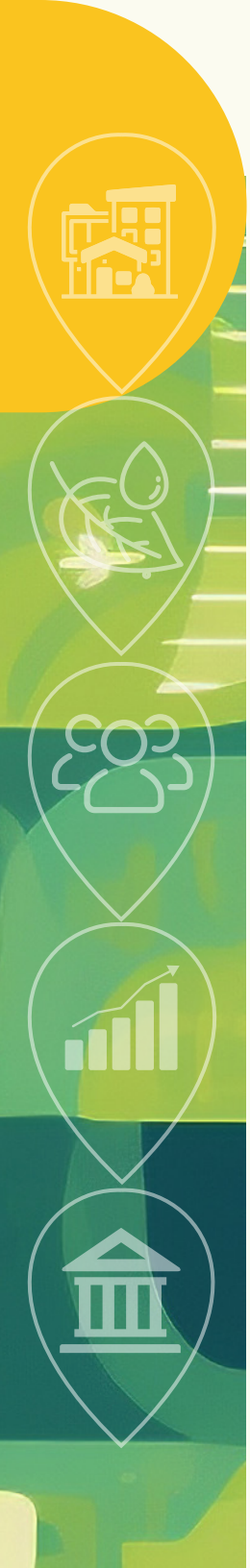
Resilience: The ability of social and ecological systems to absorb and adapt to shocks and stresses resulting from a changing climate, while becoming better positioned to respond in the future, pursued through a dynamic, iterative, and ongoing process of learning and changing.

Sensitivity: The extent that people, places, or systems are, or could be, affected by a given climate hazard. Sensitivity relates to the ability to withstand exposure to a hazard.

Socially Vulnerable Population: People experiencing characteristics that may increase the likelihood of exposure or sensitivity to a climate hazard. From the New Jersey Climate Change Resilience Strategy, this population includes socioeconomic status, age, gender, race and ethnicity, English language proficiency, and disability. This includes populations underserved due to environmental injustices, and other low-income and minority populations that have experienced historic under investment or disinvestment and are disproportionately burdened by or less able to prevent, respond to, and recover from adverse environmental impacts.

Systems Approach: An organizational framework to evaluate vulnerability of a community based on the built system, natural system, social system, economic system, and governance system that support and sustain the community.

Vulnerability: The extent to which people, environments, and systems are susceptible to experiencing damage or loss from impacts of climate hazards. Vulnerability to climate hazards is a function of exposure, sensitivity, and adaptive capacity.



WHY IS THIS GUIDE NECESSARY?

THE STATE OF NEW JERSEY ADOPTED Senate Bill No. 2607 in 2021 to enact an amendment to the New Jersey Municipal Land Use Law (MLUL) requiring that municipalities include in the land use plan element of their master plans a "climate change-related hazard vulnerability assessment" that analyzes "current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards, including, but not limited to increased temperatures, drought, flooding, hurricanes, and sea-level rise…rely[ing] on the most recent natural hazard projections and best available science provided by the New Jersey Department of Environmental Protection." The amendment requires the vulnerability assessment to include a build-out analysis, identification of critical infrastructure to be maintained during a natural disaster, an evaluation of the impact of natural hazards in relation to master plan components, strategies and design standards for implementation in response to climate change-related natural hazards, and a policy statement of alignment and consistency with other plans.

While the law calls specifically for a "climate change-related hazard vulnerability assessment," the development of such an assessment is done within a broader context. The guidance provided herein outlines a Model Climate Change-Related Hazard Vulnerability Assessment (CCRHVA) inclusive of that broader context—with all the components of the planning process inherent in a vulnerability assessment and with details on how to complete an analysis of climate change-related hazard vulnerability.

This document contains a CCRHVA process and template that satisfies the requirements of the 2021 MLUL amendment and is intended as a foundational step for ongoing climate adaptation planning and resilience efforts supported by the NJ Department of Environmental Protection (NJDEP) and partner organizations.

The NJDEP is undertaking a broad-based effort to provide guidance, tools, and implementation assistance to municipalities to become more resilient. This effort is building on NJDEP's Local Planning for Climate Change Toolkit, which provides general guidance and links to many resources for different aspects of climate adaptation planning and conducting a CCRHVA. The toolkit also provides information about how the state's planning requirements for municipal land use planning, the State Plan endorsement process, and hazard mitigation planning relate to climate adaptation planning. This guide provides links to the NJDEP Local Planning for Climate Change Toolkit and will set the stage for additional tools and resources that are under development.

The State of New Jersey Climate Change Resilience Strategy, released by the NJ Interagency Council on Climate Resiience in 2021, includes actions across six priorities that New Jersey's executive branch can take to support the climate resilience of the state's communities, economy, infrastructure and natural resources. Priority 1 is to "Build Resilient and Healthy Communities," with strategies to integrate resilience into local and regional planning, incentivize local resilience strategies that prioritize sustainable land uses, and provide technical assistance to communities. While the state is organizing itself around climate adaptation planning and a resilience framework, municipalities must also learn to be climate ready and integrate planning for climate change into their planning and decision-making. Conducting a CCRHVA is a first step for municipalities in that effort.

The CCRHVA provided in this guide helps municipalities comprehensively approach climate adaptation planning because it considers a broad range of features that can be vulnerable to impacts resulting from a whole set of climate change-related hazards (hereto referred to as climate hazards) relevant to New Jersey communities. Climate vulnerability is highly dependent on location, with certain areas being at greater risk of flooding, for example, but it can also be a factor in the functional health of social or environmental systems that support our communities in a myriad of ways. Capacity for learning, formulating effective adaptation strategies, and completing actions within a resilience-oriented governance framework of iterative, ongoing improvement is also a critical determinant of vulnerability. The CCRHVA lays the groundwork for fully integrating sustainability and climate adaptation planning into municipal governance and planning.

HOW TO USE THIS GUIDE

Planning Process

The process outlined in this guide centers climate adaptation planning at the core of municipal comprehensive planning so that it is aligned with the 2021 MLUL amendment requiring a CCRHVA in the land use plan element of the municipal master plan. It also centers equity and community participation in the planning process by embedding actions that foster meaningful engagement within the process. Fundamentally, the guide interprets the CCRHVA as a foundational step for ongoing planning and resilience efforts, at the same time that it helps municipalities be in compliance with the law requiring a CCRHVA.

Compliance with the MLUL occurs in Part II of the guide, and the main component of the guide is a step-by-step analysis workflow for practitioners, such as planners and working teams, actively involved in completing the CCRHVA to evaluate impacts of climate hazards as they pertain to the municipality. Recognizing that climate adaptation planning also involves other components, the guide is organized into three parts, with the analysis component placed where it would occur in the planning process—after "pre-planning" phases to prepare for initiating the CCRHVA, and before "post-planning" phases to implement strategies based on the outputs of the CCRHVA.

The guide, organized into three parts, walks through a set of steps nested within six phases.

PART I
GEARING UP AND SCOPING

PHASE 1 — INITIATE
- **1.1** Designate a lead individual or core team
- **1.2** Understand principles of climate adaptation planning

PHASE 2 — EXPLORE
- **2.1** Compile and review planning documents
- **2.2** Identfy partners
- **2.3** Identify community stakeholders and resources

PHASE 3 — ACTIVATE
- **3.1** Form a project team
- **3.2** Develop and implement a community engagment plan

PART II
ANALYZING AND PRIORTIZING

PHASE 4 — ANALYZE
- **4.1** Identify climate hazards, development patterns, and system features
- **4.2** Analyze and characterize the vulnerability of the features and systems supporting the community

PHASE 5 — STRATEGIZE
- **5.1** Facilitate community visioning for climate adaptation
- **5.2** Identify strategies and design standards
- **5.3** Create the plan of action

PART III
MAINTAINING AND TRACKING PROGRESS

PHASE 6 — IMPLEMENT
- **6.1** Maintain and monitor actions
- **6.2** Update and sustain climate readiness

Meeting MLUL Requirements

Activities in the guide that meet specific provisions of the MLUL are clearly identified.

Facilitates MLUL Compliance. These are intermediate activities that, when completed, can directly support meeting the requirements of the MLUL.

Achieves MLUL Compliance. These are activities that, when completed, meet the requirements of the MLUL.

Enhances MLUL Compliance. These are climate planning process activities that enhance compliance by providing a more robust assessment to better prepare the community to adapt to climate hazards.

Systems Approach

The analysis component of Phase 4 is centered on a systems approach that provides a framework for evaluating vulnerability across five systems that support the municipality. This approach promotes resilience actions that are centered on long-term sustainability, rather than only addressing certain hazards, sites, or projects. For each system, the guide provides a set of key features to analyze. Each feature represents a collection of individual features of that feature type. For example, the "natural land resources feature" includes all the individual forests, wetlands, riparian areas, etc. in the community. Municipalities can also analyze individual features if desired. For each feature provided in the guide, it provides the indicators to analyze in terms of exposure and sensitivity to specific climate hazards. The systems approach is used as a framework to holistically approach climate change adaptation.

THE FIVE SYSTEMS OF THE MODEL CCRHVA

The systems approach offers a framework by which root causes of community issues can be addressed. This includes issues relating to climate hazard risk, as well as social determinants of health and disparities in planning processes and outcomes. Combined with the model of robust and integral community participation that is included through the steps and phases of the guide, the systems framework enables communities to acknowledge, recognize, highlight, discuss, and strategize solutions for systemic and underlying issues contributing to vulnerability.

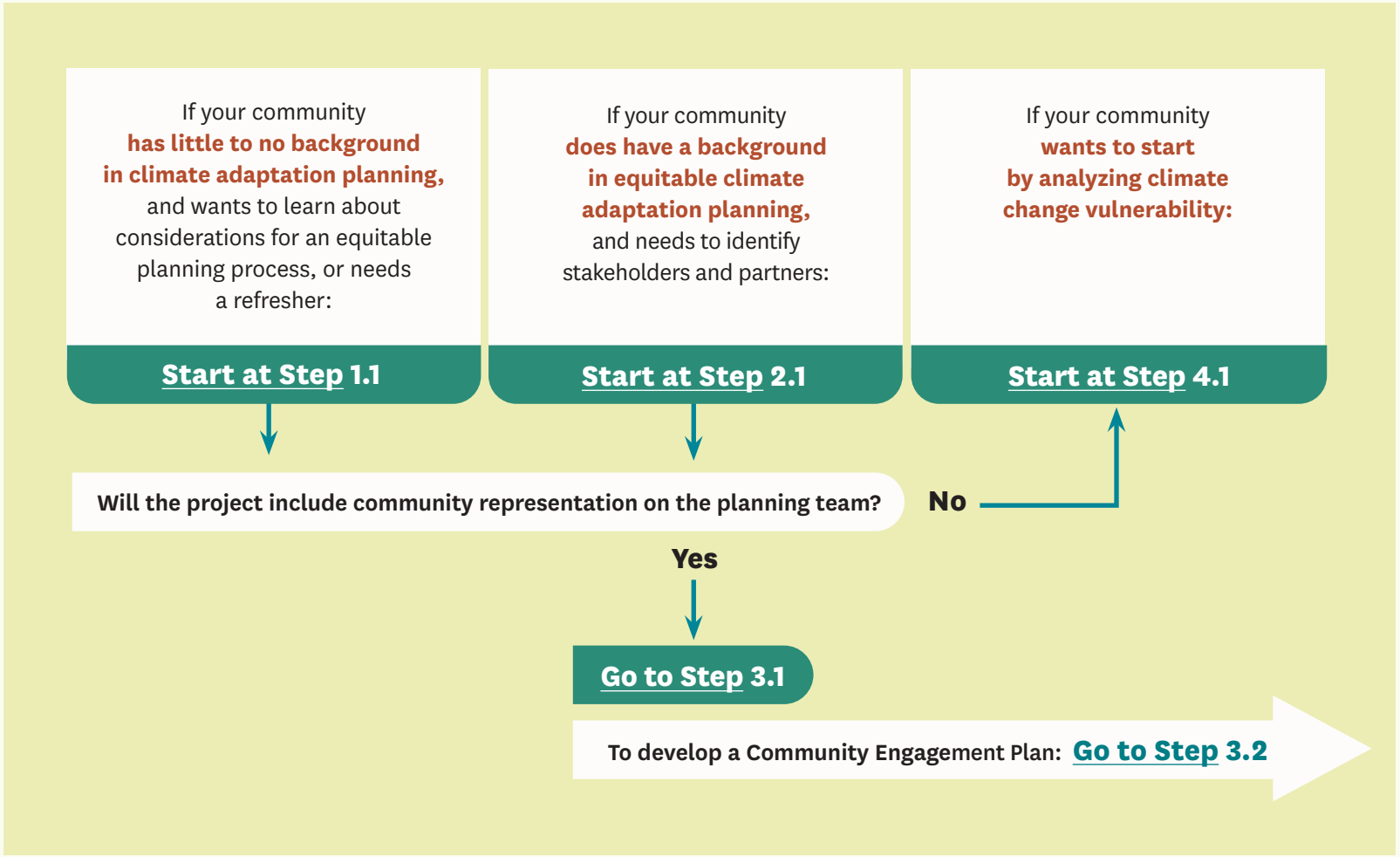
Resources

In addition to a comprehensive analysis framework, the guide includes worksheets, resource documents, and templates to facilitate the process and for municipalities to more easily satisfy the requirements of the MLUL. The guidance provided here, while indicating the parameters for a compliant CCRHVA, offers a process with flexibility for municipalities to approach the task as they see fit. Icons are placed throughout the guide to help users navigate through the process. To specifically advise on meeting the requirements of the MLUL, each step contains a set of deliverables that indicates which provision of the MLUL each deliverable meets, if any.

- Good Points in the Process to Engage Community Members
- Deliverables of Steps in the Process
- Steps in the Process, with Links to Worksheets, Templates, and Other Resources
- Links to the Appendix with Descriptions of and Links to Relevent Information in the NJDEP Local Planning for Climate Change Toolkit

Deciding Where To Start

Because this guide is comprehensive, the below decision-tree graphic can help municipalities decide where to start and how to proceed. All options of where to start in the decision tree will achieve MLUL compliance. For example, Phase 1 in the guide is to establish and educate a lead for the project, and the first step in Phase 3 is to establish a project team. Some municipalities may already have a background and leadership in climate adaptation planning and can skip Phase 1. Likewise, some municipalities may not want to establish a project team, so they can skip Step 3.1. For those municipalities that want to dive right into analysis, they can begin in Phase 4. While step 3.2 is not required for conducting analyses, a good climate adaptation planning process will always include community engagement, and it should be included in any case as a best practice for building local resilience.



PART I

PART I GEARING UP AND SCOPING

PART I INCLUDES THREE phases that will prepare the municipality to appropriately and effectively analyze information to assess its vulnerability to climate change. It involves preparing a team for the work, understanding relevant data, and connecting with partners and stakeholders. While none of the steps in Part I are required to meet the requirements of the MLUL, each of the three Phases in Part I provides steps that inform or facilitate the outcome of a CCRHVA, with Step 2.1 being particularly helpful for meeting requirements of the MLUL to relate the CCRHVA to local planning efforts.

PHASE 1

Initiate and Contextualize the Process

1.1 DESIGNATE A LEAD INDIVIDUAL OR CORE TEAM

DELIVERABLES OF THIS STEP

- A project lead is assigned responsibility for overseeing the CCRHVA.
- The project lead understands the scope and output of the project.
- The project lead prepares to identify technical assistance needs to conduct the project.

WHY THIS STEP IS IMPORTANT

Conducting a CCRHVA is not an insignificant task. There is work leading up to the assessment process, and it is not an isolated "one-and-done" activity. To realize the full benefits of the effort, it should be approached as an ongoing and iterative municipal process that ensures climate adaptation planning is integrated into all major municipal decisions. A lead with the necessary ability to understand and coordinate relevant data, stakeholders, and resources needs to take charge of the effort. Furthermore, the outcomes of the CCRHVA will lead to strategies and actions that need follow-through, and the municipality's plan or approach for implementation will need updates and ongoing monitoring and adjustments based on changing information, circumstances, or opportunities. The lead for the CCRHVA could also potentially manage and oversee these follow-through processes after the assessment process is completed.

There are multiple options for structuring the CCRHVA process, and municipalities should organize staff, consultants, volunteers, and others involved in working on the project in a way that suits their needs. This guide suggests that municipalities assign responsibility for completing the CCRHVA to a lead (or small core team) in this step, with consideration of whether it is appropriate to designate a project team (or steering committee). If a project team is established for the project, it should be done in Phase 3, after exploring data about climate hazards, vulnerable populations, and stakeholders relevant to the community. This is in order to assemble a project team with diverse perspectives and expertise based on the evaluation of data and resources.

WHAT TO DO

Designate one to three individuals as the lead responsible for making sure the work of conducting a CCRHVA for inclusion in the municipal master plan gets done and the process moves along. This

individual(s) should be responsible for producing a CCRHVA that can be included in the land use element of the master plan. An editable CCRHVA template is provided with this guide for that purpose. Additionally, the ideal lead should be positioned in the community to ensure ongoing climate adaptation planning is a priority and incorporated into municipal planning processes after the assessment is completed.

Although it can be held by municipal consultants or full-time staff, the lead position does not need to be a full-time, paid position. A volunteer or part-time staff member could fill this role. Ideally this position would serve as the point person, as well as be able to provide guidance and resources throughout the climate adaptation planning process. In the long term this position could potentially help to integrate climate adaptation planning into everything the town does and ensure there is a mechanism for continued engagement around climate readiness with the community after the assessment is completed. Potential candidates for leading the process include the municipal planner, floodplain manager, or emergency preparedness official; a member of the environmental commission, green team, or other municipal committee member; a member of municipal staff with the capacity to coordinate and manage the project; or a community champion routinely involved in municipal initiatives. For meeting the ongoing higher-capacity needs and responsibilities of climate adaptation planning, a local climate and/or sustainability resilience and adaptation officer position would serve this role well and be able to carry out ongoing coordination, management, and efforts in addition to leading the CCRHVA process.

Because of the dynamic nature of climate change impacts and information, the conversations, strategies, and actions to address climate change impacts will need to be revisited often and will require leadership, resources, and support. Aside from having the internal capacity to lead and organize these efforts, the municipality can seek assistance from available state and non-profit professionals who can connect the lead with appropriate resources, and Phase 2 of this guide provides resources for identifying various types of climate adaptation planning partners. In this step, initiate the CCRHVA process through the following actions.

Designate a lead. If the municipality chooses to solicit for a position to organize and manage the community's ongoing climate resilience and adaptation efforts, use Template 1.1 Climate Planning Lead Position as a sample position description. It can be modified based on how the position is structured. Local governments can structure the position within various departments or focus areas—including planning, emergency preparedness, health, sustainability, or environmental—depending on the needs and capacity of the community.

Understand the role of the lead. The lead should become familiar with the requirements of the MLUL to conduct a CCRHVA. Use Template 1.1 CCRHVA throughout the planning process to ensure the work is being carried out in accordance with the information needed for including the assessment in the land use element of the master plan.

Identify other roles and responsibilities. There are technical aspects to conducting analyses that are best suited for individuals who are adept at data analysis and can use a geographic information system (GIS). Once the lead or core team is established, they should prepare to secure technical services from a professional planner with appropriate GIS capabilities, or expand the municipality's capacity by learning GIS for climate resilience.

Identify technical assistance to support the lead. The municipal planner can help the lead identify what, if any, technical assistance is required from NJDEP. As per the MLUL, by request of the municipal planning board, NJDEP shall provide technical assistance, as practicable, to a municipality preparing a CCRHVA pursuant to the law. Contact the NJDEP at ResilientNJ@dep.nj.gov.

NJDEP Local Planning For Climate Change Toolkit connection

PART I

1.2 UNDERSTAND PRINCIPLES OF CLIMAT E ADAPTATION PLANNING

DELIVERABLES OF THIS STEP

- The project lead understands the purpose and importance of planning for the impacts of climate change.
- The project lead understands the role of land use planning and implementation of high-level strategies for climate adaptation **in support of MLUL provisions (iv), (v), and (vi).**
- The project lead can share resources and convey information about local climate change planning to participants and stakeholders throughout the process of conducting the CCRHVA.

WHY THIS STEP IS IMPORTANT

Before gathering information to conduct a CCRHVA, it is important to understand how the process and information learned from it will be subsequently applied to local planning and decision-making, and how climate resilience and adaptation can become embedded in the municipality. Every community in New Jersey will be increasingly impacted by climate change. Addressing this in the land use element of the master plan, as required by the MLUL, will prepare the community for ongoing, long-term efforts to plan for and respond to existing and emerging climate hazards that impact the built, natural, social, economic, and governance systems that sustain the community. This step prepares the municipality for interpreting and using a CCRHVA as a foundational resource for local decision-making and integrating climate adaptation into all municipal planning and project efforts.

According to the MLUL, the municipal master plan is intended to "guide the use of lands within the municipality in a manner which protects public health and safety and promotes the general welfare." To fulfill that intention, it is now imperative to assess the community's exposure to climate hazards, the potential impact of those hazards, and the capacity to continue to deal with a dynamic suite of hazard scenarios. The extent to which a community is vulnerable to climate hazards can drive measures of economic and social well-being for its members. Land use plays an important role, for example, in determining where housing, business district, or public infrastructure investments are made. Understanding appropriate land-use solutions in the face of a changing climate will be critical to sustaining healthy communities and ensuring the safety of individuals and first responders.

From the onset of the initiative, the lead (or core team) should apply intentional effort to support healthy, prosperous people and healthy, functioning ecosystems as an integral part of climate adaptation planning.

To meet the requirements of MLUL provision (vi), the land use element of the municipal master plan will need to "include a specific policy statement on the consistency, coordination, and integration of the climate-change related hazard vulnerability assessment with any existing or proposed natural hazard mitigation plan, floodplain management plan, comprehensive emergency management plan, emergency response plan, post-disaster recovery plan, or capital improvement plan." The MLUL amendment also requires, in provision (iv), that the CCRHVA "analyze the potential impact of natural hazards on relevant components and elements of the master plan."

Furthermore, as will be described in Phase 3, climate adaptation planning is a community-based initiative. Everyone in the community is affected by the impacts of climate change, and certain segments of the population are disproportionately impacted. This guide centers community involvement in the CCRHVA process and includes mechanisms to intentionally consider health impacts and socially vulnerable populations early in the planning process so that the CCRHVA addresses disparities in vulnerability across the community. In addition to providing information about the health profile of the community, reviewing data early on will help to highlight or reveal relevant information before decisions are made concerning a project team, community engagement, and the

general approach. An understanding of climate-related trends and the community's existing vulnerabilities will be helpful, not only for the project lead to oversee the project and for a project team (if designated) and municipal officials to have a baseline understanding at the start of the process, but also for identifying relevant stakeholders to participate in the CCRHVA throughout all phases, and for producing outreach materials to support inclusive public awareness, support, and engagement.

This step can also be used to help a municipality determine if it would benefit from designating a project team, and who should be on the team. In this guide, designating a project team occurs in Phase 3, after relevant information has been gathered.

WHAT TO DO

At the initiation and throughout this process, access educational and training resources to understand the relationship between climate vulnerability and local planning to consider ways in which the systems supporting the community may be affected by climate hazards and the things that can be done at the local level to reduce vulnerability. The lead should complete educational and training resources at initiation of the project, and these resources should subsequently be made available to all CCRHVA project team members and other stakeholders as they become involved in the process. Use the implementation goals resource document provided in this step to understand how the information gained from conducting the CCRHVA will be applicable to goals and strategies of the municipal master plan.

Through the engagement process and analyses provided in this guide, the community can be informed and proactive to "provide strategies and design standards that may be implemented to reduce or avoid risks associated with natural hazards," which is provision (v) of the MLUL.

Explore the below tools, exporting and copying information to share this information as needed in the process with team members and stakeholders. This step will familiarize the lead with information needed to analyze vulnerability in Phase 4 of the CCRHVA process.

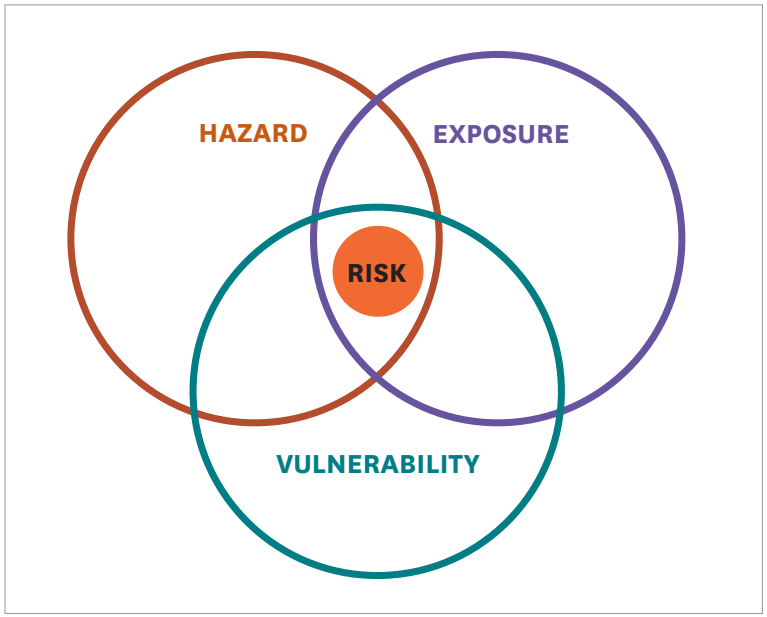
- Use Resource Document 1.2 Implementation Goals to consider ways in which master plan elements may be affected by climate change.
- Throughout this process, use the NJDEP climate science resources to understand the climate-related risks and impacts in New Jersey.
- Use the NJ Climate Change Resource Center Climate Dashboard to explore temperature and precipitation trends and impacts in New Jersey.
- View the data and conduct the planning process of the CCRHVA through the lens of equity by understanding how historic and present-day systemic and institutional racism and classism created and maintain disproportionate vulnerabilities that exist today. Resources such as the Guide to Equitable, Community-Driven Climate Preparedness Planning can help center this perspective in development of the CCRHVA.
- Complete the training, A Seat at the Table: Training for Whole-Community Climate Resilience Planning, available on the NJDEP website. This training will help a community improve the climate adaptation planning process by incorporating the needs and perspectives of populations that are especially vulnerable to changing climate conditions. It should be completed by the project lead at the start of the project and members of a project team (if designated) when they begin their roles, and it should be made available to others involved in the process.
- Understand the health profile of your community by using the New Jersey Department of Health (DOH) and NJDEP Healthy Community Planning–NJ Environmental Public Health Tool. The Map Book feature provides an overview of the environ-

mental and social features present in your community. Data from this tool will be used in Phase 4 to analyze vulnerability of community features to climate hazards.

Complete the Local Government Climate Adaptation Training, available on the U.S. Environmental Protection Agency's climate adaptation resource center website. The training is designed for local governments and describes climate vulnerabilities, how the impacts of climate change affect communities, and some examples of local adaptation.

Climate Central resources and data visualizations provide information about climate hazards and their impacts on environments and human health. There is a searchable database to find information based on state, topic, and other parameters. The visualizations may be particularly useful in conveying informationto stakeholders and decision-makers.

NJDEP Local Planning For Climate Change Toolkit connection



Source: Adapted from https://view.genial.ly/6430606e14a74800184ca32c/interactive-content-concepts.

PHASE 2

Explore Community Data and Resources

2.1 COMPILE AND REVIEW PLANNING DOCUMENTS

DELIVERABLES OF THIS STEP

- The project lead is familiarized with existing planning documents that should be reviewed and/or updated in relation to the CCRHVA.
- Planning documents are compiled **in support of MLUL provisions (iv), (v), and (vi).**

WHY THIS STEP IS IMPORTANT

Creating an inventory of planning documents serves the dual purpose of identifying how the community evaluated features and goals in the past and also cataloging where impacts of climate change need to be considered in future planning initiatives. Planning documents are data sources with information about past and present conditions, trends, objectives, and visions—all of which may be impacted by climate hazards. Reviewing these data early in the process can help inform initial conversations about the scope and goals of the climate adaptation planning process, both within the decision-making process and in community engagement efforts.

Compiling these data will also help meet provisions (iv), (v), and (vi) of the MLUL, which require municipalities to "analyze the potential impact of natural hazards on relevant components and elements of the master plan; provide strategies and design standards that may be implemented to reduce or avoid risks associated with natural hazards; [and] include a specific policy statement on the consis-

tency, coordination, and integration of the climate-change related hazard vulnerability assessment with any existing or proposed natural hazard mitigation plan, floodplain management plan, comprehensive emergency management plan, emergency response plan, post-disaster recovery plan, or capital improvement plan."

WHAT TO DO

Consult with municipal boards, committees, and staff to locate relevant planning documents. This may include paper copies or digital copies, and a system should be established to easily find the documents as needed throughout the process. Confirm that this task has not already been completed for another purpose. For example, NJ State Plan Endorsment, funding applications, or recognition programs may require certain planning documents to be compiled.

Use Resource Document 2.1 List of Planning Documents as a reference for general information about different local planning documents, where to find them, and what to look for when reviewing them.

Use Worksheet 2.1 Planning Documents Review to catalog the planning documents in your community relevant to conducting a CCRHVA and/or those that will need to be updated based on the assessment. Doing this now provides an opportunity to understand existing community goals or challenges and will save time when there is a need to locate information from various planning documents at later phases in the process of analyzing hazard vulnerability and developing strategies.

NJDEP Local Planning For Climate Change Toolkit connection

2.2 IDENTIFY PARTNERS

DELIVERABLES OF THIS STEP

Potential participants, advisors, and technical assistance providers to help complete the CCRHVA are identified.

WHY THIS STEP IS IMPORTANT

Addressing climate change is not something any municipality or local project team can do on their own. There are many resources available through the expertise, experience, and assistance of others. Understanding who can help and in what capacity will enable the municipality to seek targeted assistance. It will also inform who should be involved. Based on the principles of climate adaptation planning learned in Step 1.2, the review of planning documents conducted in Step 2.1, and an understanding of potential partners from this step and the next, organizations, roles, and individuals for specific aspects of the municipality's climate adaptation planning process can be identified, including the make-up of a project team to guide the CCRHVA process, if the municipality chooses to designate one.

WHAT TO DO

Identify agencies, organizations, and other local governments involved in climate adaptation planning work that may be relevant to the community's CCRHVA. When the lead has questions, needs a specific resource, or can learn lessons from the experiences of others, they can reach out to these partners.

Contact potential partners that may offer guidance, connect municipalities with resources or information, or provide technical assistance for local climate adaptation planning or implementation. See the text box or use Resource Document 2.3 Climate Planning Partners.

Partners That May Engage in an Advisory Capacity When the Municipality is Conducting a CCRHVA

LOCAL

American Littoral Society

County Boards of Social Services

Jacques Cousteau National Estuarine Research Reserve

Monmouth University

New Jersey Climate Change Resource Center

New Jersey Coastal Resilience Collaborative

New Jersey Future

Stevens Institute of Technology

Stockton University

Sustainable Jersey

TriCounty Sustainability Alliance

STATE

Bureau of Climate Resilience Planning, New Jersey Department of Environmental Protection

New Jersey Office of Emergency Management

New Jersey Office of Planning Advocacy

REGIONAL

Delaware Valley Regional Planning Commission

County Planning Office (Directory at New Jersey County Planners Association)

New Jersey Highlands Council

New Jersey Pinlands Commission

New Jersey Sports and Exposition Authority

North Jersey Transportation Planning Authority

South Jersey Transportation Authority

CRS Users Groups (Middlesex, Monmouth, Morris, and Ocean)

FEDERAL

FEMA Region 2

NJDEP Local Planning For Climate Change Toolkit connection

2.3 IDENTIFY COMMUNITY STAKEHOLDERS AND RESOURCES

DELIVERABLES OF THIS STEP

- Community members with lived experience and other expertise are identified as stakeholders and potential participants in completing the CCRHVA.

WHY THIS STEP IS IMPORTANT

Community members are an invaluable resource, and the whole community needs to be involved throughout the entire climate adaptation planning process. Individuals living or working with the impacts of climate change can provide data, insight, and solutions others cannot. To ensure both the process and outcomes are inclusive, it is important to understand the stakeholders in the community. Making the process inclusive entails meaningful opportunities for engagement and leadership. With knowledge of the key stakeholders in the community, along with the information gathered in previous steps, the municipality can assemble an inclusive and appropriate team for addressing climate impacts and maintaining consideration and inclusion of socially vulnerable populations throughout the planning process and in the implementation of equitable solutions.

Local resources and stakeholders include the municipal business administrator, construction official, department of public works, floodplain administrator, green team, engineer, office of emergency management, public health official or nurse, and planning office; local supports and services; and climate-related programs, including advocacy organizations, technical assistance groups, and other relevant resource groups.

PART I

WHAT TO DO

Identify community stakeholders and consider how to solicit their participation in the process. Different individuals or stakeholder groups may participate in varying roles and responsibilities. Based on the information and understanding gathered in previous steps of this process, consider whether to designate a CCRHVA project team and how to structure it. Apply an equitable approach when selecting and recruiting key stakeholders to leadership roles. Continue identifying stakeholders to assemble a diverse group in these beginning stages, and as community engagement unfolds throughout the entire process.

Use Worksheet 2.3 Key Local Stakeholders to identify municipal staff and departments, community groups and advocates, and community members who can provide expertise and diverse community perspectives throughout the climate adaptation planning process.

NJDEP Local Planning For Climate Change Toolkit connection

PHASE 3

Activate Community Engagement

3.1 FORM A PROJECT TEAM

DELIVERABLES OF THIS STEP

A project team representing relevant expertise and diverse community perspectives is established for the CCRHVA project.

WHY THIS STEP IS IMPORTANT

This step is an opportunity to build capacity, awareness, and support for the effort. Although it is not necessary to have a project team to complete the CCRHVA, communities can benefit from an inclusive project team representative of the community.

As the project kicks off, it should be acknowledged that the impacts of climate change are not experienced equally by everyone. Those most impacted are often individuals or populations least able to prepare for or cope with the effects. Begin this effort by understanding who may be more vulnerable to climate change-related impacts and who may be underrepresented in planning and decision-making processes. To reduce the overall vulnerability of the community, and to improve the community's ability to cope with climate hazards, be intentional in the outreach and engagement process to include leadership roles and engagement opportunities for these populations.

While the lead is responsible for ensuring the community conducts a CCRHVA through an appropriate process and with clear goals being achieved, a project team will inform and guide the process. Planning, technical, and community perspectives should be included on

the project team to contribute knowledge about municipal land use plans and policies, climate adaptation strategies, health and social supports, economic trends, local ecology, and community assets and challenges. Individuals from backgrounds representative of diverse perspectives and populations in the community should be on the project team.

WHAT TO DO

Based on the information gathered in Phase 2—vulnerable populations data and lists of local community advocates and organizations—identify demographic or neighborhood groups from which to solicit representatives to participate on the project team and for which engagement and outreach efforts should be focused and tailored.

- Consider if there is an existing group that could serve as the project team, such as a subcommittee of the planning board, or a team assembled previously for a different project or program.
- Use Worksheet 3.1 Project Team Selection to create the roster of individuals to solicit for participation on the project team.
- After identifying individuals to solicit for an inclusive and representative project team that will effectively guide the planning process, use Template 3.1 Project Team Solicitation to conduct outreach.

NJDEP Local Planning For Climate Change Toolkit connection

3.2 DEVELOP AND IMPLEMENT A COMMUNITY ENGAGEMENT PLAN

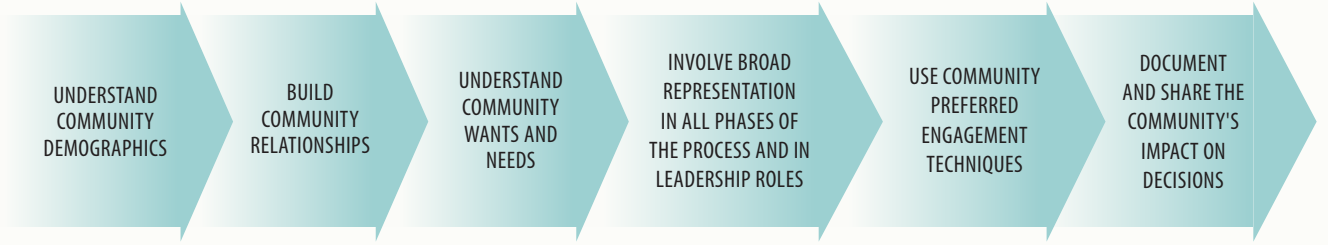
DELIVERABLES OF THIS STEP

- A plan for engaging all members of the community in meaningful and equitable ways throughout all steps of the CCRHVA process is developed.

WHY THIS STEP IS IMPORTANT

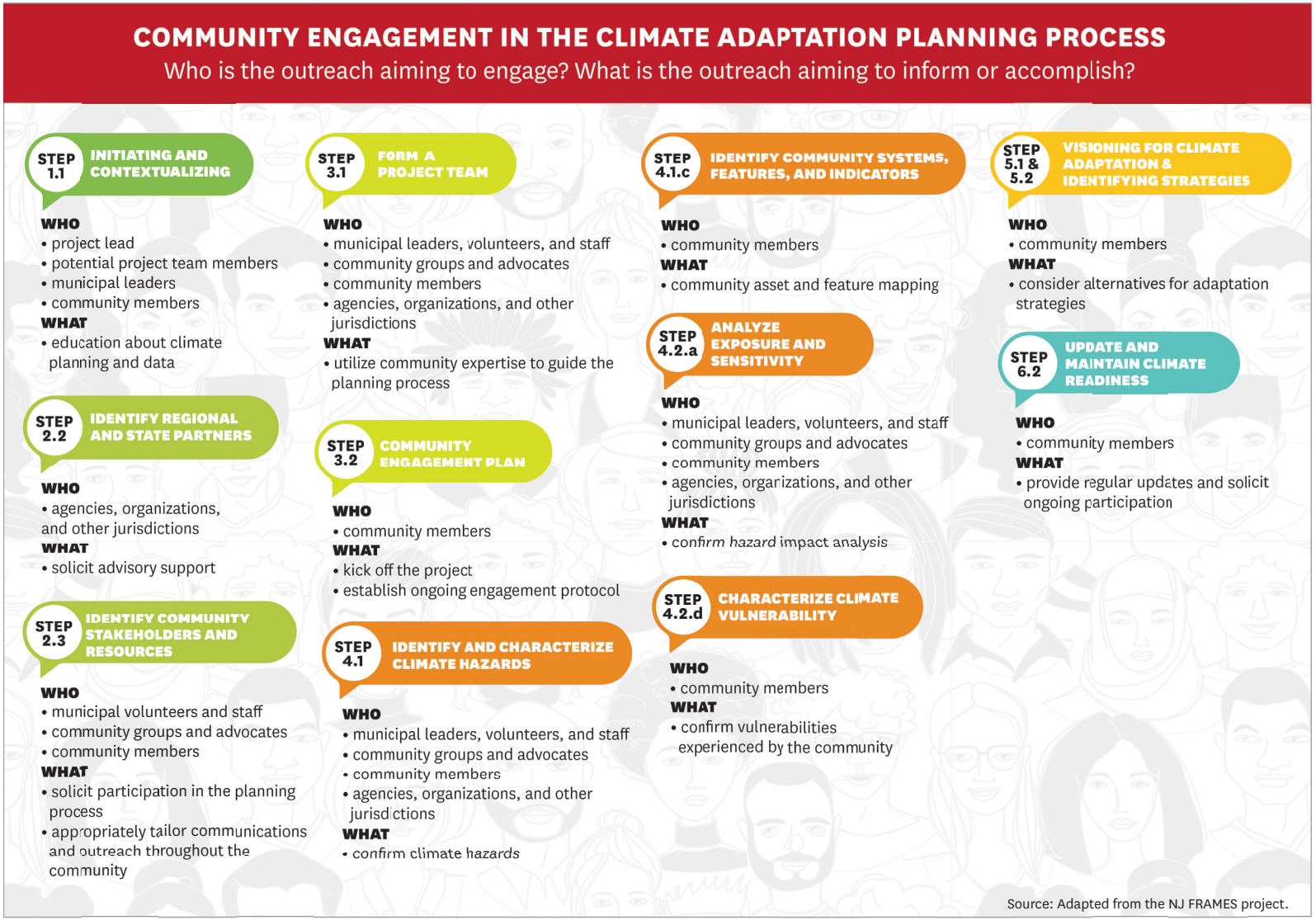
Decisions made by the project team should also be based on a robust community engagement process that extends beyond the project team members. A successful community engagement program will include diverse representation in leadership roles as well as community members reached through the program. It will provide equitable access to participation and meaningful deliberation on topics relevant to diverse perspectives. Information learned from the engagement process should be considered as data input for conducting the entire climate adaptation planning process, including analysis of hazards vulnerability, and for addressing underlying or persistent disparities within the community. Climate change is a public health threat that exacerbates existing disparities in health status, income and wealth, quality of life, access to resources, representation in government and decision frameworks, and other socially determined conditions and outcomes. The community engagement process provides an opportunity to address these.

PROMISING PRACTICES



Source: Adapted from The U.S. Department of Transportation resource, "Promising Practices for Meaningful Public Involvement in Transportation Decision-Making."

In addition to engaging with the broader community, the project team will need to incorporate the perspectives and expertise of other stakeholders identified in Phase 2 (Steps 2.2 and 2.3). The below graphic adapted from the NJ FRAMES Project report describes engagement phases and how stakeholder groups can be involved throughout the climate adaptation planning process. The report provides a description of "planned" and "actual" engagement activities, describing how community engagement was an interactive process in which different stakeholder groups played key roles during different phases of resilience scenario planning in the multi-partner regional planning initiative in the Two Rivers region of Monmouth County.



Source: Adapted from the NJ FRAMES project.

PART I

WHAT TO DO

Develop a community engagement plan that is designed to "meet people where they are" and offers appropriate types of information and opportunities to inform all community members of the effort and solicit participation. This may mean utilizing different languages, facilities, or facilitators for community outreach, and it will entail considerations of timing, childcare, transportation, and other factors that may inhibit or prevent inclusive participation in the climate adaptation planning process. Community members should participate in the engagement process as leaders and experts of their communities. It is recommended that a member of the project team be assigned responsibility for implementing the plan and ensuring meaningful participation from all perspectives in the community, with intentional efforts to involve populations experiencing social vulnerability in the community.

- Based on the information gathered in the previous phase—information about vulnerable populations and lists of local community advocates or organizations—identify demographic or neighborhood groups for which engagement and outreach efforts should be focused and tailored.

- Reference the information gathered from steps in Phases 1 and 2 to identify specific populations for which intentional inclusion and representation will contribute to equitable community engagement, and specific climate information and hazards that should be communicated in the engagement process.

- Plan the engagement process using a template such as the ATSDR (Agency for Toxic Substances and Disease Registry) Community Engagement Planning Tool for Public Health Work, which is from the ATSDR Community Engagement Playbook.

- In designing your engagement plan, include a meeting at this early stage in the planning process to introduce the initiative and solicit participation in the planning process. This kickoff meeting can serve to solicit community members to undertake leadership, advisory, or data collection roles in the process. Additional community sessions throughout the process will solicit input from the community to identify assets, goals, and climate-related issues.

- Implement your community engagement plan starting immediately and continuously throughout the entire process to complete the CCRHVA. It is recommended that a member of the project team be tasked with monitoring and implementation of the plan.

- Add a description of community participation and the planning process, including activities done throughout Part I, to Template 1.1 CCRHVA, which can serve as the draft CCRHVA.

NJDEP Local Planning For Climate Change Toolkit connection

PART II ANALYZING AND PRIORITIZING

PART II INCLUDES all the steps to specifically achieve MLUL compliance and contains two phases. The first phase—Phase 4—is for the community to analyze data to assess its vulnerability to climate hazards. The second phase—Phase 5—is to identify strategies and standards.

The steps in Phase 4 establish a process for identifying and prioritizing community vulnerabilities. In this phase, and throughout this guide, we conceptualize a community as being composed of five systems: the built system, the natural system, the social system, the economic system, and the governance system. Each system is in turn made up of discrete features. The built system is probably the easiest to conceptualize and is what typically comes to most people's mind when thinking about vulnerability to climate hazards. This system includes readily identifiable features such as buildings, roads, and other physical infrastructure. The other systems include features that are not built infrastructure such as natural features, features that relate to human health and economy, and features that relate to local capacity.

Phase 4 lays out a series of steps for analyzing the vulnerability of features for each system. After establishing climate hazards and evaluating development patterns, it initiates with identification of specific critical built infrastructure features, which is done by the community. Other types of features are analyzed based on feature categories provided by this guide, and the community can identify specific features within these categories if desired. Climate change-related threats to (and vulnerabilities of) all features are assessed by assigning an impact score to each feature based on analyses of relevant climate hazards. While it is not necessary to assign impact scores to conduct a CCRHVA, this is a useful approach for assessing the level of vulnerability so that climate adaptation strategies can be prioritized. While some steps fully meet one or more provisions of the MLUL, most steps work toward meeting provision (i), which is to "analyze current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards."

All of the steps in Phase 4 contain components to meet requirements of the MLUL, and one of the steps in Phase 5 meets a requirement of the MLUL.

The steps in Phase 5 will consider solutions to address vulnerabilities. Phase 5 relies heavily on meaningful community engagement in order to develop equitable and effective goals and strategies. Identification of strategies and design standards is a required provision of the MLUL.

Also, to meet provision (vii) of the MLUL, municipalities must rely on the most recent natural hazard projections and best available science provided by the NJDEP. Consult the 2020 New Jersey Scientific Report On Climate Change report and summary document for a detailed reference of the state's climate science. A human health & communities addendum to the Scientific Report provides additional documentation about how the physical and mental health of people in New Jersey may be impacted by climate change. The steps in this guide will direct you to the data needed for conducting a CCRHVA that complies with MLUL provision (vii).

PART II

PHASE 4

Analyze Climate Change-Related Hazard Vulnerability

The results of the steps in this phase will be combined to create the CCRHVA as per requirements of the MLUL.

4.1 IDENTIFY CLIMATE HAZARDS, DEVELOPMENT PATTERNS, AND SYSTEM FEATURES

4.1.a IDENTIFY AND CHARACTERIZE CLIMATE HAZARDS

DELIVERABLES OF THIS STEP

MLUL provision (i): Municipal-specific quantitative and qualitative profiles for each climate change-related hazard that has potential to impact the community, including mapped areas for spatially-defined hazards.

WHY THIS STEP IS IMPORTANT

Climate hazards can cause impacts to community features, affecting the sustainability of systems. Climate hazards impacting municipalities include the hazards shown in Table 1. Provision (i) of the MLUL requires that the CCRHVA shall "analyze current and future threats to, and vulnerabilities of, the municipality associated with climate change-related natural hazards, including, but not limited to increased temperatures, drought, flooding, hurricanes, and sea-level rise." This guide establishes a process for assessing the hazards required by the MLUL, as well as additional hazards that may be of concern for a community. Communities should address any hazards that are present or projected.

Table 1.

Climate change-related hazards to analyze in a municipal climate change-related hazard vulnerability assessment (referred to as a CCRHVA in this guide).

Hazard	Coastal Hazard	Required in the CCRHVA
Increased / Extreme Temperature		per MLUL
Drought		per MLUL
Flooding (includes flooding from precipitation, riverine flooding, flash flooding, urban flooding, coastal flooding, sea level rise, and storm surge)	*Sea-level Rise *Storm Surge *Coastal Erosion	per MLUL
Severe Weather (includes high winds, hurricanes, and heavy snow and ice)		per MLUL
Saltwater Intrusion	*Saltwater Intrusion *Coastal Erosion	if relevant
Ocean Acidification	*Ocean Acidification	if relevant
Mudslides / Landslides		if relevant
Wildfire		if relevant
Vector Borne Disease		if relevant
Ecological Disease / Agricultural Pests		if relevant

PART II

Hazards are characterized by their location, frequency, and extent (or magnitude and strength). The risk that a hazard poses to a community can be thought of as the likelihood of it causing harm (damage, loss, or other impacts), and the consequences of that harm (in both the short- and long-term) to the community. The likelihood that a hazard may cause harm to a community feature or asset is a function of that feature's vulnerability to the hazard, which in turn is a function of exposure to the hazard, sensitivity to the hazard, and adaptive capacity to cope with the hazard in the short- and long-term.

The CCRHVA evaluates the vulnerabilities of a community to climate hazards in terms of the potential impact each hazard could have on different features of the community. Identification of hazards is the first step in analyzing climate vulnerability as per provision (i) of the MLUL. Analysis to assess vulnerability occurs in the following steps, and the results of the CCRHVA should guide the community to take action proactively to reduce its overall vulnerability.

WHAT TO DO

First, identify the hazards currently experienced, emerging, or projected in your community. Second, characterize the hazards identified.

To meet provision (i) of the MLUL, which requires an analysis of "**current and future** threats to, and vulnerabilities of, the municipality...," hazards listed in the MLUL need to be evaluated based on current conditions and projected future conditions. Some hazards are spatially-defined, meaning that their locations are delineated on maps, while others are not spatially-defined. For the purpose of conducting a more efficient analysis, it is helpful to think of the hazards as being categorized as one of the following:

- Spatially-Defined, Current
- Spatially-Defined, Projected
- Non-Spatially-Defined, Current
- Non-Spatially-Defined, Projected

The analysis guidance provided in a later step (Step 4.2) is organized into a workflow that uses these four categories. In the workflow analysis, spatially-defined hazards are generally evaluated together against a particular feature for a more efficient workflow and assuming the use of a GIS for many parts of the analysis process.

Use Resource Document 4.1.a Climate Hazards for data sources to identify and characterize climate hazards that impact the community.

Gather information about climate hazards from community members, municipal departments, regional and state partners, the local or county hazard mitigation plan, mapping services from federal, state, and institutional sources, and other data and stakeholder sources. Determine which, if any, additional hazards beyond those required by the MLUL are relevant to the community and should be evaluated in the CCRHVA. Note that it may not be necessary for the municipality to assess all hazards in Table 1 due to varying exposure to hazards across the state; however, as per MLUL provision (i), vulnerabilities to increased temperatures, drought, flooding, and hurricanes need to be assessed by every municipality and, for coastal communities, sea level rise. Some of the information gathered in planning documents (Step 2.1) may be applicable to this step.

To help identify hazards, conduct a community session that will solicit information from community members in all areas of the municipality.

Characterize the hazards that will be included in the CCRHVA by describing the location, frequency, and extent of each hazard to the degree possible. Quantitative data exist to inform characterization of some hazards, while other hazards will need to be characterized based on qualitative data alone. Characterization of the hazard does not need to repeat at great length the information found in other documents that profile hazards, such as hazard mitigation plans, or describe historic events or occurrences in great detail or length. It should briefly describe the hazard (location, frequency, and extent) using tables,

maps, and narratives, without necessarily describing details of historical events or impacts of the hazards on the community, as this is typically done in hazard mitigation plans. Impacts will be assessed in terms of vulnerability throughout Step 4.

After characterizing hazards, confirm the characterization matches the community's experience by conducting a community session. This activity could be combined with a community session designed for Step 4.1.c, which is to identify community assets and features potentially impacted by climate change-related hazards.

While working through the process in this guide, outputs of certain steps that complete a section of the municipal CCRHVA can be added to the draft CCRHVA template. Add the characterization of the hazards to Template 1.1 CCRHVA, or the draft CCRHVA.

NJDEP Local Planning For Climate Change Toolkit connection

4.1.b EVALUATE CURRENT AND FUTURE DEVELOPMENT ZONES

DELIVERABLES OF THIS STEP

- **MLUL provision (i):** Determination of parcels that are currently or projected to be exposed to climate hazards, to meet a requirement of the MLUL to analyze climate hazard threats and vulnerabilities.
- **MLUL provision (ii):** Analysis and outputs to meet a requirement of the MLUL to include a build-out analysis in the CCRHVA.
- **MLUL provision (ii):** Determination of municipal zoning regulations that may be incompatible with current and future climate hazards to meet the MLUL requirement of assessing results of a build-out analysis.

WHY THIS STEP IS IMPORTANT

One way to reduce vulnerability to climate hazards is through development regulation. Climate hazard impact can be reduced by developing to design standards that protect against hazard impact and by keeping development out of harm's way. Evaluating current development patterns in relation to current and projected hazard locations identifies areas of vulnerability in the community. Vulnerability to climate hazards that are not spatially-defined is also related to land use. For example, in the case of high winds, which can potentially occur anywhere and everywhere in a municipality during a severe storm, the impacts of strong winds are greater in areas where utilities are not buried. Evaluating climate hazards in relation to current development is one component of the CCRHVA that meets provision (i) of the MLUL.

Furthermore, the locations and features that experience hazard-related harm can change if your community is built to what is permitted by the local zoning regulations. Therefore, a build-out analysis is needed to determine what the community would look like in the future if it were built to current zoning. The results of that analysis are then assessed in relation to existing and projected climate hazards. Future development can occur as new development, infill development, or redevelopment.

A build-out analysis in relation to climate hazards is now a required component of the municipal master plan land use plan element. According to provision (ii) of the MLUL, a community's vulnerability assessment must "include a build-out analysis of future residential, commercial, industrial, and other development in the municipality, and an assessment of the threats and vulnerabilities [associated with climate change-related hazards] related to that development."

Doing a build-out analysis will help assess if the current zoning will make the community more vulnerable to impacts of climate change in the future, and if it will achieve the goals of climate adaptation planning efforts. While this is a useful tool to identify needed chang-

es to local plans, zoning ordinances, and development regulations, patterns of development are determined by multiple factors that are not controlled by zoning and cannot be definitively predicted through a build-out analysis. Nonetheless, this analysis will identify where built development is likely to increase, and strategies to address any potential threats or vulnerabilities from the increase in development in relation to climate change should be included in the municipal master plan. This may entail relocating out of hazard areas, and this step may also help identify areas with reduced exposure for directing redevelopment at higher density.

WHAT TO DO

Evaluate the community's current zoning map and development regulations for each zone in relation to existing and projected climate hazards to meet provision (i) of the MLUL. Then conduct a build-out analysis to project where future development can occur, and at what densities, based on current zoning, and evaluate the output of the analysis in relation to projected climate hazards. The build-out analysis and assessment of it in relation to hazards will meet MLUL provision (ii). There are various methods and approaches for conducting a build-out analysis, and such an analysis conducted for one purpose may not meet the needs or requirements of other purposes or programs. The methodology presented in this guide will meet the requirements of the MLUL.

The output of the build-out analysis will include a map showing areas where future development can occur but does not currently exist and where future development can be different from existing development due to redevelopment. The build-out analysis will also produce tables showing the parcels and zoning districts identified in the build-out analysis that may be vulnerable to climate hazards.

A build-out analysis that includes all development—residential, commercial, industrial, etc.—conducted to achieve State Plan Endorsement, an approved wastewater management plan, approved Highlands Regional Plan Conformance, a municipal stormwater management plan such as NJDEP MS4 permitting rules, or for the FEMA Community Rating System (CRS) program activity 452.b Watershed Master Plan (WMP) element can be used to meet the requirement of the MLUL provision. The build-out analysis should be completed within a reasonable timeframe of the CCRHVA (e.g., within five years of the CCRHVA), or it should be updated, if it is older, to include any development or zoning changes that have occurred since the build-out was completed.

- Use Worksheet 4.1.b Development Analysis to identify where current development and potential future development overlap with current and projected hazard areas. Then conduct a build-out analysis to compare it with climate hazards. A build-out analysis is best done in a GIS. Follow the steps in the worksheet to complete the analysis, or use one of the acceptable build-out analyses already conducted, then follow the worksheet steps to consider how development under current land use and under built-out conditions would be impacted by spatially-defined hazards and non-spatially-defined hazards. In a later step to conduct analyses of vulnerabilities to climate hazards (Step 4.2.a), populations living in the community will be evaluated. The report, "Who Lives in New Jersey Housing?" is a useful resource to begin thinking about climate impact on people living in different areas of the municipality. This step, however, is concerned only with zoning and development patterns in relation to climate hazards.

- Add the worksheet, or the results of the analysis, to Template 1.1 CCRHVA, or the draft CCRHVA.

NJDEP Local Planning For Climate Change Toolkit connection

SYSTEMS APPROACH TO CLIMATE ADAPTATION AND ASSESSING VULNERABILITY TO CLIMATE HAZARDS

WHAT IS A SYSTEMS APPROACH?

A systems approach considers the impacts on a community from the perspective of the key features that sustain the community. It provides an organizational framework. The key features are categorized into systems based on their function and how they are administered, managed, maintained, and received. The benefits of this approach include greater feasibility in assessing a limited number of key features and the potential to realize dynamic relationships and co-benefits within and among systems. This framing enhances approaches to resilience that focus on isolated efforts that aim to identify specific risks and corresponding projects to mitigate the risks individually. Because municipalities are more accustomed to organizing themselves around ways to improve the sustainability and functioning of their communities than they are to defining and studying natural hazards data, a systems approach provides a framework for municipal decision-makers and practitioners and other local stakeholders to holistically perceive climate vulnerability in ways that resonate.

WHY IS THIS APPROACH IMPORTANT FOR CLIMATE ADAPTATION?

Adaptation is the act of changing the way things are done. It is not always something that can be achieved by a single act or attention to a single risk. Climate adaptation requires long-term strategies grounded in transformative change. The changes enacted will impact how municipal functions are carried out, and a systems approach can help understand how those changes will affect the sustainability of the community, what needs to be done to make the changes happen, and potential synergies that will facilitate the changes happening. The systems approach provides a framework for climate adaptation evaluation, communication, and action.

HOW DOES THIS RELATE TO LOCAL PLANNING IN GENERAL?

Municipalities have a responsibility to manage conditions within their boundaries. Many of the things involved in conducting a CCRHVA are things that towns are already doing or aim to do in order to maintain quality of life for community members. The information learned as a result of the CCRHVA informs processes and decisions at the local level in ways that are beneficial to health and sustainability. There are also opportunities to work regionally and inform regional planning and decision-making. Analyzing the features that support systems in the community can reveal necessary improvements to governance regarding plans, policies, regulations, strategies, actions, outcomes, feasibility, and cost-effectiveness of solutions.

EQUITY AND PARTICIPATION

People are the key features of community social systems, and we all play a role in developing solutions that will keep everyone safe and healthy. Everyone is vulnerable to climate hazards, and we are all impacted by climate change, but we are not all impacted equally. Socially vulnerable populations are disproportionately impacted by climate change because it acts like a “threat multiplier.” Factors such as age, race, ethnicity, income, education, and disability are all major determinants of exposure to climate-related impacts. What makes climate change a threat multiplier is that individuals already experiencing vulnerability due to a range of societal or individual circumstances or conditions are often less able to prepare for, cope with, and respond to climate impacts. Furthermore, vulnerability can be imposed on people by the policies and practices of our society that create places where the entire community experiences disproportionate burdens, simply because of where they live. An essential part of conducting a CCRHVA is ensuring that the process is centered on equitable process, participation, decision-making, and outcomes.

SYSTEM FEATURES AND INDICATORS

The approach focuses on a set of key features and indicators for system sustainability because it is not possible to evaluate every feature of a municipality for the CCRHVA. The following system features and indicators are evaluated in the CCRHVA systems approach. →

SYSTEM	FEATURE	INDICATOR
BUILT SYSTEM	Facilities & Infrastructure	Physical Damage
		Operational Damage
	Housing Stock & Businesses	Residential & Commercial Structures
		Public & Affordable Housing Siting
NATURAL SYSTEM	Natural Lands Resources	Protected Natural Lands & Buffers for Migration
		Biodiversity & Connectivity
		Urban Ecology
	Water Source Resources	Water Quality
		Water Quantity
	Air Quality	Air Pollution
SOCIAL SYSTEM	People	Public Health
		Vulnerable Populations
ECONOMIC SYSTEM	Sustainable Economic Development	Jobs
		Non-Residential Tax Base
	Working Lands	Farming
	Outdoor Recreation	Eco-Tourism
		Agri-Tourism
GOVERNANCE SYSTEM	Equitable Land Use	Land Use Ordinances
	Community Engagement	Studies
		Programs
	Jurisdictional Plans & Accountability	Code Enforcement
		Staffing
		Budget & Funding

ANALYSIS

For each indicator of each feature, specific factors affecting exposure and sensitivity to climate hazards are evaluated. The indicators are based on maintaining system functionality, and the analyses are based on which hazards impact the indicators, the best available data to evaluate impact, and considerations for capacities municipalities have to conduct a comprehensive assessment. Capacity is a critical issue, not only for conducting the CCRHVA, but also for climate adaptation. In addition to hazard impact, adaptive capacity is evaluated in the CCRHVA based on municipal plans, policies, regulations, procedures, and resources. Taken together, hazard impact and the capacity to adapt based on the impact, represent the vulnerability of a feature to climate hazards.

OUTPUTS

The result of the CCRHVA is a more informed community, with strategies to develop a plan of action to address climate hazard vulnerabilities. Because the systems approach evaluates each system based on a broad set of climate hazards and impacts, the outputs of the analyses provide a holistic perspective of what needs to change in the community to reduce vulnerability. By conducting the CCRHVA through a robust process that involves meaningful community and stakeholder participation, with a particular focus on vulnerable populations, the outcomes will reflect the needs of the community and help facilitate community-scale transition into productive ways of thinking about land use, sustainability, equity, and climate change impacts.

Outputs of the CCRHVA will inform the following types of implementation goals:

- **RE**SPOND to Natural Hazard Events
- **RE**GULATE Land Use
- **RE**STORE Natural Infrastructure
- **RE**INFORCE Necessary Built Infrastructure and Buildings
- **RE**ADY the Community
- **RE**LOCATE Out of Hazard Areas
- **RE**DUCE Green House Gasses

PART II

4.1.c IDENTIFY COMMUNITY SYSTEMS, FEATURES, AND INDICATORS

DELIVERABLES OF THIS STEP

- An understanding of the systems framework guiding the process in this guide to analyze climate vulnerability.
- **MLUL provision (iii):** Identification of critical infrastructure to meet a requirement of the MLUL.
- **MLUL provision (i):** Identification of critical infrastructure features that are of priority for the community to analyze in relation to climate hazards in the CCRHVA.
- Working lists of potential climate readiness actions and hazard mitigation projects **in support of MLUL provision (v)**.

WHY THIS STEP IS IMPORTANT

In this step, the community will identify specific built critical infrastructure features and prepare for analysis of key features that sustain the built, natural, social, economic, and governance systems that support the municipality. Critical infrastructure to be identified in the CCRHVA as per MLUL provision (iii) are the features that are "necessary for evacuation purposes and for sustaining quality of life during a natural disaster." This includes "facilities, utilities, roadways, and other infrastructure." Features that may not be assets, but are challenges or problems in the community, like a hazardous waste site or brownfield, should be considered critical infrastructure.

Critical infrastructure features are part of the built system, which includes physical features like transportation and utility infrastructure and buildings and facilities like public works yards, hospitals, schools, stores and businesses, historic structures, park amenities, playgrounds, community centers, and government administration buildings. These types of features should be assessed, along with critical infrastructure, in the CCRHVA to meet provision (i) of the MLUL because they are valued by the community and contribute to the safety, health, and quality of life for people.

Communities may generate a long list of built features, as there are potentially thousands of built facility and infrastructure features that exist in a community. After identifying which are critical infrastructure features to meet provision (iii) of the MLUL, any feature that is not critical but still a priority for the community, including critical and non-critical features, should also be selected from the extensive list to analyze in relation to climate hazards. Spatial data providing the point locations for many critical infrastructure and other built features are available for use in a GIS, and data sources are provided in this guide.

In addition to analyzing features of the built system, communities need to analyze the vulnerability of natural system features, social system features, and economic system features to meet provision (i) of the MLUL. The next step of this guide (Step 4.2.a) contains a minimum set of features for each of these four systems that need to be analyzed in terms of exposure and sensitivity to specific hazards for the vulnerability assessment. If appropriate, municipalities can also include additional features when analyzing these four systems. The fifth system, the governance system, will be evaluated as adaptive capacity in a subsequent step.

In order to capture a comprehensive representation of "community features"—the features comprising all four systems—relevant to climate adaptation planning, intentional effort should be made to ensure all sectors of the community are reached in community engagement to make sure that all important built and non-built features are captured in the analysis.

Understanding what is of value or concern in the community will help guide climate adaptation planning strategies that incorporate protection or improvement of important features. Addressing underlying problems and safeguarding community asset features in a holistic manner will improve the systems that support and sustain the community in the long term.

PART II

WHAT TO DO

Consult community members, assessments and plans, data sources, inventories, maps, and advisory stakeholders, such as individuals with roles described in Worksheets 2.3 Key Local Stakeholders and 3.1 Project Team Selection, to list and map built infrastructure features that are assets or challenges in the community. Include all built infrastructure features that are important in the community, including critical and non-critical infrastructure. Then, prioritize which features on the list will be analyzed in relation to climate hazards (analysis occurs in the next step).

Review pages 28-30, an exerpt from Resource Document 4.1.c Systems Approach, to understand how this process will incorporate evaluation of the built, natural, social, economic, and governance systems supporting the municipality into the vulnerability analysis. This resource also describes potential impacts to each feature of each system from the climate hazards that are listed in Table 1 in Step 4.1.a. By using a systems approach, it is not necessary to identify every discrete feature in the community. However, it is a requirement of provision (iii) of the MLUL to identify critical infrastructure features necessary "for evacuation purposes and for sustaining quality of life during a natural disaster, to be maintained at all times in an operational state."

Use Worksheet 4.1.c Vulnerability Matrix as a tool to create a list of the public-serving facilities and infrastructure on the "Built Infrastructure Features Full List" worksheet tab. Public-serving facilities and infrastructure include the built features that are important for keeping a community operational and healthy. This can include assets, as well as facilities and infrastructure that have the potential to cause harm in the community, such as contaminated sites.

In any particular community, there can be a wide range of facilities that are considered critical or important to the viability of the community, including but not limited to:

- utilities (e.g., energy, water, wastewater, broadband);
- care facilities (e.g., hospitals, clinics, nursing homes, assisted living);
- schools and child care centers;
- emergency management and response facilities sites (e.g., fire, police, evacuation shelters);
- evacuation routes and other important roadways;
- dams;
- stormwater management infrastructure;
- hazardous materials sites; and
- other community facilities (e.g., libraries, grocery stores, check cashing sites, food distribution sites, homeless shelters, community centers, culturally significant structures/infrastructure), and bicycle and pedestrian infrastructure.

The full list compiled in this step can be included in the CCRHVA as identification of critical infrastructure to meet provision (iii) of the MLUL, or a subset of the list can be extracted to identify critical infrastructure as per the provision. Note that it is not necessary to complete this specific spreadsheet or use this worksheet; it is provided as a tool, and it may be easier to export lists from a GIS or other tool or data source.

Begin compiling the list of built infrastructure by starting with data sources of critical infrastructure, such as by using FEMA's seven community lifelines approach. Lifeline data can be accessed through the Homeland Infrastructure Foundation-Level Data (HIFLD) portal, including emergency and utility features, as well as features such as places of worship, public venues, care facilities, and others. Certain data sets with Lifeline Sectors identified by the US Department of Homeland Security have also been compiled in the NJ HazAdapt tool. Critical infrastructure data should also be available through the local hazard mitigation planning process, which is typically done at the county level. It is worth noting that data and information about critical infrastructure, hazards, and municipal vulnerabilities to hazards should be shared with the coordinating agency (typically the county) for the multi-jurisdictional hazard mitigation plan and be included in the municipal annex of the plan.

Municipalities within the Highlands Region can use the Highlands Region Interactive Environmental Resource Inventory (ERI) Tool to map and list certain critical infrastructure and other built infrastructure features.

Community facilities and infrastructure that are in addition to the lifeline facilities and data available through the HazAdapt tool, Highlands ERI, and county hazard mitigation plans should also be added by the community in order to include all public-serving facilities and infrastructure to the extent possible to meet provision (i) of the MLUL. Many are included in GIS data available from the NJDEP or the NJ Geographic Information Network of the NJ Office of GIS. The community should map any additional built features based on local knowledge and community engagement, being sure to include in the list any resources, amenities, and features important to community members, particularly vulnerable populations.

Prioritize the built features identified by choosing those for which an analysis of vulnerability of physical and operational damage will be conducted in the next step (Step 4.2). There is a column in the "Built Infrastructure Features Full List" tab of Worksheet 4.1.c Vulnerability Matrix to indicate which features are prioritized for analysis in the CCRHVA. Prioritization of built features may be necessary because some communities may have a very large number of built features on the list, and many features identified by communities may be outside the jurisdiction of the municipality, and will therefore be harder to analyze. Regardless, communities should develop a strategy to work with partners to conduct the best possible analysis. At a minimum, each municipality must analyze the physical and operational vulnerability of municipal-owned or operated facilities and infrastructure considered critical for the municipality to remain operational during and after a disaster as part of the built system analysis.

If a community wishes to assess in detail any particular feature in the community in relation to specific climate hazards, individual features can be added to the "Individual Feature Assessment" tab of Worksheet 4.1.c Vulnerability Matrix. Identification of features other than built infrastructure is encompassed in the analysis workflow when evaluating vulnerability through the systems approach. The reason to approach this from a systems perspective is to contextualize the hazard impacts so that strategies can be geared toward long-term sustainability of the systems that people rely on for day-to-day needs and activities. However, there may be specific features that a community would like to evaluate individually, such as a particular park, reservoir, or economic driver. Analysis of these individual features should be included in the analysis of system features while analyzing the system to which they belong, and they can be evaluated individually as well.

During the process of identifying relevant community features, specific needs or ideas for governance actions that the municipality can implement to be more climate ready may arise, and the community may wish to note them. Review the information provided in Worksheet 4.1.c Municipal Governance to explore actions that municipalities can take to improve adaptive capacity in ways that decrease vulnerability to climate hazards. Use Worksheet 4.1.c Climate Readiness Actions List—throughout the process and as needed—as a resource to record potential actions the municipality may want to take to reduce climate hazard vulnerability through municipal operations, protocols, communications, access and response to dynamic climate adaptation planning information, and other procedures. This activity is in support of meeting provision (v) of the MLUL. Worksheet 4.1.c Municipal Governance will be completed at a later step in the process (Step 4.2.c).

During the process of identifying relevant community features, specific needs or ideas for projects to implement hazard mitigation actions may also arise, and the community may wish to note them. These should be captured for inclusion in the community's hazard mitigation plan, master plan, capital improvement plan, and funding procurement efforts. Use Worksheet 4.1.c Mitigation Projects List as a resource to record new or ongoing projects that are related to natural hazard mitigation planning in the community.

PART II

To help complete the list of community facilities and infrastructure, and identify priority features, conduct a community session that will solicit information from community members in all areas of the municipality to confirm and identify important community features. Prior to developing any climate strategies, engage with the community to identify valued community assets and features through a participatory process such as described in the Sustainable Jersey Community Asset Mapping Action.

NJDEP Local Planning For Climate Change Toolkit connection

4.2 ANALYZE AND CHARACTERIZE THE VULNERABILITY OF THE FEATURES AND SYSTEMS SUPPORTING THE COMMUNITY

4.2.a ANALYZE EXPOSURE AND SENSITIVITY OF COMMUNITY FEATURES AND SYSTEMS

DELIVERABLES OF THIS STEP

- **MLUL provision (i):** Results of analyzing the impact of climate hazards on community features to meet a requirement of the MLUL.
- Climate hazard impact scores assigned to community features to assess vulnerability **in support of MLUL provision (i)**.
- Understanding of the impact of climate hazards on community features **in support of MLUL provisions (iv) and (vi)**.

WHY THIS STEP IS IMPORTANT

Based on what has been recorded in the previous steps about the hazards and community-specific features, the community can now begin to analyze its vulnerability to experiencing harm from the hazards. Ranking the relative exposure and sensitivity—the hazard impact—of all climate hazards across all systems supporting the community can help the community understand the relative severity of the risks posed by climate change across the community. This will assist later in prioritizing strategies and actions. This evaluation of the impact of climate hazards on important features and systems of the community, along with assessing adaptive capacity in the following step in this phase, constitutes an analysis of climate vulnerability in the community toward meeting provision (i) of the MLUL.

Climate resilience involves "bouncing forward," and if forward-looking progress is to be inclusive of all aspects of the community, vulnerability should be understood at the scale of the community as a whole. While assessing the vulnerability of specific features provides a good understanding of vulnerability for those individual features, a more holistic analysis of hazards and risks is needed to inform multi-sectoral, interdisciplinary strategies and design standards to reduce vulnerabilities in the long term and promote municipal-level sustainability. This step will also inform an explanation of the relationship between the vulnerability assessment and all elements of the municipal master plan and other planning frameworks, which is required as per provisions (iv) and (vi) of the MLUL, respectively.

WHAT TO DO

Use data and mapping information gathered in previous steps (i.e. analysis of development zones and identification of climate hazards, community features, and vulnerable populations), as well as information learned from stakeholder engagement activities while working through this step, to assign vulnerability impact scores based on analyses of exposure and sensitivity for community features to climate hazards. For hazards that are spatially-defined, this will

require overlay mapping to assess the exposure, which is based on the location of features in relation to where hazards are present and projected to be present. A GIS should be used to evaluate spatial exposure. Other methods, including community self-assessment, are also used to evaluate exposure and sensitivity to climate hazards. The analysis process includes evaluation of the vulnerability of key built, natural, social, and economic features in the community to understand the bigger picture of how various climate-related hazards impact systems that support the municipality. The governance system will be analyzed in the next steps to evaluate adaptive capacity (Steps 4.2.b and 4.2.c).

Compile and refer to the information gathered in previous steps, including community and stakeholder input, current and projected development conditions (i.e. the build-out analysis), and current and projected climate hazards.

Refer to the Analysis Quick Guide on pages 35-36, or in Resource Document 4.2.a Analysis Quick Guide, prior to beginning, and while working through, the detailed process outlined in Phase 4. This provides an overview of the process of analyzing important features in the community to assess climate change-related hazard vulnerability, and it links to Resource Document 4.1.c Systems Approach, which should be used throughout the process to understand the framework for evaluating hazards in relation to community features.

Use Worksheet 4.2.a Analysis Workflow as a step-by-step guide for working through analyses of each indicator for each system feature. This worksheet is also linked in the Analysis Quick Guide, and it provides guidance for an efficient approach to work with data and tools provided to conduct this step of the CCRHVA. The "Analysis Matrix Code" provided in each analysis component listed in Worksheet 4.2.a Analysis Workflow corresponds to a high-level view of the workflow provided in Worksheet 4.2.a Analysis Matrix. The analysis matrix is not used in the analysis; it is a tool to easly see all of the analysis components at once. It can also be used to track the status of the analysis phase, checking off the indicators of features as the analysis of each is completed.

The Analysis Quick Guide also includes a link to Resource Document 4.2.a Vulnerability Key, which is also found on pages 37-41 and provides guidance in assigning an impact score after evaluating the indicator features in relation to hazards. By applying the vulnerability key to the outputs of the analyses performed by following the workflow, an impact score (which is a combination score assessing exposure and sensitivity) can be assigned for each hazard that affects each feature.

The Analysis Quick Guide also includes a link to use Worksheet 4.1.c Vulnerability Matrix (started in Step 4.1.c) to record the impact scores of each feature analyzed. After evaluating each feature on the list in relation to each relevant hazard, an overall impact score that accounts for compounding hazards will be automatically calculated in the worksheet for each feature. It is not necessary to evaluate the impact of every hazard in relation to every feature. The analysis matrix and workflow worksheets indicate which hazards shouldbe evaluated at minimum, and if the community chooses to evaluate additional hazards, they may. It is not necessary to complete this spreadsheet; it is provided as a tool to strategically assess vulnerability based on analyses.

Update Worksheet 4.1.c Climate Readiness Actions List, as needed, to record additional new or ongoing actions that are related to local climate readiness planning through municipal governance. Refer to Worksheet 4.1.c Municipal Governance as a resource.

Update Worksheet 4.1.c Mitigation Projects List, as needed, to record additional new or ongoing projects that are related to natural hazard mitigation planning in the community.

Use the stakeholder lists that were generated at earlier phases of the process to seek input and resources in analyzing the impact of climate hazards on community features. If Phase I was not already part of the CCRHVA process, see Steps 2.2, 2.3, 3.1, and 3.2 of this guide.

NJDEP Local Planning For Climate Change Toolkit connection

ANALYSIS QUICK GUIDE A PRACTITIONER'S RESOURCE TO FOCUS ON CONDUCTING THE ANALYSIS INSTEAD OF FIGURING OUT A PROCESS.

Below are the main steps for analyzing vulnerabilities associated with climate hazards. This guide contains details on how to follow the overall process shown below.

1. THINK HOLISTICALLY

Use Resource Document 4.1.c Systems Approach throughout the process to understand the framework for evaluating hazards in relation to community features. The perspective outlined in the systems approach framing helps practitioners understand why the analyses conducted in this step are important and how they will yield information related to land use planning and community sustainability. It also describes how the key features of systems are impacted by specific climate hazards.

2. GATHER HAZARDS DATA

Two scenarios of hazards data are needed—current hazards and projected hazards. Not all of the hazards are delineated spatially. Therefore, within the two scenarios—current and projected—only certain hazards will be spatially-defined (i.e. mapped) for analysis. For spatially-defined hazards, the spatial data will be used repeatedly to evaluate exposure of various features of the community to the same hazards. It is therefore beneficial to have a GIS map project that contains all of the spatially-defined hazards within the boundaries of the municipality to use as a basemap, along with the municipal parcel data, while working through analysis of each indicator. Hazards data for the CCRHVA falls into one of four categories: spatially-defined current, spatially-defined projected, non-spatially-defined current, non-spatially-defined projected. Some hazards may need to be characterized qualitatively, particularly if quantitative data are not available. (Sources of hazards data are provided in Resource Document 4.1.a Climate Hazards.)

3. ANALYZE FEATURES

Worksheet 4.2.a Analysis Workflow provides a step-by-step process for evaluating exposure and sensitivity of each feature, including explanations of the analyses and data sources. In order to approach the CCRHVA from the perspective of advancing community-scale resilience, and not limited to hazard mitigation pertaining to specific projects, it is strongly encouraged that the analysis generally proceed through a system-by-system and feature-by-feature approach. The analysis workflow worksheet provides the guidance for doing that while combining workflows that use similar data and tools. Some components of the CCRHVA analysis use quantitative data and others rely on qualitative data. Some analyses can be applied to the assessment of multiple features. Some features will need to be assessed by a "community self-assessment," which entails talking with experts and stakeholders. Based on the outputs of the analyses, a hazard impact score is given to each indicator of system features in order to assign a score for each system feature (and specific individual features, if applicable). (See "Score Hazard Impact" below). Worksheet 4.2.a Analysis Matrix provides a high-level visual of the analyses and of which hazards apply to which features, in the format of an indexed table, and the indexed cells on the table correspond to steps outlined in the analysis workflow worksheet.

4. SCORE HAZARD IMPACT

The hazard impact score will be a combined score for both exposure and sensitivity. Analysis of vulnerability to climate hazards involves evaluation and consideration of community features in terms of the impacts specific hazards will have on the features, determined by the level of exposure each feature has to the hazard and the sensitivity of each feature to experience harm from the hazard. The analyses conducted will enable each feature to be assigned a combined impact score for each relevant hazard based on exposure and sensitivity to the hazard. After analyzing each indicator/feature, use Resource Document 4.2.a Vulnerability Key for guidance on assigning a combined impact score to each indicator of system features (and specific individual features, if applicable). The score is then added to Worksheet 4.1.c Vulnerability Matrix. Based on the combined impact of hazards, an all-hazard impact score can be assigned in order to determine the level of vulnerability of a feature (See "Score Vulnerability" below).

5. SCORE ADAPTIVE CAPACITY

Adaptive capacity is the extent to which people or systems can respond to and learn from disturbances to mitigate the causes and the impacts of climate-related hazards. It is the ability to address vulnerabilities of the community through an ongoing, iterative process of learning, building capacity, and adapting. Use Worksheet 4.1.c Municipal Governance as a resource to analyze the adaptive capacity of the community. Then use Resource Document 4.2.a Vulnerability Key for guidance on assigning an adaptive capacity score for each feature in Worksheet 4.1.c Vulnerability Matrix.

6. SCORE VULNERABILITY

Vulnerability of each feature is scored by using Resource Document 4.2.a Vulnerability Key to compare the impact of hazards with adaptive capacity. The vulnerability score helps the community understand which issues are more pressing to address, helping to inform prioritization of adaptation actions. Vulnerability should be characterized at the level of system feature, and it can also be characterized in relation to system, hazard, or specific features, such as a particular building or road. The vulnerability score can be added to Worksheet 4.1.c Vulnerability Matrix.

VULNERABILITY KEY

A SET OF KEYS AND MATRICES TO HELP ASSIGN SCORES FOR HAZARD IMPACT, ADAPTIVE CAPACITY, AND VULNERABILITY TO THE INDICATORS, FEATURES, AND SYSTEMS THAT ARE ANALYZED.

The scoring is based on information gathered throughout the assessment process, analyses conducted to evaluate exposure and sensitivity of features to hazards, and deliberation among stakeholders. Scores are applied during sub-steps of Step 4.2.

HOW TO USE THE VULNERABILITY KEY:

1. The Hazard Impact Key provides descriptions of levels of impact in terms of exposure and sensitivity.

2. The Hazard Score Impact Matrix can be used in conjunction with the Hazard Impact Key to determine a combined impact score when evaluating a particular feature or indicator. Higher exposure and higher sensitivity indicate higher vulnerability due to the higher potential for negative impact.

3. The impact of a hazard can be mitigated to some extent by adaptive capacity to cope with it. After evaluating the community's plans, programs, and policies to address hazard impacts, the **Adaptive Capacity Key** can be used to help assign a score for the community's adaptive capacity to address each impact score that was assigned.

4. The Vulnerability Score Matrix can then be used to compare hazard impact to adaptive capacity, in order to determine a vulnerability score.

Based on the information gathered by analyzing the impact and adaptive capacity for a feature or indicator, and its overall vulnerability score, the community can develop and prioritize strategies for action to address the hazards of concern. Phase 5 of this guide describes development and prioritization of climate adaptation strategies.

SCORING THE IMPACT OF CLIMATE HAZARDS ON FEATURES

1. After working through Worksheet 4.2.a Analysis Workflow to analyze the indicators of system features (and specific individual features, if applicable) in relation to specific hazards, use the outputs from the analyses to score the potential impact due to exposure and sensitivity of each indicator of a system feature (and specific individual features, if applicable) to the hazard based on the below Hazard Impact Key. Refer to information from the community, project advisors, and other stakeholders to deliberate the scoring of hazard impacts your community could experience. For each indicator, there should be an impact score for exposure and an impact score for sensitivity.

HAZARD IMPACT KEY		
Impact Score	**Exposure**	**Sensitivity**
NEGLIGIBLE	Exposure is unlikely to occur.	There is no noticeable physical damage or functional disruption to a feature or system. There is no noticeable change to public health, safety, or system viability.
LOW	Exposure is somewhat likely to occur.	There is minor physical damage or functional disruption to a feature or system. There is some noticeable change to public health, safety, or system viability.
MODERATE	Exposure is likely to occur.	There is intermediate physical damage to a feature or system. There is potential for chronic stress and reduced functional reliability. Services may be entirely disrupted on occasion or for extended periods of time. There is a detectable decline in public health, safety, or system viability. There is a potential for long-term effectiveness and sustainability of the system to be degraded.
HIGH	Exposure is highly likely to occur.	There is significant physical damage or functional disruption to a feature or system. Services may be limited and unable to meet needs frequently or permanently. There is a significant decline in public health, safety, or system viability. The long-term effectiveness and sustainability of the system may be degraded.
VERY HIGH	Exposure is certain or nearly certain to occur.	There is substantial physical damage or functional disruption to a feature or system. The ability to provide services is destroyed. There is substantial or severe harm to public health, safety, and system viability. The long-term effectiveness and sustainability of the system is degraded.

2. For each indicator of system features analyzed (and specific individual features, if applicable), use the hazard impact scores for exposure and sensitivity derived from the above table to find the combined hazard impact score on the below Hazard Impact Score Matrix Table. The combined impact score is the hazard impact score to plug into Worksheet 4.1.c. Vulnerability Matrix after analyzing each indicator of system features (and specific individual features, if applicable).

HAZARD IMPACT SCORE MATRIX						
		Exposure				
		Negligible	Low	Moderate	High	Very High
Sensitivity	Negligible	1	2	3	3	3
	Low	2	2	3	3	4
	Moderate	2	3	3	4	4
	High	3	4	4	4	5
	Very High	4	4	4	5	5

3. The table in Worksheet 4.1.c. Vulnerability Matrix will automatically calculate the sum of the impact scores of all hazards for each indicator of system features (and specific individual features, if applicable). The sum value can range from 10-50, depending on the number of hazards evaluated and the hazard impact scores given to each hazard that was evaluated. Use the Hazard Impact Key to assign an "all-hazard" impact score between 1 and 5, based on deliberation in the community. The "all-hazard" impact score represents the cumulative impact from multiple hazards. In the subsequent step, the assigned impact score is compared to the community's adaptive capacity in order to score vulnerability. In this guide, individual indicators are not assessed for adaptive capacity or vulnerability. If a community prefers to characterize vulnerability at the level of feature indicator, or individual feature, they may do so.

SCORING ADAPTIVE CAPACITY

4. Use the output from the analysis of potential impact on the master plan and consistency with other planning efforts and the community's adaptive capacity (Steps 4.2.b & 4.2.c.), to score the capacity of the community to address each assigned hazard impact score in Worksheet 4.1.c. Vulnerability Matrix based on the below "Adaptive Capacity Key."

ADAPTIVE CAPACITY KEY	
Adaptive Capacity Score	**Observed Community Adaptation Potential**
LOW	The community is not able to anticipate impact, respond to impact, and proactively avoid impact from climate change-related hazards. The public is generally unaware of specific changes that are needed to adapt to impacts. Planning documents generally do not consider the impacts beyond minimum federal, state, or regional regulatory requirements. There is no mechanism to manage implementation of climate planning strategies and continuously monitor adaptation to impacts. Major changes to local policies and practices are needed.
MODERATE	The community is somewhat able to anticipate impact, respond to impact, and proactively avoid impact from climate change-related hazards. There is some public awareness of changes that are needed to adapt to impacts. Planning for impacts is considered in most local planning documents beyond minimum federal, state, or regional regulatory requirements. There may be a mechanism to manage implementation of climate planning strategies and continuously monitor adaptation to impacts. Some local policies and practices are in place or under consideration, but significant changes to local policies and practices are needed.
HIGH	The community is highly able to anticipate impact, respond to impact, and proactively avoid impact from climate change-related hazards. Most of the public are aware of changes that are needed to adapt to impacts. Planning for impacts is considered in all local planning documents beyond minimum federal, state, or regional regulatory requirements. There is an effective mechanism to manage implementation of climate planning strategies and continuously monitor adaptation to impacts. Several local policies and practices are in place and under consideration. Continuation of changes to local policies and practices is sufficient to occur at a similar pace compared to the present.

SCORING VULNERABILITY

5. For each feature in Worksheet 4.1.c. Vulnerability Matrix, compare the assigned all-hazard impact score and adaptive capacity score using the "Vulnerability Score Matrix." This score represents the level of vulnerability of a feature in the community to all hazards. The same process can be applied to individual hazards or indicators if the community wants to characterize vulnerability by hazard or indicator, however, that may require more detailed information and/or evaluation. The matrix also includes space to write a brief description of the vulnerability for each feature and system. To assist with viewing different segments of information, columns have filters that can be applied. The information compiled in Worksheet 4.1.c. Vulnerability Matrix, along with the analysis outputs and stakeholder inputs, will be used to document the community's climate-change related hazard vulnerability assessment (CCRHVA). Use Template 1.1 CCRHVA to transfer information into the format of a CCRHVA.

VULNERABILITY SCORE MATRIX

		Hazard Impact				
		1 Negligible	2 Low	3 Moderate	4 High	5 Very High
Adaptive Capacity	Low	Moderate	Moderate	Moderate	High	High
	Moderate	Low	Moderate	Moderate	High	High
	High	Low	Moderate	Moderate	Moderate	High

PART II

4.2.b ANALYZE POTENTIAL IMPACT ON THE MASTER PLAN AND CONSISTENCY WITH OTHER PLANNING EFFORTS

DELIVERABLES OF THIS STEP

- **MLUL provision (iv):** Compiled information to meet a requirement of the MLUL to analyze the potential impact of natural hazards on the municipal master plan.
- **MLUL provision (vi):** A policy statement regarding the relationship between the CCRHVA and other plans to meet a requirement of the MLUL.

WHY THIS STEP IS IMPORTANT

In order for the CCRHVA to inform actions that reduce the vulnerability of the community to climate hazards, the information learned from the CCRHVA needs to be integrated into all local planning efforts so that goals and actions can be updated accordingly. Provisions (iv) and (vi) of the MLUL require that the CCRHVA "analyze the potential impact of natural hazards on relevant components and elements of the master plan" [and] "include a specific policy statement on the consistency, coordination, and integration of the [CCRHVA] with any existing or proposed natural hazard mitigation plan, floodplain management plan, comprehesive emergency management plan, emergency response plan, post-disaster recovery plan, or capital improvement plan."

There are various individuals and entities that participate in different roles to conduct multiple aspects of local planning. Without a systematic attempt to ensure all plans reflect the community's vulnerability to climate hazards, there may not be enough overlap in planning processes for adaptation strategies to be adequately represented in all the necessary planning documents. Furthermore, the development of strategies and design standards, which is also a requirement of provision (v) of the MLUL, requires a full understanding of existing plans and efforts underway, so that they can be modified based on the most pressing climate hazards impacting the community. Then going forward, with proper climate adaptation planning in hand, municipalities can put forth decisions, regulations, and actions that proactively build their resilience to the impacts of climate change.

WHAT TO DO

Compare the results of the CCRHVA with the municipal master plan and other plans. If the review of planning documents described in Step 2.1 was already completed, this step only involves an update of that review to incorporate the impact of climate hazards on relevant plans. If planning documents have not yet been compiled and reviewed, that should be done prior to working through this step.

After analyzing the potential impacts (exposure and sensitivity) of climate hazards on community features in Step 4.2.a, consider how planning documents listed in Worksheet 2.1 Planning Documents Review should be updated to have consistency, coordination, and integration with hazard impact analyses conducted in step 4.2.a. Many of the planning documents were likely already gathered and initially reviewed during Step 2 of this process. Update the last column (New Planning Considerations) to complete Worksheet 2.1 Planning Documents Review based on the hazard impact analyses. The information provided in Worksheet 2.1 Planning Documents Review can fulfill provision (iv) (potential impacts on the master plan) of the MLUL amendment and prepares for provision (vi) (policy statement on consistency, coordination, and integration).

While completing Worksheet 2.1 Planning Documents Review, consult the results of the CCRHVA hazard impact analyses conducted in Step 4.2.a and refer back to Resource Document 1.2 Implementation Goals to help identify "new planning considerations," or "updates and changes" that should be made to the goals of each planning document.

PART II

Include a policy statement, as per provision (vi) of the MLUL, in the Land Use Plan Element of the municipal master plan, and consider adding policy statements to other plans, regarding consistency, coordination, and integration of the CCRHVA with them.

NJDEP Local Planning For Climate Change Toolkit connection

Example Policy Statement

Within two years of completing the [CCRHVA title], [municipality name] shall review other intersecting plans including, but not limited to, the natural hazard mitigation plan, floodplain management plan, comprehensive emergency management plan, emergency response plan, post-disaster recovery plan, and capital improvement plan, and effort shall be made to update them within that same period. The [CCRHVA title] shall be updated within every five years, and other intersecting plans shall be updated according to an iterative, integrated process within that same period. With any change to the [CCRHVA title] or other intersecting plans, evaluation of consistency and coordination should occur, and relevant updates to all plans shall be made in a timely manner to maintain consistency among plans. When there is a natural disaster, the [CCRHVA title] and other intersecting plans shall be reviewed for consistency with the most current understanding of hazard impacts, and effort shall be made to update all relevant plans simultaneously and in a timely manner. Due to the dynamic nature of climate change and data related to assessing its impacts, [municipality name] shall address known deficiencies of the [CCRHVA title] through an update to the [CCRHVA title] as deficiencies become apparent, based on current or projected climate change-related hazards and impacts, and deemed consequential to climate change adaptation and mitigation. Any relevant other intersecting plan shall be updated within a two-year period of any deficiency update to the [CCRHVA title] affecting it.

Within five years, or at the time of the county hazard mitigation planning process, [municipality name] shall provide data and information from the [CCRHVA title] to inform the risk analysis prepared for any Natural Hazard Mitigation Plan, including the municipal annex of a Multi-Jurisdictional Natural Hazard Mitigation Plan, and shall provide locally-derived information regarding climate hazards and mitigating hazard impacts to socially vulnerable populations.

Within five years, [municipality name] shall update its Floodplain Management Plan and Stormwater Management Plan, and accompanying implementing ordinances, to ensure the best climate change-related information is being used in site plans and development applications.

Within two years, or at the time of an emergency plan update, the [municipality] shall use the data and information found in the [CCRHVA title] to update the Comprehensive Emergency Management Plan and Emergency Response Plan to prioritize socially vulnerable populations and prudently safeguard community assets identified through the CCRHVA planning process, including identified evacuation corridors and other facilities and infrastructure deemed important to the continuity of operations and necessary for sustaining quality of life during a natural disaster.

Any updates to a Post-disaster Recovery Plan affecting the [municipality name] shall use the outputs of the [CCRHVA title] to ensure future investments and reinvestments are made with an understanding of the vulnerabilities and impacts of climate hazards to [municipality name].

Prior to adding a new project to its Capital Improvement Plan, [municipality name] shall review the project in relation to the [CCRHVA title] and any hazard mitigation plan to ensure it accounts for current and projected impacts of climate hazards and addresses any disparities in exposure and sensitivity to climate hazards related to investments in infrastructure and resources for community members provided by the municipality. When considering financial expenditures for repairs and reconditioning of deteriorating infrastructure, as well as new infrastructure, [municipality name] shall evaluate the vulnerabilities associated with locations and the built, natural, social, and economic systems that support the community.

PART II

4.2.c ANALYZE ADAPTIVE CAPACITY

DELIVERABLES OF THIS STEP

- **MLUL provision (i)**: Results of analyzing adaptive capacity to determine how "climate ready" the community is in terms of existing plans, policies, and practices to meet a requirement of the MLUL.
- Specific climate readiness action items to address vulnerabilities to climate hazards **in support of MLUL provision (v)** .

WHY THIS STEP IS IMPORTANT

Vulnerability to climate hazards can be decreased or minimized by increasing adaptive capacity, or the extent to which the impacts of climate hazards due to exposure and sensitivity can be reduced through adaptive actions. To characterize vulnerability of a community (which is done in the next step), exposure and sensitivity need to be considered in the context of adaptive capacity. Adaptive capacity reflects the ability of the community to address vulnerabilities through an ongoing, iterative process of learning, building capacity, and adapting. This step will consider the extent the community is prepared to cope with, or avert, the impacts of climate hazards.

There is a positive relationship between adaptive capacity and governance—in a community governed by strong policies and practices that incorporate vulnerabilities to current and projected climate hazards, the capacity to adapt to dynamic climate impacts is greater. Analyzing municipal adaptive capacity identifies where improvements and changes are needed to local plans, practices, and regulations. This step is a continuation of a previous step that reviewed planning documents in relation to the hazard impact analysis, and it will help a community reflect on the things already being done well and areas that may need more capacity.

Also, by intentionally evaluating adaptive capacity, necessary changes to procedures, behaviors, and features that address the underlying driving forces of inequities or vulnerabilities of a community can be illuminated and prioritized. A community can realize benefits that go beyond simply responding to climate impacts by aiming to advance substantive community benefits that improve quality of life for community members and long-term sustainability of the community.

WHAT TO DO

Evaluate how the existing municipal governance structure includes specific actions that can reduce vulnerability of community features to the impacts of climate hazards, and identify any additional actions already implemented by the municipality. Use this evaluation to determine the extent of adaptive capacity the municipality has to address vulnerabilities identified in the CCRHVA.

- Complete Worksheet 4.1.c Municipal Governance to evaluate how operations and decision-making are governed in the community, in relation to potential impacts from climate hazards.
- Use the Adaptive Capacity Key in Resource Document 4.2.a Vulnerability Key to score each feature analyzed in Step 4.2.a, based on the information recorded in Worksheet 4.1.c Municipal Governance and Worksheet 2.1 Planning Documents Review.
- Update the "Feature Adaptive Capacity Score" column of Worksheet 4.1.c Vulnerability Matrix, if using the spreadsheet as a tool to strategically assess vulnerability based on analyses.
- Update Worksheet 4.1.c Climate Readiness Actions List, as needed, to record additional new or ongoing actions that are related to local climate readiness planning through municipal governance. Refer to Worksheet 4.1.c Municipal Governance as a resource.

Update Worksheet 4.1.c Mitigation Projects List, as needed, to record additional new or ongoing projects that are related to natural hazard mitigation planning in the community.

NJDEP Local Planning For Climate Change Toolkit connection

4.2.d CHARACTERIZE CLIMATE VULNERABILITY

DELIVERABLES OF THIS STEP

- Scores characterizing combined hazard vulnerability for community features **in support of MLUL provision (i)**.
- **MLUL provisions (i-iv & vi-vii):** A municipal CCRHVA draft document that meets all but one provision of the MLUL.

WHY THIS STEP IS IMPORTANT

This is where everything comes together to provide an overall assessment of vulnerability to climate hazards—how all the hazards impact key features for sustaining systems that support health and well-being throughout the whole community, and the capacity of the municipality to adapt accordingly. As described previously, vulnerability to climate hazards is a function of exposure, sensitivity, and adaptive capacity. Having analyzed each of these components in the two steps preceding this one, it is possible to characterize vulnerability by comparing hazard impact (exposure and sensitivity) to adaptive capacity. This can be done with respect to features, systems, and hazards. Describing vulnerability in this framework provides a more holistic perspective that helps municipalities address the dynamic and complex nature of climate hazards. Simply looking at the isolated impact of individual hazards on specific assets does not offer the same insight, and incorporating an evaluation of municipal governance as a measure of adaptive capacity can help reveal gaps and synergies in reducing vulnerabilities. There are many layers of information, and data and conditions are always changing, which makes it even more important to evaluate vulnerability holistically and within a structured framework to account for multiple factors simultaneously.

PART II

Based on the analyses conducted in Phase 4 leading up to this step, assign a combined hazard score for each feature. Compile all the information gathered throughout each step of the process to produce the CCRHVA, which is a descriptive report to characterize the vulnerability of community features and systems to all climate hazards. The template provided can be used to guide organization of the information, and it can be modified to suit the needs of the municipality. The template presents the information acquired by following the process outlined in this guide with indication of compliance with provisions of the MLUL.

Use the "Vulnerability Score Matrix" in Resource Document 4.2.a Vulnerability Key to assign a score of low, moderate, or high to the "Feature Vulnerability Score" column in Worksheet 4.1.c Vulnerability Matrix. The table can be filtered by system, and there is a column to provide a qualitative description of vulnerability for the system.

Incorporate the community engagement data gathered throughout this process, and conduct additional engagement and targeted outreach as necessary, to assign a vulnerability score that accurately reflects conditions experienced by the community. Also, consult with stakeholders and advisory partners to enhance accuracy of the vulnerability score.

Add the worksheets and/or results of the analyses conducted in Step 4.2 to Template 1.1 CCRHVA, or the draft CCRHVA.

NJDEP Local Planning For Climate Change Toolkit connection

PHASE 5

Strategize for Action

5.1 FACILITATE COMMUNITY VISIONING FOR CLIMATE ADAPTATION

DELIVERABLES OF THIS STEP

- A climate adaptation vision formulated by the community.
- Revisions to scores assigned for hazard impact, adaptive capacity, and vulnerability based on community stakeholder knowledge **in support of meeting provision (i) of the MLUL.**
- A framework for identifying and prioritizing actions and strategies in local planning processes through community engagement.

WHY THIS STEP IS IMPORTANT

To identify strategies for addressing current and projected climate hazards, it is important to understand how community members envision future development to occur and investments to be made. Vulnerabilities to a hazard can manifest in the form of either acute events or continuous stressors, and the visioning process will help the community avoid inadvertently creating new vulnerabilities or exacerbating existing ones while also integrating community goals into the climate adaptation planning process.

Based on the scores assigned for hazard impact and adaptive capacity (in Phase 4), and perspectives from the community learned via engagement efforts throughout the process, issues that

need to be addressed are identified. In this step, the most pressing issues can be prioritized in collaboration with the whole community. Strategies can then be developed to address the issues, and community visioning can also help initialize formulation of strategies to thoroughly consider in the next step.

WHAT TO DO

Conduct a visioning workshop, incorporating the hazard impacts and municipal capacities analyses, and solicit community input to confirm or adjust and prioritize the impact and adaptive capacity scores that were assigned in Phase 4.

- Establish goals for the visioning meetings. One of the goals should be for community members to define a climate adaptation vision for the community.
- Ensure the meetings are designed so that equitable participation and decision-making informs the CCRHVA, including the strategies and actions prioritized, and the distribution of positive and negative effects of implementation. All sectors and perspectives should be solicited to provide guidance on interpreting the analysis results based on local knowledge and experience.
- Use the information compiled in the "Characterization of Community Systems, Features, and Hazard Vulnerabilities" and "Climate Hazards Descriptions" section of Template 1.1 CCRHVA to develop communication and meeting materials for public engagement and community workshop sessions. Provide easy-to-interpret summaries of hazard impacts and the municipality's governance capacity to address them. Provide maps and graphics for participants to evaluate whether their lived experiences align with the outcomes of the analyses. Collect data at the meetings regarding inconsistencies between community perceptions and analysis outcomes.
- Review Resource Document 1.2 Implementation Goals with participants.
- Assist participants to evaluate the assets and features that were identified as important by the community in Step 4.1.c. Assets and features should be evaluated in relation to hazard impacts identified in Phase 4. Facilitate prioritization and development of adaptation strategies to address features and aspects of the community that are vulnerable to climate impacts. Use a framework, such as the one provided in *Table 8: Equitable Adaptation Considerations and Strategies* in the Guide to Equitable, Community-Driven Climate Preparedness Planning created by the Urban Sustainability Directors Network, to compare typical adaptation strategies with equitable solutions. The guide also describes a process of generating and analyzing alternative strategies to identify preferred strategies.
- Present the actions and projects identified on Worksheet 4.1.c Climate Readiness Actions List and Worksheet 4.1.c Mitigation Projects List to solicit feedback from participants. Make adjustments to the lists based on the feedback.
- Adjust the scores for hazard impact, adaptive capacity, and vulnerability that were assigned in Phase 4, based on information learned from the community sessions.
- Update the description of community participation and planning process in Template 1.1 CCRHVA, or the draft CCRHVA.
- Consider adopting the framework of this visioning process as a procedural policy for master planning, State Plan endorsement, regional plan conformance, and other planning processes.

NJDEP Local Planning For Climate Change Toolkit connection

PART II

5.2 IDENTIFY STRATEGIES AND DESIGN STANDARDS

DELIVERABLES OF THIS STEP

- **MLUL provision v:** List of strategies and design standards to meet a requirement of the MLUL.
- **MLUL provisions i-viii:** A final municipal CCRHVA document that meets all the provisions of the MLUL.

WHY THIS STEP IS IMPORTANT

Well-formulated strategies and design standards can reduce the community's vulnerability to climate hazards, often while providing additional benefits. There are a multitude of things that can be done to advance local resilience; however, a targeted approach focused on adapting municipal policies and practices in ways that will address the most pressing issues of the community is a desirable approach, given the substantial (and increasing) effects of climate hazards already experienced by communities. The implementation of transformative and actionable strategies and the adoption and enforcement of appropriate design standards are among the most effective resilience efforts because of the potential for long-term change and enhanced sustainability. Provision (v) of the MLUL requires that the CCRHVA "provide strategies and design standards that may be implemented to reduce or avoid risks associated with natural hazards." Without such information, it can be hard to know what actions to take and how any particular action would reduce the comunity's vulnerability.

WHAT TO DO

Compile information from community engagement and stakeholder input, data analyses, and considerations of municipal capacity to identify strategies and design standards that will address the hazard impacts prioritized in the community's CCRHVA.

If strategies weren't already discussed during visioning sessions, as described in the previous step (Step 5.1), conduct workshops with the community to evaluate strategy alternatives. Use a framework such as the one provided in *Table 8: Equitable Adaptation Considerations and Strategies* in the Guide to Equitable, Community-Driven Climate Preparedness Planning created by the Urban Sustainability Directors Network to compare typical adaptation strategies with equitable solutions. The guide also describes a process of generating and analyzing alternative strategies to identify preferred strategies.

Relying on the information entered into Template 1.1 CCRHVA in Step 4.2.d, and/or on worksheets and data used throughout the CCRHVA process, for each feature or group of features that received a vulnerability score of "high" or "moderate," add them to Worksheet 5.2 Strategies and Design Standards. The municipality can add other features if appropriate.

Complete Worksheet 5.2 Strategies and Design Standards, using Resource Document 1.2 Implementation Goals to help identify strategies and design standards that will expand municipal capacity and/or address hazard impacts. Also refer back to Worksheet 2.1 Planning Documents Review to include relevant strategies and design standards already considered in other plans or studies, such as, for example, in hazard mitigation planning, State Plan endorsement assessments, or any local or regional plans. For additional ideas, review resources such as the "Local Resilience Actions Matrix" provided in the NJDEP Local Planning for Climate Change Toolkit, which contains nearly 300 actions categorized as either "capability and

capacity building actions" or "risk reduction actions." Funding strategies should also be considered and included in an action plan, which is described in the next step of this guide.

Update the "Strategies and Design Standards" section of Template 1.1 CCRHVA to include the information recorded in Worksheet 5.2 Strategies and Design Standards. The CCRHVA can be finalized at this point, or with the addition of a plan of action, as described in the next step (Step 5.3).

NJDEP Local Planning For Climate Change Toolkit connection

5.3 CREATE THE PLAN OF ACTION

DELIVERABLES OF THIS STEP

Action planning document to guide implementation of climate adaptation strategies and design standards.

WHY THIS STEP IS IMPORTANT

Although it is not necessary to develop a full-scale plan as part of this process, it is more likely that action will be taken to reduce vulnerability if some of the details for taking action are outlined in a plan of action. Some municipalities may want to translate the CCRHVA into a working document for implementation of actions to fulfill strategies and design standards outlined in the CCRHVA. An action plan is helpful for those communities that wish to organize and track implementation of actions.

Some communities may have planning documents that relate to a climate adaptation plan, such as a resilience plan or climate action plan, and they may wish to integrate climate adaptation actions into such other plans, rather than develop a separate plan. In any case, it is helpful to articulate details of implementation.

WHAT TO DO

Use the information learned throughout the CCRHVA process to create a plan of action that guides implementation of climate adaptation goals.

Use Template 5.3 Action Plan Outline as a structure for developing an action plan based on the CCRHVA process and outcomes. The next step (Step 6.1) will provide considerations for implementation of the plan.

Update Template 1.1 CCRHVA, or the CCRHVA with a description of implementation of strategies, standards, and ongoing climate adaptation based on the plan of action established in this step. Alternatively, an independent plan can be developed or updated.

NJDEP Local Planning For Climate Change Toolkit connection

PART III MAINTAINING AND TRACKING PROGRESS

PART III INCLUDES one phase that is ongoing for the community to continually address climate vulnerabilities and adapt to climate change through the implementation of actions. Maintaining and tracking progress will help municipalities to update plans, policies, and practices based on changing climate data and conditions, opportunities that arise, and modifications to goals of the community—including updates to the CCRHVA to remain in compliance with the MLUL or reassess vulnerability to climate hazards. While none of the steps in Part III are required to meet the MLUL, doing them puts the CCRHVA into practice and ensures the effort to conduct it results in climate adaptation actions that reduce climate change-related vulnerabilities in the community.

PHASE 6
Implement Climate Readiness

6.1 MAINTAIN AND MONITOR ACTIONS

DELIVERABLES OF THIS STEP

- Implementation and monitoring details for short- and long-term strategies and actions.

WHY THIS STEP IS IMPORTANT

It can often be difficult to transition from planning to implementation, which makes this step important to include in a process intended to lead to actions that reduce vulnerability to climate hazards. Implementation of climate adaptation strategies, or an action plan derived from the CCRHVA, will decrease the community's vulnerability to climate hazards. Then, to maintain climate readiness, plans, implemented actions, and changing data and conditions should be regularly evaluated and monitored. The outputs of the CCRHVA can be used as a baseline for future evaluations of climate impacts, plans, and adaptation strategies.

Maintaining and monitoring is not a step, but rather something that should be done continuously in order to have confidence in decisions made and actions taken. After the process of conducting the vulnerability assessment and developing and implementing adaptation actions, dynamic forces will continue to influence feasibilities and outcomes. With limited resources, and a genuine need to address impacts of climate hazards, it is important to adjust course as needed. Evaluating and monitoring plans, implemented actions, and changing data and conditions helps a community recognize when it is appropriate to make adjustments. The municipality should install mechanisms to maintain evaluation and monitoring.

WHAT TO DO

Identify actions to take now or in the near future, and begin by garnering the resources, capacity, and community support needed to begin implementing short-term actions. Assistance and guidance for implementation may be available through partners identified while conducting the CCRHVA, and regional approaches should be pursued. Longer-term strategies and actions should have time frames and lead individuals established to guide their implementation.

- Use a spreadsheet to track progress of both implementation and meeting the goals of each strategy or action.

NJDEP Local Planning For Climate Change Toolkit connection

PART III

6.2 UPDATE AND SUSTAIN CLIMATE READINESS

DELIVERABLES OF THIS STEP

- Schedules for updating plans, policies, procedures, and the CCRHVA.

WHY THIS STEP IS IMPORTANT

Based on the information learned through the CCRHVA process, an organized effort to modify other plans, policies, and procedures to align with the municipality's CCRHVA and climate adaptation action plan is an adaptation strategy in and of itself. Making the CCRHVA a core driver of municipal actions and decisions improves governance and adaptive capacity. Not doing this can result in contradicting or negating the CCRHVA, ultimately increasing the community's vulnerability to climate hazards. Along with maintaining updates on data and conditions, municipalities also need to provide updates to community stakeholders. Communication of monitoring, progress status, and updates made should be regularly occurring, sufficiently informative, easy to understand, and widely accessible and distributed.

WHAT TO DO

Create and maintain a schedule based on estimated time frames for expected updates to all planning documents, policies, and procedure protocols so they can align with the CCRHVA (and climate adaptation action plan, if developed) as soon as possible.

- Notify the departments or agencies responsible for planning documents, policies, and procedure protocols that there is new information from the CCRHVA that should be included in the updates, or that should trigger an update.
- Establish a schedule for seeking updated data and information and a corresponding process for updating the CCRHVA on a regular basis. The example policy statement provided in Step 4.2.b offers a suggested schedule for updates to the CCRHVA and other intersecting plans.
- Communicate updates regularly to the community and solicit participation in ongoing climate adaptation planning efforts.

NJDEP Local Planning For Climate Change Toolkit connection

APPENDIX

NJDEP Local Planning for Climate Change Toolkit Connection

Step 1.1:

NJDEP's Local Planning for Climate Change Toolkit provides general assistance to municipalities conducting a CCRHVA and should be referenced throughout the climate adaptation planning process. Relevant sections of the toolkit are linked to corresponding steps in this guide.

Step 1.2:

There is an Equitable Community Resilience Evaluation Toolkit under the "Overview" tab. It includes general information about the planning process and incorporating principles of equity throughout. It also provides links to resources and worksheets that will be referenced at the corresponding steps throughout this guide during which they would be applied.

The "Planning Team" section of the "Build the Team" section under the "Initiate and Engage" tab provides links to the self-guided training, A Seat at the Table Training (Part One section). The "Forming a Planning Team" worksheet under the same section has a link to the Whole-Community Resilience Planning: A Checklist for Planners, which provides an overview of seven key principles for climate adaptation planning with and for the whole community.

The "Climate Change in New Jersey" section under the "Overview" tab has information to understand how climate change affects temperature, precipitation, sea level, and drought conditions in New Jersey.

Step 2.1:

The "Gather Data" section under the "Understand Your Vulnerability" tab provides a list of local planning documents to consider and a link to a Data Collection worksheet for data collection by people experiencing social vulnerability, including guidance on ground-truthing analyses for a more accurate representation of the entire community. (This worksheet is also found in the Equitable Community Resilience Adaptation Toolkit section under the "Overview" tab).

Step 2.2:

The "Advisory Committees" section under the "Build the Team" section of the "Initiate and Engage" tab provides information about identifying advisory stakeholders.

Step 2.3:

The toolkit provides a Stakeholder Identification Worksheet for exploring stakeholder groups and individuals relevant to the climate adaptation planning process.

Step 3.1:

The Equitable Community Resilience Adaptation Toolkit under the "Overview" tab is a resource to guide an intentionally inclusive planning process. The Equitable Community Resilience Evaluation Toolkit: Build a Representative Team worksheet under the "Planning Team" section of the "Build the Team" section under the "Initiate and Engage" tab (as well as in the Equitable Community Resilience Adaptation Toolkit section under the "Overview" tab) can help identify representative project team members.

The Forming a Planning Team worksheet under the "Planning Team" section of the "Build the Team" section under the "Initiate and Engage" tab provides steps and resources for designating an inclusive and representative project team. The Committee Participant Invitation Template provides a draft letter to invite individuals to participate on the project team.

Step 3.2:

The "Create Inclusive and Equitable Engagement" section contains considerations for maintaining inclusivity in the engagement process,

and the Getting Started on an Engagement Plan document under "The Engagement Plan" section of the "Initiate and Engage" tab (as well as in the "Equitable Community Resilience Adaptation Toolkit" section under the "Overview" tab) provides considerations for guiding the process. Throughout the process, the Equitable Engagement Checklist in the "Equitable Community Resilience Adaptation Toolkit" section under the "Overview" tab can be used to evaluate whether the lead and project team are conducting a sufficiently inclusive process.

The "Developing an Engagement Plan" section of the "Initiate and Engage" tab contains sections about the engagement plan—including sample survey questions and other resources, building a communication plan, and creating inclusive and equitable engagement.

The "Gather Data" section under the "Understand Your Vulnerability" tab of the NJDEP Local Planning for Climate Resilience Toolkit provides a link to a Data Collection worksheet for methods of data collection by "socially vulnerable people," and guidance on ground-truthing analyses for a more accurate representation of the entire community (worksheet is also found in the Equitable Community Resilience Adaptation Toolkit section under the "Overview" tab).

Step 4.1.a:

The toolkit contains guidance on engaging the community to characterize hazards under the "Get Stakeholder and Public Input" section in the "Self Assessment" section of the "Understand Your Vulnerability" tab.

Step 4.1.b:

The toolkit contains key recommendations under the "Build Out Analysis" section in the "Gather Data" section of the "Understand Your Vulnerability" tab.

Step 4.1.c:

The toolkit provides general information about asset prioritization and categories of assets, including a list of key asset types per category, under the "Identify & Prioritize Assets" section of the "Gather Data" section under the "Understand Your Vulnerability" tab.

Step 4.2.a:

The toolkit provides guidance on creating a vulnerability matrix on the "Creating a Vulnerability Matrix" page in the "Self Assessment" section of the "Understand Your Vulnerability" tab. The toolkit also includes information and links to resources to evaluate flood risk, temperature, and public health impacts in the "Advanced Assessments" section under the same tab. The "Helpful Tools and Data" section in the "Overview" section under the "Understand Your Vulnerability" tab has links to explore various data tools.

Step 4.2.b:

The toolkit describes concepts and examples pertaning to local planning and regulations, public health, and local funding mechanisms under the "Resilience and Adaptation Actions: Capability and Capacity Building" section under the "Develop a Strategy" tab.

Step 4.2.c:

The toolkit does not include information about analyzing adaptive capacity, however, as described for Step 4.2.b, there is reference to actions that can be taken to improve capacity under the "Resilience and Adaptation Actions: Capability and Capacity Building" section under the "Develop a Strategy" tab.

Step 4.2.d:

The toolkit does not indicate how to characterize vulnerability in a structured way, but, as described for Step 4.2.a, it does provide information and resources to evaluate flood risk, temperature, and public health impacts in the "Advanced Assessments" section under the "Understand Your Vulnerability" tab.

Step 5.1:

The toolkit provides general guidance in the "Why Visioning Is Important" and "Creating a Vision With Climate Change" sections of the "Setting A Vision" section under the "Initiate and Engage" tab. The former also contains considerations for maintaining equity in visioning, with a link to the Equitable Community Resilience Evaluation Toolkit also found under the "Overview" tab.

Step 5.2:

The toolkit describes considerations about developing strategies that meet the needs of the community in the "Evaluating Actions" section of the "Evaluate the Strategy" section under the "Develop a Strategy" tab, including an "Equitable Community Resilience Evaluation Toolkit: Evaluate Climate Adaptation Actions Worksheet" to help communities identify and prioritize strategies based on equity and consideration of vulnerable populations. Under the same section, the "Finalizing the Strategy" section lists general components that should be included in a municipal strategy to address climate hazards.

The toolkit also provides information to help develop strategies based on a climate adaptation planning process under four separate sections in the "Overview" section of the "Develop a Strategy" tab. There is a description of how to consider a "no action scenario," what type of information to use to identify strategies and actions, how to apply an innovating brainstorming process, and a "Local Resilience Actions Matrix" of nearly 300 actions categorized as either "capability and capacity building actions" or "risk reduction actions."

Under the "Resilience and Adaptation Actions: Capability and Capacity Building" section under the "Develop a Strategy" tab, the "Advancing Health & Social Resilience" section provides an "Advancing Health and Social Resilience Matrix," with a list of 59 specific strategies and the climate impacts they address, along with worksheets for considering these strategies. A "Local Planning and Regulations Matrix" with 65 strategies and worksheets is also provided in the "Local Planning & Regulations" section under the same section and tab, along with the "Mitigating Hazards through Land Use Solutions Workshop worksheet, developed by NJDEP and FEMA.

Under the "Resilience and Adaptations Actions: Risk Reduction" section under the "Develop a Strategy" tab, there are two sections that have a "Building and Infrstructure Projects Matrix" and a "Green Infrastructure and Nature Based Solutions Matrix," (both including worksheets) along with many other resources for developing strategies and actions that reduce risks to places and structures.

Step 5.3:

The toolkit does not include specific information about developing an adaptation action plan, however, some of the information regarding the development of "a strategy," as described for Step 5.2, may provide helpful information for articulating a plan of action.

As described for Step 6.1, the toolkit provides potential state, federal, and local funding sources under the "Funding and Finance Options" section under the "Track Your Progress" tab.

Step 6.1:

The toolkit provides information about federal and state funding programs and local funding mechanisms under the "Funding and Finance Options" section under the "Track Your Progress" tab. Under the "Economic Tools & Incentives Matrix" section of the "Resilience and Adaptation Actions: Capability and Capacity Building" section under the "Develop a Strategy" tab, it also links to an "Economic Tools & Incentives Matrix" that shows which hazards can be addressed by 23 different funding strategies and includes worksheets to consider them. The Toolkit also provides a general description of a monitoring program and equity considerations for implementation under the "Monitoring Tools & Approaches" section of the "Implementation of Actions" section under the "Track Your Progress" tab.

Step 6.2:

The toolkit describes the communication of progress and updates to local plans, including a list of plans to update after conducting the CCRHVA, under the "Next Steps" section of the "Implementation of Actions" section under the "Track Your Progress" tab.

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