IMPLEMENTATION ROADMAP

The magnitude of flood risk in the Raritan River and Bay Communities region both today and in the future demands coordinated action at multiple scales by every level of government. Successful implementation of the preferred scenario will require action on multiple scales and recognition that resilience building in the region is truly a shared responsibility.

The Implementation Roadmap lists every institutional action identified within this plan and includes additional detail about specific recommended locations, lead entities, immediate next steps, partners, and costs. The actions recommended in this plan complement and reinforce one another at the resilience opportunity area, sub-watershed, and regional scale. Many of the policy and governance strategies that are applicable regionwide may be necessary or highly desirable to support actions at the sub-watershed or resilience opportunity area scale. Coordination of local, county, state and federal entities, as described in *Governance and Continued Coordination* section, will be necessary to implement this plan and track progress.

What does it take to implement the actions identified in this plan?

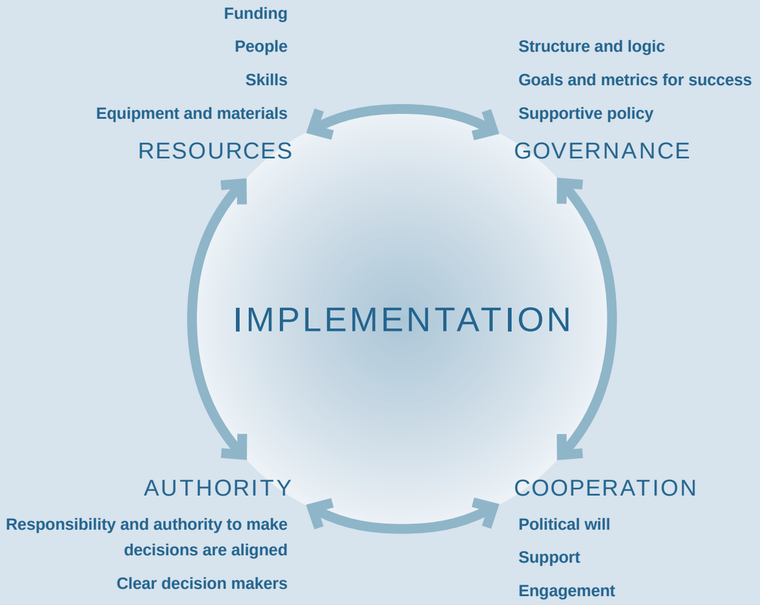
The implementation process for flood resilience and other climate hazard strategies and actions is complex and takes time. Depending on the technical complexity of the specific action, additional implementation planning such as project phasing analyses and permitting assessments may be required to advance the strategy. Each action and strategy type will necessitate a different timetable for bringing this *Action Plan* from concept, through design and development, to ultimate delivery. Implementation of all recommended actions must include ongoing stakeholder engagement, including those who will need to play a role in strategy implementation and those who will be affected by its outcome.

What can I do?

The following pages include actions that can be taken at both the individual and institutional scales. Actions for individuals includes steps that residents and property and business owners can take at the scale of individual properties and buildings to reduce flood risk and build resilience to additional hazards. These actions include better understanding their risk, preparing for disaster, and adapting their properties through a variety of site-specific approaches.

The **implementation roadmap** includes **160 actions** in total, including 19 actions addressing additional climate hazards beyond flooding.

- Of the **141 actions addressing flooding**, 44 are policy and governance strategies, 86 are physical and nature-based infrastructure strategies, and 11 are outreach, education, and capacity building strategies.
- **59 actions** are to be advanced across the region **over the next 3 years**. These are actions that require less resources and time to implement and can be advanced today.
- **72 actions** are to be advanced **over the next 3-10 years**. These actions are those that require some additional time and resources and may need some additional study and concept development before they can be implemented.
- **29 actions** are to be advanced in the **next 10+ years**. These are actions that will require additional time and resources to assess feasibility, identify and pursue funding, and coordinate with involved stakeholders.



Implementation needs depend on many factors, including action type, scale, and complexity, as well as the stage of implementation we're in, but all actions will require the same essential components identified above.

FUNDING

Cost Estimation

The project team used information from prior studies and construction projects around the United States to develop planning-level costs estimates for all actions. The resulting estimates are presented within the implementation roadmap on the following pages. The following scale is used for all actions:

$ = <$2M

$$ = $2-10M

$$$ = $10-49M

$$$$ = $50-100M

$$$$$ = >$100M

More refined costs were developed for select physical and nature-based infrastructure actions, including stormwater management and coastal resilience approaches, for which the necessary information was available. These costs are based on readily available data and do not reflect detailed design-level considerations for the project area, such as existing underground utilities or geotechnical information. Further, these estimates must account for the numerous uncertainties that exist at this stage of preliminary planning. Given this, these estimates can be used for planning purposes to understand the magnitude of anticipated project costs. Subsequent stages of design and engineering will help collect additional information to enable more detailed cost estimation for each strategy. Note that detailed cost estimates are representative of the ultimate proposed action, not interim planning steps.

Overview of Funding Sources

In developing this *Action Plan*, it was important to consider the ways in which recommended actions could be matched with funding sources to facilitate implementation. Funds are available for implementing the *Action Plan* from various sources. Public funding can come from grant and loan programs, as well as through revenue generation – such as taxes and fees. The federal government provides funding through grant programs funded by congressional allocations. There are also state grants and loans, local government sources, and even private or non-for-profit organizations that provide funding through grants, bonds, or loans. Leveraging grant funding reduces the burden on local municipalities and allows for the implementation of this these beneficial actions in a timely manner. Each source of funding has a specific focus, eligibility criteria, and amount of funding available. Grant funding is often available through annual funding cycles and is often awarded through a competitive process.

When considering funding for actions recommended in this *Action Plan*, it's helpful to break the plan down into specific funding categories. These categories help to discern applicable funding sources to pursue. The table below provides upcoming, potential funding opportunities in each of the identified funding categories that could be competitively pursued to begin implementation the *Action Plan*. There are numerous other funding opportunities available from a variety of sources that are not included in this table. For a more in-depth look at potential funding opportunities, refer to *Appendix G.*

The summary of all recommended action starting on page 223 identifies all actions recommended in this *Action Plan* and identifies potential funding sources. We have identified multiple local, state, and federal funding sources that are used to fund everything from coastal resilience projects to stormwater projects, planning studies, transportation improvements, and capacity building, among many others. Many of these funding sources are available now and can be actively pursued to begin implementing these important actions. Additionally, the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law, passed by the Biden administration in the fall of 2021, will be providing $550 billion in new federal funding over the next five years for resilience projects, which Resilient NJ hopes to leverage.

OVERVIEW OF FUNDING SOURCES

The chart below shows some but not all of the funding sources that could be used to support implementation. Note that some funding sources can fund projects in more than one category.

Funding Category	Source	Program	Description
Policy & Governance	NJEDA	Garden State Commercial Property Assessed Clean Energy (C-PACE)	Financing of eligible commercial renewable energy, water efficiency projects in participating municipalities
Physical and Nature-Based Infrastructure	NJDEP	Natural Climate Solutions Grant	Grant funding for implementation of projects that create, restore, and enhance New Jersey's natural carbon sinks, such as salt marshes, seagrass beds, forests, urban parks and woodlands, and street trees.
	NOAA	Transformational Habitat Restoration and Coastal Resilience Grants	Grant funding for projects to restore habitat for fisheries and protected resources while also strengthening the resilience of coastal communities and ecosystems.
	FEMA	Building Resilient Infrastructure and Communities (BRIC)	Competitive grants of up to $50 million for hazard mitigation projects, reducing risks from disasters and natural hazards
	USDOT	Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT)	Grant funding to make transportation infrastructure more resilient to natural disasters, including planning grants to assess vulnerability and plan emergency response strategies
Outreach, Education, & Capacity Building	FEMA	Building Resilient Infrastructure and Communities (BRIC), Capability & Capacity Building	Annual grant program funds capability and capacity building activities such as evaluating and adopting updated building codes, partnership network analysis, partnership development activities, and other planning activities.

ACTIONS FOR INDIVIDUALS

Complementing collective and institutional actions, individuals—particularly landowners—may also play an important role in advancing resilience in the region. Individuals' actions generally fall into one of three types: understanding risk, personal disaster preparation, and physical adaptation and resilience.

Understanding Risk

Taking action on climate change begins with understanding the ways and extent to which you are at risk. Flooding is perhaps the most significant climate impact in our region. This flooding is caused both by global climate change and the unique land use history of this region. In addition to sea level rise from melting glaciers, a warmer atmosphere and ocean waters also create more favorable conditions for severe coastal storms and extreme precipitation events

One of the best ways to understand how increasingly intense and frequent flooding could impact you is by looking at the Flood Insurance Rate Maps (FIRMs) created by the Federal Emergency Management Agency (FEMA). Pay special attention to whether you live in a Special Flood Hazard Area (SFHA), which means you could be affected by a 1% annual chance flood today

You can access information on your own flood risk through resources offered by the NJDEP here. Understanding your future flood risk will help you effectively implement risk reduction measures on your property.

Personal Disaster Preparation

Flood Insurance

- Most standard home and business insurance policies do not cover flood damage. This means that the financial impact of a flood disaster could make it even more devastating
- You can purchase flood insurance through FEMA's National Flood Insurance Program or a private insurer
- All properties in the SFHA that have a federally-backed mortgage are required to have flood insurance. However, you should still consider purchasing flood insurance even if you are not in the SFHA. Your property may still be at risk of flooding even if it has not experienced a flood in the past or is not located right along the coastline. Properties in lower risk areas are eligible for flood insurance coverage at lower rates

Put together a flood preparedness kit

- Store valuable items, important documents, and things like family heirlooms in a safe location. Ideally, this would be on an upper floor or even in a watertight container. Additionally, store copies of important documents online.
- Create a list of your belongings, which can help with processing insurance claims.
- Create a plan to secure outdoor objects like lawn furniture, external fuel tanks, grills, bicycles, and children's toys.
- Assemble a basic disaster supplies kit. Ready.gov is the best source of information for the items you should include.

Physical Adaptation And Resilience

Install a backflow valve and/or sump pump

- During flood events, sewage can back up through drainage pipes on your property. In addition to being unpleasant, this is a public health hazard. A sewer backflow valve can prevent this. Similarly, a sump pump works by pumping groundwater away from your property to prevent basement flooding. These devices should be installed by a licensed plumber, who will ensure they comply with local regulations.
- Protect doors and windows
- Windows and doors are a common point of failure during flood events and coastal storms. When they break, it can cause serious damage by allowing wind, water, and debris to enter a structure.
- There are a variety of options to prevent windows and doors from failing during storm events.
  - » High-impact windows have stronger glass than standard windows and are carefully engineered to withstand more extreme storm events.
  - » Storm shutters cover windows and doors to protect them from wind, water, and debris during a storm event.
  - » Sandbags are a low cost option that can be deployed ahead of an expected extreme storm event.
  - » More expensive deployable flood barriers such as sliding gates, inflatable floodwalls, and portable flood gates may also help to protect your property from damage during a flood or storm event.

Other risk reduction approaches

- Simpler flood risk reduction approaches include elevating appliances and utilities above expected flood levels, sealing the foundation and basement walls of structures, using flood resistant building materials as much as possible, reducing impervious surfaces and installing flood vents.
- More expensive, complex flood risk reduction approaches include raising the entire first floor of the structure, dry-floodproofing non-residential structures, and relocation.

Addressing climate impacts beyond flooding

- Although flooding is the most significant and apparent climate threat in the RRBC area, other climate impacts may also pose a risk. These include extreme heat, drought, wildfires, and vector-borne illnesses.
- Property owners can take steps to mitigate these risks:
  - » Extreme heat can be mitigated through strategies including green roofs, facades that have low rates of heat transference, exterior shading features, and tailored ground and landscaping features.
  - » Water efficient appliances, low-flow plumbing fixtures, residential rainwater harvesting, and the use of efficient irrigation practices in agricultural contexts can help to mitigate drought events.
  - » Eliminating stagnant water, ensuring proper site drainage, and window and door screens can help to prevent vector-borne illnesses.
  - » In areas where wildfires are a significant concern, the safe storage of combustible materials, ensure access to water for firefighting on site, and smart landscaping practices can help to reduce risk.

RARITAN BAY WATERFRONT. SOUTH AMBOY
Image Credit: TripAdvisor

SUMMARY OF RECOMMENDED ACTIONS

The roadmap below organizes these actions by regional action category (policy and governance, physical and nature-based infrastructure, outreach, education, and capacity building, and all hazards) for each identified lead entity. Lead entities are those primarily responsible for shepherding actions through the identified next steps and all subsequent steps through implementation. Lead entities should take ownership over identifying and securing funding for projects, identifying project partners and ensuring the recommendation is ultimately implemented. Lead entities have been identified based on their jurisdiction and capacity to implement the action.

Regional Action Category:

Policy & Governance

Physical & Nature-Based Infrastructure

Outreach & Capacity Building

Additional Climate Hazards

Timeframe for Implementation:

Near (<3 years)

Mid (3-10 years)

Long (>10 years)

***Guide to ID numbering**:*

A = All Municipalities
US = Federal Agencies
NJ = State Agencies
MC = Middlesex County Utilities Authority
NG = Non-governmental agencies
C = Carteret
O = Old Bridge
P = Perth Amboy
RRBC = Resilient RRBC
SA = South Amboy
SV = Sayreville
SR = South River
W = Woodbridge

Guide to Costs:

$ = <$2M
$$ = $2-10M
$$$ = $10-49M
$$$$ = $50-100M
$$$$$ = >$100M

***Note:** Costs are reflective of outreach to property owners, not the buyouts themselves.*

POLICY AND GOVERNANCE

** (Near <3 years, Mid 3-10, Long >10)*

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
All Municipalities	**A1**	Governance and Coordination	Explore opportunities for inter-municipal agreements which further resilience goals	Inter-municipal agreements are one potential strategy municipalities can coordinate across jurisdictions on issues and needs at the regional or watershed scale.	All	Identify potential needs	All municipalities	$	FEMA BRIC; NJDEP Water Quality Restoration Grants, Nonpoint Source Pollution, FEMA Regional Catastrophic Preparedness Grant Program	**Mid**
All Municipalities	**A2**	Zoning and Land Use Policy	Incorporate resiliency into all waterfront redevelopment projects	Require that property is provided for contiguous waterfront walkway during redevelopment that could also provide space for future coastal protection infrastructure, where appropriate given location and land uses.	All	Explore within specific redevelopment plans	Local property owners and developers local residents and stakeholders	$	FEMA BRIC	**Long**
All Municipalities	**A3**	Zoning and Land Use Policy	Incorporate higher standards into local stormwater management ordinances	Incorporate higher standards into stormwater management ordinance including lowering the threshold for "major development," defining "minor development" to mitigate the impacts of smaller projects, redefine "regulated impervious surface," require more distribution of stormwater management best management practices throughout developments by lowering maximum contributory drainage areas, require enhanced on-site groundwater recharge.	All	Research potential code improvements	Middlesex County, NJDEP	$	FEMA BRIC	**Near**
All Municipalities	**A4**	Governance and Coordination	Continue regional coordination around implementation of Action Plan	Participate in ongoing Steering Committee meetings and provide updates on implementation of projects recommended in the plan.	All	Join ongoing Steering Committee meetings hosted by the County	Middlesex County	$	FEMA BRIC Capacity Building	**Near**
All Municipalities	**A5**	Zoning and Land Use Policy	Update the Flood Hazard/ Flood Damage prevention ordinance to incorporate best practices in the latest NJDEP Model Ordinances and explore opportunities to include higher standards	All municipalities need to update local codes to be up to date with the latest model statewide code. Municipalities should also explore opportunities to include higher standards such as requirement of an elevation certificate, limited outdoor storage of materials in flood hazard areas, standards for cumulative substantial improvements and/or lower substantial improvement threshold, and/or application of standards in the 0.2% floodplain.	All	Research potential code improvements	Middlesex County	$	FEMA BRIC	**Near**
All Municipalities	**A6**	Zoning and Land Use Policy	Explore zoning and building code improvements to improve stormwater management	Explore minimum green area ratios, require green/solar roof and/or blue roof tops within zoning and building codes.	All	Research potential code improvements	All Municipalities	$	FEMA BRIC	**Near**
All Municipalities	**A7**	Adapt or Protect Critical Facilities	Relocation of vulnerable emergency shelters	Consider relocation of flood-prone shelters to less flood-prone areas (First Reformed Church of South River, Madison Park Elementary School, Fords Middle School, others as appropriate).	All	Identify alternate evacuation shelters in less prone locations	All Municipalities	$	TBD	**Mid**
All Municipalities	**A8**	Zoning and Land Use Policy	Explore sewer connection permits	Require permit for connection to City sewer, set maximum allowable discharge rate, allow use of green infrastructure to meet requirements.	All	Research potential permit requirements	All Municipalities	$	FEMA BRIC	**Near**
All Municipalities	**A9**	Zoning and Land Use Policy	Explore the concept of a critical area ordinance	Explore the concept of a critical area ordinance that excludes wetlands, flood hazard areas, and other defined environmental features throughout the municipality.	All	Explore as part of local master plan updates	All Municipalities	$	FEMA BRIC	**Mid**
All Municipalities	**A10**	Zoning and Land Use Policy	Incorporate resiliency into all redevelopment projects	Incorporate resiliency into redevelopment plans by including higher standards for flood elevations, requirements for provision of coastal protection and drainage requirements, as appropriate, and site specific urban design requirements to minimize impacts of higher elevations on the public realm.	All	Explore within specific redevelopment plans	Local property owners and developers, local residents and stakeholders	$	FEMA BRIC, FEMA Regional Catastrophic Preparedness Grant Program	**Mid**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
All Municipalities	**A11**	Governance and Coordination	Coordinated municipal comment on NJPACT rules	As NJPACT regulatory reforms are developed, jointly commenting on the proposed rules could increase the collective voice of individual municipalities.	All	Discuss common priorities	All municipalities	$	N/A	**Near**
Carteret	**C1**	Zoning and Land Use Policy	Review and amend Chrome Waterfront Redevelopment Area	Review and amend Chrome Waterfront Redevelopment Area to accommodate proposed Noe's Creek flood mitigation and resilience projects.	Arthur Kill Waterfront	Assess necessary amendments	Local property owners and developers, local residents and stakeholders	$	FEMA BRIC	**Mid**
Carteret	**C2**	Zoning and Land Use Policy	Promote additional voluntary buyouts in highly vulnerable areas	Coordinate with the NJDEP Blue Acres program to identify suitable buyout properties in areas of high risk, such as the area near Louis St./Washington Ave./Cypress St. which is prone to flooding from heavy rainfall and coastal flooding.	Arthur Kill Waterfront	Conduct outreach to property owners and connect them with NJDEP resources	Property owners	$ (see note on page 223)	NJDEP Blue Acres	**Long**
NJDEP	**NJ1**	Zoning and Land Use Policy	Advocate for improved flood disclosure laws statewide	While there are some flood disclosure laws already on the books in New Jersey, there is a need to strengthen these laws and enforce them. Adequate flood disclosure is needed to make sure that prospective buyers and renters are aware of flood risk.	All	Review existing laws and enforcement and coordinate with legislators on addressing gaps	State Legislature	$	N/A	**Near**
NJDEP	**NJ2**	Governance and Coordination	Communicate flood risk and evolving climate science	There is a need for a consolidated online portal that provides guidance on what is the official source for flood risk and climate change projections. As the scientific understanding of the extent and nature climate threats changes over time, those changes should be communicated to local officials and other stakeholders.	All	Develop statewide communications strategy	Rutgers and other NGOs, Middlesex County, all Municipalities	$	NJDEP Community-Based Art Grant Program	**Near**
NJDEP	**NJ3**	Governance and Coordination	Communicate evolving code changes and regulatory requirements	There is a need for greater awareness at the local level of statewide efforts to update codes and standards to account for climate change.	All	Develop statewide communications strategy	Middlesex County, all Municipalities	$	N/A	**Near**
NJDEP	**NJ4**	Governance and Coordination	Coordinate with State and Federal agencies on implementing projects identified in the plan	There is a need for NJDEP to continue coordination with state agencies with responsibilities identified in this plan, and track progress of implementation.	All	Set up follow-up meetings with State Agencies on recommendations after plan release	NJDOT, NJ TRANSIT, NJOEM, USACE, US Coast Guard	$	N/A	**Near**
NJDEP	**NJ5**	Governance and Coordination	Ongoing technical assistance to municipalities and Counties	Expand State resilience technical assistance resources available to municipalities and counties, including support for local code changes, Community Rating System participation, and improved availability of flood data.	All	Coordinate with Middlesex County and municipalities on needs	Middlesex County, all Municipalities	$	N/A	**Near**
NJDEP	**NJ6**	Zoning and Land Use Policy	Update state codes and standards to reflect climate change	Continue to review and develop proposed regulatory changes to incorporate climate change projections into state codes and standards.	All	Release Emergency Stormwater Rules	All Municipalities, Middlesex County	$	FEMA BRIC Capability & Capacity Building	**Near**
NJDEP	**NJ7**	Governance and Coordination	Coordination of regional water and transportation infrastructure	Water and transportation infrastructure is owned and maintained by various municipal, county, and state agencies. There is a need to coordinate these actors so that impacts and issues that cross jurisdictional boundaries can be understood and managed.	All	As part of Interagency Council on Climate Change, discuss specific regional coordination needs	Middlesex County, NJ TRANSIT, NJDOT, All Municipalities	$	N/A	**Mid**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
NJDEP	**NJ8**	Governance and Coordination	Guidance on re-use of properties in the Blue Acres Program	Within the goal of the Blue Acres program is to return land to a natural state, there is an opportunity to develop guidance on acceptable uses and improvements that meet flood risk reduction, environmental, and community goals.	All	Consult with municapities and other stakeholder on challenges and desires	All municipalities, but especially Sayreville and South River	$	N/A	**Near**
NJDEP	**NJ9**	Zoning and Land Use Policy	Expand state Blue Acres program	Expand state Blue Acres program to provide funding for additional properties, including commercial and multifamily properties.	All	Pursue additional federal funding	Middlesex County, all municipalities	$$$$$	FEMA or CDBG-DR Funding	**Mid**
Old Bridge	**O1**	Zoning and Land Use Policy	Explore zoning changes and other tools to promote resilient redevelopment of waterfront	Promote resilient redevelopment with a mix of uses along Laurence Parkway in Laurence Harbor.	Cheesequake/Laurence Harbor	Explore as part of a master plan update	Local property owners and developers, local residents and stakeholders	$	FEMA BRIC Capability & Capacity Building	**Near**
Old Bridge	**O2**	Zoning and Land Use Policy	Exploration of opportunities for increased density outside the floodplain	Exploration of opportunities for increased density outside the floodplain, such as along Route 9 and near the Garden State Parkway, to accommodate growth.	South River/Washington Canal	Explore as part of a master plan update	Middlesex County, Local property owners and developers, local residents and stakeholders	$	N/A	**Mid**
Old Bridge	**O3**	Zoning and Land Use Policy	Promote additional voluntary buyouts in highly vulnerable areas	Coordinate with the NJDEP Blue Acres program to identify suitable buyout properties in areas of high risk, such as area surrounding Cheesequake State Park that are prone to coastal flooding from Cheesequake Creek.	Cheesequake/Laurence Harbor	Conduct outreach to property owners and connect them with NJDEP resources	Property owners	$ (see note on page 223)	NJDEP Blue Acres	**Long**
Perth Amboy	**P1**	Zoning and Land Use Policy	Exploration of opportunities for increased density outside the floodplain	Exploration of opportunities for increased density outside the floodplain, such as near the train station and along 2nd street.	Raritan Riverfront and Bay	Explore as part of a master plan update	Local property owners and developers, local residents and stakeholders	$	N/A	**Mid**
Perth Amboy	**P2**	Zoning and Land Use Policy	Explore zoning changes and other tools to promote resilient redevelopment of waterfront industrial properties	Promote redevelopment of waterfront industrial properties and brownfields along the Arthur Kill and Woodbridge Creek to new forms of light industry like warehousing and incorporate resilience standards and wetland restoration.	Raritan Riverfront and Bay	Explore as part of a master plan update	Local property owners and developers, local residents and stakeholders	$	FEMA BRIC Capability & Capacity Building	**Long**
Resilient RRBC	**RRBC1**	Governance and Coordination	Support ongoing regional coordination on plan implementation	The Steering Committee should continue to meet and discuss ways regional coordination can advance resilience goals and enhance coordination and relationship between the Coutny and municipalities.	All	Determine who should continue hosting of regular Steering Committee meetings	NJDEP	$	FEMA BRIC?	**Near**
Resilient RRBC	**RRBC2**	Governance and Coordination	Ongoing technical assistance to municipalities	Enhance staff capacity to support dissemination of state resources and support municipalities in building-scale mitigation. Expand upon existing County resilience technical assistance resources available to municipalities such as the MS4/CRS User Group to include additional resources connecting municipalities to guidance on updating local codes, pursuing federal funding opportunities, and best practices for floodplain management, stormwater management, and climate resiliency.	All	Coordinate with NJDEP on needs and potential funding sources	All municipalities, NJDEP	$	FEMA BRIC?	**Near**
Resilient RRBC	**RRBC3**	Governance and Coordination	Identification of priority collective action to demonstrate proof of concept and benefits of ongoing coordination in the region	Additional actions can serve as a proof of concept of the benefits of regional coordination. As NJPACT regulatory reforms are developed, jointly commenting on the proposed rules could increase the collective voice of individual municipalities.	All	Continue participation in regular Steering Committee meetings	All municipalities	$	N/A	**Near**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
Resilient RRBC	**RRBC4**	Zoning and Land Use Policy	Explore potential and structure of a regional Transfer of Development rights	Explore potential and structure of a regional Transfer of Development rights program to manage increases in density outside the floodplain and lowered density in areas at high risk.	All	Explore goals and concepts	All municipalities	$	N/A	**Long**
South Amboy	**SA1**	Zoning and Land Use Policy	Promote resilient redevelopment along the waterfront	Incorporate resiliency standards, such as elevating first floors and streetscape standards, into redevelopment plans. Should incorporate standards that go beyond the mapped FEMA floodplain to account for future climate change.	Raritan Riverfront and Bay	Incorporate into redevelopment plans	Middlesex County, Local property owners and developers, local residents and stakeholders	$	FEMA BRIC Capability & Capacity Building	**Mid**
South River	**SR1**	Zoning and Land Use Policy	Use zoning to limit development potential of sites that have not been bought out along the South River	Expand parks, open space and conservation zone to encompass more of the flood hazard area. Conservation zone provisions can prevent new construction and require improvements to adhere to higher design standards. Zone could include a cumulative damage or improvement provision. Allow maritime uses along waterfront.	South River/Washington Canal	Explore as part of a master plan update	Sayreville, local residents and stakeholders	$	N/A	**Mid**
South River	**SR2**	Zoning and Land Use Policy	Promote resilient redevelopment along Main Street	Incorporate resiliency standards, such as elevating first floors and streetscape standards, into redevelopment plans. Should incorporate standards that go beyond the mapped FEMA floodplain to account for future climate change.	South River/Washington Canal	Explore as part of a master plan update	Local property owners and developers, local residents and stakeholders	$	N/A	**Mid**
South River	**SR3**	Zoning and Land Use Policy	Promote additional voluntary buyouts in highly vulnerable areas	Coordinate with the NJDEP Blue Acres program to identify suitable buyout properties in areas of high risk, such as industrial and commercial areas along the South River.	South River/Washington Canal	Conduct outreach to property owners and connect them with NJDEP resources	Property owners	$ (see note on page 223)	NJDEP Blue Acres	**Long**
Sayreville	**SV1**	Zoning and Land Use Policy	Incorporate resiliency into Riverton Development	Incorporate resiliency standards, such as elevating first floors and streetscape standards, into redevelopment plans. Should incorporate standards that go beyond the mapped FEMA floodplain to account for future climate change.	South River/Washington Canal	Incorporate into redevelopment plans	Local property owners and developers, local residents and stakeholders	$	FEMA BRIC Capability & Capacity Building	**Near**
Sayreville	**SV2**	Zoning and Land Use Policy	Use zoning to limit development potential of sites that have not been bought out along the South River	Expand the OS-C Zone within the SED Zones and remaining residential neighborhoods along MacArthur Avenue. Consider including provisions like the Woodbridge OSC/R Ordinance to limit future development and require enhanced design for any change of use, change of tenancy, and major improvements.	South River/Washington Canal	Explore as part of a master plan update	South River, local residents and stakeholders	$	N/A	**Mid**
Sayreville	**SV3**	Zoning and Land Use Policy	Exploration of opportunities for increased density outside the floodplain	Exploration of opportunities for increased density outside the floodplain, such as along Route 35 to accommodate growth.	South River/Washington Canal	Explore as part of a master plan update	Middlesex County, Local property owners and developers, local residents and stakeholders	$	N/A	**Mid**
Woodbridge	**W1**	Zoning and Land Use Policy	Explore zoning changes and other tools to promote resilient redevelopment of waterfront industrial properties	Promote redevelopment of waterfront industrial properties and brownfields along the Arthur Kill and Woodbridge Creek to new forms of light industry like warehousing and incorporate resilience standards and wetland restoration.	Arthur Kill Waterfront, Woodbridge Creek	Explore as part of a master plan update	Local property owners and developers, local residents and stakeholders	$	FEMA BRIC Capability & Capacity Building	**Long**
Woodbridge	**W2**	Zoning and Land Use Policy	Exploration of opportunities for increased density outside the floodplain	Exploration of long-term opportunities for increased density outside the floodplain, such as along the Route 1 corridors.	Rahway River and Tributaries, Woodbridge Creek	Explore as part of a master plan update	Middlesex County, Local property owners and developers, local residents and stakeholders	$	N/A	**Long**
Woodbridge	**W3**	Zoning and Land Use Policy	Use zoning to limit development potential of highly vulnerable areas along Pumpkin Patch Brook and the South Branch of the Rahway River	Expand the OSC/R Zone or the PQP Zone to encompass the most recently substantially flooded areas.	Rahway River and Tributaries	Explore as part of a master plan update	Local property owners and developers, local residents and stakeholders	$	N/A	**Mid**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
Woodbridge	**W4**	Zoning and Land Use Policy	Explore opportunities for increased density outside the floodplain	Encourage mixed-use development outside floodplain near Avenel and Woodbridge train stations.	Woodbridge Creek	Explore as part of a master plan update	NJ TRANSIT, Local property owners and developers, local residents and stakeholders	$	N/A	**Mid**
Woodbridge	**W5**	Zoning and Land Use Policy	Explore opportunities for increased density outside the floodplain	Encourage mixed-use development outside floodplain near Metropark train station. Development should avoid portions of the area vulnerable to flooding from the South Branch of the Rahway River.	Rahway River and Tributaries, Woodbridge Creek	Coordinate with NJ TRANSIT on development plan	NJ TRANSIT	$	N/A	**Mid**
Woodbridge	**W6**	Zoning and Land Use Policy	Promote additional voluntary buyouts in highly vulnerable areas	Coordinate with the NJDEP Blue Acres program to identify suitable buyout properties in areas of high risk, such as the homes along Wedgewood Brook, Heards Brook, Woodbridge Creek, the South Branch of the Rahway River, and Pumpkin Patch Brook.	Arthur Kill, Rahway River and Tributaries, Woodbridge Creek	Conduct outreach to property owners and connect them with NJDEP resources	Property owners	$ (see note on page 223)	NJDEP Blue Acres	**Long**

PHYSICAL AND NATURE-BASED INFRASTRUCTURE

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
All Municipalities	**A12**	Contaminated Sites and Brownfields	Advance remediation of priority sites	Support refinement of the prioritization methodologies presented herein and confirm high risk / opportunity sites and advance catalyst resilient transformation projects at high risk / opportunity publicly owned contaminated sites / brownfields.	All	Review preliminary prioritized list and methodology	NJDEP, Middlesex County	$	NJEDA Brownfields Impact Fund, NJDEPA / NJEDA Hazardous Discharge SIte Remediation Fund (HDSRF)	**Mid**
Carteret	**C3**	Adapt or Protect Critical Facilities	Site-specific flood mitigation of Carteret Sewer Department and Recycling	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from coastal storm surge and heavy rainfall. While in the long-term there is a coastal protection project proposed to protect this site, near-term improvements to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Arthur Kill Waterfront	Pursue site-specific study of mitigation options.		$$	FEMA BRIC	**Mid**
Carteret	**C4**	Coastal Resilience	Multi-purpose coastal flood barrier and tide gate along Arthur Kill as part of the Noe's Creek project - North Portion	Floodwall and a recreational harborwalk along the Arthur Kill from Noe's Creek to the Carteret Waterfront Park, with a tide gate across the Noe's Creek inlet.	Arthur Kill Waterfront	Pursue funding for a feasibility study	Middlesex County	$$$$$	FEMA BRIC, USACE	**Long**
Carteret	**C5**	Coastal Resilience	Multi-purpose coastal flood barrier for public access along Arthur Kill - South Portion	Floodwall and a recreational harborwalk along the Arthur Kill from the Carteret Waterfront Park to Tufts Point.	Arthur Kill Waterfront	Pursue funding for a feasibility study	Middlesex County, Woodbridge	$$$$$	FEMA BRIC, USACE	**Long**
Carteret	**C6**	Contaminated Sites and Brownfields	Identify brownfield sites north of Peter J. Sica Industrial Highway that are suitable for wetland restoration	Contaminated sites vulnerable to flooding can be remediated and prioritized for ecosystem restoration with resiliency benefits.	Rahway River and Tributaries	Pursue funding for a feasibility study	Middlesex County, Woodbridge	$	NJEDA Brownfields Impact Fund, NJDEPA / NJEDA Hazardous Discharge SIte Remediation Fund (HDSRF)	**Mid**
Carteret	**C7**	Stormwater Management	Explore opportunities for expanded stormwater storage on facilities and right of ways owned by Carteret (Noe's Creek Resilience Opportunity Area)	Potential sites include Carteret High School, Carteret Park, Sycamore St and Solted Ave Park, and more. See map on pages 140-141.	Arthur Kill Waterfront	Examine feasibility of preliminary suggested sites	Local parks, public works, and education departments.	$$$$$	FEMA BRIC	**Mid**
Carteret	**C8**	Stormwater Management	Explore opportunities for expanded stormwater storage on municipal-owned facilities and right of ways	Potential stormwater storage sites include Chrome Park and Contrell Rd/ Colonial Dr Open Space.	Arthur Kill Waterfront, Raritan Riverfront and Bay	Examine feasibility of preliminary suggested sites.	Local parks, public works, and education departments.	$$$$$	FEMA BRIC, NJ I-Bank	**Mid**
Carteret	**C9**	Stormwater Management	Noe's Creek Pump Station	A pump station for improved coastal and inland flood management is needed to complement proposed tide gate and coastal protection in this area.	Arthur Kill Waterfront	Pursue funding for a feasibility study	Middlesex County	$$$$	FEMA BRIC	**Long**
MCUA	**MC1**	Adapt or Protect Critical Facilities	Elevation of critical systems to protect South Amboy Pump Station	This pump station was impacted during Sandy and remain vulnerable to flooding from coastal storm surge and heavy rainfall according to the flood models developed by Resilient NJ. MCUA is already working to develop strategies to protect adapt this facility.	Cheesequake/Laurence Harbor	Pursue site-specific study of mitigation options.	South Amboy	$$	FEMA BRIC, NJ I-Bank	**Near**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
MCUA	**MC2**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at MCUA Wastewater Treatment Plant and Middlesex Generating Facility	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Raritan Riverfront and Bay	Pursue site-specific study of mitigation options.	Sayreville	$$$$$	FEMA BRIC, NJ I-Bank	**Mid**
Lower Raritan Watershed Partnership (to be confirmed)	**NG1**	Coastal Resilience	Explore additional coastal resilience opportunities along the South River	Explore opportunities to expand South River Ecosystem Restoration & Flood Resiliency Enhancement Project to protect residential and commercial properties north of Tyska Avenue.	South River/Washington Canal	Pursue funding for an additional study of nature-based resilience strategies	South River, Sayreville, Middlesex County, Rutgers	$	FEMA BRIC, NFWF America the Beautiful Grant, NOAA National Coastal Resilience Fund, NJDEP Natural Climate Solutions Grant	**Mid**
Lower Raritan Watershed Partnership	**NG2**	Coastal Resilience	Implement the South River Ecosystem Restoration & Flood Resiliency Enhancement Project	Continued partnership with South River and Sayreville communities in implementation of South River Ecosystem Restoration & Flood Resiliency Enhancement Project.	South River/Washington Canal	Advance design and permitting	South River, Sayreville, Middlesex County, Rutgers	TBD	FEMA BRIC, NFWF America the Beautiful Grant, NOAA National Coastal Resilience Fund, NJDEP Natural Climate Solutions Grant	**Near**
Rutgers (to be confirmed)	**NG3**	Coastal Resilience	Restore wetlands and riparian areas along the Raritan River	There are opportunities for wetland restoration along the Raritan River and increase its resilience to sea level rise.	Raritan Riverfront and Bay	Pursue funding and partnerships	Middlesex County, Sayreville	$$	NJDEP Natural Climate Solutions Grant, EPA Wetland Program Development Grants, NOAA National Coastal Zone Management Grant, NFWF America the Beautiful Grant, NOAA Transformational Habitat Restoration and Coastal Resilience Grants	**Mid**
Rutgers (to be confirmed)	**NG4**	Coastal Resilience	Study resilience of existing wetland systems and identify opportunities for restoration and improvements	There is a need for a regional assessment of wetland resources to assess ecosystem health and resiliency needs.	All	Pursue funding and partnerships	NJDEP, Middlesex County	$	NJDEP Natural Climate Solutions Grant, EPA Wetland Program Development Grants, NOAA National Coastal Zone Management Grant, NFWF America the Beautiful Grant, NOAA Transformational Habitat Restoration and Coastal Resilience Grants	**Mid**
NJDEP	**NJ10**	Adapt or Protect Critical Facilities	Develop guidance for State and Local agencies on design standards and climate projections	While many individual agencies have incorporated climate change into their own guidelines, there is a need to establish and coordinate a common set of guidelines to promote design and rehabilitation of critical infrastructure.	All	Explore as part of the Interagency Council on Climate Resilience	Interagency Council on Climate Resilience	$	USDOT	**Near**
New Jersey Turnpike Authority (to be confirmed)	**NJ11**	Resilient Mobility Systems	Examine sections of the Garden State Parkway at risk of future flooding and identify mitigation measures	Examine sections of the Garden State Parkway at risk of future flooding and identify mitigation measures, such as the stretches within Cheesequake State Park. Potential strategies include elevation or building a berm/floodwall along the roadway.	Cheesequake/Laurence Harbor	Pursue statewide assessment of flood risks	NJDOT, NJDEP, Middlesex County, Municipalities	$$$$$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
New Jersey Turnpike Authority (to be confirmed)	**NJ12**	Resilient Mobility Systems	Examine sections of the NJ Turnpike (I95) at risk of future flooding and identify mitigation measures	Examine sections of the New Jersey Turnpike at risk of future flooding and identify mitigation measures near Woodbridge Creek. Potential strategies include elevation or building a berm/floodwall along the roadway.	Arthur Kill, Woodbridge Creek	Pursue statewide assessment of flood risks	NJDOT, NJDEP, Middlesex County, Municipalities	$$$$$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
NJ TRANSIT (to be confirmed)	**NJ13**	Resilient Mobility Systems	Assess and improve resilience of vulnerable sections of NJ Coast Line	Study and develop alternatives to reduce flood risk to the NJ TRANSIT Coast Line, including the section in Old Bridge at Cheesequake Creek.	Cheesequake/Laurence Harbor	Further analysis to identify priority areas	Municipalities	$	FEMA, USACE	**Mid**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
NJ TRANSIT (to be confirmed)	**NJ14**	Resilient Mobility Systems	Protect vulnerable portions of the Perth Amboy Train Station	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing, elevation of critical systems, and floodwalls, should be explored.	Raritan Riverfront and Bay	Pursue site-specific study of mitigation options.	Perth Amboy	$$$$$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
NJ TRANSIT (to be confirmed)	**NJ15**	Stormwater Management	Increase conveyance between rail line and marsh inland of Raritan Bay Waterfront	The NJ Coast Line cuts between two wetlands in this location and is vulnerable to flooding. Increasing conveyance between the marshes through additional culverts could alleviate flooding and improve ecological functions.	Cheesequake/Laurence Harbor	Pursue funding for a feasibility study		$$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Long**
NJ TRANSIT (to be confirmed)	**NJ16**	Stormwater Management	South Rahway River Under Northeast Corridor Rail Line Culvert Expansion	This site has been identified as a potential opportunity to reduce flooding through increasing the size of this culvert. Additional analysis is needed to assess potential flood risks and benefits.	Rahway River and Tributaries	Pursue site specific investigation of capacity and future needs	Middlesex County, Woodbridge	$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
NJ TRANSIT (to be confirmed)	**NJ17**	Stormwater Management	Wedgewood Brook and NJ TRANSIT Line Culvert Expansion	This site has been identified as a potential opportunity to reduce flooding through increasing the size of this culvert. Additional analysis is needed to assess potential flood risks and benefits.	Woodbridge Creek	Pursue site specific investigation of capacity and future needs	Woodbridge	$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
NJDEP	**NJ18**	Coastal Resilience	Adapt existing bulkheads	Standards and guidance for the elevation of bulkheads is needed so that as bulkheads are replaced, they are elevated to maintain functionality with sea level rise.	All	Pursue as part of NJPACT	Interagency Council on Climate Resilience	$	NJDEP Shore Protection Grants and Loans	**Mid**
NJDEP	**NJ19**	Coastal Resilience	Monitoring, management, and restoration of wetlands to improve flood storage capacity within and around the edges of Cheesequake State Park	Wetlands within the park should be evaluated and monitored for resiliency to sea level rise and other stressors. Evaluation of the potential to restore wetlands in ways that also create flood resiliency benefits.	Cheesequake/Laurence Harbor	Pursue funding for a feasibility study	NJ Parks	$	NJDEP Natural Climate Solutions Grant, EPA Wetland Program Development Grants, NOAA National Coastal Zone Management Grant, NFWF America the Beautiful Grant, NOAA Transformational Habitat Restoration and Coastal Resilience Grants	**Long**
NJDEP	**NJ20**	Contaminated Sites and Brownfields	Coordinate and align state funding programs to accelerate resilient transformation of contaminated sites	Consider collaborating on the development of guidelines and requirements a site might follow to flow through the process and funding and supporting resilient transformation of high priority sites under RNJ banner.	All	Coordinate with relevant departments to advance the concept	All Municipalities, Middlesex County	$	EPA	**Near**
NJDEP	**NJ21**	Contaminated Sites and Brownfields	Expand the brownfields inventory	Expand the brownfields inventory across the state, beyond CCI municipalities (which are the only municipalities included as of June 2022).	All	Identify resources		$	EPA, NJEDA	**Near**
NJDEP	**NJ22**	Contaminated Sites and Brownfields	Improve the Known Contaminated Site List	Continue data improvements to Known Contaminated Site List and other state-managed databases to provide more complete information on resilience-related factors (e.g., expanding available information or accuracy on contaminant type and extents, remedial design type, site status).	All	Identify resources		$	EPA, NJEDA	**Near**
NJDEP	**NJ23**	Contaminated Sites and Brownfields	Incorporate climate considerations into brownfield remediation planning	Explore a statewide climate risk assessment of contaminated and remediation sites and explore integration of climate risks into remedial design.	All	Identify resources		$$	EPA, NJEDA	**Mid**
NJDEP	**NJ24**	Resilient Mobility Systems	Develop guidance for State Transportation agencies on design standards and climate projections	While many individual agencies have incorporated climate change into their own guidelines, there is a need to establish and coordinate a common set of guidelines to promote design and rehabilitation of infrastructure.	All	Explore as part of the Interagency Council on Climate Resilience	Interagency Council on Climate Resilience	$	USDOT	**Near**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
NJDEP	**NJ25**	Stormwater Management	Provide guidance to municipalities and utilities on incorporating climate change into the standards for Long Term Control Plans	The current standards set by NJDEP that LTCPs must follow use historic rainfall data, not including future projections, despite them being long-term plans. Incorporating climate projections into the process for developing LTCPs would ensure that they better address near and long-term resilience and water quality issues.	All	Develop standards and guidance		$	N/A	**Near**
NJDOT (to be confirmed)	**NJ26**	Resilient Mobility Systems	Assess and improve resilience of hurricane evacuation routes	Review flood risk of major hurricane evacuation routes in region as part of capital planning process, and integrate considerations to reduce risk to the extent feasible.	All	Continue assessment of flood risks	NJOEM	$	USDOT PROTECT	**Near**
NJDOT (to be confirmed)	**NJ27**	Resilient Mobility Systems	Examine opportunities to protect vulnerable sections of Route 35 in Old Bridge	Review flood risk to vulnerable sections of State Route 35 in Laurence Harbor and integrate considerations for how to reduce flood risk into future capital plans to the extent feasible.	Cheesequake/Laurence Harbor	Continue assessment of flood risks	Old Bridge	$$$$$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
NJDOT (to be confirmed)	**NJ28**	Stormwater Management	Explore opportunities for expanded stormwater storage on facilities and right of ways owned by NJ DOT (Middlesex County Greenway Extension Resilience Opportunity Area)	Potential sites include Rt 9 and GSP on and off ramps. Review opportunities presented and integrate into capital planning process to the extent feasible. See map on page 140-141.	Raritan Riverfront and Bay	Examine feasibility of preliminary suggested sites	Local parks, public works, and education departments.	$$$$$	FEMA BRIC	**Mid**
NJDOT (to be confirmed)	**NJ29**	Stormwater Management	Explore opportunities for expanded stormwater storage on State facilities	There are potential opportunities for stormwater management in the Open Space along Route 1 and Route 35. Review opportunities presented and integrate into capital planning process to the extent feasible.	All	Examine feasibility of preliminary suggested sites.	Municipalities	$$$$	FEMA BRIC, NJ I-Bank	**Mid**
NJDOT (to be confirmed)	**NJ30**	Stormwater Management	Heards Brook and Route 35 Culvert Expansion	This site has been identified as a potential opportunity to reduce flooding through increasing the size of this culvert. Additional analysis is needed to assess potential flood risks and benefits. Review opportunities for flood risk reduction into capital planning process to the extent feasible.	Woodbridge Creek	Pursue site specific investigation of capacity and future needs	Woodbridge	$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
NJDOT (to be confirmed)	**NJ31**	Stormwater Management	South Rahway River under Route 27 culvert expansion	This site has been identified as a potential opportunity to reduce flooding through increasing the size of this culvert. Additional analysis is needed to assess potential flood risks and benefits. Review opportunities for flood risk reduction into capital planning process to the extent feasible.	Rahway River and Tributaries	Pursue site specific investigation of capacity and future needs	NJ TRANSIT, Woodbridge	$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Near**
NJDOT (to be confirmed)	**NJ32**	Resilient Mobility Systems	Improve coordination around evacuation planning	CUpdate the statewide evacuation plan, with input from local and county stakeholders..	All	Continue work on updating the statewide evacuation plan	NJOEM, All Municipalities, Middlesex County, NJTPA, NJTRANSIT	$	USDOT PROTECT	**Mid**
North Jersey Transportation Planning Authority (NJTPA, to be confirmed)	**NJ33**	Resilient Mobility Systems	Assess and improve resilience of bus routes	Comprehensive evaluation of flood-prone bus routes (137, 815, 817) in region	All	Pursue statewide assessment of flood risks	NJDOT, NJ TRANSIT	$	USDOT PROTECT	**Mid**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
Old Bridge	**O4**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Madison Park Elementary School	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	South River/Washington Canal	Pursue site-specific study of mitigation options.		$$$	FEMA BRIC	**Mid**
Old Bridge	**O5**	Stormwater Management	Explore opportunities for expanded stormwater storage on municipal-owned facilities and right of ways	Potential stormwater storage sites include Veterans Park, Open Space Along Tennent Brook and William Way, Tenant Brook Tributary Baseball Fields.	South River/Washington Canal	Examine feasibility of preliminary suggested sites.	Local parks, public works, and education departments.	$$$$$	FEMA BRIC	**Mid**
Old Bridge Municipal Utilities Authority	**O6**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Old Water Works Pumping Station	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	South River/Washington Canal	Pursue site-specific study of mitigation options.		$$$	FEMA BRIC	**Mid**
Old Bridge Municipal Utilities Authority	**O7**	Adapt or Protect Critical Facilities	Site-specific mitigation of Laurence Harbor Pump Station	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Cheesequake/Laurence Harbor	Pursue site-specific study of local flood risk and mitigation options.	Old Bridge	$$$	FEMA BRIC	**Mid**
Perth Amboy	**P3**	Coastal Resilience	Floodwall on Sadowski Parkway - Peth Amboy Portion	Elevated Harborwalk on New Seawall.	Raritan Riverfront and Bay	Pursue funding for a feasibility study		$$$$$	NJDEP Shore Protection Grants and Loans	**Mid**
Perth Amboy	**P4**	Coastal Resilience	Multi-purpose coastal flood barrier along the Arthur Kill	Multi-purpose coastal flood barrier with bike and pedestrian paths along Perth Amboy shoreline from Armstrong Lane to Perth Amboy Harborside Marina.	Arthur Kill Waterfront	Pursue funding for a feasibility study	Middlesex County	$$$$$	USACE	**Long**
Perth Amboy	**P5**	Stormwater Management	Explore opportunities for expanded stormwater storage on facilities and right of ways owned by Perth Amboy (Middlesex County Greenway Extension Resilience Opportunity Area)	Potential sites include Seaman Street Playground and Sports Fields and Lake Between Pfeiffer Blvd and Dorothy Ave, and more. See map on page 140-141.	Raritan Riverfront and Bay	Examine feasibility of preliminary suggested sites	Local parks, public works, and education departments.	$$$$$	FEMA BRIC	**Mid**
Perth Amboy	**P6**	Stormwater Management	Explore opportunities for expanded stormwater storage on municipal-owned facilities and right of ways	Potential stormwater storage sites include along Sadowski Parkway, Franklin Drive Sports Fields and Washington Road and Lakeview Drive Baseball Fields.	Raritan Riverfront and Bay	Examine feasibility of preliminary suggested sites.	Local parks, public works, and education departments.	$$$$	FEMA BRIC	**Mid**
Perth Amboy	**P7**	Stormwater Management	Implement the Long-Term Control Plan to reduce CSOs and improve drainage	Improvements include deep storage, new pumping station at 2nd street and beach, additional storage and treatment strategies, sewer separation, and green infrastructure.	Raritan Riverfront and Bay	Formally approve long-term control plan.	NJDEP, MCUA	Varies	NJ I-Bank	**Near**
Resilient RRBC	**RRBC5**	Contaminated Sites and Brownfields	Coordinate with municipalities to identify priority brownfield and contaminated sites for remediation	Support refinement of the prioritization methodologies presented herein and support municipalities in confirming high risk and high opportunity sites for action.	All	Review preliminary prioritized list and methodology	All Municipalities, NJDEP	$	NJEDA Brownfields Impact Fund, NJDEPA / NJEDA Hazardous Discharge SIte Remediation Fund (HDSRF)	**Near**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
Resilient RRBC	**RRBC6**	Resilient Mobility Systems	Examine opportunities to protect vulnerable sections of State St. (CR 611) and Port Reading Ave. near the Arthur Kill	Study and develop alternatives to reduce flood risk to State St. (CR 611) and Port Reading Ave. through road elevation or other measures. The roads flood frequently leading to many disruptions and is an evacuation route.	Woodbridge Creek	Pursue funding for a study to assess risks and mitigation options	Woodbridge, Perth Amboy	$$$$$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
Resilient RRBC	**RRBC7**	Stormwater Management	Assess opportunities for incorporating flood storage and conveyance into an extension of the Middlesex County Greenway	Extension of the Middlesex County Greenway further into Woodbridge and into Perth Amboy could increase recreation and mobility. It also presents an opportunity to overcome drainage impediments formed by the rail embankment.	Raritan Riverfront and Bay	Examine feasibility of incorporating stormwater improvements into the proposed greenway extension.	CSQ/Norfolk Southern, Woodbridge, Perth Amboy	$$$$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Long**
Resilient RRBC	**RRBC8**	Stormwater Management	Continue to explore a regional stormwater utility in partnership with municipalities	A stormwater utility creates the ability to assess fees, based on a fair and equitable approximation of the contribution of stormwater runoff from a real property, which can then be used to fund stormwater programs.	All	Coordinate with municipalities to understand interest in a stormwater utility at various scales.	All Municipalities, MCUA	$	N/A	**Near**
Resilient RRBC	**RRBC9**	Stormwater Management	Culvert Expansion at Port Reading Ave and Woodbridge Creek	This site has been identified as a potential opportunity to reduce flooding through increasing the size of this culvert. Additional analysis is needed to assess potential flood risks and benefits.	Woodbridge Creek	Pursue site specific investigation of capacity and future needs	Woodbridge	$	USDOT PROTECT, USDOT RAISE, USDOT Transportation Alternatives Program (TAP)	**Mid**
Resilient RRBC	**RRBC10**	Stormwater Management	Explore opportunities for expanded stormwater storage on County facilities and rights of way	Potential sites include Merrill Park, Alvin P. Williams Memorial Park, William Warren Park, and more. See map on page 140-141.	All	Examine feasibility of preliminary suggested sites.	County parks department; municipalities.	$$$$$	FEMA BRIC	**Mid**
Resilient RRBC	**RRBC11**	Stormwater Management	Study opportunities and potential benefits of upstream storage and diversion within the South River watershed	Existing water bodies within the upstream tributaries of the South River can be managed to increase the storage of stormwater upstream and reduce peak flows downstream. Additional study is needed to model the effectiveness of this approach.	South River/Washington Canal	Pursue funding and partnerships for a study of this concept	South River, Sayreville, Old Bridge, USACE	$$$$$	USACE	**Long**
South Amboy	**SA2**	Adapt or Protect Critical Facilities	Site-specific flood mitigation of South Amboy Fire Department Snorkel Fire Company	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from coastal storm surge and heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Cheesequake/Laurence Harbor	Pursue site-specific study of mitigation options.		$$	FEMA BRIC, NJ I-Bank	**Mid**
South Amboy	**SA3**	Adapt or Protect Critical Facilities	Site-specific flood mitigation of South Amboy Fire Mechanicsville Hose Company	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Raritan Riverfront and Bay	Pursue site-specific study of mitigation options.		$	FEMA BRIC, NJ I-Bank	**Mid**
South Amboy	**SA4**	Stormwater Management	Explore opportunities for expanded stormwater storage on municipal-owned facilities and right of ways	Potential stormwater sites include John Zdanewicz Park, South Amboy Elementary School, and more. See map on page 140-141.	Cheesequake/Laurence Harbor	Examine feasibility of preliminary suggested sites.	Local parks, public works, and education departments.	$$$$$	FEMA BRIC, NJ I-Bank	**Mid**
South River	**SR4**	Coastal Resilience	Coastal flooding protection along the South River	Evaluate flood protection alternatives for riverfront from the railroad crossing at Whitehead Avenue south to Bissetts Recreational Area.	South River/Washington Canal	Pursue funding for a feasibility study of potential options	Middlesex County	$$$$$	FEMA BRIC, USACE	**Long**
South River	**SR5**	Coastal Resilience	Coastal flooding protection of South River downtown core	Evaluate potential alignments for protection of South River downtown core.	South River/Washington Canal	Pursue funding for a feasibility study of potential options	Middlesex County	$$$$$	FEMA BRIC, USACE	**Long**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
South River	**SR6**	Stormwater Management	Explore opportunities for expanded stormwater storage on municipal-owned facilities and right of ways	Potential sites include Dailey's Pond Recreation Area, Burton Ave and Louis Street Baseball Field, and more. See map on page 140-141.	South River/Washington Canal	Examine feasibility of preliminary suggested sites.	Local parks, public works, and education departments.	$$$$$	NJDEP Natural Climate Solutions Grant, NOAA National Coastal Zone Management Grant, NFWF America the Beautiful Grant, NOAA Transformational Habitat Restoration and Coastal Resilience Grants, FEMA BRIC	**Mid**
Sayreville	**SV4**	Coastal Resilience	Work with Riverton developer to incorporate nature-based solutions along the shoreline, such as a living shoreline/ into redevelopment plan	Incorporation of nature-based solutions, such as a living shoreline, can create additional habitat opportunities and allow for inland migration of wetlands with sea level rise.	Raritan Riverfront and Bay	Incorporate into development phases	NJDEP, Developers	$	FEMA BRIC, NJDEP Natural Climate Solutions Grants	**Near**
Sayreville	**SV5**	Stormwater Management	Explore opportunities for expanded stormwater storage on municipal-owned facilities and right of ways	Potential sites include the Sayreville Sports Complex, Walter D. Faith Memorial Fields, Veterans Park, and more. See map on page 140-141.	Raritan Riverfront and Bay, South River / Washington Canal	Examine feasibility of preliminary suggested sites.	Local parks, public works, and education departments.	$$$$$	FEMA BRIC, NJ I-Bank	**Mid**
U.S. EPA	**US1**	Contaminated Sites and Brownfields	Remediation of Slag superfund site	EPA has issued a record of design for the site's clean-up which includes excavating and dredging contaminated material.	Cheesequake/Laurence Harbor	Complete design plans for site remediation	Old Bridge, USACE, NL Industries	$$	EPA	**Near**
USACE	**US2**	Coastal Resilience	Beach Nourishment along Ocean Boulevard	Restoring the eroding beach along the Atlantic Ocean by adding more sand and height to dunes along the shoreline.	Cheesequake/Laurence Harbor	Examine options as part of the Laurence Harbor project.	NJDEP, Old Bridge	$$	NJDEP Shore Protection Grants and Loans	**Long**
USACE	**US3**	Coastal Resilience	Beach replenishment in Perth Amboy to protect waterfront park and recreational assets	Restoring the eroding beach along the Arthur Kill River by adding more sand and height to dunes along the shoreline.	Raritan Riverfront and Bay	Examine options as part of the NYNJ HATS Project	NJDEP, Perth Amboy	$$$	NJDEP Shore Protection Grants and Loans	**Long**
USACE	**US4**	Coastal Resilience	Rehabilitation of Cheesequake Creek jetty	Improvement of the jetty.	Cheesequake/Laurence Harbor	Pursue design and permitting	NJDEP, Middlesex County, Old Bridge	$$$	Water Resources Development Act	**Near**
USACE	**US5**	Coastal Resilience	Beach Nourishment along Raritan Bay	Restoring the eroding beach along the Raritan Bay by adding more sand and height to dunes along the shoreline.	Cheesequake/Laurence Harbor	Examine options as part of the NYNJ HATS Project	NJDEP, South Amboy	$$$	FEMA BRIC, USACE, NJDEP Shore Protection Grants and Loans	**Long**
USACE	**US6**	Coastal Resilience	Implement Rahway River Basin project	The project includes a levee/floodwall along the south bank of the Rahway River along with road raising. It will provide benefits to vulnerable properties in Carteret and Woodbridge.	Rahway River and Tributaries	Allocate funding for construction	NJDEP, Carteret, Woodbridge	$$$$	Water Resources Development Act	**Long**
USACE	**US7**	Coastal Resilience	Study regional and local coastal protection solutions through the NY/NJ Harbor and Tributaries Study	This study is examining several alternatives to coastal flood risk reduction, including examining a storm surge barrier across the Lower New York Bay as well as more localized surge barriers such as across the Arthur Kill at Perth Amboy.	All	Issue a report on a tentatively selected plan	NJDEP, Perth Amboy	$$$$$	Water Resources Development Act	**Long**
USACE	**US8**	Coastal Resilience	Installation of breakwaters at Cheesequake Inlet	Breakwaters along the coast could serve to buffer storm waves and reduce erosion of the beach.	Cheesequake/Laurence Harbor	Examine options as part of the Laurence Harbor project.	NJDEP, Middlesex County, Old Bridge	$$$$	FEMA BRIC, USACE, NJDEP Shore Protection Grants and Loans	**Mid**
Woodbridge	**W7**	Adapt or Protect Critical Facilities	Site-specific flood mitigation of Hopelawn Engine Company 1	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from coastal storm surge and heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Raritan Riverfront and Bay	Pursue site-specific study of mitigation options.		$$	FEMA BRIC, I-Bank	**Mid**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
Woodbridge	**W8**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Cypress Recreation Center	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Woodbridge Creek	Pursue site-specific study of mitigation options.		$$	FEMA BRIC, I-Bank	**Mid**
Woodbridge	**W9**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Fords Middle School	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Woodbridge Creek	Pursue site-specific study of mitigation options.		$$$$	FEMA BRIC, NJ I-Bank	**Mid**
Woodbridge	**W10**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Henry Inman Library	This library was flooded by Hurricane Ida, leading to the library's temporary closure. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Rahway River and Tributaries	Pursue site-specific study of mitigation options.		$$	FEMA BRIC, NJ I-Bank	**Mid**
Woodbridge	**W11**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Menlo Park Terrace Elementary School	According to the flood models developed by Resilient NJ, this school is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Woodbridge Creek	Pursue site-specific study of local flood risk and mitigation options.		$$$	FEMA BRIC, NJ I-Bank	**Mid**
Woodbridge	**W12**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Woodbridge Recycling Center	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Raritan Riverfront and Bay	Pursue site-specific study of mitigation options.		$$$$	FEMA BRIC, I-Bank	**Mid**
Woodbridge	**W13**	Adapt or Protect Critical Facilities	Site-specific mitigation of flood-prone assets at Woodbridge Township Fire District 2 Port Reading	According to the flood models developed by Resilient NJ, this facility is vulnerable to flooding from heavy rainfall. Strategies to protect or adapt this facility, including wet and dry floodproofing and elevation of critical systems, should be explored.	Woodbridge Creek	Pursue site-specific study of mitigation options.		$$	FEMA BRIC, I-Bank	**Mid**
Woodbridge	**W14**	Coastal Resilience	Floodwall on Sadowski Parkway - Woodbridge Portion	Elevated Harborwalk on New Seawall.	Raritan Riverfront and Bay	Pursue funding for a feasibility study		$$$$$	FEMA BRIC, USACE, NJDEP Shore Protection Grants and Loans	**Mid**
Woodbridge	**W15**	Coastal Resilience	Protect and manage tidal wetlands along Woodbridge Creek for sea level rise	Monitor and evaluate coastal wetlands and identify opportunities to restore wetlands and address resiliency to sea level rise.	Woodbridge Creek	Identify partners and pursue funding opportunities	Middlesex County, NJDEP, Rutgers	$$$	NJDEP Natural Climate Solutions Grant, NOAA National Coastal Zone Management Grant, NFWF America the Beautiful Grant, NOAA Transformational Habitat Restoration and Coastal Resilience Grants, FEMA BRIC	**Long**
Woodbridge	**W16**	Stormwater Management	Explore opportunities for expanded stormwater storage on municipal-owned facilities and right of ways	Potential sites include Lynn Crest Elementary School, Cypress Recreation Center, and more. See map on page 140-141.	Arthur Kill, Rahway River and Tributaries, Woodbridge Creek	Examine feasibility of preliminary suggested sites	Local parks, public works, and education departments.	$$$$$	FEMA BRIC	**Mid**
Woodbridge	**W17**	Stormwater Management	Heards Brook and Elmwood Ave Culvert Expansion	This site has been identified as a potential opportunity to reduce flooding through increasing the size of this culvert. Additional analysis is needed to assess potential flood risks and benefits.	Woodbridge Creek	Pursue site specific investigation of capacity and future needs		$	USDOT RAISE Grant Program	**Mid**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
Woodbridge	**W18**	Stormwater Management	Heards Brook and School St Culvert Expansion	This site has been identified as a potential opportunity to reduce flooding through increasing the size of this culvert. Additional analysis is needed to assess potential flood risks and benefits.	Woodbridge Creek	Pursue site specific investigation of capacity and future needs		$	USDOT RAISE Grant Program	**Mid**
Woodbridge	**W19**	Stormwater Management	Increase the storage and conveyance capacity of Heards Brook	Examine strategies to increase storage and conveyance along the stream along with ecological restoration.	Woodbridge Creek	Pursue funding for a feasibility study	NJDEP	$$	NJDEP Natural Climate Solutions Grant, NOAA National Coastal Zone Management Grant, NFWF America the Beautiful Grant, NOAA Transformational Habitat Restoration and Coastal Resilience Grants, FEMA BRIC	**Long**
Woodbridge	**W20**	Stormwater Management	Increase the storage and conveyance capacity of Pumpkin Patch Brook riparian corridor	Examine strategies to increase storage and conveyance along the stream along with ecological restoration.	Rahway River and Tributaries	Pursue funding for a feasibility study	NJDEP	$	FEMA BRIC	**Long**
Woodbridge	**W21**	Stormwater Management	Increase the storage and conveyance capacity of Wedgewood Brook	Examine strategies to increase storage and conveyance along the stream along with ecological restoration.	Woodbridge Creek	Pursue funding for a feasibility study	NJDEP	$$	NJDEP Natural Climate Solutions Grant, NOAA National Coastal Zone Management Grant, NFWF America the Beautiful Grant, NOAA Transformational Habitat Restoration and Coastal Resilience Grants, FEMA BRIC	**Long**
Woodbridge	**W22**	Coastal Resilience	Implement living shoreline at Boynton Beach	A living shoreline provides for improved intertidal habitat and creates opportunities for inland wetland migration as sea levels rise.	Arthur Kill Waterfront	Pursue design and permitting	NJDEP	$$$	NJDEP Natural Climate Solutions Grant	**Mid**

OUTREACH AND CAPACITY BUILDING

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
All Municipalities	**A13**	Flood Awareness Outreach Campaign	Support ongoing Flood Awareness Outreach Campaign	Support ongoing outreach and awareness in partnership with the YMCA and the County. Share information on flood risk with property owners to empower them to take action and advocate for additional support.	All	Pursue funding opportunities	NJDEP, Middlesex County, YMCA	$	Watershed Institute Grants	**Near**
Carteret	**C10**	Flood Awareness Outreach Campaign	Develop evacuation plan for flood-prone public housing including Jeanette Smith Village	Promote communication and awareness of flood risk and what to do when there is a severe storm forecast with residents of public housing in areas vulnerable to flooding.	Arthur Kill Waterfront	Coordinate with Carteret Housing Agency to understand existing emergency operations and needs	Middlesex County, NJOEM, NJ TRANSIT	$	NJDEP Community-Based Art Grant Program	**Near**
Carteret	**C11**	Technical Support for Property Owners	Targeted outreach on mitigation options to Ida impacted homeowners.	Share information about resiliency investments they can make to their homes, or interest in buyouts.	Arthur Kill, Rahway River and Tributaries	Gather informational materials about options to share with property owners and community organizations	Middlesex County, NJDEP, Community Organizations	$	N/A	**Near**
YMCAs/ Other NGOs	**NG5**	Flood Awareness Outreach Campaign	Support ongoing Flood Awareness Outreach Campaign	Integrate flood awareness into community programming using materials developed by Resilient NJ.	All	Pursue funding opportunities	NJDEP, Middlesex County, all municipalities	$	NJDEP Community-Based Art Grant Program	**Near**
NJDEP	**NJ34**	Technical Support for Property Owners	Outreach to private owners and operators of industrial facilities and critical utilities	Major critical facilities like oil and gas terminals, and power stations, as well as cell towers, are located in vulnerable areas throughout the region. While some assets have made some resiliency improvements, there is a need for further coordination and outreach to promote adaptation.	Arthur Kill Waterfront, Rahway River and Tributaries	Reach out to property owners to understand what improvements have been made and what needs remain.	PSEG, Buckeye Global Marine Terminal, Kinder Morgan, NextEra Energy Resources, CPV, AT&T	$	FEMA BRIC Capability & Capacity Building	**Near**
NJDEP	**NJ35**	Technical Support for Property Owners	Develop funding programs to property owners for floodproofing, elevations, buyouts, and green infrastructure retrofits	Funding programs can include loans and grants and should be developed to supporting a range of property types including residential, multi-family, and commercial.	All	Identify funding opportunities		$$$$$	HUD CDBG-DR Ida, FEMA Swift Current	**Near**
NJDEP	**NJ36**	Flood Awareness Outreach Campaign	Explore opportunities for additional funding for ongoing Flood Awareness Outreach Campaign	Additional funding and technical support is needed to continue Resilient NJ outreach and awareness building led by the County, municipalities, and the YMCAs.	All	Identify funding opportunities	Middlesex County, all Municipalities, YMCA	$	Watershed Institute Grants, Sustainable New Jersey Grants, FEMA Regional Catastrophic Preparedness Grant Program	**Near**
Perth Amboy	**P8**	Technical Support for Property Owners	Targeted outreach on mitigation options to Ida impacted homeowners	Share information about resiliency investments they can make to their homes, or interest in buyouts.	Arthur Kill, Raritan Riverfront and Bay	Gather informational materials about options to share with property owners and community organizations	Middlesex County, NJDEP, Community Organizations	$	N/A	**Near**
Resilient RRBC	**RRBC12**	Flood Awareness Outreach Campaign	Support ongoing Flood Awareness Outreach Campaign as identified by the County All Hazard mitigation plan	Support ongoing outreach and awareness in partnership with the YMCA and municipalities and enhance staff capacity to support dissemination of state resources and support municipalities in building-scale mitigation.	All	Pursue funding and partnership opportunities	NJDEP, all Municipalities, YMCA	$	FEMA BRIC Capability & Capacity Building, FEMA Regional Catastrophic Preparedness Grant Program	**Near**
Sayreville	**SV6**	Flood Awareness Outreach Campaign	Promote flood awareness campaign and evacuation for Winding Woods apartment complex	Promote communication and awareness of flood risk and what to do when there is a severe storm forecast with residents of Winding Woods Apartment Complex.	South River/Washington Canal	Reach out to property owners to understand opportunities	Private property owners, residents	$	Sustainable New Jersey Grants	**Near**
Woodbridge	**W23**	Technical Support for Property Owners	Targeted outreach on mitigation options to Ida impacted homeowners, particularly along Pumpkin Patch Brook and the South Branch of the Rahway River	Share information about resiliency investments they can make to their homes, or interest in buyouts.	Rahway River and Tributaries	Gather informational materials about options to share with property owners and community organizations	Middlesex County, NJDEP, Community Organizations	$	N/A	**Near**

ADDITIONAL CLIMATE HAZARDS

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
All Municipalities	**A14**	Additional Climate Hazards	Enhance enforcement of existing local and state regulations relating to hazards other than flood	Existing regulations including the 2021 NJ Stormwater Rule, State Emission Statement rule, NJ Air Quality State Implementation plan regulations, Statewide water quality standards, and others may be leveraged to increase green infrastructure, monitor state progress towards emissions reductions, improve water quality and more.	All	Conduct a review of key regulations in coordination with NJDEP and develop a strategy for equitable enforcement	NJDEP	$$	N/A	**Near**
All Municipalities	**A15**	Additional Climate Hazards	Explore zoning overlays, restrictions, and/or buffers to address groundwater contamination and wildfire risk	Implement groundwater protection zoning overlays to protect water within potential contamination zones or buffer distances around groundwater intakes. Develop zoning restrictions to address fire risk.	All	Conduct an initial investigation and convene with other entities across the country that have successfully implemented such structures on best practices/ lessons learned	NJDEP	$	N/A	**Near**
All Municipalities	**A16**	Zoning and Land Use Policy	Develop site-specific plans for contaminated sites, especially those located in environmental justice communities	Incorporate considerations of hazards beyond flooding and needs of environmental justice communities in remediation of contaminated sites.	All	Work with NJEJA and existing partners to identify and conduct outreach with key CBOs to identify high priority needs and low-hanging fruit	Local community-based organizations, NJ Environmental Justice Alliance	$	EPA	**Near**
All Municipalities	**A17**	Additional Climate Hazards	Conduct targeted community outreach with agricultural and fishery workers	Outreach should be focused on understanding future needs and localized social and economic impacts of ocean acidification and changes to water supply levels and projected future demand to help shape decision making.	All	Identify key stakeholders for outreach	NJ Department of Agriculture, NJ Fish and Wildlife, NJDEP, Middlesex County	$	FEMA Regional Catastrophic Preparedness Grant	**Near**
All relevant public water utilities	**A18**	Additional Climate Hazards	Prioritize capital improvement projects to replace and/or renew deteriorating and inefficient pipelines and water supply assets	In accordance with the 2018 American Water Infrastructure Act, this would involve developing risk and resilience assessments for drinking water systems that consider climate change impacts. Could also involve partnering with the Lead Service Line Replacement program and others.	All	Conduct a comprehensive review of existing data and identify any critical information gaps	All municipalities	$	NJ I-Bank, WIFIA	**Near**
YMCAs/ Other NGOs	**NG6**	Additional Climate Hazards	Study present-day vulnerabilities to and impacts of extreme heat and poor air quality	Partner with the academic community and community-based organizations to conduct localized studies and public health screenings of present-day vulnerabilities to and impacts of extreme heat and poor air quality.	All	Pursue funding and partnerships	Rutgers and other NGOs	$	NOAA Climate Program Office (CPO) Extreme Heat Risk Initiative Competition, EPA Environmental Justice Grants	**Near**
NJ Board of Public Utilities: Division of Water	**NJ37**	Additional Climate Hazards	Investigate tying water conservation rate structures to water utilities	Water conservation rate structures would be tied to public water utilities based on the amount of water volume consumed to mitigate the risk of water shortages. This could be seasonal and be based on metrics as recommended in the 2017-2022 NJ Water Supply Plan. Any such structure must be equitable and be designed to not burden low-income households.	All	Conduct an initial investigation and convene with other entities across the country that have successfully implemented such structures on best practices/ lessons learned	NJDEP Division of Water Supply and Governance, municipal public water utility authorities	$	N/A	**Mid**
NJ Department of Health	**NJ38**	Additional Climate Hazards	Work with community-based organizations to conduct public health studies of localized current-day “invisible” effects of air quality	Poor air quality in the region is not merely a future issue. The RRBC population is currently at extremely high risk, relative to the rest of the state, for air toxics-related cancer impacts.	All	Assess existing data gaps and identify key CBOs at the municipal scale to help ground-truth initial assumptions	Middlesex County, NJDEP, local community-based organizations, all municipalities	$	EPA Environmental Justice Grants	**Near**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
NJDEP	**NJ39**	Additional Climate Hazards	Enhance regional planning and coordination around additional hazards	Efforts may include goals to support local planning for accessible, equitable public and multi-modal transportation infrastructure, and others. These efforts should complement watershed scale or regional planning to address flood risk.	All	Convene with Resilient RRBC stakeholders to identify regional goals on additional climate hazards	All municipalities, Middlesex County, NJDOT, NJ Fish and Wildlife	$	USDOT PROTECT	**Mid**
NJDEP	**NJ40**	Additional Climate Hazards	Work with environmental justice groups to initiate an accessible, regional program to incentivize mitigating and sustainable practices	This strategy can be complemented by the recommended individual actions and outreach, education and capacity building for private property owners.	All	Conduct outreach with key environmental justice organizations, develop program goals and identify funding sources	NJ Environmental Justice Alliance, local community-based organizations, all municipalities	$$	EPA Environmental Justice Grants	**Mid**
NJDEP	**NJ41**	Additional Climate Hazards	Identify high-opportunity contaminated sites for urban green space placement in underutilized and non-municipal land	Contaminated sites or brownfields, vacant land, and existing publicly owned impervious surfaces in environmental justice communities experiencing high urban heat and/or poor air quality should be identified and prioritized for green space placement.	All	Develop evaluation criteria for high-priority, high-opportunity sites, identify funding opportunities	All municipalities, Middlesex County	$	NJDEP Green Acres, NJDEP Natural Climate Solutions Grant	**Mid**
NJDEP	**NJ42**	Additional Climate Hazards	Invest in regional ecosystem-based adaptation projects to address multiple climate hazards	Like flooding and other flood resilience issues, ecosystem-scale adaptation can be leveraged to build resilience to Additional Hazards through habitat restoration and sustainable agroforestry.	All	Convene with Resilient RRBC stakeholders to identify regional goals on additional climate hazards	Key regional environmental organizations, NJ Fish and Wildlife, NJ Board of Public Utilities: Division of Water, all municipalities	$$	N/A	**Long**
NJDEP	**NJ43**	Additional Climate Hazards	Initiate universal public programs to distribute risk-mitigating resources and technical assistance	This program could involve distribution of air conditioners, clean energy technology and transportation subsidies, emergency at-home water filtration systems and other mitigation resources.	All	Work with NJEJA and existing partners to identify and conduct outreach with key CBOs to identify high priority needs and low-hanging fruit	NJ Environmental Justice Alliance, local community-based organizations, all municipalities	$$	FEMA Regional Catastrophic Preparedness Grant	**Near**
NJDEP	**NJ44**	Additional Climate Hazards	Adopt ordinances and building codes to state, national, and international models and guidance and consider higher standards	Higher standards including the 2021 US Department of Labor Occupational Safety and Health Administration standards, 2021 International Energy Conservation Code, US Environmental Protection Agency air quality standards, World Health Organization Air Quality Guidelines and others should be evaluated to determine which should be adopted to meet resilience goals and improve quality of life.	All	Leverage Resilient RRBC to convene a working group/action committee focused on identifying low-hanging fruit and conducting outreach with elected officials	All municipalities, Middlesex County, NJ Department of Labor & Workforce Development, NJ Office of Planning Advocacy	$	FEMA BRIC Capability & Capacity Building	**Near**
NJDEP	**NJ45**	Additional Climate Hazards	Require specific mitigations on publicly owned properties	For example, require outdoor heat mitigation, which may include measures such as canopy cover or photovoltaic (PV) shade canopies, water-based cooling stations, or cool pavements.	All	Conduct an initial investigation and convene with other entities across the country that have successfully implemented such structures on best practices/ lessons learned	All municipalities, NJDOT, Middlesex County	$	Garden State C-PACE	**Near**

LEAD ENTITY	ID	REGIONAL STRATEGY	ACTION	DESCRIPTION	SUBWATERSHED	NEXT STEP	INVOLVED ENTITIES	COST	POTENTIAL FUNDING SOURCES	TIMEFRAME*
NJDEP Office of Environmental Justice	**NJ46**	Additional Climate Hazards	Pursue local regulations specific to environmental justice issues and cumulative impacts	For example, look to the Newark Environmental Justice/Cumulative Impacts ordinance. Develop a streamlined standard operating procedure for integrating review of all potentially impactful development activity.	All	Meet with the City of Newark to discuss best practices, undertake investigation of identifying a clear pathway to including amendment to the New Jersey Administrative Codes (NJAC), similar to the process undertaken for the Stormwater Management Rule	All municipalities, NJ Environmental Justice Alliance	$	EPA Environmental Justice Grants	**Near**
NJDOT (to be confirmed)	**NJ47**	Additional Climate Hazards	Plan for accessible, equitable public, multi-modal transportation infrastructure	Establish regional goals and undertake coordination to encourage local and regional planning for more accessible and equitable public and multi-modal transportation infrastructure to reduce emissions from cars.	All	Convene with Resilient RRBC stakeholders to identify regional goals	All municipality planning departments, NJ Office of Planning Advocacy, NJDEP, local community-based organizations	$	USDOT PROTECT	**Mid**
Office of the New Jersey State Climatologist	**NJ48**	Additional Climate Hazards	Partner with the research community to gather best-available, publicly accessible regional data and develop models and projections of future risk for additional hazards to aid in decision-making	High priority data gathering needs include a current water table elevation map for the region, a comprehensive contaminant source inventory that details depth and water-solubility of contaminants, and others. High priority regional modeling and projections needs include projected future changes in depth-to-groundwater with sea level rise, additional groundwater modeling where high-risk conditions exist to help forecast contamination plumes, and others.	All	Secure funding and partnerships for identified data gathering and modeling needs	NJDEP, Rutgers Center for Remote Sensing and Spatial Analysis, Consortium for Climate Risk in the Urban Northeast (CCRUN), U.S. CDC	$	FEMA CTP	**Near**
Resilient RRBC	**RRBC13**	Additional Climate Hazards	Start a regional education campaign with resources for individual mitigation and to promote advocacy related to additional hazards	Develop an educational campaign to point people to the right resources for minimizing their own risk while also collaborating with community-based organizations that may educate communities on how to organize for collective action on Additional Hazards issues.	All	Convene with Resilient RRBC stakeholders to identify regional goals on additional climate hazards	NJDEP	$	EPA Environmental Justice Grants	**Near**

NEXT STEPS

The release of this action plan is an important step in addressing the flood risks this region faces, but what comes next is even more important. This plan builds on many prior planning efforts at the local, county, and regional scale and is intended to serve as a launching pad for what comes next.

This plan:

- Assesses the risk and costs of inaction
- Identifies critical issues that need to be addressed
- Identifies key strategies applicable across the region
- Makes recommendations on specific next steps for key actors to take
- Focuses on specific project concepts within the identified Resilience Opportunity Areas as priorities for concerted action

The next steps include:

- Pursuing funding to advance the development of concepts identified in the plan
- Additional coordination across levels of governance on the implementation of actions recommended in the plan and tracking of the plan's progress
- Ongoing outreach and engagement with key stakeholders and communities on strategies presented in this plan

PERTH AMBOY WATERFRONT, NJ
Image Credit: Adobe Stock Photos

CHEESEQUAKE STATE PARK, OLD BRIDGE

06 - REFERENCES

REFERENCES

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ACRONYMS

BRIC – Building Resilient Infrastructure and Communities, a FEMA program

CBO – community-based organization

CCI – Community Collaborative Initiative

CDC – Centers for Disease Control and Prevention

CEA – classification exception area

C-PACE – Commercial Property Assessed Clean Energy

CPV – Competitive Power Ventures

CRS – Community Rating System, a FEMA program

CSO – combined sewer overflow

CSS – combined sewer system

DEWS – drought early warning system

DVRPC – Delaware Valley Regional Planning Commission

EJScreen – USEPA Environmental Justice Screening and Mapping Tool

EO – executive order

EPA – United States Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map, a part of FEMA's NFIP

FMA – Flood Mitigation Assistance, a FEMA program

GI – Green Infrastructure

HDSRF – Hazardous Discharge Site Remediation Fund

HMGP – Hazard Mitigation Grant Program, a FEMA program

HUC – Hydrologic Unit Code

HUD – United States Department of Housing and Urban Development

HVAC – heating, ventilation, and air conditioning

I-Bank – New Jersey Infrastructure Bank

IECC – International Energy Conservation Code

LTCP - Long-Term Control Plans

MS4 – municipal separate storm sewer system

NDRC - National Disaster Resilience Competition

NEP – National Emphasis Program

NFIP – National Flood Insurance Program, a FEMA program

NFWF – National Fish and Wildlife Foundation

NJ – New Jersey

NJAC – New Jersey Administrative Codes

NJDEP – New Jersey Department of Environmental Protection

NJDOT – New Jersey Department of Transportation

NJEDA – New Jersey Economic Development Authority

NJOEM - New Jersey Office of Emergency Management

NJPACT – New Jersey Protecting Against Climate Threats

NJTPA – New Jersey Transportation Planning Authority

NOAA – National Oceanic and Atmospheric Administration

OSC/R – open space conservation/resiliency

OSHA – Occupational Safety and Health Administration

PA – Public Assistance, a FEMA program

pH – potential of hydrogen, a measure of the acidity or alkalinity of something

PM2.5 – fine particulate matter

PROTECT - Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation, a USDOT program

PSE&G - Public Service Electric and Gas

PV – photovoltaic

RNJ – Resilient NJ

RRBC – Raritan River and Bay Communities

RWBR – reclaimed water for beneficial reuse

SAC – Stormwater Advisory Committee

SCO – stormwater control ordinance

SFHA – Special Flood Hazard Area

SJTPO – South Jersey Planning Organization

SVI – social vulnerability index

07- LIST OF APPENDICES

LIST OF APPENDICES

A . **About Our Region Report (Planning Context Report)**

B. **Vision and Priorities Report (Visioning Report)**

C. **Flood Impact Assessment Report**

D. **Asset Profile Tables**

E. Scenario Evaluation (Resilience and Adaptation Scenario Evaluation Tool and Action Sheet for the three preliminary scenarios and the preferred scenario)

F. Cost Estimation Approach and Workbook

G. Funding Strategy and Sources

H. Review of Long-Term Control Plan

I. Resilient Transformation of Contaminated Sites

J. Engagement and Capacity Building

K. Watershed Planning and Governance

L. Stormwater Management and Green Infrastructure

M. Regional Coordination of Evacuation Planning

N. Risk Rating 2.0 Outreach Campaign

P. Additional Climate Hazards

Note: Scenario Development Memo, Scenario Visualization Products, and Resilience and Adaptation Scenario Report is covered in Chapter 4 of this report.