



ResilientMass Finance Strategy Executive Summary

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massDOT
Massachusetts Department of Transportation



ResilientMass



Executive Summary

Massachusetts is already feeling the impacts of a changing climate—through increased flooding, extreme heat, coastal erosion, wildfires, and other disruptions that put communities, infrastructure, and ecosystems at risk. These events are growing in frequency and intensity, and they carry real costs to public health and safety, local economies, and long-term fiscal stability. The Commonwealth has already developed comprehensive plans and policy frameworks to address impacts and build long-term resilience. However, continued adaptation to both a changing climate and an evolving funding landscape will require an integrated investment system capable of delivering projects beyond the capacity of any individual secretariat. Massachusetts must take a whole-of-government approach to finance and deliver resilience at scale.

The ResilientMass Finance Strategy responds directly to a [2023 ResilientMass Plan](#) action and [Climate Chief recommendation](#) to develop a comprehensive strategy for investing in climate resilience. It addresses three essential questions:

- What are important infrastructure-related resilience measures in the Commonwealth?
- What will they cost, and what is the value of these investments?
- How can Massachusetts build a long-term system to fund, finance, and scale the pace of implementation?

The result is a two-part strategy. First, an **Investment Assessment** estimates the investment need and resilience value of seven key resilience measures—high-impact capital interventions across infrastructure, ecosystems, and public services. Second, the **Resilience Finance Roadmap: Building Capacity for Action** outlines a phased approach to building the financial, institutional, and technical capacity needed to deliver those measures over time. Together, they offer a clear path forward grounded in current priorities, designed for long-term adaptation, and focused on turning climate goals into sustained, statewide action. The key takeaways from the project are presented below. The full report can be found at resilient.mass.gov.

INVESTMENT ASSESSMENT OF KEY RESILIENCE MEASURES



Resilience Measure

As defined by this project, a capital project or program, or portfolio of capital projects or programs, that is actionable and aims to achieve climate resilience outcomes and benefits across one or more of the following sectors: Human Health and Wellbeing, Governance, Infrastructure, Natural Environment, and Economy.



Resilience Value

Resilience value encompasses the avoided costs as well as broader social, environmental, and economic benefits that may result from measures taken to prepare for, withstand, and rapidly recover from disruptions to everyday life from a changing climate.



Investment Need

Investment need is presented as a rough order of magnitude estimate of the upfront capital expenditure that may be required to implement the key resilience measures.

The Investment Assessment focuses on the key resilience measures identified in Table 1 that provide benefits to a variety of sectors and to geographic locations throughout the Commonwealth. These seven key resilience measures focus specifically on projects that require upfront capital investment and do not represent the universe of all resilience investments or need, such as programs that support preparedness or community capacity building.

Table 1: Summary Results of Rough Order of Magnitude Investment Need Estimates by Key Resilience Measure

Key Resilience Measure	Investment Need Through 2050*
Significant and High Hazard Dams: Remove or, where not feasible, upgrade or repair significant and high hazard dams to respond to future climate conditions, protect communities' safety and security, and restore habitats for cool-water and warm-water fisheries	<ul style="list-style-type: none"> Remove 200 to 300 dams (of the state-regulated dams ~200 are significant or high hazard and in unsafe or poor physical condition)
Small Bridges and Culverts: Replace priority undersized small bridges and culverts to reduce flood hazards for communities and critical inland infrastructure and restore fish and wildlife movement	<ul style="list-style-type: none"> Replace/upsized half of the existing culverts and small bridges
Coastal and Riverine Wetlands and Floodplains: Protect, enhance, and reconnect coastal and riverine wetlands and floodplains through: <ul style="list-style-type: none"> Restoration of coastal and riverine wetland and floodplain habitat Permanent conservation of undeveloped land Property buyout District-scale flood protections 	<ul style="list-style-type: none"> Restore coastal and freshwater wetlands Install district-scale flood protection in coastal areas Buy out 1,250 to 2,500 residential properties, assuming buy out of around 50-100 properties annually
Forest Conservation and Tree Planting: Expand forest conservation and tree planting, including urban forestry, to reduce urban heat island effect, increase carbon sequestration, improve stormwater management, and enhance cooling capacity	<ul style="list-style-type: none"> Conserve 685,000 acres of forest based on the Commonwealth's 40% by 2050 conservation goals Plant 64,000 acres of urban and riparian trees based on the Commonwealth's 2050 goals for tree planting
Strategic Transportation Infrastructure: Reduce impacts from flood waters and erosion on strategic transportation infrastructure through protection or relocation of roadways, railway, tunnels, bridges, and transit facilities and infrastructure	<ul style="list-style-type: none"> Elevate, protect or otherwise maintain a portion of exposed mile of roads class 1 to 4 (highways and major roads) in the 100-year floodplain Protect bridges with riprap and strengthen bridge piers and abutments to withstand future conditions Install flood protection at tunnels portals in the Central Artery/Tunnel system and at Massachusetts Bay Transportation Authority (MBTA) tunnel portals, and complete pump room upgrades to protect MBTA tunnels Elevate commuter rail that is MBTA-owned in the 100-year floodplain Upgrade and protect transit facilities and infrastructure
Drinking Water, Wastewater, and Stormwater Infrastructure: Protect and upgrade critical drinking water, wastewater and stormwater infrastructure to reduce impacts from coastal and inland flooding and extreme precipitation	<ul style="list-style-type: none"> For drinking water and wastewater infrastructure, increase storage, add effluent treatment, protect or relocate facilities, and expand green and gray infrastructure to handle higher flows For stormwater infrastructure, expand green stormwater infrastructure to address wet weather events and invest in separating the combined sewer systems in the 19 combined sewer overflow permittee communities across the Commonwealth
Heat Preparedness and Relief: Invest in heat preparedness and relief including: <ul style="list-style-type: none"> Increase in access to cooling for residents, unhoused people, and outdoor workers such as through expanded cooling in buildings and cooling centers Increase in shade structures, splash pads, parks, swimming areas and waterfront access 	<ul style="list-style-type: none"> Implement cooling measures in schools, homes, and government buildings Install shade structures, pools, and splash pads at Department of Conservation and Recreation parks
Total Rough Order of Magnitude Range (rounded, \$2024)	
\$90B to \$130B	

Notes: Results are shown in 2024 United States dollars (\$) and are rounded. B = Billion

The information presented reflects estimates developed using a defined set of assumptions and inputs. It is intended to illustrate the potential scale of investment that may be required to progress the above key resilience measures and does not represent final investment need or spending commitments.

*The Investment Assessment focuses primarily on resilience investments through 2050 for publicly owned assets, though the methodology varies by key resilience measure.

The Investment Assessment focuses primarily on resilience investments through 2050 for publicly owned assets, though the methodology varies by key resilience measure. It includes case studies of resilience measures to illustrate investment needs and value. Overall, the Investment Assessment is not a capital improvement plan and does not identify specific assets for prioritization or investment. The Investment Assessment estimates rough order of magnitude capital costs for a subset of strategies within each key resilience measure based on data and method availability and does not represent all resilience investment need. The investment need for the seven key resilience measures through 2050 is estimated to be between \$90 billion (B) and \$130B. These investments do not necessarily represent new work but build upon the Commonwealth's existing capital priorities and significant initiatives already present across all the key resilience measures.

Investing now will mitigate real, quantifiable economic losses. Depending on the level of response, the total cost of storm damages in Boston alone is estimated between \$5B and \$100B during this century.¹ The Federal Reserve Bank of Boston found that municipal expenditures will increase considerably in the coming decades due to projected rising temperatures. The cost of climate impacts will not be distributed evenly, and certain populations will be disproportionately affected. Global projections of climate change damages estimate that even with significant action today, the world economy is already committed to a 19% income reduction through 2050, due to losses in labor productivity, reduced agricultural yields, and damage to physical infrastructure.²

Benefits of adaptation can include avoided physical damages and disruption, avoided public health impacts, fiscal benefits and other co-benefits such as job creation and recreation. In the United States (US), a retrospective study of mitigation activities funded by federal grants found that over a period of around 20 years, \$1 in natural hazard mitigation investment resulted in \$6 of savings in avoided damages.³ A study from the US Chamber of Commerce of 25 modeled natural disaster scenarios adds

to this finding, estimating \$7 in reduced economic costs after an event (e.g., production and income losses from people leaving the labor force) from each \$1 in resilience investment. When adding in the benefits from avoided damage and cleanup costs, benefits were estimated to outweigh costs 13:1.⁴ Based on analysis of prototypical projects that fall within the key resilience measures, the benefits consistently outweigh costs on an order of at least 2:1. The benefits for these prototypical projects are likely to be higher given not all benefits are readily monetizable, and the analysis focuses on direct benefits, rather than avoided cascading economic losses to the regional economy.

RESILIENCE FINANCE ROADMAP: BUILDING CAPACITY FOR ACTION

The Roadmap is a strategic framework to guide and accelerate sustained investment in the key resilience measures across Massachusetts. Its central purpose is to align public and private capital with the Commonwealth's key resilience measures—those with the highest potential to reduce risk, protect infrastructure and ecosystems, and support community well-being.

The Roadmap lays out the institutional and financial reforms needed to make investment in the key resilience measures more consistent, coordinated, and scalable. It starts with the Commonwealth's existing priorities and capabilities, then builds over time toward a fully integrated, long-term investment system. It focuses first on ready-to-go projects and current funding tools, while laying the groundwork for broader institutional and financial reforms.

The Roadmap is structured in three phases identified in Figure 1 but designed to be flexible. Actions may overlap, and strategies will adapt based on experience. At its core, the Roadmap supports continuous learning, expanding capacity, and staying aligned with evolving risks, needs, and opportunities. Phase 1 actions are most certain, and Phase 2 and 3 actions are subject to change based on evolving conditions, priorities, and learnings.

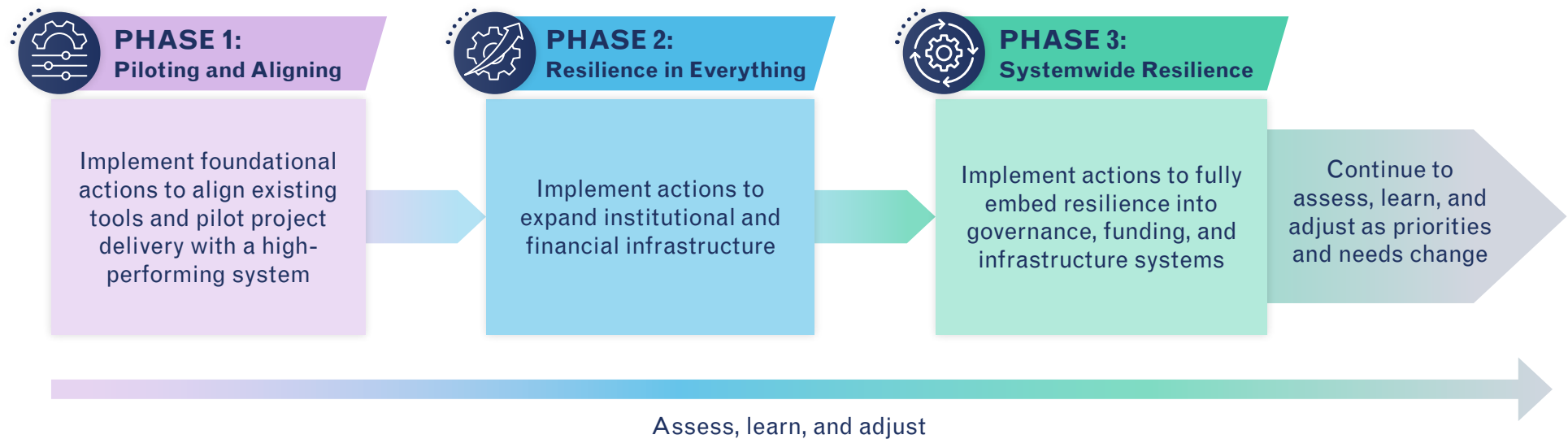
1 Environmental Protection Agency, "What Climate Change Means for Massachusetts," August 2016, <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-ma.pdf>.

2 Maximilian Kotz et al., "The Economic Commitment of Climate Change," *Nature* 628, no. 8008 (2024): 551–57, <https://doi.org/10.1038/s41586-024-07219-0>.

3 "Natural Hazard Mitigation Saves: 2019 Report" (Multi-Hazard Mitigation Council, 2019), https://nibs.org/wp-content/uploads/2025/04/NIBS_MMC_MitigationSaves_2019-1.pdf.

4 "The Preparedness Payoff: The Economic Benefits of Investing in Climate Resilience" (U.S. Chamber of Commerce, 2024).

Figure 1: Resilience Finance Roadmap Phased Implementation Process



PHASE 1 **Phase 1: Piloting and Aligning.** The first phase focuses on enabling implementation now—using existing programs, funding sources, and institutional tools to move high-priority projects forward. At the same time, it begins to lay the groundwork for a more stable and scalable investment system. Key actions include launching the proposed Resilience Revolving Fund as a proof of concept for long-term financing, launching and expanding the Executive Office of Energy and Environmental Affairs (EEA) Environment and Climate OneStop to streamline resilience funding and strengthen project readiness, aligning and streamlining permitting processes, expanding technical assistance where appropriate, piloting bundled project delivery models, and conducting a rigorous assessment to inventory current program spending.

During Phase 1, the Commonwealth would also stand up an adaptive management system to track and assess progress, gather feedback, and evolve finance strategies to meet needs and priorities. Adaptive management is a critical element that would be used in all phases and beyond to ensure that the system can adjust as needed.

PHASE 2 **Phase 2: Scaling Implementation-Advancing Resilience in Everything.** The second phase focuses on the systems that make scale possible. That means establishing a formal, statewide pipeline of resilience projects, expanding shared services to support delivery at the regional and local levels, and diversifying funding through exploring new revenue and financing mechanisms. It also includes steps to improve coordination across agencies and to standardize how funding is tracked and allocated over time.

PHASE 3 **Phase 3: Institutionalizing and Integrating for Systemwide Resilience.** The third phase completes the shift to a fully integrated investment model. Resilience becomes a core part of how the Commonwealth plans, funds, and manages capital projects. Financing tools like the Resilience Revolving Fund are scaled, alongside new systems to track results, adapt strategies, and direct future investments toward what is working. While this represents a long-term structural goal, some foundational elements—such as cross-agency coordination, equity metrics, and early-stage financing tools—are already underway, laying the groundwork for broader system transformation.



Flagship Early Roadmap Action

Launch the Resilience Revolving Fund

The proposed Resilience Revolving Fund in the 2025 Mass Ready Act is a cornerstone of the Commonwealth's long-term strategy to expand access to flexible, sustainable capital for climate resilience. With proposed initial capitalization of \$50 million, the fund would support high-impact projects that align with the key resilience measures, prioritizing communities facing the greatest climate risks and the greatest barriers to financing.

The proposed Resilience Revolving Fund is designed to do more than fill immediate gaps. It serves as a scalable financing platform that will evolve over time, helping Massachusetts transition from fragmented, short-term funding toward a more coordinated and durable investment model. Early lending would focus on project types with clear public value but limited access to traditional financing—such as culvert replacements, dam removals, green infrastructure, floodplain restoration, and heat relief infrastructure.

The Clean Water Trust would administer the proposed Resilience Revolving Fund, with strategic oversight and project selection coordinated by the Executive Office of Energy and Environmental Affairs in partnership with key agencies. Insights gained through early rounds of lending will inform the fund's ongoing development and ensure it remains responsive to community needs, financing gaps, and system-wide investment goals.

The Roadmap is built around four strategic priorities that shape how progress unfolds across all three phases. These priorities are not isolated actions. They are pathways that guide decisions, investments, and system design from early implementation through full integration. Advancing these priorities in parallel is what makes it possible to deliver resilience investments at scale—consistently, equitably, and over time.



Strategic Priority 1

Make Projects Easier to Implement

- Enhancing municipal and regional capabilities, especially in disadvantaged or small communities, by reducing administrative burdens, providing standardized implementation tools, and expanding access to technical assistance and early-stage support.



Strategic Priority 2

Streamline and Expand Access to Funding

- Streamlining and aligning Commonwealth-level programs to improve access, reduce administrative burden, and expand the scale and impact of public funding. This includes standardizing grant processes, coordinating program timelines, and expanding eligible uses of existing funds.



Strategic Priority 3

Implement Financing Mechanisms

- Developing scalable, long-term financing tools and pathways—such as loan funds, value capture, and outcome-based models—to ensure sustained investment in resilience and support public-private collaboration.










Strategic Priority 4

Build Regional and Organizational Capacity

- Building durable structures for statewide coordination, regional governance, and performance management—ensuring that the resilience system is accountable, adaptive, and equitable over time.

Figure 2: Phased Implementation of Strategic Priorities

	 PHASE 1	 PHASE 2	 PHASE 3
Four Strategic Priorities	Piloting and Aligning	Resilience in Everything	Systemwide Resilience
 Make Projects Easier to Implement	Develop standards, pre-approved designs, templates, and streamlining opportunities	Formalize and expand project delivery templates / frameworks	Streamline permitting, planning, and delivery processes
 Streamline and Expand Access to Funding	Simplify access to existing revenues and resources via EEA Environment and Climate OneStop	Broaden EEA Environment and Climate OneStop to include additional funding programs	Establish increased access to redundant, sufficient, and diverse revenues
 Implement Financing Mechanisms	Launch Resilience Revolving Fund	Expand pooled and regional financing mechanisms as needed based on Phase 1 learnings	Ensure the availability of affordable capital
 Build Regional and Organizational Capacity	Pilot approaches for regional coordination and prioritization	Develop durable governance/ leadership structures	Ensure leadership accountability/ transparency

Taken together, the three phases and four strategic priorities form a clear path toward building a durable resilience investment system for Massachusetts. Figure 2 demonstrates how strategic priorities and actions are phased. While the Roadmap is structured sequentially, many actions would advance in parallel, allowing for real-time learning, adjustment, and scaling of what works. This approach is grounded in practical delivery and designed for long-term transformation: aligning resources, reforming systems, and building the capacity needed to sustain impact across regions and over time while managing for uncertainty. The result is a more focused, coordinated, and adaptive platform for investing in the Commonwealth's resilience—now and into the future.

Translating Strategy into Action. While the Roadmap lays out a long-term vision, several actions are already underway to put it into motion. Four early efforts stand out for their potential to accelerate progress across multiple phases and priorities:

- Launch the proposed Resilience Revolving Fund to expand flexible, long-term financing
- Launch and expand the EEA Environment and Climate OneStop to streamline access to resilience funding
- Streamline permitting for resilience projects and build on the Resilience Playbook to help get good projects implemented
- Establish regional program to identify and facilitate priority projects from planning through construction

AN INCLUSIVE PROCESS

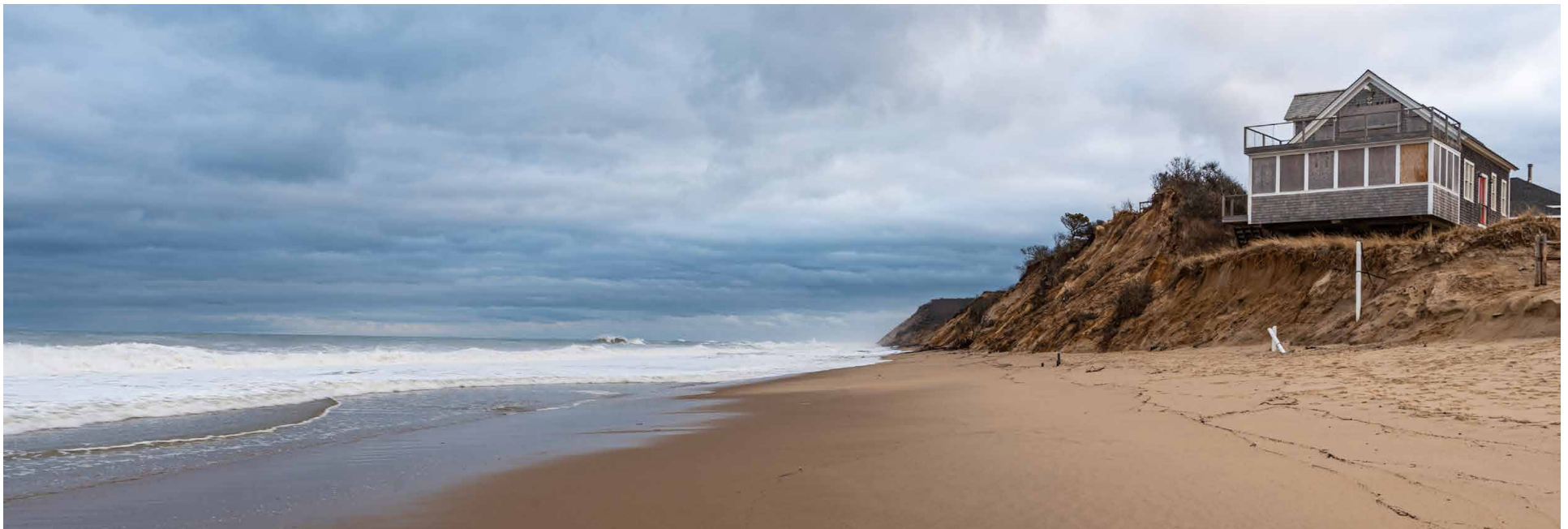
The Investment Assessment and the Roadmap were both informed by a ResilientMass Finance Advisory Committee. The Committee included over 40 representatives from municipal government, regional planning agencies, community-based organizations, academic institutions, and advocacy groups across Massachusetts, with a focus on including voices from organizations representing Environmental Justice populations. Five Committee meetings, conducted over the course of the project, served as a critical forum for stress-testing assumptions, assessing the level of public support for resilient measures and funding mechanisms, and collecting ideas. Focus group meetings with municipalities and Commonwealth agencies were also conducted to gather additional technical information and resources.

Stakeholders' verbal and written input was incorporated into each step of the project and directly informed the prioritization of resilience investments and evaluation of innovative financing mechanisms. The engagement process helped ensure the final product not only reflects technical and economic feasibility but also advances climate equity, community resilience, and long-term stakeholder alignment.

CONCLUSION

Massachusetts has already defined what climate resilience looks like through clear priorities, a growing portfolio of projects, and an assessment that demonstrates both the scale of investment required and the value those investments can deliver. The Roadmap builds on that foundation, offering a strategic path to turn plans into action and ambition into results.

Together, the Investment Assessment and the Resilience Finance Roadmap: Building Capacity for Action provide both the “what” and the “how.” It is a set of key resilience measures that offer clear public value, and a phased strategy for financing, delivering, and scaling those measures over time. By focusing on practical implementation, institutional capacity, and long-term financing, the Roadmap transforms resilience from a collection of important, yet fragmented programs into a cohesive, durable system. It enables smarter investment, stronger coordination, and more equitable outcomes—ensuring that the Commonwealth's most important resilience priorities are not just identified but also delivered.



All images used are from the Commonwealth unless otherwise noted.

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