

Exhibit D Need
New York State
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Narrative Summary

On October 29, 2012, the largest storm in New York’s recorded history swept ashore. Superstorm Sandy’s impact was devastating, causing widespread damage to residents, homes, businesses, core infrastructure, government property, and an economy just recovering from the recent financial crisis. Fourteen counties were declared Federal Disaster Areas. Two million utility customers lost power, with some blackouts lasting up to three weeks. The storm damaged or destroyed more than 164,342 housing units, affected or closed over 2,000 miles of roads, produced catastrophic flooding in subways and tunnels, and damaged major power transmission systems.

Superstorm Sandy’s impact was particularly tragic coming on the heels of Hurricane Irene and Tropical Storm Lee, which in 2011 devastated many communities in upstate New York’s Catskill, Adirondack, and Hudson Valley regions, and caused severe damage on Long Island. Tens of thousands of homes incurred damage in these three storms, and many were destroyed by flood waters and wind. Businesses and infrastructure suffered substantial damage as well. Appendix B of the NDRC NOFA outlines disaster declarations by county and declaration type for all storms between 2011 and 2013.

In addition to the widespread and deep destruction, the storms of 2011 through 2013 left a realization of New York State’s vulnerability to the interrelated effects of climate change and extreme weather. The State has responded to the destruction caused by these events with an extensive recovery and rebuilding response, detailed in Exhibit C (pages 31-33). However, as Exhibit B makes clear (pages 12-29), there are remaining unmet recovery needs across the State. In Action Plan Amendment Eight (APA8), the State has calculated \$17.80 billion in unmet recovery needs statewide, and that State’s NDRC-specific analysis identified economic

revitalization, infrastructure, or housing unmet recovery needs in the following 11 counties designated by HUD as Most Impacted and Distressed: Greene, Nassau, Schoharie, Suffolk, Tioga, Westchester, and the five counties of New York City. As the State continues its recovery and rebuilding, it will pursue a systems-based approach to address the effects of climate change induced floods on riverine and coastal communities. GOSR’s systems-based approach outlined in this Phase 1 application hinges upon identifying strategies that will simultaneously improve the physical, social, economic, and environment resilience of these communities. As discussed further below, a comprehensive and science-based risk approach has been—and will continue to be—central to New York State’s identification and implementation of recovery and rebuilding projects and programs.

Threats, Hazards, Vulnerabilities

New York State is focusing on the effects of flooding in riverine and coastal communities caused or exacerbated by climate change. These threats, hazards, and vulnerabilities arise from both shocks (one-time events) and stressors (continued events). In both instances, they often have broad, impacts that cross jurisdictional boundaries and so must be addressed with systems-based, regional solutions.

These threats, hazards and vulnerabilities were found through a series of analyses initiated in the wake of Superstorm Sandy and in preparation for this Phase 1 NDRC application:

- The Governor’s Office of Storm Recovery (GOSR) conducted significant outreach—detailed in Exhibit E (56-61) and Attachment D (pages 96-111)—to New York’s counties, state agencies, and other stakeholders to better shape its understanding of vulnerabilities for this Phase 1 NDRC application.

- GOSR’s NY Rising Community Reconstruction (NYRCR) Program formed and supported citizen Planning Committees through an intensive, months-long recovery and resiliency planning process culminating in 66 NYRCR Plans. This grassroots program helped shape the State’s understanding of hazards, risks, and vulnerabilities.
- The New York State Department of State (DOS) developed a risk analysis tool for use in the NYRCR Program. The DOS model incorporates predictions of sea level rise and the probability of different storm hazard levels, and analyzes the likelihood that an infrastructure asset will be exposed to various levels of storm hazards in the one-hundred year planning time frame. NYRCR Plans posted for public review on the GOSR website illustrate the model’s utility in a wide range of project and program settings.
- In Action Plan Amendment Eight (APA8), GOSR revisited the State’s unmet recovery needs analysis. The concentration of the State’s needs in coastal and riverine communities has helped shape this application’s approach, and the specific types of needs identified will help to guide project development should the State advance to Phase 2 of the NDRC. Following HUD’s CDBG-DR Allocation Methodology as published in the Federal Register Notice FR-5696-N-11, the State estimated approximately \$5.68 billion in unmet needs to repair and mitigate the State’s housing, business, and infrastructure as a result of the covered disasters. If HUD’s high construction cost multiplier is factored in, unmet needs are estimated at \$6.85 billion, reflecting the likelihood that reconstruction costs

will be higher in New York State than elsewhere in the United States.¹ The State’s additional analysis methodology, which incorporates infrastructure needs that may not be eligible for CDBG-DR funding, estimates approximately \$17.8 billion in outstanding recovery and mitigation needs not currently funded by federal programs (if the HUD construction cost multiplier is applied to housing and small business).

Residents and businesses that have been subjected to repetitive flooding are most directly impacted by the threats discussed above, although the impacts of catastrophic flooding—including social and economic impacts—have adversely affected entire communities and, in fact, the entirety of New York State. As is discussed below, a significant number of low- and moderate-income (LMI) individuals have been affected by past disasters in New York State. LMI communities and otherwise vulnerable populations face increasingly severe physical, social, economic, and environmental impacts of coastal and riverine flooding.

Best Available Data

GOSR has utilized federal government data from the Federal Emergency Management Agency (FEMA), Small Business Administration (SBA), Federal Transit Administration (FTA), Federal Highway Administration (FHWA), U.S. Army Corps of Engineers (USACE), U.S. Department of Agriculture (USDA), and others. These data are the basis of funding allocations provided by HUD. However, as HUD asserts in the NOFA, some of these data sources are now

¹ Federal Register Notice (FR-5696-N-11) indicates that HUD employs a high construction cost multiplier in its updated CDBG-DR allocation methodology. In the case of New York State, housing and small business unmet needs are multiplied by a factor of 1.44.

out of date. As a result, the State has supplemented these data with other data detailing both the impact of recent disasters on New York’s communities and the future impact of climate change on the State.

To utilize the best available data as required by the NOFA, the State has used the analysis detailed above, as well as relied on the following data-driven efforts in developing its systems-based approach to resiliency:

- Following Superstorm Sandy, New York State launched a series of blue-ribbon panels to study the State’s vulnerabilities, including the New York State (NYS) 2100 Commission², the NYS Ready Commission³, and the NYS Respond Commission⁴. These panels, staffed by top-experts, studied challenges and made proposals to increase the resiliency of the State.
- The New York State Hazard Mitigation Plan, which includes a risk-assessment characterizing and analyzing risks and hazard facing the State to help guide investments in mitigation measures, was updated in 2014 to focus on the most prominent 15 natural hazards, including climate change, coastal erosion, extreme temperatures, flood, hurricane, and land subsidence/expansive soils.
- The New York State Resiliency Institute for Storms and Emergencies (RISE), a consortium of New York’s higher education institutions, which act as a hub for

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<http://www.governor.ny.gov/sites/governor.ny.gov/files/archive/assets/documents/NYS2100.pdf>

³ <http://programs.governor.ny.gov/NYSReadyCommission>

⁴ <http://programs.governor.ny.gov/NYSRespondCommission>

cutting-edge research on climate science, storm preparedness, and mitigation, developed a science-based comprehensive risk analysis with support from GOSR to guide the State in determining which infrastructure projects to implement. RISE scientists analyzed forecasts of coastal and inland flooding from storm surge and sea level rise and severe weather events, and used advanced climate models to predict sea level rise and future storm intensity.

Comprehensive Risk Approach to Analyzing Need

New York State has faced, and continues to face, the threat of severe coastal and riverine flooding as a result of sea-level rise and increasingly frequent extreme weather events, both linked to climate change. GOSR has utilized scientific projections of climate change, alongside analysis of demographic and economic trends, to identify and focus on the threats facing the State’s most vulnerable communities. Some of those efforts, although not an exhaustive list, are detailed in this Exhibit. These studies indicate that New York State is at a very high risk of continued exposure to coastal and riverine flooding.

While the science-based predictive models employed by the State have demonstrated that sea-level rise and increasingly frequent extreme weather will continue to pose major threats, the extent to which each of these conditions will increase over time is not known with certainty. While some of the impacts of these conditions on communities—specifically, flooding and flooding-related impacts—are well known, the full scope of the impacts of these threats over time is unknown. A critical element of the State’s systems-based approach will be continuing to utilize rigorously and methodologically sound approaches, like those developed by RISE, to resolve these unanswered questions.

Insurance

It is difficult to capture with certainty the number of buildings and improvements in the State that are un-insured or under-insured against flooding and other risks associated with sea level rise and increased incidence of extreme weather events. According to FEMA's *Region II Hurricane Season Fact Sheet—Summer 2012*, as of summer 2012, there were 84,758 flood-insurance policies in high-risk areas in the State. The number of structures and other improvements in the State likely exceeds this number by some margin. The universe of uninsured buildings and improvements includes those that are not required to carry flood insurance: residential and commercial buildings without mortgages, public buildings that have never benefited from federal disaster assistance, and structures that are not eligible for flood insurance coverage. It also includes structures which must, under federal law, be insured and which are uninsured and out of compliance, either because the owner is unaware of the requirement or unable to afford coverage.

It is also difficult to estimate with any certainty the number of structures that require flood insurance because they have received federal disaster assistance, but are uninsured. That said, of the 1,534 applicants that received CDBG-DR assistance for either Hurricane Irene or Tropical Storm Lee, 935 sought assistance for damage connected to Superstorm Sandy—and 186, or roughly 20 percent, were deemed non-complaint with their flood-insurance requirement. This number may or not be reflective of the larger universe of (FEMA-IA) recipients, from Irene, Lee, or other Declared Disaster events statewide, who are required to carry flood insurance but may not.

Insurance can play an important role in a systems-based approach to resiliency by protecting against those residual risks that cannot be eliminated through adaptive grey and green flood protection, environmental remediation, elevations, buyouts, etc. The shortfall in flood

insurance in high-risk areas has limited and will limit the resiliency of the State’s communities because it inhibits the ability to rebuild quickly after an event.

The primary factor limiting the purchase and maintenance of flood insurance, both by those who are required to carry it and those who otherwise should, is cost. Elevation, flood proofing, and community participation in the Community Rating System may reduce those costs and encourage higher levels of participation. These activities, and others that reduce the risk to communities, are part of New York’s systems-based resiliency approach.

Benefits of Addressing Threats and Hazards Related to Vulnerabilities

As detailed above, New York’s recent analysis, conducted as part of APA8, revealed significant unmet recovery needs in the areas of housing, economic revitalization, and infrastructure in the State’s coastal and riverine communities. The State’s systems-based approach is focused on resiliency efforts that will be closely integrated into recovery investments in these sectors to ensure a long-term resilient recovery.

The State has made, and will continue to make, significant investments in the recovery of communities affected by coastal and riverine flooding. Where possible, these recovery investments are supplemented by efforts to build back better, with allowances for resiliency measures, including flood-proofing and elevation. Additional investments in resiliency supported by the NDRC could help to further protect these existing investments, and also to support and sustain the ongoing social and economic recovery of impacted communities.

Current Risks to Vulnerable Populations

The most severe impacts of coastal and riverine flooding are often felt by already-vulnerable communities and individuals: with low- and moderate-income, limited English proficiency, functional needs, the elderly, or the isolated—often individuals and communities

that have fewer resources to cope with stresses and shocks. Analysis conducted as part of the APA8 unmet needs analysis found that low- and moderate-income households were significantly impacted by the Qualified Disasters. This was particularly true of renters; the State estimated that over 74.5% of all rental units impacted by the storms were occupied by low- and moderate-income households. For rental units with major to severe damage the low- and moderate-income household proportion was 74%. Understanding the significant impact that disasters have on this population, the State will continue to utilize recovery resources to strengthen this population's resilience.

Functional Needs

The State firmly believes that any systems-based resiliency strategy should focus on delivering solutions that benefit those with functional needs. For instance, many homeowners impacted by the storms and living in the 100-year floodplain are pursuing resiliency measures such as home elevation, the use of flood resistant materials, bulkhead repairs, and other construction techniques that mitigate the impacts of future flooding. The State has worked together with FEMA as well as with public housing authorities throughout the recovery process, and will continue to engage these stakeholders as a commitment to meeting functional needs.

Opportunities and Existing Conditions in Current and Future Rebuilding and Recovery Work

New York State has already taken the opportunity to address the vulnerabilities profiled above through programming current and future investments in a way that will increase resiliency and foster economic revitalization in vulnerable communities. Examples include the NYRCR Program, which incorporated grassroots, community-driven planning; the Community Risk and Resiliency Act (CRRA), which requires state agencies to take climate change into account in their permitting and programming decisions and which calls upon state agencies to develop sea-

level rise projections and model laws to help local governments incorporate resiliency into their local decision-making; and the Regional Economic Development Councils' Consolidated Funding Application, through which the State has allocated grant funding, including economic development funding, to resiliency projects in storm-affected communities.

Building upon this work, the NDRC represents an opportunity for the State to further operationalize resiliency and to continue to develop its systematic approach to resiliency by proposing solutions that will simultaneously protect communities from the physical impacts of flooding, while generating social, environmental, and economic co-benefits.

Many of New York's communities are clustered on the coast or on the banks of rivers and streams. The impacts of coastal and riverine flooding threaten not only the health and well-being of State's communities, but also the State's overall economy. The New York State Energy Research and Development Authority's *ClimAID* report, published in 2011, estimated that the economic impact of climate change to the State, without adaptation, will rise to \$3.8-7.5 billion annually by the middle of this century.⁵

As discussed in Exhibit C (pages 40-41), environmental degradation—specifically, nitrogen loading—adversely affects coastal and riverine ecosystems and exacerbates vulnerability to flooding. The State has already made significant efforts to address nitrogen loading, including improvements to wastewater treatment facilities on Long Island in the wake of

⁵ Leichenko, Robin, David C. Major, Katie Johnson, Lesley Patrick, and Megan O'Grady. "An Economic Analysis of Climate Change Impacts and Adaptions in New York State." *ClimAID Annex III* from *Responding to Climate Change in New York State*. NYSERDA. <

<http://www.nyserda.ny.gov/climaid>>.

Superstorm Sandy, but further efforts are necessary. Mitigating levels of nitrogen in New York’s coastal and riverine ecosystems will be a critical element of the State’s systems-based approach to resiliency.

New York State’s significant ongoing efforts to recover from the impacts of coastal and riverine flooding are detailed throughout this application, in particular in Exhibit G (pages 74-77). They include significant investments of state and federal funds, and statutory and regulatory mechanisms intended to guide state and local decision-making to reduce vulnerability. The extraordinary scale of New York’s vulnerability to coastal and riverine flooding means that the State must continue to develop systems-based strategies that leverage all available resources and generate the maximum benefits relative to investment. Should the State advance to Phase 2 of the NDRC, GOSR and its partners will advance projects that will help bridge this gap.