



INFRASTRUCTURE RESILIENCE FOR LOW- CAPACITY COMMUNITIES: Recommendations to Reduce Barriers and Provide Support

A RIPDWG White Paper

October 2021

Resilient Investment Planning and Development Working Group

RIPDWG Member Organizations

Note: Representation on RIPDWG does not imply an organization's endorsement of this white paper.

Government Coordinating Council Members

U.S. Army Corp of Engineers
U.S. Department of Agriculture
U.S. Department of Energy
U.S. Department of Homeland Security, Cybersecurity and Infrastructure Security Agency
U.S. Department of Homeland Security, Science & Technology
U.S. Department of Transportation
U.S. Federal Emergency Management Agency

Sector Coordinating Council Members

Communications SCC

Lumen

Information Technology SCC

Internet Security Alliance

Cross-Sector Coordinating Council Members

State, Local, Tribal and Territorial Coordinating Council

D.C. Homeland Security Emergency Management Agency

Regional Consortium Coordinating Council

Institute for Innovating Security and Resilience
Pacific Northwest Economic Region

Staff Editors

Sandra Pinel RIPDWG Coordinator, CISA/IAA, Resilience Services Branch Senior Planner
Spencer Whitaker CISA/IAA, Resilience Services Branch Analyst

NOTICE: This report represents the consensus views of the RIPDWG and its recommendations to CISA, and as such does not necessarily represent the views, policy decisions, or findings of CISA, DHS, or the United States Government. The public release of this report does not constitute or imply endorsement by the United States Government of the findings or recommendations, nor does it convey CISA's commitment to any specific future course of action with respect to the report's findings and recommendations.

EXECUTIVE SUMMARY

For our Nation to remain secure and resilient, it is imperative that all communities have the provision of and equitable access to reliable critical infrastructure services. These capacities, however, are often lacking in resource-constrained urban and rural jurisdictions, including those with at-risk populations and declining private sector investment. Consequently, these *low-capacity communities*, known to be highly vulnerable to the adverse effects of disruptive events, are less able to effectively prepare for and recover from hazard events and adapt to dynamic conditions. Despite federal efforts to support hazard risk reduction, mitigation, recovery, and resilience, *low-capacity communities* are confronted with barriers that hinder their ability to meet national preparedness and resilience goals. This paper focuses on three critical capability challenges that low-capacity communities experience in building community resilience through federal aid and provides recommendations to federal government policymakers to overcome these challenges.

Communities with immediate unmet needs often lack the resources and expertise necessary to invest in infrastructure resilience, meet basic federal program requirements, plan effective projects, and compete for discretionary project funding - or even apply for assistance to do so. The challenges low-capacity communities face in accessing and effectively using federal programs to increase resilience can be attributed to the overly competitive and often overlapping requirements of federal programs, the limited investment in and accessibility to sustained technical assistance for communities, as well as the various obstacles to developing collaborative cross-sector and cross-boundary partnerships necessary to enhance the resilience of infrastructure systems and services. To address these challenges, a cross-agency commitment to capacity-building within low-capacity communities is required to mitigate risk and provide resilience to the Nation's critical infrastructure services.

Federal government programs should invest in the planning processes and institutions that can bring the necessary resources to low-capacity communities so that mitigation funds result in equitable risk reduction. Therefore, RIPDWG recommends the following for federal action:

1. Invest in existing and emergent collaborative institutions, mechanisms, and processes that can provide sustained support to low-capacity communities.
2. Support place-based institutions that provide local capacity-building to perform disaster risk reduction, implement hazard mitigation, and build resilience.
3. Coordinate and make planning and project requirements flexible across federal programs.
4. Identify and assess the extent and consequences of unequal participation in risk reduction efforts by low-capacity communities in a manner that helps guide resource allocation.

RIPDWG acknowledges that there are multiple issues outside the scope of this paper that should be addressed to ensure the resilience of communities and supporting infrastructure systems. This paper highlights three of the most important capability barriers faced by low-capacity communities in mitigating risks and building resilience: 1) program requirements that impede access and benefits, 2) limited investment in local and regional technical assistance, and 3) obstacles to developing collaborative projects and partnerships.

TABLE OF CONTENTS

Executive Summary	i
Introduction	1
Background	1
Barriers in Existing Federal Programs	2
Requirements that Impede Access and Benefits	2
Application Requirements	2
Planning Requirements	3
Limited Investment in Local and Regional Technical Assistance	4
Obstacles to Collaborative Projects and Partnerships	5
Building Capacity – A Networked Approach	6
Recommendations for Federal Action	7
Conclusion	10
Bibliography	11
Glossary	15
Acronyms and Abbreviations	16
Acknowledgments	17

INTRODUCTION

National security and resilience include the provision of and equitable access to reliable critical infrastructure services. Infrastructure service reliability depends on the authority, knowledge, staffing, and financial capacity of public and private institutions to identify risks, plan for, maintain, and invest in infrastructure systems that can adapt to future conditions. These capacities are often lacking in resource-constrained urban and rural jurisdictions, including those with at-risk populations and declining private sector investment. Consequently, *low-capacity communities*, known to be highly vulnerable to disruptive events and their consequences, are less able to effectively prepare for and recover from hazard events and adapt to changing conditions.¹

This white paper outlines key resource and capability challenges that low-capacity communities face in building community resilience and captures recommendations to aid federal government policymakers in taking action to build capacity to overcome these challenges. It is important to acknowledge that identified resource and capability challenges stem from many causes, including economic, social, and civic inequity in underserved communities—the systemic causes of each resource and capability challenge are not detailed in this paper. Instead, this paper focuses on three obstacles faced by low-capacity communities in accessing and effectively using existing federal programs. It recommends changes to simplify

program application requirements, align pre-project planning requirements, identify and assess the extent and consequences of unequal participation in risk reduction efforts by low-capacity communities, and increase support to networks of existing civic, academic, private, and regional government institutions to sustain planning and technical assistance to low-capacity communities. These recommendations will need to be implemented with consideration of systemic causes of the resource and capability challenges they are intended to address.

For the purposes of this paper:ⁱ

Community is loosely defined as one or more groups of people sharing a geographic location and some other combination of characteristics.

Low-capacity is the term used to describe communities facing obstacles due to a lack of resources and capability, hindering their ability to address community problems, take advantage of opportunities, and build resilience.

Background

The equitable delivery and resilience of critical infrastructure services is often limited by the capacity of many communities to seek and effectively compete for federal resources for infrastructure services, housing, environmental protection, cybersecurity, etc. Several federal efforts are underway to address long-standing inequities that limit communities' capacity to maintain critical services and reduce impacts to underserved communities in the face of disasters and disruptions. In 2020, the Federal Emergency Management Agency (FEMA) rolled-out the Building Resilient Infrastructure and Communities (BRIC) program, which focuses on supporting states, local communities, tribes, and territories as they undertake hazard mitigation projects to reduce the risks they face from disasters and natural hazards. Guiding principles of this innovative program include supporting communities through capability- and capacity-building (C&CB), promoting partnerships, and enabling large projects.³ The recent Coronavirus Aid Relief and Economic Security (CARES) Act and related COVID-19 relief provisions recognize demographic and fiscal disparities affecting infrastructure services and

ⁱ These definitions are not without exception to other factors, and the authors recognize the greater complexity associated with them. Some of these complexities include the many conditions that create low-capacity (population decline, economic disinvestment, lack of political power, isolation, revenue challenges, etc.) and the various characteristics that have led to systemic denial of opportunity to fully participate in aspects of economic, social, and civic life.²

targeted support to reduce consequences to the most impacted communities. In January 2021, the Biden-Harris Administration announced the Justice40 Initiative to combat some barriers that underserved communities face. The Justice40 Initiative creates a government-wide initiative aimed at delivering 40 percent of the overall benefits of relevant federal investments to disadvantaged communities. Justice40 is also intended to inform equitable decision-making across the federal government.⁴ In order to achieve this initiative and the benefits of new programs, the resource and capacity gaps that impede access to, use of, and benefits from federal programs by low-capacity communities should be addressed.

Several federal programs are intended to support infrastructure and community resilience before and after events. However, program requirements can inadvertently create obstacles to achieving these purposes. This paper focuses on the following barriers hindering low-capacity communities:

1. Competitive and often overlapping program requirements impede access for low-capacity communities and reduce mitigation and resilience effectiveness;
2. Limited federal investment in sustained technical assistance that is locally accessible from trusted regional, non-governmental, and intermediary place-based institutions over the lifecycle of infrastructure systems; and
3. Obstacles to developing collaborative, cross-sector and cross-boundary partnerships and infrastructure projects at a scale necessary to enhance the resilience of infrastructure systems and services.

These barriers are illustrated throughout this paper with reference to various federal program examples.

BARRIERS IN EXISTING FEDERAL PROGRAMS

Requirements that Impede Access and Benefits

Low-capacity communities frequently encounter barriers when applying for federal assistance due to impediments within program eligibility and application requirements. Communities with immediate unmet needs often do not have the resources and expertise needed to meet basic program requirements, plan effective projects, compete for discretionary funding, or even apply for assistance to do so. This is true for not only communities but also the public utilities that serve them. Technical capacities such as problem identification, root cause analysis, and execution of the process for building resilience require a specialized competence that is lacking in many rural and urban areas, putting them at a disadvantage when competing with larger or more economically robust jurisdictions. There needs to be a level playing field created wherein resources are mobilized to help augment low-capacity communities' limited capabilities so that they are not precluded from effectively accessing federal assistance.⁵

Application Requirements

In a competitive grant application process, high-capacity communities continue to garner resources and increase resilience, while low-capacity communities will often be excluded, magnifying existing resource disparities and exposure to risk. In fact, experience shows that many low-capacity communities simply do not apply for hazard mitigation program grants, further decreasing their capability to mitigate risks and build resilience.⁶

While there are federal funds available for hazard mitigation planning, there is a large gap between identifying and listing priority projects and being able to adequately perform risk analysis and design projects that actually

mitigate risks and are competitive for funding. For example, subject matter experts noted that small counties and communities experienced barriers within various federal programs such as the 2020 BRIC application process wherein they needed to front pre-development costs without any guarantee of project funding.^{6, 7} Additional project application criteria, such documentation of a benefit-cost analysis and matching funds, further limit access for those without technical and financial resources.

Such barriers are hard to overcome without sufficient staff, expertise, data, and other planning and administrative resources. This is corroborated by a recent State Hazard Mitigation Officer survey report which notes that the demands of FEMA Hazard Mitigation Assistance grant programs, as an example, are difficult for even well-resourced communities and therefore “ultimately unrealistic” for low-capacity communities.⁸ In addition, a geographic analysis of successful 2020 BRIC sub-applications seems to indicate that metropolitan and higher-capacity communities are generally more effective in bidding for grant funds.⁹

Planning Requirements

Low-capacity communities often lack the resources and access to outside expertise needed to develop plans and respond to multiple, differing requirements for the various specific federal programs.

Federal program-specific pre-proposal planning requirements exacerbate the disadvantage for low-capacity communities without professional planners. Although implementation of hazard mitigation activities requires actions that are authorized under other plans (e.g., comprehensive plans, regional transportation plans, municipal capital improvement plans, etc.) necessary to obtain bonding and state loans, federal agency programs typically require documentation and approval of specific plans or specialized justification to meet eligibility requirements. For example, BRIC

requires a FEMA-approved Local Hazard Mitigation Plan (LHMP) for eligibility. Low-capacity communities, by and large, do not have on-staff professional planners to accomplish this requirement. Therefore, low-capacity communities either do not apply, delegate planning to over-committed emergency managers, or hire a consultant to produce a plan that meets minimum standards solely for the purpose of being eligible for grant funds. The result is many LHMPs that are not operational in nature, making them ineffective in mitigating risk and building resilience within a community. In the end, communities are spending scarce money for program-specific plans that do not offer an equivalent benefit. Enhancing the long-term resilience of critical infrastructure services and the communities they serve requires support for comprehensive local and regional planning that integrates hazard mitigation into other plans such as transportation, economic development, healthcare, etc.

EXAMPLE: Through State/Territory Allocation and Tribal Set-Aside, the BRIC program allocates a certain amount of funding each year for capability- and capacity-building, up to 50% of which per applicant can be used for mitigation planning and planning-related activities. However, all planning activities funded by BRIC must result in a new or updated FEMA-approved hazard mitigation plan. To enhance resilience, especially in low-capacity communities, use of program planning funds should allow for alignment with state-required infrastructure sector plans, regional sector-specific and general plans, and the other efforts of planning institutions previously developed with federal support. Similarly, eligibility for mitigation project funding should be justifiable by inclusion of mitigation planning elements in a jurisdiction’s comprehensive plan, capital improvement programs, or other implementing ordinances rather than requiring a program-specific plan.

EXAMPLE: The Housing and Urban Development (HUD) Community Development Block Grant (CDBG) program is utilized in both underserved and some Native American tribal communities for pre-development and recovery planning and projects, however there are separate administrative requirements for each.¹⁰

Disjointed and sector-specific federal program project requirements—each with a unique process, set of criteria, and prerequisite documentation—further impede

applicants' ability to develop strategies that effectively address risk. In several reports, the Milken Institute has documented that beyond plan writing and before hazard mitigation and infrastructure projects can begin, there are pre-development costs that a locality must spend for economic feasibility studies, site acquisition, architectural and engineering work, permitting, and other prerequisite work.¹¹ Many communities across the nation do not have the capabilities nor the capacities to develop disaster risk reduction strategies. The need for this capacity is "especially acute for smaller and historically underserved communities which cannot begin to plan until these basics are covered."¹² Communities with human or financial means can hire engineers to scope projects, complete a Benefit Cost Analysis (BCA), submit required documentation, and outcompete low-capacity communities that lack similar resources.

If federal mitigation programs are to be accessible and successful in reducing risk, protecting infrastructure services, and achieving 'whole community'¹³ resilience, application and eligibility requirements should be integrated within and among federal program processes, planning, and technical support mechanisms.

Limited Investment in Local and Regional Technical Assistance

Low-capacity communities often lack technical capabilities and need technical assistance including resources and expertise to plan for and develop strategies to improve the resilience of critical infrastructure services. Yet over the past 40 years, the federal government has reduced support for multi-purpose planning processes and institutions in favor of funding 'shovel-ready' projects. For instance, a Congressional Research Service review of tribal energy development grants pointed out that funding was being reduced for technical assistance in the name of more efficient use of federal funds for actual projects.¹⁴

EXAMPLE: In 2021, the FEMA BRIC program offers non-financial direct technical assistance to up to 20 selected communities to support mitigation outcomes and allocates \$1,000,000 to each state for capability- and capacity-building (C&CB) activities necessary to produce quality, competitive, and impactful projects.

Fortunately, several federal agencies including FEMA, the Department of Agriculture (USDA), Environmental Protection Agency (EPA), and the Department of Energy (DOE) have developed robust and often successful program-specific technical assistance resources for low-capacity communities. The problem is that eligible

EXAMPLE: The DOE Energy Transitions Initiative (ETI)¹⁵ demonstrates the effectiveness of a place-based approach to infrastructure investments by relying on strategic partnerships with relevant local community institutions, whether public, private, or non-profit, among others.ⁱⁱ

communities are required to proactively access this assistance and coordinate the different programs—something that low-capacity communities may not be well-equipped to do. While some federal programs are beginning to assign federal program representatives to provide support at the state level, what is needed is more locally available technical assistance that provides sustained support throughout the process of building infrastructure resilience at the community level. This would include technical assistance for: collecting hazard risk and

infrastructure vulnerability data; engaging with infrastructure owners, operators, and neighboring jurisdictions that share systems; developing and evaluating mitigation alternatives; leveraging financial resources; managing funding; and assessing and improving outcomes. This kind of technical assistance requires

ⁱⁱ The DOE ETI program team has provided technical assistance and capacity building for local organizations and, for example, continued its support as Hawaii renewed its commitment to clean energy in 2014 and set a new goal of 100% renewable energy by 2045. The ETI team hosts trainings on resilience planning and developed resources, such as the Engage modeling tool for cross-sectoral energy system planning and simulation to enhance the ability of the public utilities Commission, electric utilities, and stakeholders to predict changes based on investment decisions.

investment in institutions that can sustain support to communities across regions and over the lifecycle of infrastructure.

Previous federal investment helped build a system of institutions that localities relied on for technical assistance and program development.ⁱⁱⁱ Through increased federal investment in these institutions, they could be more effectively utilized to provide sustained technical assistance to low-capacity communities. The recent channeling of CARES Act economic recovery funds to regional development organizations (RDOs) provides an example for re-investment in these types of institutions that can work across sectors, programs, and scales to support local communities.^{iv}

Obstacles to Collaborative Projects and Partnerships

Given the interconnected and cross-boundary nature of infrastructure systems, an effective use of federal programs to reduce the disruptions of critical lifeline services requires the capacity of communities to assess, plan, and implement resilience measures across jurisdictions, public and private entities, and businesses.

EXAMPLE: Many tribal governments provide water, wastewater, internet, and other services to surrounding rural communities but there are obstacles in the way funds are allocated to the development of infrastructure projects serving Native and non-Native communities. For instance, the Nez Perce Tribe in Idaho and the Oneida Tribe in Wisconsin, are the ones with the capacity to provide water and wastewater systems, transit, and internet access to non-Native rural communities.²¹

Critical lifeline services that are necessary to the vitality of communities depend on public and private infrastructure such as telecommunications, energy, and transportation systems operating as an interdependent system of systems at multiple scales.^{16, 17, 18, 19, 20} The infrastructure that enables a community's critical services may be privately or publicly owned systems outside of their local jurisdiction. Thus, any program that focuses on implementation by award to discrete local government jurisdictions can unintentionally exclude or overlook the communities, businesses, and industries with shared and interconnected infrastructure systems.

Federal funding programs should recognize the role of the private sector, special districts, tribal governments, and other entities in making decisions that affect infrastructure systems and services. This may require investing in collaborative efforts that recognize the separate authorities and fund the development of agreements for larger projects. Such collaborations can result from an inclusive planning or assessment process.

Although some federal programs, such as BRIC, encourage the cross-boundary collaboration necessary to enhance the resilience of infrastructure systems, benefit-cost and matching fund requirements create planning and technical analysis challenges for a multi-jurisdictional project. Federal agencies should consider adding planning support within low-capacity communities to facilitate the development of partnerships and agreements needed to successfully use federal funding programs to effect infrastructure resilience.²² While set-asides for tribal and territorial governments recognize the legal government-to-government status of tribal nations and their community priorities, funds should also support sponsorship and inclusion of tribal

ⁱⁱⁱ For example, the development of the Land Grant Universities and county agricultural extension programs, the Department of Housing and Urban Development's support of comprehensive planning, the Environmental Protection Agency's support of regional watershed districts, the U.S. Department of Agriculture's investment in regional resource conservation districts, the U.S. Department of Transportation's investment in metropolitan planning organizations, and the Economic Development Administration's continued support of regional development organizations.

^{iv} CARES Act funds could be used by RDOs to provide planning and federal program access assistance to member local governments.

governments and other communities in state or regional projects.^v The BRIC program, for example, allows tribes to apply for funding as a sub-applicant under state/territory allocated funding or as the applicant themselves under tribal set-aside funding.

BUILDING CAPACITY – A NETWORKED APPROACH

The Nation requires a cross-agency commitment to capacity-building for low-capacity communities to be able to mitigate risk and provide for the resilience of critical infrastructure services to its citizens. Ultimately, the Nation benefits when supporting low-capacity communities by saving lives and billions in recovery dollars and economic losses.²³ While there are currently little to no data specifically documenting these benefits, the social and economic costs of inaction are starkly illustrated by the disparate and devastating effects of recent disasters on low-capacity communities.

As noted by multiple organizations over the decades and in recent testimonies,²⁴ a capacity-building strategy that more effectively achieves the stated hazard mitigation and resilience goals of federal programs must include both the reduction of planning and application requirements that competitively disadvantage many localities from accessing programs and the removal of programmatic rules that hinder collaborative civic approaches. Such a capacity-building strategy should leverage professional expertise over an extended period of time to continually improve and strengthen governance practices necessary to: engage low-capacity communities; address underlying and legacy infrastructure system vulnerabilities such as financing for operation and maintenance; and form cross-sector (across public and private) and multi-jurisdictional (across boundaries and scales) collaborative processes and partnerships to address infrastructure resilience challenges.

EXAMPLE: “RDOs can bring leaders together from the private sector and from across geographies and political affiliations to develop regional approaches to complex issues. Some economic development professionals note that RDOs with some degree of state support—either financial or political—may have expanded impact and influence on planning and implementation efforts.”²⁵

This capacity-building approach needs to include support for the institutions within each region that can deliver and improve capabilities over time. Existing institutions established through previous federal and private investments can be leveraged to create the necessary long-term, lifecycle, cross-sector, and appropriately scaled approach to capacity-building. Specific capabilities that these institutions can provide to low-capacity communities include access to the best information on hazards and infrastructure vulnerability assessment, planning and assessment tools and techniques, human capital and expertise, and partnership building resources to sustain urban and rural infrastructure systems. For instance, a ‘hub’ or repository of capabilities could be established within each state or region as a centralized point that communities could reach out to (physically or virtually) to meet their capacity needs. These hubs would establish networks and communication channels that are mutually beneficial between jurisdictions and their local universities, engagement specialists, non-governmental organizations (NGOs), regional organizations, private sector, and other agency partners. These hubs could provide access to services such as engagement facilitation, partnership forming

^v The important set-asides for tribal and territorial governments that recognize the legal government status of tribal nations inadvertently create additional obstacles for development of larger infrastructure projects that would enhance resilience for several jurisdictions. Challenges include misunderstanding of the dependent sovereign nation status of tribal governments and how tribal services are financed, which can lead to state or tribal government hesitancy to work together and legal impediments to establishing user fees and service agreements for water, wastewater, roads, or other utilities.

and technical expertise, as well as resources such as data and assessment tools, enabling communities to build capacity and capabilities in a sustainable and resilient manner.

Resilience requires participation by emergency responders, hazard mitigation professionals, economic developers, planners, and others involved in envisioning the future of a community and the challenges it is likely to face. There are multiple examples of community-engaged learning and research approaches that can be used as models for community engagement specific to resilience-based capacity-building and outreach to low-capacity communities. The Land Grant University system is a model of applied knowledge with extension specialists and outreach agents used in many states to advance planning beyond agriculture.²⁶ Extension agents are joining networks focused on community development and hazard mitigation, as exemplified by joint professional and Extension programs in several states.^{26, 27} Some public and land/sea grant universities are developing planning, engineering, and landscape architecture professionals by working with communities and foundations and engaging the county extension agents jointly funded by counties, tribal governments, and the Land Grant university system.

Similarly, the USDA Office of Partnerships and Public Engagement partners with minority-serving colleges to provide community development education, tools, and resources to rural and underserved communities.²⁸ Other examples include the Engineers Without Borders program and the ever-expanding service-learning practice of using graduate and undergraduate planning and landscape architecture students to innovate community plans and designs. For example, the National Oceanographic and Atmospheric Agency worked with universities and other agencies to develop and pilot the Climate Resilience Toolkit,²⁹ which provides a centralized and user-friendly interface for federal risk reduction and planning data and tools while building hazard mitigation capacity through research grants to the American Planning Association and universities. Some of these place-based practices are documented to effectively build on private foundation anti-poverty programs.³⁰

The U.S. Army of Corps of Engineers (USACE) sponsors the Silver Jackets teams, which are multi-agency teams from federal, state, local, and tribal agencies that share knowledge to reduce the risk of flooding, providing a model for federal to state knowledge of training and tools for other disaster risk reductions. Similarly, FEMA's Hazard Mitigation Grant Program provides funding to state, local, tribal, and territorial governments (SLTTGs) to increase resiliency within rebuilt public property damaged by a disaster. Collaborative approaches like these are encouraged during disaster response and would be a beneficial way of building the capacity of low-capacity communities in advance of hazard events.

As illustrated above, investing in collaborative approaches, and leveraging the capabilities of existing institutions at the sub-state and regional scales will best address the capacity needs of low-capacity communities, enabling them to mitigate risks and build resilience.

Recommendations for Federal Action

The federal Sector Risk Management Agencies (SRMAs) and other federal agencies should make programs and services more accessible to low-capacity communities. The Federal interagency should also invest in the planning processes and institutions that can bring resources to SLTTGs and low-capacity communities so that mitigation/resilience funds and programs can effectively achieve long-term risk reduction and resilience. The following common principles for improving existing federal programs to better address low-capacity communities were identified through a brief review of 2020 and 2021 SLTTG consortia and professional association position papers:^{31, 32, 33, 34}

- Reduce uncertainty by changing some discretionary programs into other forms such as block grants and multi-year grants with allowable planning and project development costs recognizing SLTTG responsibilities and the time frame necessary to plan and build infrastructure;
- Align and streamline planning and application requirements so that analysis and plans can be used to justify multiple sources of funding;
- Provide incentives for mitigation and innovative and collaborative governmental and non-governmental projects rather than using prescriptions and prerequisites that disadvantage low-capacity applicants; and
- Provide increased, flexible funding for planning and capacity-building to organizations that have and can provide sustained technical assistance to low-capacity communities and that facilitate regional, collaborative, and integrated use of funding and resources to support social, economic, infrastructure, and environmental resilience.

The Resilient Investment Planning and Development Working Group (RIPDWG) suggests the following additional actions to improve existing federal programs and address the barriers identified in this white paper:

- 1. Invest in existing and emergent collaborative institutions, mechanisms, and processes that can provide sustained support to low-capacity communities.**
 - a. Identify existing governmental and non-governmental collaborative institutions (e.g., federal-state-regional commissions, RDOs, metropolitan planning organizations (MPOs), Council of Governments (COGs), tribal corporations, community development corporations, community-based non-profits, etc.), their purpose, and how they can be applied to and support community resilience.
 - b. Support partnership-building activities (e.g., collaboration activities that enable cross-jurisdictional, cross-sector, public-private projects to address infrastructure system vulnerabilities).
 - c. Require that funded collaboratives include trusted community organizations (i.e., nonprofit organizations, NGOs, faith-based organizations, local government, etc.).
 - d. Identify ways to incentivize involvement of private sector partners.
 - e. Expand and diversify collaborative learning networks (similar to the USACE Silver Jackets network but applied to all phases of hazard planning – preparedness, mitigation, response, and recovery).
 - f. Coordinate the delivery of federal technical assistance toolkits and playbooks through academic and regional institutions who have trusted relationships with communities.
- 2. Support place-based institutions that provide local capacity-building to perform disaster risk reduction, implement hazard mitigation, and build resilience.**
 - a. Focus federal funding for existing infrastructure resilience planning and project development at the local, sub-state, state, and regional levels.
 - b. Facilitate and invest in the development or expansion of state or regional hubs that provide community engagement and access to resources (data, information, potential funding opportunities, networks, expertise, etc.) and invest in their expanded applications.

- c. Create incentives to utilize peer-to-peer mentorship programs and networks to educate and engage local leaders, advocates, champions, and citizens on resilience project options and best practices.
 - d. Support the expanded use of outreach-oriented academic and professional programs (e.g., land grant college and university extensions, minority-serving institutions, professional planning, engineering, and public administration programs, etc.) that provide technical assistance, outreach, and engagement to low-capacity communities in their regions with a focus on use of existing federal programs.
 - e. Following large disasters, embed Federal staff (e.g., USACE, EPA, DOE, FEMA, etc.) alongside low-capacity communities on long-term assignments to assist these communities in developing resilience and mitigation projects as part of their recovery planning.
- 3. Coordinate and make planning and project requirements flexible across federal programs.**
- a. Allow planning and administrative funds to be used to develop inclusive plans that meet multiple purposes or enhance existing local and regional plans.
 - b. Encourage the multi-purpose use of local and regional plans by replacing program-specific planning requirements with hazard reduction criteria that can be included in any formally adopted local or regional plan.
 - c. Consistently encourage cross-sector and cross-boundary infrastructure projects that have multiple benefits and improve the continuity of services to the most vulnerable communities.
 - d. Continue implementing the Mitigation Framework Leadership Group (MitFLG) National Mitigation Investment Strategy to coordinate matching fund provisions amongst federal programs and standardize post-award project management processes.
- 4. Identify and assess the extent and consequences of unequal participation in risk reduction efforts by low-capacity communities in a manner that helps guide resource allocation.**
- a. Identify the gap between areas with the lowest investment in mitigation per population density and population income and areas that are actual program recipients.
 - b. Research the causes, consequences, and geographic distribution of losses due to underinvestment in operation and maintenance of infrastructure systems.
 - c. Analyze and understand the extent to which gaps in local planning and administrative capacity limit communities' access to programs and ability to meet administrative requirements. Incorporate the findings into strategies and tactic to address the gaps.
 - d. Encourage states to identify low-capacity communities in their Threat and Hazard Identification and Risk Assessment (THIRA) and establish best practices for fostering equity amongst communities.
 - e. Identify what has worked well for low-capacity communities that are fully engaging in federal programs.
 - f. Research, develop, and pilot new innovative incentives that spur public and private investment in adaptation and/or resilience measures.

These recommendations reinforce and add to those also submitted by State Hazard Mitigation Officers for the BRIC program,⁸ the Interim Guidance for Justice40 Initiative,³⁵ and repeated suggestions made to Congress by the American Planning Association,³⁶ the RAND Corporation,³⁷ the National Association of Regional Councils,³² and others.²⁴

CONCLUSION

RIPDWG acknowledges there are multiple issues outside the scope of this paper that must be addressed to ensure the resilience of communities and supporting infrastructure systems. Investing in mitigation and long-term resilience is a challenge. For our Nation to remain secure and resilient, low-capacity communities need direct assistance to build capacity and reduce barriers. This paper is intended to help voice the obstacles faced by low-capacity communities to inform federal interagency program and research initiatives.

As mentioned previously, several recent laws and programs attempt to address the inequitable access to and effective use of federal programs to increase resilience for low-capacity communities. Despite these new initiatives, three obstacles still plague low-capacity communities' ability to build capacity. RIPDWG recommends both policy changes to simplify application requirements, align pre-project planning requirements, and increase support to networks of existing civic, academic, private sector, and regional government institutions that can provide sustained planning and technical assistance to low-capacity communities to enhance resilience within and across jurisdictions. Implementation of the actions and research priorities recommended herein ensures that planned federal investment in the Nation's infrastructure and equity initiatives will effectively achieve national resilience objectives by addressing capability challenges and access barriers faced by low-capacity communities.

BIBLIOGRAPHY

- ¹ Therrien, M., Usher, S., & Matyas, D. (2019, November 16). Enabling strategies and impeding factors to urban resilience implementation: A scoping review. Retrieved July 20, 2021, from <https://onlinelibrary.wiley.com/doi/10.1111/1468-5973.12283>
- ² Exec. Order No. 13985, 86 Fed. Reg. 7009 (Jan 20, 2021)
- ³ FY 2020 Building Resilient Infrastructure and Communities Notice of Funding Opportunity. (2020). U.S. Department of Homeland Security, Federal Emergency Management Agency.
- ⁴ Exec. Order No. 14008, 86 Fed. Reg. 7619 (Jan 27, 2021)
- ⁵ Pflücke, K., Heide, J., Fenn, J., Kroneberger, M., Herlitz, M. (2020) Guide to Expanding Mitigation: Making the Connection to Equity. Retrieved August 13, 2021, from https://www.fema.gov/sites/default/files/2020-09/fema_region-2_guide-connecting-mitigation-equity_09-10-2020.pdf
- ⁶ D. Vaughn, personal communication, July 03, 2021.
- ⁷ B. Edge, Director of Community Development, Green River Area Development District. Presentation to RIPDWG Investment Strategy Task Group, January 27, 2021.
- ⁸ Vilá, O., Smith, G., & Gyawali, S. (2021, May). *Capacity to Implement FEMA HMA Grants: SHMO Survey Report*. Retrieved from https://www.researchgate.net/profile/Gavin-Smith-10/publication/351727136_Capacity_to_Implement_FEMA_HMA_Grants_SHMO_Survey_Report/links/60a667f892851ca9dcbd93b9/Capacity-to-Implement-FEMA-HMA-Grants-SHMO-Survey-Report.pdf
- ⁹ Smith, K., PhD. (2021, July 1). Mountain, Midwest, and Gulf States Fail to Secure FEMA Resilience Funding. Retrieved July 20, 2021, from https://headwaterseconomics.org/natural-hazards/bric-funding/?fbclid=IwAR3GD5lun3Y7cSL6heU78INwlw4b_rDcje8K25qP3BYTfZj8dO26xzU5y0k
- ¹⁰ Piro, R., Leiter, R., & Rooney, S. (2017). *Emerging Trends in Regional Planning* (Report No. 586). Retrieved from <https://www.planning.org/publications/report/9118764/>
- ¹¹ Horton, M., Galdamez, M., Wang, I., & Kesteven, C. (2021). *Accelerating Infrastructure Investment across the Country*. Retrieved from <https://milkeninstitute.org/sites/default/files/reports-pdf/accelerating%20infrastructure%20v1.21.21.pdf>

- ¹² Horton, M., Galdamez, M., Wang, I., & Kesteven, C. (2021). *Accelerating Infrastructure Investment across the Country*. Retrieved from <https://milkeninstitute.org/sites/default/files/reports-pdf/accelerating%20infrastructure%20v1.21.21.pdf>
- ¹³ Heide, J., Herlitz, M., Gutierrez, J. (2021). Guide to Expanding Mitigation: Making the Connection to the Whole Community. Retrieved August 13, 2021, from https://www.fema.gov/sites/default/files/documents/fema_connecting-mitigation-whole-community.pdf
- ¹⁴ Congressional Research Service (2021). Tribal Consultation: Administration Guidance and Policy Considerations. CRS Insight 11606, February 21, 2021, Washington D. C., CRS.
- ¹⁵ Office of Energy Efficiency & Renewable Energy. (n.d.). Energy Transitions Initiative Partnership Project—What We Do. Retrieved July 20, 2021, from <https://www.energy.gov/eere/energy-transitions-initiative-partnership-project-what-we-do>
- ¹⁶ *Methodology for Assessing Regional Infrastructure Resilience*. (Estimated 2021). Cyber Security and Infrastructure Security Agency, Infrastructure Security Division. UNPUBLISHED.
- ¹⁷ U.S. Department of Energy. (2021). *Energy Resilience Playbook*. Retrieved from <https://www.eere.energy.gov/islandsplaybook/pdfs/islands-playbook.pdf>
- ¹⁸ Monitz, G., Heide, J., Gutierrez, J., Herlitz, M. (2020). Guide to Expanding Mitigation: Making the Connection to Electric Power. Retrieved August 13, 2021, from https://www.fema.gov/sites/default/files/2020-09/fema_region-2_guide-connecting-mitigation-electric-power.pdf
- ¹⁹ Heide, J., Gutierrez, J., Herlitz, M. (2021). Guide to Expanding Mitigation: Making the Connection to Communications Systems. Retrieved August 13, 2021, [from https://www.fema.gov/sites/default/files/documents/fema_connecting-mitigation-communications-systems.pdf](https://www.fema.gov/sites/default/files/documents/fema_connecting-mitigation-communications-systems.pdf)
- ²⁰ Heide, J., Kroneberger, M., Herlitz, M. (2020). Guide to Expanding Mitigation: Making the Connection to Transportation. Retrieved August 13, 2021, from https://www.fema.gov/sites/default/files/2020-09/fema_region-2_guide-connecting-mitigation-transportation.pdf
- ²¹ Community development. (2021). Retrieved July 20, 2021, from <https://extension.umn.edu/community-development>

- ²² Huang, C., & Taylor, R. (2019, June 28). Any Federal Infrastructure Package Should Boost Investment in Low-Income Communities. Retrieved July 20, 2021, from <https://www.cbpp.org/research/federal-budget/any-federal-infrastructure-package-should-boost-investment-in-low-income>
- ²³ Institute for Sustainable Communities - Community Resilience. (2021). Retrieved June 30, 2021, from Tamu.edu website: <https://ifsc.tamu.edu/Discovery/Community-Resilience>
- ²⁴ Carol, D. (2020, April 3). The Case for an Infrastructure Predevelopment Fund. Retrieved July 20, 2021, from <https://www.milkenreview.org/articles/the-case-for-an-infrastructure-predevelopment-fund>
- ²⁵ Lawhorn, J. (2020). *The Role of Regional Development Organizations (RDOs) in Economic Development* (CRS Report IF 11587). Retrieved from <https://crsreports.congress.gov/product/pdf/IF/IF11511>
- ²⁶ Pinel, S., & Urie, R. (2017). Learning Reflective Planning: The Application of Participatory Action Research Principles to Planning Studio Design and Assessment. *Journal of Architectural and Planning Research*, 34(1), 32–48. Retrieved from <https://www.jstor.org/stable/44987215>
- ²⁷ Boyle, P. (1990). Integration of Research and Extension Education: The Wisconsin Approach. *Choices*, 5(3), 23-25. Retrieved June 30, 2021, from <http://www.jstor.org.antioch.idm.oclc.org/stable/43624533>
- ²⁸ *Office of Partnerships and Public Engagement*. (n.d.). USDA. Retrieved from <https://www.usda.gov/partnerships>
- ²⁹ U.S. Climate Resilience Toolkit | U.S. Climate Resilience Toolkit. (2014). Retrieved from <https://toolkit.climate.gov/>
- ³⁰ Kothuis, B., Lee, Y., Brody, S. (2018). *NSF-PIRE Coastal Flood Risk Reduction Program Authentic Learning and Transformative Education* (Volume I). Retrieved from <https://www.tamug.edu/CTBS/pdf/PIRE-Coastal-Flood-Risk-Reduction-2016-17.pdf>
- ³¹ National Governors Association. (2019, April 9). Principles for National Infrastructure Investment. Retrieved July 20, 2021, from <https://www.nga.org/advocacy-communications/policy-positions/principles-for-national-infrastructure-investment/>
- ³² National Association of Regional Councils. (2020). *Resilience and Disaster Recovery*. Retrieved from <https://narc.org/wp-content/uploads/2020/02/2020-Resilience-One-Pager-Web.pdf>
- ³³ National Association of Counties (2021). Support the Community Services Block Grant (CSBG), a Policy Brief, Washington D. C. NACO.

- ³⁴ Congressional Research Service (2021). Tribal Consultation: Administration Guidance and Policy Considerations. CRS Insight 11606, February 21, 2021, Washington D. C., CRS.
- ³⁵ Young, S., Mallory, B., McCarthy, G. (2021) Interim Implementation Guidance for the Justice40 Initiative. Retrieved August 13, 2021, from <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>
- ³⁶ DeAngelis, J., Briel, H., & Lauer, M. (2019). *Planning for Infrastructure Resilience* (Report No. 596). Retrieved from <https://www.planning.org/publications/report/9192800/>
- ³⁷ Mendelsohn, J., Johnson, G., Klima, K., Steratore, R., Cohen, S., Kirkwood, G., Dixon, L., Hastings, J., Steinberg, P. (2021). *Developing Metrics and Scoring Procedures to Support Mitigation Grant Program Decisionmaking*. Retrieved from https://www.rand.org/content/dam/rand/pubs/research_reports/RRA300/RRA377-1/RAND_RRA377-1.pdf

GLOSSARY

Community - one or more groups of people sharing a local or regional territory and some other combination of characteristics such as heritage, interests, civic organizations, or government.

Cross-agency - conducted by more than one agency at more than one level of government

Disadvantaged - a combination of variables that may include, but are not limited to, the following:

- Low income, high and/or persistent poverty
- High unemployment and underemployment
- Racial and ethnic residential segregation, particularly where the segregation stems from discrimination by government entities
- Linguistic isolation
- High housing cost burden and substandard housing
- Distressed neighborhoods
- High transportation cost burden and/or low transportation access
- Disproportionate environmental stressor burden and high cumulative impacts
- Limited water and sanitation access and affordability
- Disproportionate impacts from climate change
- High energy cost burden and low energy access
- Jobs lost through the energy transition
- Access to healthcare

Emergent - occurring through self-governance at different scales independently of higher-level decisions

Low-capacity Community - a community facing obstacles that hinder its ability to address problems, take advantage of opportunities, and build resilience due to a lack of resources and capability

Place-based - having continuity of connection with a local area; rooted in the local area with intimate knowledge of local conditions.

Underserved Community - populations sharing a characteristic, as well as geographic location, that have systemically been denied a full opportunity to participate in aspects of economic, social, and civic life

ACRONYMS AND ABBREVIATIONS

BCA	Benefit Cost Analysis
BRIC	Building Resilient Infrastructure and Communities
C&CB	Capability- and Capacity-Building
CARES Act	Coronavirus Aid Relief and Economic Security Act
CDBG	Community Development Block Grant
CISA	Cybersecurity and Infrastructure Security Agency
COG	Council of Governments
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
ETI	Energy Transitions Initiative
FEMA	Federal Emergency Management Agency
GCC	Government Coordinating Council
HUD	U.S. Department of Housing and Urban Development
IAA	Infrastructure Assessments & Analysis
IDR	Infrastructure Development and Recovery
LHMP	Local Hazard Mitigation Plan
MitFLG	Mitigation Framework Leadership Group
MPO	Metropolitan Planning Organization
NGO	Non-Governmental Organization
RC3	Regional Consortium Coordinating Council
RDO	Regional Development Organization
RSB	Resilience Service Branch
RIPDWG	Resilient Investment Planning and Development Working Group
SLTTG	State, local, tribal, and territorial government
SCC	Sector Coordinating Council
SME	Subject matter expert
SRMA	Sector Risk Management Agency
USACE	U.S. Army of Corps of Engineers
USDA	U.S. Department of Agriculture

ACKNOWLEDGMENTS

Background information and content for paper findings were contributed by subject matter experts (SMEs) acknowledged below. Recommendations herein are consensus advice of RIPDWG Members only (see title page).

David Vaughn	Clemson University, SME
Derek Kauneckis	Desert Research Institute, SME
Mary Lasky	Johns Hopkins University Applied Research Lab, SME
Frederick Ferrer	Idaho National Laboratory, SME
Elizabeth Keller	International City County Management Association, SME
David Winks	AcquSight, SME
Irvin Varkonyi	Supply Chain Operations Preparedness Education, SME
John Organek	Electrical Infrastructure Security Council, SME
Sanj Malushte	Bechtel NS&E Corporation, SME

Note: Organizational affiliations are provided for recognition only and do not represent the organizations' endorsement of this white paper.