

The Global Resilience Institute's (GRI) Integrated Resilience Enhancement Solution (I-RES) is applied to both communities and to the enterprises that exist and operate to provide the economic, civic, and social operational backbone upon which communities are built and depend. Enterprises may include for example, businesses, hospitals, schools, NGO's, and government entities. Specific processes and tools may vary between individual enterprises and communities but core I-RES deliverables and services include:

Community/Enterprise Resilience Overview: a high level description of the current state of critical functions and supporting processes and systems. This overview is used as a starting point for in-depth analysis and stakeholder validation.

Community/Enterprise Resilience Baseline Analysis & Report

- *Resilience Landscape:* Building on the overview the Resilience Baseline Analysis creates an in-depth description of the current state of relevant critical functions and supporting systems and their capacities, strengths, and vulnerabilities to stress and disruption in appropriate community, social, economic, personal, and/or enterprise context. The Baseline Analysis is heavily informed by comprehensive multi-stakeholder engagement.
- *Investment Landscape:* An analysis focused on those community/enterprise strengths that can be leveraged as foundations for investments in resilience enhancing initiatives.
- *Opportunity Landscape:* Recommended transformative suites of resilience enhancing investments - integrated sets of multi-dimensional initiatives that work synergistically to enhance community/enterprise resilience.

Integrated Resilience Enhancement Action Plan: Using the Baseline Analysis as a roadmap a comprehensive but realistic action plan is developed based on community/enterprise priorities, functional interdependencies, and constraints. The plan is presented in a 5-3-1 format – a five year vision, a three year strategic plan by quarter, and a rolling 12 month tactical implementation plan.

Project Impact Analysis: An optionally bi-directional impact analysis for specific projects of both:

- The predicted impact of the completed project on the overall resilience of the host community or enterprise offering data to inform/enhance project design
- The predicted impact of existing community or enterprise resilience on the proposed project offering data to potentially modify project design and scope.

Capital Funding Opportunity Analysis & Report: Comprehensive analysis of potential capital stack components and sources to support investment in resilience enhancing projects. In addition to self-funding, multiple government, private, and philanthropic programs and sources appropriate for different recommended suites of resilience enhancing initiatives as well as specific projects are included reflecting specific program requirements, constraints, processes etc.

Resilience Enhancement Implementation Support:

- Design and implementation support for resilience enhancement initiatives for critical functions, physical infrastructure, social, economic, and individual resilience enhancing programming and projects. Examples include focus on Supply Chain, Cyber Security, Business Continuity, Security & Safety, Energy, Telecom, Transportation, Water, Waste, Healthcare, Housing, Workforce, Economic Development, etc.
- *Stakeholder Engagement*: Convening and facilitation of appropriate stakeholders to gather input as well as educate and communicate on resilience risks and potential enhancement strategies and initiatives.

Performance Validation Analysis: Comprehensive pre and/or post investment validation that funded initiatives meet all performance, legal, and financial requirements and objectives for process and outcomes.

I-RES for Communities

The Global Resilience Institute understands that economic development is the foundation for healthy and resilient communities. Economic vitality attracts and supports people desiring to work and live and thrive in a community. Economic development in turn is contingent on supportive and resilient infrastructure systems and functions such as energy, transportation, telecom, healthcare, water, waste, housing, and public safety.

GRI's community resilience enhancement work shows that economic and supporting infrastructure development is most successful when it is supported by close partnership between the public and private sectors in collaboration with civic organizations that engage residents in formulating and supporting a shared vision for their community. Major cities across the United States are beginning to develop such a culture of collaboration, positioning them to take full advantage of incentive programs, such as the creation of Opportunity Zones authorized by the Tax Cuts and Jobs Act of 2017 as one example, which can put private capital to work in ways that benefit investors and underserved communities alike. The result will be investments that measurably improve economic and social outcomes for all

Derived from over a decade of applied research in collaboration with several U.S. national laboratories and the National Institute of Standards and Technology (NIST), GRI's community-focused components of I-RES have been developed to provide communities with a comprehensive decision-support process to guide the prioritization of their investment needs for enhancing infrastructure and community resilience, thereby reducing risk to the affected community and to investors while increasing the probability of success for all stakeholders. The I-RES ensures that both community and investor interests are served. Development investments are assessed for community resilience impact, and resilient communities increase the potential value of an investment over the forecasted lifecycle of the project. This dual-focus creates a win-win outcome for all parties.

When deploying the I-RES, the GRI team will partner with institutions of higher education and philanthropic organizations who have deep roots in a local community and have earned the trust of its residents. Additionally, GRI collaborates with a stakeholder group made up of local business and industry leaders. Based on the preferences of community leaders, GRI will apply the I-RES analysis to a defined geography, such as one or more neighborhoods, single or multiple Opportunity Zones, special tax districts, or an entire metro or multi-county region. Using a robust data capture methodology, an evidence-based, resilience indicator assessment, and a dynamic and proven community engagement process, GRI is able to provide an indication of the likely resilience benefits to be derived from investments in a community setting the stage for resilience focused economic development.

In addition I-RES provides investors and developers with the knowledge and data necessary to:

1. effectively adapt proposed projects to actual community conditions
2. discover project modifications or additions that benefit the investor and the community
3. achieve tangible and sustainable social and economic progress for the affected region.

The experts across the Global Resilience Institute have decades of experience and in-depth knowledge to not only understand a community and how to support its goal of becoming more resilient, but also facilitate collaborative approaches which can leverage incentive programs, such as Opportunity Zones which can put private capital to work in ways that benefit both investors and underserved communities.

GRI's unique Integrated Resilience Enhancement Solution makes us well-positioned to support these development opportunities by implementing a tailored, comprehensive decision-support process that guides the prioritization of a community's investment needs for enhancing infrastructure and resilience, as well as ensure investor interests are served.

I-RES for Enterprises

The Global Resilience Institute understands that enterprises of all types including businesses, schools, hospitals, government and quasi government entities, NGO's etc. comprise the economic and operational backbone of the communities where they exist. These enterprises and the people they employ and serve are subject to their own unique stresses and disruptions from all manner of natural, man-made, economic, and market threats. Further, their operations and critical resource supply chains are all dependent on multiple interoperating local supporting infrastructure systems such as transportation, energy, water, waste management, healthcare, public safety, housing, etc.

Continuous viability of the enterprise then is critical to all stakeholders including owners, investors, employees, customers, suppliers, and citizens of their host communities. A great strategy well executed is sufficient for blue sky days. But resilience is key to surviving and thriving in the face of the inevitable bad days. Without resilience enterprises are "brittle" and subject to disruption and cascading failures. The resilient enterprise is thus more valuable to all stakeholders.

Further, by their nature, enterprises have both an inward as well as outward facing resilience imperative. An organization's internal operational resilience is at least somewhat dependent on the resilience of its suppliers and customers as well as that of the communities where it has facilities and employees.

Built on decades of research and experiential learning, and leveraging continuous access to evolving global resilience best practices and innovations, GRI's Integrated Resilience Enhancement Solution (I-RES) enterprise focused components have been proven to provide organizations of all types with a comprehensive understanding of their vulnerabilities and multi-faceted solutions to those resilience challenges. Then I-RES goes further and can support practical implementation of resilience enhancing initiatives through realistic prioritization and planning, project design support, financing strategy development, and project performance management and validation.

Deploying I-RES for an enterprise is very much a collaborative effort between the GRI team and your organization's leadership and management team. GRI offers resilience focused analysis and solution methodology, process, tool, and financing expertise. Our team will include subject matter experts on your industry drawn from our affiliated faculty, distinguished senior and corporate fellows, and as necessary from

across the Global Resilience Research Network (GRRN) of 36 universities and research institutes in 20 countries. But only your internal leaders and managers with input from other critical stakeholders can truly understand how your enterprise actually operates day to day.

Initially GRI's Executive Education offerings are leveraged to level set enterprise leadership and management teams on key resilience concepts, terminology, and the I-RES methodology. This work is followed by initial identification of key resilience challenges leading to engagement scoping and objective setting. This is followed by comprehensive data gathering and analysis to understand critical vulnerabilities and associated potential impacts. Only then can solutioning and solution implementation support work begin.

Resilience to disruption increases the value of an enterprise to all of its stakeholders. Application of GRI's Integrated Resilience Enhancement Solution is a proven way to identify and support initiatives of all types to enhance enterprise resilience.

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About GRI

Launched in 2017 with the approval of Northeastern University's Board of Trustees, the Global Resilience Institute (GRI) is the world's first university-wide institute to respond to the resilience imperative. Today, GRI undertakes multi-disciplinary resilience research and education efforts that draws on the latest findings from network science, health sciences, coastal and urban sustainability, engineering, cybersecurity and privacy, social and behavioral sciences, public policy, urban affairs, business, law, game design, architecture, and geospatial analysis.