

TEXAS ECONOMIC DEVELOPMENT COUNCIL

TEDC Economic Resilience Resource Guide 2021-2022

**A Comprehensive Resource for Texas
Communities, Counties, and Regions**

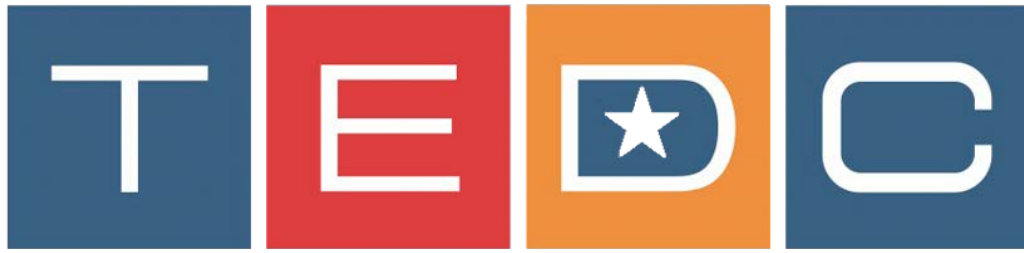
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TEXAS ECONOMIC DEVELOPMENT COUNCIL

Disaster Recovery and Resilience Resource Guide for Texas Communities

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Introduction

From March 15 2020 to July 15, 2021 the world endured the worst pandemic in 100 years, a record number of tropical storms, massive flooding throughout the globe, massive wildfires in Australia and the western U.S., and freezing temperatures that crippled almost all of the State of Texas. The impacts of these events can be overwhelming to local and regional economies and must be dealt with, raising the issue of community and regional resilience. For economic development organizations and professionals, economic resilience is no longer a luxury-it is a core need to respond when prospective and resident industry inquire about disaster risk.

Recognizing this need, the Texas Economic Development Council (TEDC) successfully obtained a grant from the US Economic Development Administration (EDA) to help Texas communities recover from COVID19 and increase their resilience, particularly economic resilience. TEDC then contracted with the International Sustainable Resilience Center, Inc. (ISRC) to provide a resource guide and a series of 6 workshops in the State's six major regions, two in fall of 2021 and six in the first half of 2022.

This resource guide will serve as both a compliment to the workshops and a stand-alone reference source for economic developers to explore resources and information to put what they have learned into action. This guide is not about taking a position on climate change. It is about giving communities the tools to deal with ongoing disasters of all types, including natural, pandemic, industrial, acts of terror, and the newest threat, cyber-incidents.

This guide is a mixture of reports and reference guides designed to provide both direction and information on taking resilient actions. There are nine individual resources, and most contain more detailed summaries for quick reference to their contents:

ISRC President David Dodd is available to answer any questions and assist in understanding how to access resources. His email address is david@isrc-ppp.org and phone number is 318-525-5559.



What is Economic Resilience and Why is it Important?

“Don't Mess With Texas”

Before We Begin--

- A little about me—half Texan, son of hatchery and farm owner in Shelby County, in economic development since 1989, in economic recovery/resilience since 2005.
- This workshop is NOT a series of lectures—it IS a series of conversations—PLEASE don't be polite! Interrupt and challenge if you want!
- Focus is on practical information you can use-not theory.
- Resource guide is meant as a reference, regional profile provides basis for grants, etc. from resource spreadsheet.

An Unsustainable Path!!

- World Bank: From 1970-2019, total estimated disaster losses: \$5.8 Trillion—and that was PRIOR to COVID19, which cost an estimated \$5.6 Trillion
- The National Resources Defense Council projected yearly disaster losses would triple to 1% of global GDP (\$900b/yr) by 2050. In 2017, 33 years prior to NRDC's prediction, total economic disaster impacts were estimated to exceed \$1 Trillion, representing 1.1% of 2017 global GDP
- Site location consultants now consider and disaster risk reduction:
 - “If we are looking at a region that has been subject to disaster loss, our clients will require that they prove steps have been taken to reduce disaster risk”—Mark Sweeney, leading site location consultant whose clients include Boeing, Nissan, Airbus, and others
- Disaster risk is now among leading site location factors

What IS Economic Resilience?

- Economic Resilience is the ability of a community's businesses and economic development efforts to better withstand, and recover more quickly from, adverse incidents of any kind
 - Incidents include natural and manmade disasters, pandemics, economic upheavals, civil unrest, acts of terror, and cyber attacks
 - Resilience includes response, recovery, & risk mitigation



Economic Resilience Components

1. Organize: Convene a Disaster Resilience Task Force
2. Assess: Perform a comprehensive resilience assessment
3. Identify: Based on assessment, identify shortcomings
4. Gain Knowledge: Direct and Indirect Research, Advice
5. Secure Resources: Funding, Expertise, Assistance
6. Take Action: Create a step-by-step action agenda

Questions:

- What does economic resilience mean to you?
- How has the pandemic altered your economic development efforts?
- Outside the pandemic, what types of disasters do you see as most problematic for your community?
- Have your resident businesses/industries, prospects, leaders or entrepreneurs asked about risk from disasters?



1. Organize

- Convene an Economic Resilience Task Force, Including:
 - Local, County, and State Emergency Management Officials
 - Local, County, and State Economic Development, Transportation, Energy, & Workforce, plus Local, County, and State Government
 - Resident Industry, Small Business, Entrepreneurship Representatives
 - Community and Faith-Based Organizations, Educational Institutions
- Objective: Address Economic Issues in Response, Recovery and Risk Reduction (Mitigation) for All Hazards, Including the EDO Itself, Businesses, Essential Services, and the Workforce



2. Assess

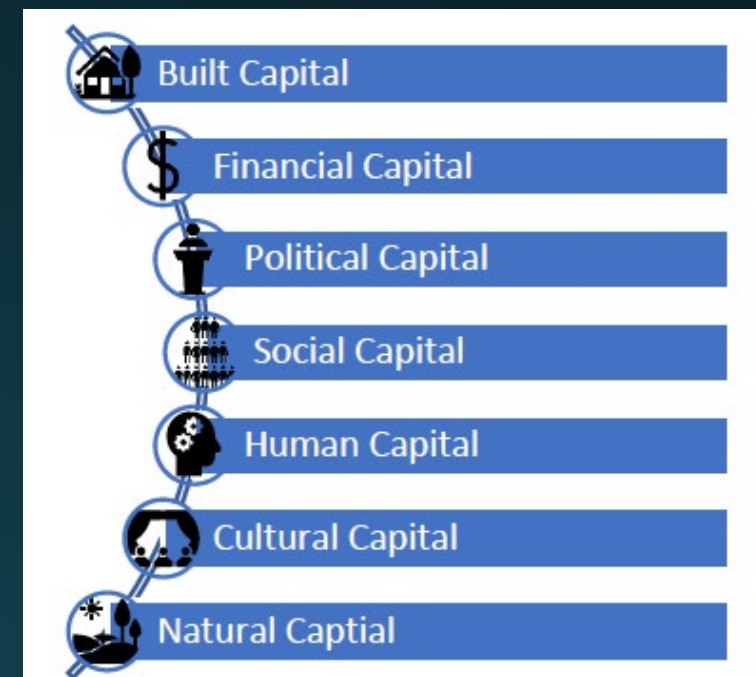
- Once organized, the Task Force should assess economic readiness for and ability to recover from incidents
- This can be accomplished through use of a resilience assessment system such as the ISRC/Statebook Economic Resilience Scorecard:
 - TEDC has included the 15 core assessment questions and will administer it to all participants
 - The Scorecard provides a core view of economic resilience efforts and training in specific actions to increase economic resilience
 - Should TEDC receive follow-on grant funding in 2022, the entire scorecard may be implemented for Texas counties/communities
- There are other, more general assessment models:
 - <https://unbreakable.gfdrr.org/>
 - <https://mcr2030.undrr.org/disaster-resilience-scorecard>

2a. Resilience Scorecard Core Questions

#	Action
1	Established an economic resilience committee/task force
2	Drafted a resilience action plan specifically for Economic Development, including resilience of the ED Organization
3	Established a business emergency operations center and a business recovery center (either stand-alone or integrated)
4	Built an economic risk profile including identification and frequency of specific types of disasters and past impacts
5	Developed and share resilience best practices of key resident industries and/or targeted industries
6	Integrated economic resilience into other types of planning efforts (land use, economic development, redevelopment)
7	Integrated federal, state, and regional/local public sector emergency management and disaster recovery into planning
8	Ensured engagement of stakeholders including community organizations/nonprofits, workforce organizations, private infrastructure providers (85% is private), and regional EDOs
9	Developed a system for implementation and monitoring of the economic resilience strategy (#2 above)
10	Provided for Public Private Partnerships to increase the effectiveness of physical and systematic resilience

3. Identify Gaps in Economic Resilience

- Based on Results of the Resilience Scorecard, Identify Gaps
- Not an “all or nothing”, a task force may be dormant or incomplete
- Again, Economic Resilience Involves Many Factors
- A useful tool can be looking at a framework based on “Community Capital” that includes built and financial capital, plus political, social, human, cultural, and natural capital.
- Vulnerabilities in any of these forms can lead to impacts on the others
- Once gaps are identified, prioritize them according to the resilience scorecard



4. Gain Knowledge

- Information on disaster resilience is everywhere—almost too much
- The resource guide accompanying this workshop can help
- Courses and webinars—leading organizations for good information
 - FEMA: New BRIC Initiative, which allocated an additional \$2.5 billion in the Hazard Mitigation Grant Program: <https://www.fema.gov/grants/mitigation/2021-building-resilient-infrastructure-and-communities-and-flood-mitigation-assistance-programs>
 - National Hazard Mitigation Association: <http://nhma.info/>
 - World Bank: <https://olc.worldbank.org/content/resilience-and-disaster-risk-management-learning-lab>
- Peer networking—TEDC, SEDC, and IEDC—best sources are from those who have recovered

5. Secure Resources (Funding)

- The Center for Disaster Philanthropy provides information on foundation grants for resilience: <https://disasterphilanthropy.org/>
- Grantstation.com: Subscription database-Major Foundations that have disaster recovery and resilience as a core area of interest:
Doris Duke Charitable Foundation
Ford Foundation
W.K. Kellogg Foundation
John D. & Catherine T. MacArthur Foundation,
Andrew W. Mellon Foundation
- The resource spreadsheet in your guide has information on over – sources of funding complete with contact information
- COVID19 and Infrastructure Funding: <https://www.grants.gov/>

6. Take Action!

- Once resilience gaps are identified and information and resources for filling them is secured, task force members with specific interest in, and/or responsibility for, specific areas should take responsibility
- The old “who, what, where, when, how” mantra is the best formula:
 - WHO will do WHAT by WHEN
 - WHAT resources/funds are needed
 - WHERE will those resources come from
 - WHEN can the action be completed
 - HOW will we measure success
- This should form an action agenda (NO PLANS!) that is a living document, to be updated as changes occur

Example 1: Programmatic PPP to Integrate Resilience into the Transportation System

- After significant disruption to all transportation systems in 2016 Louisiana floods, recovery forming a PPP to integrate resilience into current & planned transportation infrastructure
- Public: State & Federal Transportation, Economic, & Community Development Depts, FEMA, State Homeland Security, Public Universities
- Private: Port, Road Transportation, and related Associations, Industry Associations, Private Universities, State and National Foundations
- Co-funded analysis of existing and planned transportation assets, recommended policy changes to enhance resilient infrastructure
- Can facilitate horizontal (B to B, interagency) and vertical (business to government) connections and joint actions using PfPPP principles

Example 2: PPP to Construct and Operate a Super-Resilient Emergency Care Facility

- New Orleans Iconic Art-Deco “Big Charity” Public Hospital, a Massive 1.2mm sq. ft. public hospital- - flooded, condemned
- Federal and State governments could not afford the added investment needed to produce resilient facilities, specifically a new super-resilient emergency facility
- Of the 1,170 deaths from Katrina, estimated **520** were in acute medical care prior to the storm
- Construction of new, 450-bed facility with extremely resilient emergency care facility-\$1.1 b
- Non-profit health foundation partnered in building, operation

Source	Funding	Operation
Federal	\$642m	Public Health
State	\$279m	State University Medical School
Private	\$143m	Management

The Rest of Our Time Today

- From strategic to tactical—Determining where your community is and specific steps to move it forward
- Using the resource guide and regional profile, introduction to the resilience scorecard
- Applied resilience: Case study (Exes, Texas)
- Working lunch to develop case study response
- Presentations and awards, final discussion
- Adjourn, but not Adios—We will be an ongoing resource



Core Actions Needed to Implement Economic Resilience Resilience and Recovery Workshop-“Don’t Mess With Texas

Action Agenda Items

1. Form an Economic Resilience Task Force with broad representation
2. Engage the business community
3. Review past incidents to identify points of failure and areas of strength
4. Map critical infrastructure and systems
5. Perform self-assessment (scorecard)
6. Build capacity and secure resources
7. Inform and build community support
8. Draft a specific agenda for action
9. Measure progress--celebrate success and adjust as needed



1. Form an Economic Resilience Task Force

Dr. Peter Williams—”Cities and Communities are ‘Systems of Systems’ of interacting physical, infrastructural, economic, and social systems. Each system may have a different owner and management chain, yet each must interact with the others to minimize risks from hurricanes, floods, tornadoes, wildfires, and the like, as well as from pandemics.”

--The task force should include:

1. Government: Planning, Finance, Health, Education, Emergency Management, Transportation, Water/Sanitation--local, state, & federal
2. Private Sector: Private Infrastructure (85%), Industry, SMEs, Banks, Insurers, Media, Chamber of Commerce and Tourist Bureaus
3. Non-profit/Community Orgs: Neighborhood associations, churches, charities, special interest groups

2. Engage the Business Community

- Once the Task Force is formed, engage businesses together with public sector and nonprofit organizations to address specific areas of resilience:
 - Infrastructure readiness/resilience--robust, rapid recovery, adaptable)
 - Resilience (continuity) planning—nationally, less than 30% have them
 - Employee resilience-Economic resilience is dependent on individual & community resilience—must educate workers on being prepared
 - Reduce interruption—redundant supply chains & transportation
 - Encourage small businesses to collaborate on space, materials, etc.
- Question: Have your businesses expressed interest/concern in any of the areas outlined above? Any areas NOT outlined above?

3. Review Past Plans and Disaster Outcomes

1. Existing economic development strategies
 - How have disasters impacted them?
 2. Community and/or comprehensive plans
 - Do they provide for disaster resilience?
 3. Local, County, Regional (COG) and State Emergency Response Plans
 - Is response to businesses included?
 4. Local, County, Regional and State Hazard Mitigation Plans
 - Do they factor reducing economic loss?
- How do these plans impact economic resilience, and vice versa?



4. Map Critical Infrastructure and Systems

Knowing where power, water/wastewater, transportation, broadband and related systems are, and where vulnerabilities may lie, is critical

--Most effective strategy: Form a critical infrastructure council

- Public sector—water/wastewater, roads, public utilities, ports/airports
- Private sector—private utilities, broadband, rail, trucking, shipping, logistics-supply chains
- Business and Economic Development organizations --Local, Regional, State, Federal



5. Perform Self-Assessment

- Looking at resilience through an economic development lens:
 - How prepared is the community/region to help businesses recover?
 - What programs are in place to help them cope with specific hazards?
 - Are investments (funding, effort) being made to reduce hazard risks?
 - Are after-hazard efforts (re-entry, workforce, contracting) in place?
 - How about the Local Government and your EDO—do they have a plan?
- These questions, and more, are included in the draft Resilience Scorecard-online
- Draft includes initial 10 questions, provides rating and virtual assistance
- Working with TEDC on enabling offering the entire scorecard and comprehensive educational system



6. Build Capacity and Funding

- Based on the Self-Assessment, and including reviews of plans and prior outcomes plus mapping critical infrastructure, gaps can be identified
 - Programmatic gaps can be addressed by the task force
 - Funding/investment gaps will need further time and effort
- Funding is available as never before—Councils of Government are a good source of information and assistance, TEDC/ISRC will also assist
- Building capacity for resilience should occur as a result of implementing resilience-building actions



7. Inform and Build Community Support

- As the process gets underway, begin informing the community of the reasons economic resilience is needed—a familiar message!
 - Helps resident businesses--their employers and providers—stay afloat
 - Businesses can continue to provide tax revenue for essential services
 - Enhances the community's ability to attract new investment and jobs
 - In other words, the same message, presented in a specific content!
- For many of the same reasons, solicit support from elected officials
 - Understanding that investing in resilience provides economic return
 - Partnering with the private sector to aid the entire community/county



8. Draft a specific agenda for action

--Based on Analysis, Mapping, Assessment, and Capacity, 5 W's and H



9. Measure and Adapt as Needed

- There are many good project management software programs to manage and measure results from the action agenda
- Implementing one and using it to chart progress is critical to effectiveness of the resilience effort
- Practicing resilience—adapt to changing circumstances—the agenda is a living document and should be online for consistent review and adjustment with agreement of stakeholders
- People-first public private partnerships that value transparency, equity, stakeholder involvement, are fit for purpose, sustainable, and resilient can be a powerful tool to implement the action agenda
 - Following are two examples of PfPPP for resilience



Summary

- Following these steps is not a “magic bullet”, but can provide a real return on investment of time and resources through loss reduction
 - Based on historical data, average return on resilience investment = 4:1
- Next, we will dig into the tools included in your resource guide
- Then, we will apply these actions and tools to a reality-based case study
- The ISRC team is available 24/7 to answer questions and provide info



Don't be a “Firehead”,
take action now!!



TEDC “Don’t Mess With Texas” Resilience Workshop

Exes, Texas Case Study

Exes, Texas (apologies for the reference) is a mid-sized community with a population of 50,000. Though located over 100 miles from the Gulf Coast, it was ravaged by the remnants of Hurricane Ike in 2008 and suffered flooding from Hurricane Harvey in 2017. In addition, Exes suffered extensive damage from a EF 4 tornado in 2019, which although spared downtown, devastated its primary business park, causing several manufacturers to stop production for over three weeks, causing significant business interruption costs.

Now, a giant technology company is searching for a new location for its app developers. As Exes is home to a small but highly ranked university specializing in engineering and science, it has generated significant interest as a potential location. The facility would have 300,000 sq ft and generate 1,200 jobs with an average salary of \$80,000/yr. Obviously, this is a desirable prospect, and Exes has developed a complete package, including an ideal site, tax abatements, and both degree and non-degree workforce training programs.

The company has its own site location/asset management executives, who have been talking with the Exes Economic Development Council on various issues related to the community. In one conversation, the site executive threw a bit of a curve ball when he asked about Exes’ economic resilience efforts. Though the county emergency management agency had a disaster response plan, Exes had no concerted effort toward economic resilience.

Exes’ EDC Executive Director responded that the EDC was finalizing an economic resilience strategy and promised to provide it within the next three days. Of course, the Executive Director was being, well, an economic developer! So, the Executive Director approached you and begged you to assemble a team and develop a resilience strategy. Luckily, you just completed a TEDC workshop on economic resilience and had a resource guide to help with this daunting task.

The site location executive will be back in Exes, so the Executive Director asked you and your team to prepare and deliver a 5-minute presentation on its’ economic resilience strategy to the executive. Directions for this exercise are simple: break into groups, and develop resilience presentations, beginning now and working through lunch. Please keep the following in mind:

--The executive is aware of the weather-related incidents that befell Exes, and the damage to the industrial park.

--The proposed facility will be highly dependent on reliable power and a robust broadband infrastructure.

--Not only the facility, but also the workforce, are critical to avoid significant interruption costs.

The winning team will receive an original New Orleans treat compliments of the Texas Cajun.

Economic Resilience Guide for Texas Communities and Regions

Prepared for the Texas Economic Development Council

By the International Sustainable Resilience Center, Inc.

Introduction

According to the Federal Emergency Management Agency, “Resilience is the capacity of individuals, communities, businesses, institutions, and governments to adapt to changing conditions and to prepare for, withstand, and rapidly recover from disruptions to everyday life, such as hazard events. Texas understands disruptions to everyday life more than most any location in the world, as a frequent victim of hurricanes, tornadoes, both drought and floods and the COVID-19 pandemic. Stakeholders recognize the need for more—more rapid response, more effort in recovery, and more hazard mitigation. To achieve more in all three categories of resilience, a bold action agenda is critical. Taking resilience into their own hands will allow communities and regions to control their own destiny regarding adverse events. Increasing resilience will rely on the following goals and action agendas. The following steps should be taken by communities, EDOs, and regions in Texas to increase economic resilience:

A. Establish a Resilience Task Force and Create Action Plan with Four Components

The first step in increasing resilience is to establish a regional economic resilience task force to guide the resilience-enhancing process. The task force should include representatives from each community, Texas and Federal government agencies, regional and local third sector nonprofits (NGOs), economic development organizations (EDOs), Communities and Local/Regional leadership, and industry representatives. The task force will serve as a central point of action, working with governments, municipalities, EDOs, NGOs, and industry to fund and implement resilience-enhancing actions. The resilience task force should be organized and begin working no later than December 31, 2021.

1. Draft a regional economic resilience action plan, including resilience of Communities and Local/Regional EEOs

Immediately on formation of the Task Force should begin development of a regional economic resilience action plan. The plan should focus on whole community resilience, with emphasis on helping businesses and institutions develop and implement continuity of operations plans and ensuring that essential services can be provided in the wake of a disaster. The Task Force may also consider contracting with subject matter expertise for development and implementation to ensure the plan is successful. The action plan should be a living document, able to change as circumstances merit. National and International best practices in resilience planning are readily available for guidance in drafting the plan. An implementation tracking system for action plan should be developed and administered by a cloud-based program such as Microsoft Teams. The action plan should be completed by June 30, 2022

2. Establish a regional BEOC, alone or within existing emergency management (EM) centers.

Regional Business Emergency Operations Centers (BEOCs) are gaining in popularity nationwide. While the primary function of BEOCs is emergency communications, many also provide ongoing information on response, recovery, and ongoing resilience for businesses in the region. Critical to BEOCs is the relationship with local emergency management offices, and some BEOCs are co-located at EM offices. The Resilience Task Force should explore these options, work to secure both initial and ongoing operational funding, and work with local EM officials to successfully implement regional BEOCs.

3. Create and curate a resilience information section on the EDO/Community website

Information and resources for Communities and Local/Regional EDOs, including direction on how to integrate resilience into other local and regional resilience efforts, such as land use, economic development and redevelopment planning, should be placed on the Community and/or EDO website under "Community and Local/Regional Resilience Resources". Highlighting this resource can help ensure engagement of community stakeholders including community organizations, nonprofits, workforce organizations, and private infrastructure providers such as broadband, cellular, and other owner/operators--nationally, 85% of infrastructure is private.

4. Utilize FEMA's BCA tool and PPPs to leverage resilience investments.

FEMA's Benefit Cost Analysis (BCA) tool is designed document benefits of resilience investments and to apply for Hazard Mitigation Grant Program funding. Using the BCA, organizations can also develop public private partnerships, both hard (built environment) and soft (programmatic) ones. It can also be used as justification for providing incentives for business and industry to invest the time and effort necessary to develop continuity plans, and to justify dedication of resources to protect and restore essential services such as power, water, and telecom infrastructure. The task force should provide training to key staff in how to operate the BCA (a comprehensive, nine-part course including presentations and workbooks is available free from FEMA), and work with local governments and regional Councils of Government (COGs) to explore PPPs as a viable way to leverage infrastructure investments.

B. Initiate Initiatives to Enhance Small Business Resilience and Recovery

Small businesses are especially vulnerable to disasters. Unlike large companies, they generally do not have reserve capital to withstand damage and/or interruption, and less than 30% have business continuity (resilience) plans, the following should be implemented:

1. Develop emergency funding sources for small businesses.

FEMA states a sad statistic--after major disasters, 40% of businesses never reopen. One of the keys is funding to survive and reopen until federally backed funding (SBA Disaster Loans, CDBG-Disaster Recovery Business Loans) arrives. The most successful of these emergency funds have been originated by the third sector, who agreed in advance that when disaster strikes, they will immediately put funding in place for small (\$10,000-\$20,000) survival loans to keep businesses from closing forever. Using a triage system developed after 9-11, businesses that have been damaged but can still survive with help will be prioritized from those that unfortunately cannot be saved or those that can survive for the time being.

2. Provide information on types and importance of insurance protection by type of hazard.

Many small business owners are unaware of specific insurance that is both affordable and critical to their survival after disaster. These include business interruption policies, the National Flood Insurance Program (NFIP), and Insurance-Linked Securities such as Catastrophe Bonds. These disaster-specific insurance products may be the difference between survival and failure for many businesses.

3. Implement education and awareness initiatives for small businesses

Often, small businesses are unaware of many response and recovery operations/ resources. Often businesses are simply unaware of resources available for them in recovery. SBA disaster loans, CDBG-DR loan programs, Small Business Development Center advice and counseling, and aid to communities through Public Assistance to repair public infrastructure damage may help

businesses in recovery, but only if businesses know how to access them. Providing information (pre-recorded videos, guidebooks, etc.) can make a difference as businesses struggle to recover.

4. Develop assistance for local businesses in securing response and recovery contracting Often, local businesses who are struggling due to damage and/or interruption may miss the chance to obtain contracts and/or sell goods to recovery operations. This business may make the difference between survival and failure, but not without knowledge of potential opportunities flowing from recovery funding. A recovery contracting/sales opportunity portal should be implemented to ensure local businesses are aware of these opportunities.

5. Have ready-to-implement buy local awareness campaigns to help businesses in recovery

Often, disaster survivors are unsure or unaware of the status of businesses in their communities, and often go elsewhere to purchase (or increasingly, order goods and services online). A campaign to use local and social media to let the community know that businesses either escaped damage or are back up and running is critical to ensuring their customers do not go elsewhere. Preparing such a program for “plug and play” should be done as soon as possible.

6. Develop a program to assist small and informal businesses in proper record-keeping

To meet public recovery assistance requirements, small and/or informal businesses such as fishermen or roadside food vendors, plus many others must keep records in a format that is required for aid from FEMA and other federal agencies. An outreach program with simple tools to help businesses keep better records could yield positive results for small and/or informal businesses.

7. Create resilience hubs and develop resilience networks for small business

Communities and Local/Regional EDOs should apply to establish resilience hubs. Resilience hubs provide training before disasters and can serve as a shelter and source of information after disasters. In addition, small business resilience networks have shown to increase collaboration and cooperation in bringing them together to help each other in disaster, including sharing space, working together to keep local businesses, and in some cases even joint production. Both these initiatives can increase small business survival.

8. Work with local and state agencies to streamline zoning/permitting after disasters

To hasten small business recovery, communities affected by disaster, such as Branson Missouri that was devastated by a tornado in 2012, worked to temporarily ease restrictions on zoning and permitting. They gave small businesses a 60-day moratorium on having to meet some regulations (such as required parking spots) so they could resume operations quickly.

C. Develop relationships between Communities and Local/Regional EDOs and critical infrastructure owners/operators/supply chains

Critical infrastructure is defined by FEMA as those assets, systems, networks, and functions so vital to the United States that their incapacitation or destruction would have a debilitating impact on security, national economic security, public health or safety, or any combination of those matters. Owners and operators such as municipalities, EDOs, and public and private interests (nationally, 85% of all types of infrastructure is privately owned) are essential to economic resilience. Of particular concern is that debilitation of critical infrastructure will interrupt business supply chains, affecting both suppliers and end users. Communities and Local/Regional EDOs should work with organizations to ensure local businesses maintain access to supply chains through pre-incident contingency planning. Businesses, whether large or small, manufacturing or retail, rely on supplies of products and/or materials to continue operations.

Supply chain resilience has become a critical component of overall resilience, as amplified by the COVID19 pandemic. To support this effort, Communities and Local/Regional EDOs should provide a toolkit of resources to enable businesses to implement contingency plans for supply chain interruption.

D. In EDO strategy, include diversification via key industry clusters to enhance economic resilience

Economic resilience includes economic diversification, whether against natural disasters, man-made incidents, or most recently pandemics. COVID19 decimated economies very dependent on travel and tourism, while economies that included information technology, logistics and distribution, and production of essential goods often grew even in the worst of the pandemic. The following six steps can help diversify while accounting for vulnerabilities of the resident industry mix:

- 1. Identify specific vulnerabilities in key resident and targeted prospective industries, take action to mitigate those risks.**
- 2. Provide information on most likely hazards, and specific efforts underway to mitigate them, to EDOs in the region so they can in turn inform both existing industry clusters and prospects.**
- 3. Charted industry interdependencies and opportunities to enhance resilience via industry/government partnerships.**
- 4. Actively promote ongoing research, innovation, and actions to strengthen resilience, and recruit and/or grow a base of companies in the disaster recovery and resilience industries to both provide services quickly and diversify the economic base.**
- 5. Have a mechanism to provide live, updatable resource guides for industry clusters prior to and after incidents.**
- 6. Include training/information in individual resilience and strategies (transportation, childcare) so employees in industry clusters can better withstand incidents and return to work more quickly.**

E. Pandemics

As of the completion of this guide, the global COVID19 pandemic is not yet under control. Pandemics are particularly difficult to address, and the current affliction has forever changed both business and personal behavior. There are, however, actions that can be taken to mitigate some of the risks for this and future pandemics, as outlined in the following 3 steps.

- 1. Work with local/state government developed a detailed response effort to help adapt businesses and citizens to changes brought about by pandemics, including social distancing, digital business models, and similar measures.**
- 2. Create a contingency plan for infrastructure adaptation such as expanding healthcare and education facilities, caused by pandemics, using a combination of grants and public private partnerships.**
- 3. Have pre-registration programs for businesses, individuals and community organizations in advance of major disasters and pandemics so that they may return immediately after areas are declared safe.**

F. Cyber Security

Increasingly, cyber-related incidents are plaguing both industry and government. Recent high-profile attacks on the U.S. government and tech giants like IBM have dominated the headlines, but small-to-medium sized businesses, and even self-employed and gig workers have been subject to information theft and ransomware. Consensus by several organizations in the field is that in 2021 Cyber-attacks will inflict damages totaling \$6 Trillion nationally, and over \$10 Trillion globally. To increase resilience of the regional economy to these incidents, Communities and Local/Regional EDOs should implement the following three actions to enhance Cyber Security resilience.

- 1. Serve as convener and coordinator of collaborative measures for critical cyber resilience**

Working with owners/operators of critical infrastructure and public services such as power and water, implement resilience measures such as joint purchases of cyber protection systems, communications between owners/operators on cyber incidents, and joint recovery operations in partnership with local and Texas government emergency management agencies.

2. Provide training and assistance programs for business to create their own cyber-security plans

Numerous training programs, including FEMA's Emergency Management Institute, offer courses in Cyber Security are available for business and industry of all sizes. FEMA's EMI cyber training is here: (<https://training.fema.gov/is/courseoverview.aspx?code=IS-523>) Businesses, plus local government and nonprofit organizations can all receive training in how to develop and implement cyber security plans. Communities and Local/Regional EDOs can provide messaging on these resources and assist organizations in obtaining them.

3. Develop options for alternative sources of critical infrastructure

Cyberattacks on infrastructure systems can create severe and long-lasting disruption. New technologies, such as water purification treatments, satellite-provided cell and broadband connections, and solar powered long-lasting battery power backup, can help businesses, government, and community organizations to survive and reopen.

G. Natural (Blue and Green) Resilience Infrastructure

Valuing natural infrastructure such as coral reefs and mountainside trees increases resilience. New recognition of the contribution of these assets to protect the built environment, and their value to sustainable development such as ecotourism and carbon credits is becoming fully recognized. As Texas is rich in natural infrastructure, Communities and Local/Regional EDOs should support an effort to value and sustainably develop it. This initiative would focus on blue infrastructure, including coastal and ocean, and green infrastructure inland, while integrating federal and philanthropic grants, facilitating establishment of value through parametric insurance, and leveraging that value for both preservation and resilience, based on reduction of risk to public and private built environment.

H. Terrorism, Geopolitical, and Industrial Incidents

Adverse incidents are not at all limited to natural disasters and pandemics. Ask the people of Oklahoma City and New York, both of which were severely impacted by terrorism. Or Baltimore Maryland, Minneapolis Minnesota, and other communities that are impacted by geopolitical unrest. Or states on the Gulf Coast impacted by the BP oil spill, and of course the town of West, that were all decimated by industrial incidents. Finally, disruptive technology can have severe negative impacts, ask travel agencies who have been severely impacted by online travel sites. To ensure elements of resilience are addressed for these incidents, Communities and EDOs can lead and/or support the following efforts.

- 1. Work with emergency management agencies to create a contingency plan for businesses in case of terrorist attacks.**
- 2. Have a plan to provide supplies of water in case of severe drought or terrorist-related water contamination.**
- 3. Create a program to incentivize/assist businesses to create a continuity plan specifically for terrorist attacks.**
- 4. Develop an economic response and recovery strategy for industrial incidents such as oil spills, explosions, etcetera.**
- 5. Create an initiative to help businesses respond to global geopolitical incidents such as conflicts over trade, external or internal conflict, and civil unrest.**
- 6. Create strategies for business adaptation to disruptive technology (energy sources, digitization, AI, robotics, etcetera).**

I. Develop a public relations response plan for incidents of any type

A critical, but often overlooked resilience initiative is to develop a public relations plan to enable united, solid response in case of local and/or widespread press coverage. Clear, consistent messaging should be developed and agreed to by all six municipalities, designed to inform and reassure businesses and citizens, in the community while providing a clear, consistent message of resilience to the outside world. Communities and/or EDOs should work with stakeholders to develop a PR response plan that can be activated .

By following these steps and implementing these strategies, Texas communities and regions can better withstand, and more quickly recover from, adverse events of all types.



User Guide

The Resilience Analysis and Planning Tool (RAPT) is a geographic information systems (GIS) tool to help emergency managers and community partners at all GIS skill levels to visualize and assess potential challenges to community resilience.

This **User Guide** provides in-depth information on RAPT functionality and step-by-step instructions on how to use all the features.

The link to RAPT as well as video tutorials are available at <https://www.fema.gov/RAPT>

DATA OVERVIEW

RAPT includes multiple data layers:

- **Infrastructure** information drawn from the Homeland Infrastructure Foundation-Level Data (HIFLD)¹ Subcommittee, such as fire station and hospital locations.
- **Hazards** such as real-time weather layers from the National Oceanic and Atmospheric Administration (NOAA), and historic tornado/hurricane tracks.
- **Risk information** from the [National Risk Index](#) on the estimated annualized frequency of 15 natural hazards, including coastal flooding, drought, earthquake and wildfire.
- The 20 **Community Resilience Indicators** identified in the [Community Resilience Indicator Analysis: County-Level Analysis of Commonly Used Indicators from Peer-Reviewed Research: 2020 Updates \(CRIA\)](#) conducted by FEMA and Argonne National Laboratory. All 20 indicators include county data; 12 also include census tract data. Tribal census data is also included in RAPT.

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¹ The HIFLD Open data portal contains national foundation-level geospatial critical infrastructure data in the public domain. You can access HIFLD Open at <https://hifld-geoplatform.opendata.arcgis.com/>.

GETTING STARTED

Accept the User Agreement

The initial splash page shows a user agreement on a map of the continental United States. Accept the user agreement each time to gain access to RAPT.

Left Side Display Page

When RAPT opens, the left side of the screen will be a display page with a description of RAPT and links to the following resources:



- **RAPT StoryMap** – A storymap introduction to RAPT.
- [RAPT User Guide](#) – A user guide providing detailed information on all elements of RAPT.
- [RAPT Data Layers and Sources](#) – A complete list the data layers and their sources of information. Click on and off data layers to explore potential challenges to resilience and community resources.
- [How-To Videos](#) – Videos highlighting various functions of RAPT.
- [Community Resilience Indicator Research Summary](#) – Detailed information on each community resilience indicator, including its connection to resilience, data source, national average, and binning method.
- [CRIA Correlation Analysis](#) – Describes how individual community resilience indicators may be related to each other. Communities can design resilience strategies that take these relationships into account.

You can close this left side display page by clicking on the arrow tab at the middle of the page.

NAVIGATING THE MAP

You can move around the map and explore areas of interest. The initial view shows the continental United States, but you can move to other areas, such as Hawaii, Alaska, or Puerto Rico. Navigate with the following:



- **Location:** Type the name of a specific county, city, or state in the search bar.
- **Zoom:** Click the +/- boxes at the top left of the map to zoom in or out on a map location.
- **Home:** Use the home button to bring the map back to the initial view.
- **My Location:** Use the circular button below home to center the map on your current location.
- **Mouse:** Use your mouse to move the whole map or click on a specific county.

At the Top: Navigation Bar Icons

These icons are along a top navigation bar. Depending on your browser and your webpage's zoom level, some of the icons may be hidden – in that case, you will see a “More” icon to reveal the additional icons.

Click the “More” icon if your browser hides some icons





Frequently Asked Questions

Provides answers to frequently asked questions about RAPT, including information on the data sources, functionality and uses of RAPT.



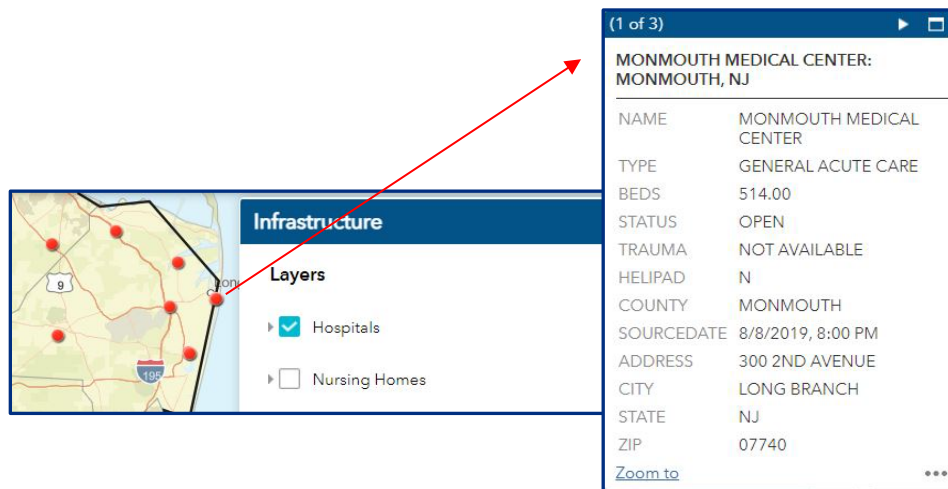
Legend

Helps you keep track of all the layers (hazard, infrastructure, county and census tract indicators) you have open.



Infrastructure

Shows community infrastructure points available through the Homeland Infrastructure Foundation-Level Data (HIFLD) Open Source page. A video tutorial of infrastructure layers can be found [here](#).



- Click on the name of the infrastructure layer to see how that data will appear on the map (the shape and color of the datapoint).
- Click on the box next to the infrastructure layer and the datapoints will appear on the map.
- Click on a datapoint and a pop-up box will appear with the information HIFLD has available.
- Click the “x” in the top right of the pop-up box to close it.



Hazards

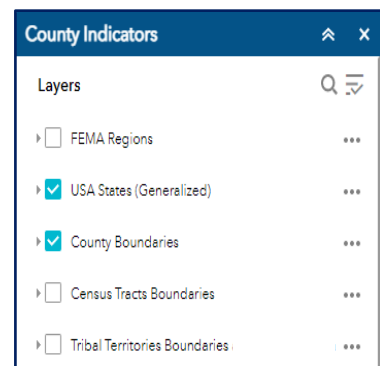
Shows GIS layers of flood hazard zones, historical hazard data for tornadoes and hurricane tracks; risk estimates from the National Risk Index for 15 natural hazards, including coastal flooding and earthquake; and real-time radar and watch and warning notifications from the National Weather Service, including severe weather, excessive rainfall and river flood outlooks. A video tutorial of hazard layers can be found [here](#).

- NOTE: Because the dataset is so large, FEMA’s National Flood Hazard Layer will only populate on the map when the area shown on the screen corresponds to an altitude of 10,000 feet or lower. Zoom in on the map to activate. When the layer name turns black, the data is available. Flood maps are not available for all counties.



County Indicators

Click on the County Indicators icon to see the list of all the layers available with county-level data. The top of the list shows a set of layers for different geographic boundaries: FEMA Regions, USA States, County Boundaries, Census Tract Boundaries, and Tribal Territory Boundaries. State and county boundaries are turned on by default.

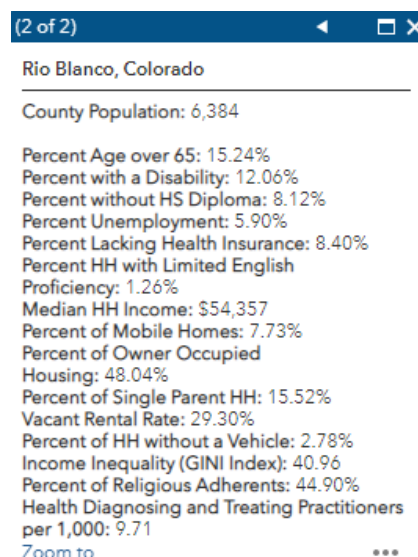


CRIA Indicators

Population-Focused Indicators	Community-Focused Indicators
CRIA Commonly Used Indicators	CRIA Commonly Used Indicators
% Population without Health Insurance ^{a,b}	Connection to Civic/Social Organizations
% Population Unemployed ^{a,b}	Hospital Capacity
% Population without a High School Education ^{a,b}	Medical Professional Capacity
% Population with a Disability ^{a,b}	Affiliation with a Religion
% Population without Access to a Vehicle ^{a,b}	Presence of Mobile Homes ^{a,b}
% Population with Home Ownership ^{a,b}	Public School Capacity
% Population over 65 ^{a,b}	Population Change
% Population Single-Parent Households ^{a,b}	Hotel/Motel Capacity
% Population with Limited English Proficiency ^{a,b}	Rental Property Capacity ^{a,b}
Median Household Income ^{a,b}	
Gini Index: Income Inequality	
CRIA Aggregate Resilience Indicator ^c	

The next set of layers are the county data for the CRIA Aggregate Resilience Indicator, all 20 individual community resilience indicator layers identified in the CRIA, and additional indicators not included in CRIA. (NOTE: 12 of the CRIA indicators are available for census tracts and 13 are available for tribal territories under those tabs). A video tutorial of community resilience indicator layers can be found [here](#).

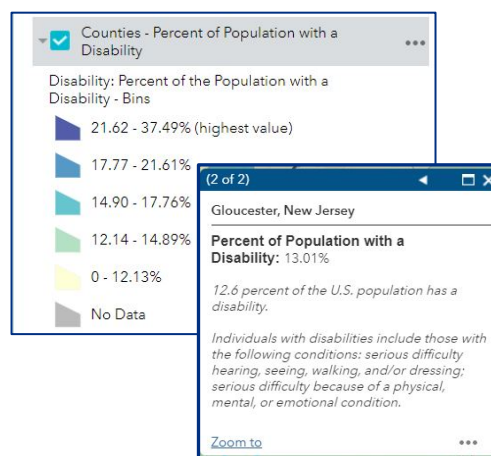
When the County, Census Tract, or Tribal Territory Boundaries layer is turned on, the list of available CRIA Indicators will be displayed as a pop-up box when you click a location on the map. Scroll down inside the pop-up box to see the full list. (For Counties, the CRIA Aggregate Resilience Indicator will be included at the bottom of the list.)



NOTE: The “County Boundaries” and “Census Tracts Boundaries” layers MUST be toggled on for some tools (e.g. Population Count, Query Tool) to function correctly.

You can display the County Indicators data by color-coded bins when you toggle on a specific indicator layer.

- Click on the title of the desired layer, and a legend will appear below the layer name. The county indicators are organized into five bins, with the darker colors indicating potential greater challenges to resilience.
- NOTE: The data ranges for each color bin is different for each indicator. Refer to the legend for each indicator to see the data ranges for each bin/color. Review the [Community Resilience Indicator Research Summary](#) for more information on the binning methodology.
- Toggle indicator layers on, and the bins will populate the map.
- Click on a county on the map for a pop-up box of that county’s data and the national average for that indicator.
- If multiple indicator layers are toggled on, the map will only display the colored bins for the indicator that is highest on the drop-down list. The pop-up box will, however, include the county datapoints and the national average for all data layers that are turned on.



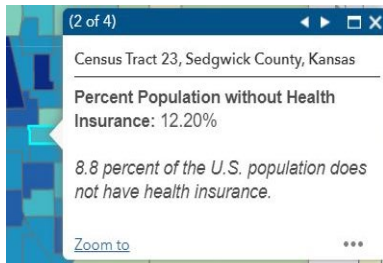


Census Tract Indicators

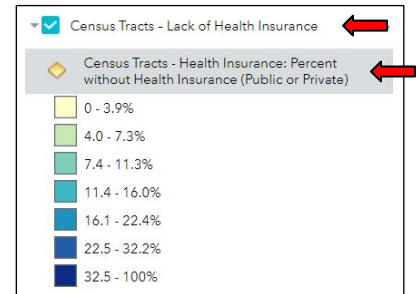
Click on the Census Tract Indicators icon to see the list of all the layers available with census tract data. The top of the list shows a set of layers for different geographic boundaries: FEMA Regions, USA States, County Boundaries, Census Tract Boundaries, and Tribal Territory Boundaries. State and county boundaries are turned on by default. When the County, Census Tract, or Tribal Territory Boundaries layer is turned on, the list of available CRIA Indicators will be displayed as a pop-up box.

There are 12 CRIA community resilience indicators available with census tract data.

- To view the legend and data bins for each census tract layer, click the name of the indicator, **and then also** click on the detailed name of the indicator. Darker colors denote greater challenges to resilience. Census tract data is grouped into 7 bins to allow greater differentiation across this much larger dataset.



- Click on a census tract on the map for a pop-up box with information on the selected indicator data.
- If multiple layers are toggled on, the map will only display the colored bins for the indicator that is highest on the drop-down list. The pop-up box will, however, include the census tract datapoints for all data layers that are turned on.

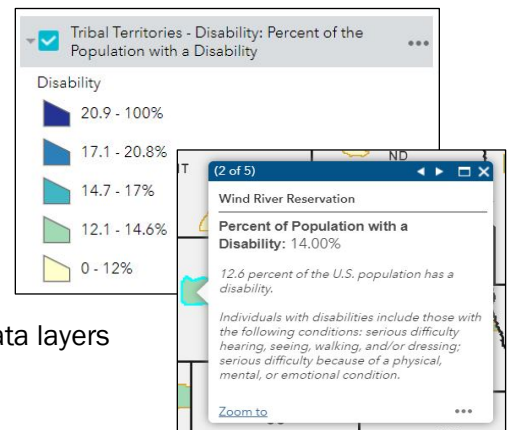


Tribal Territories Indicators

Click on the Tribal Territories Indicators icon to see the list of all the layers available with tribal census data. The top of the list shows a set of layers for different geographic boundaries: FEMA Regions, USA States, County Boundaries, Census Tract Boundaries, and Tribal Territory Boundaries. State and county boundaries are turned on by default. When the County, Census Tract, or Tribal Territory Boundaries layer is turned on, the list of available CRIA Indicators will be displayed as a pop-up box.

There are 13 CRIA community resilience indicators available with tribal census data.

- Similar to the County Indicators tab, click the name of the indicator to see the legend showing its data bins. Darker colors denote greater challenges to resilience. Tribal territory data is grouped into 5 bins.
- Click on a tribal area on the map for a pop-up box with information on the selected indicator data.
- If multiple layers are toggled on, the map will only display the colored bins for the indicator that is highest on the drop-down list. The pop-up box will, however, include the tribal datapoints for all data layers that are turned on.



Basemap Gallery

The Basemap Gallery allows you to change the display of the base map. The default map is the Streets Map; other options include satellite imagery, grey canvas, and terrain views. The street map view is

especially helpful to assess evacuation routes, and the terrain views are useful when looking at hazards such as flood or wildfire. A video tutorial for the basemap gallery can be found [here](#).

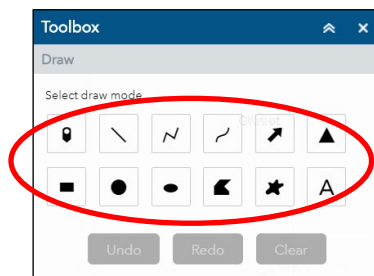
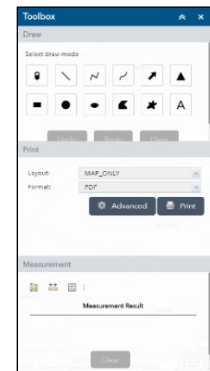


Toolbox

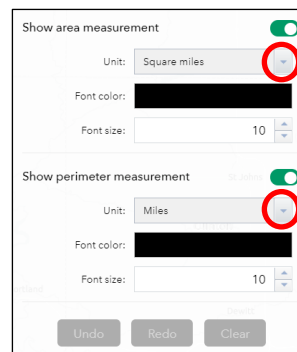
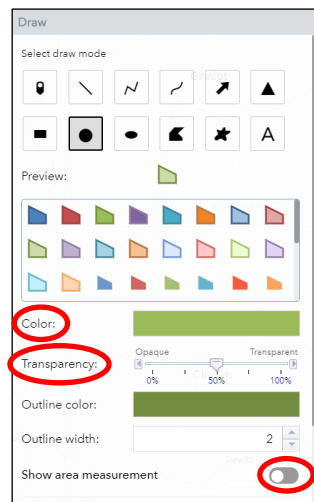
When you open the Toolbox icon, in the upper-right corner of the screen, you will see three tools to help visualize areas on the map: Draw, Print, and Measurement. A video tutorial for the toolbox can be found [here](#).

- **Draw:** The Draw tool lets you create graphics that display on the map (single points, lines, polygons, etc.). It can also display measurements for drawn features, such as length, area, and perimeter.

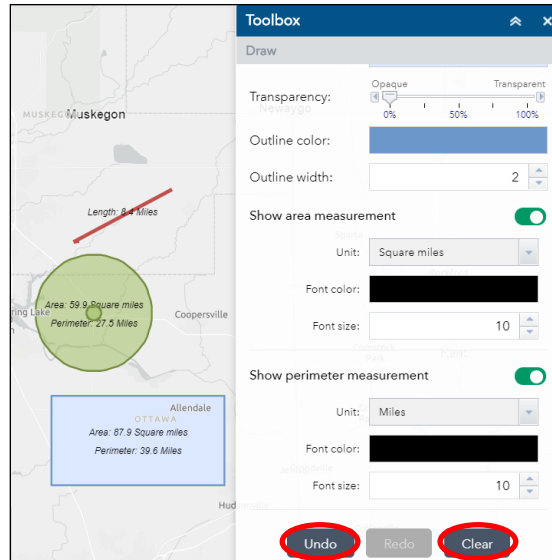
- To draw an object, select the shape of the object you wish to draw.



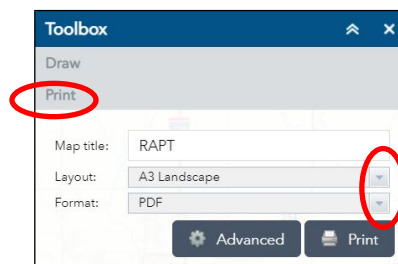
- Once you select the shape you want, formatting options will appear below that allow you to adjust the color and transparency of the figure and include measurements (depending on the type of image).
- Use the drop-down for “Show area/length measurement” to select the unit of measurement.
- Change the font size depending on preference.



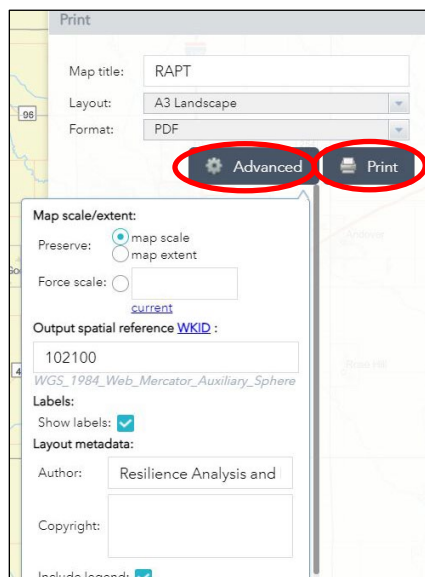
- After you select the shape and choose the formatting, move your cursor to the map. A pop-up box will appear with instructions on how to draw the shape.
- You can have multiple shapes on the map. To draw additional shapes after your first, go back to the Select Draw Mode, select your next shape and follow the previous steps.
- You can undo the most recent drawing and clear all drawings by clicking the “Undo” or “Clear” buttons at the bottom of the formatting box.



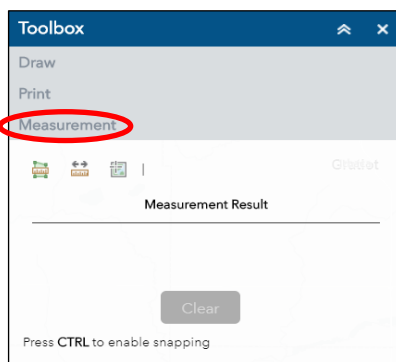
- NOTE: Drawings are not saved when you exit the application. They remain on the map until you click “Clear” or refresh your browser.
- **Print:** The Print function lets you save a PDF of the map on your screen.
 - NOTE: The PDF will only show the extent of the map that is visible on your display.
 - Click the “Print” bar in the Toolbox (the Print function may take some time to load) and select layout and format preferences from the drop-downs.



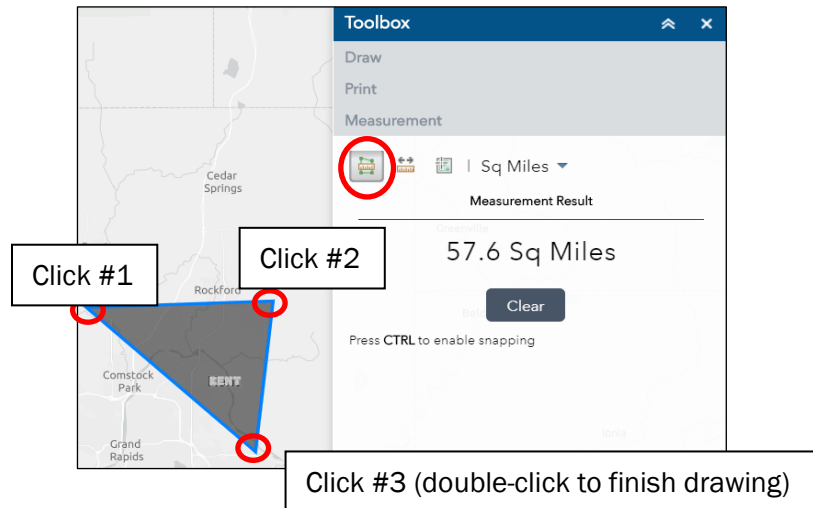
- Click the “Advanced” button to modify various aspects of your map, including labels, map size, and print quality.
 - In the Advanced Options, the “include attributes” box needs to remain toggled off for the map to print.
- Click “Print” and your map will save as a PDF.



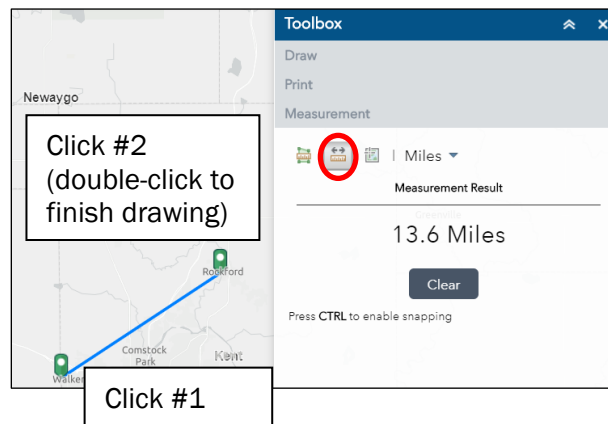
- **Measurement:** The Measurement tool lets you create polygonal shapes and straight lines while providing the square miles or distance as you draw your shapes. It can also provide latitude and longitude values for a specific point on the map.
 - NOTE: The Measurement tool differs from the Draw tool in that it allows you to see the area of a polygon or the length of a line you are drawing while you’re using the tool. This is useful for potentially determining the distance between events and infrastructure, geographical landmarks, or the affected radius of an event.
 - Click on the “Measurement” bar located below the “Print” option in the Toolbox.



- To draw a polygon and measure the area within the polygon, click the “Area” icon.
- Click on points on the map to determine the corners of your polygon.
- Double-click the final corner of your polygon and the shape and area will appear.



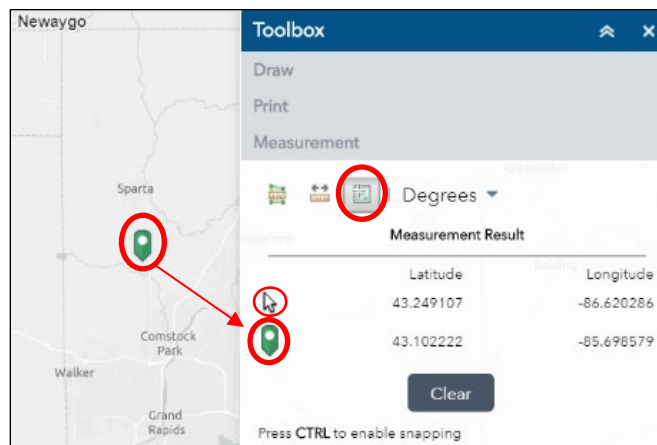
- To draw a line and measure the distance of the line as you draw, click on the “Distance” icon.
- Click a point on the map as the start point of your line. As you move your mouse from that point, the distance will display under the “Measurement Result” section.
- Double-click the final point of your line and the total distance will appear.



- To see the latitude and longitude values of a specific point on the map, click on the “Location” icon.
- Click the map at the desired location and the latitude and longitude values will display under “Measurement Result” section.

As you move your mouse, the latitude and longitude values for your mouse location will display next to the mouse icon.

- If you click on a new location in the map, the latitude and longitude values will change to display the new location.



Add Data

The Add Data tool allows you to add data to the map by searching for layers hosted on ArcGIS Online or on a Portal for ArcGIS, entering URLs to data sources, or uploading local files (appropriate data types include a zipped shapefile, KML, CSV, GPX, or GeoJSON). You can temporarily add layers to and remove layers from the map, but **these layers cannot be saved to the map** to be retained for future review.



Not all layers are available for free; some require a subscription to Esri. When scrolling down the available layers, click on the details link to the right to see if that layer requires a subscription (a shield will appear). If you would like to access to the subscriber data layers, please contact your organization's lead GIS analyst to obtain the requisite login information. You can also upload your own GIS layers by zipping a shapefile and dragging and dropping the zipped folder into the Add Data Tool.

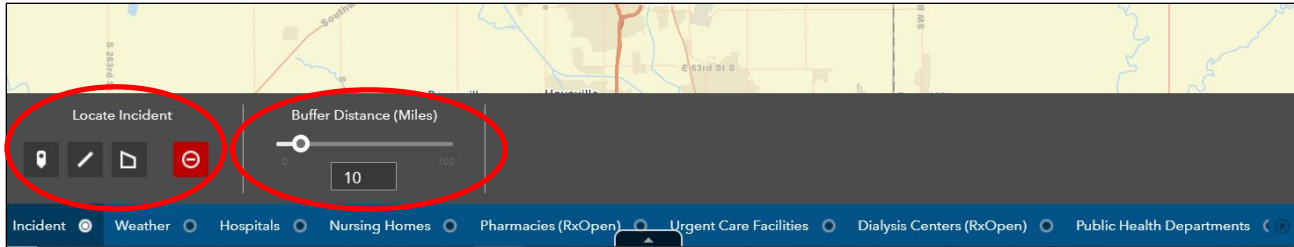
While you can upload additional layers for analysis, and you can print with a screenshot with these layers (see the print function in the Toolbox) **you will not be able to save these layers into RAPT**. Because RAPT is a publicly-available tool that does not require a username or password, local layers cannot be permanently saved or embedded. A video tutorial for the add data tool can be found [here](#).



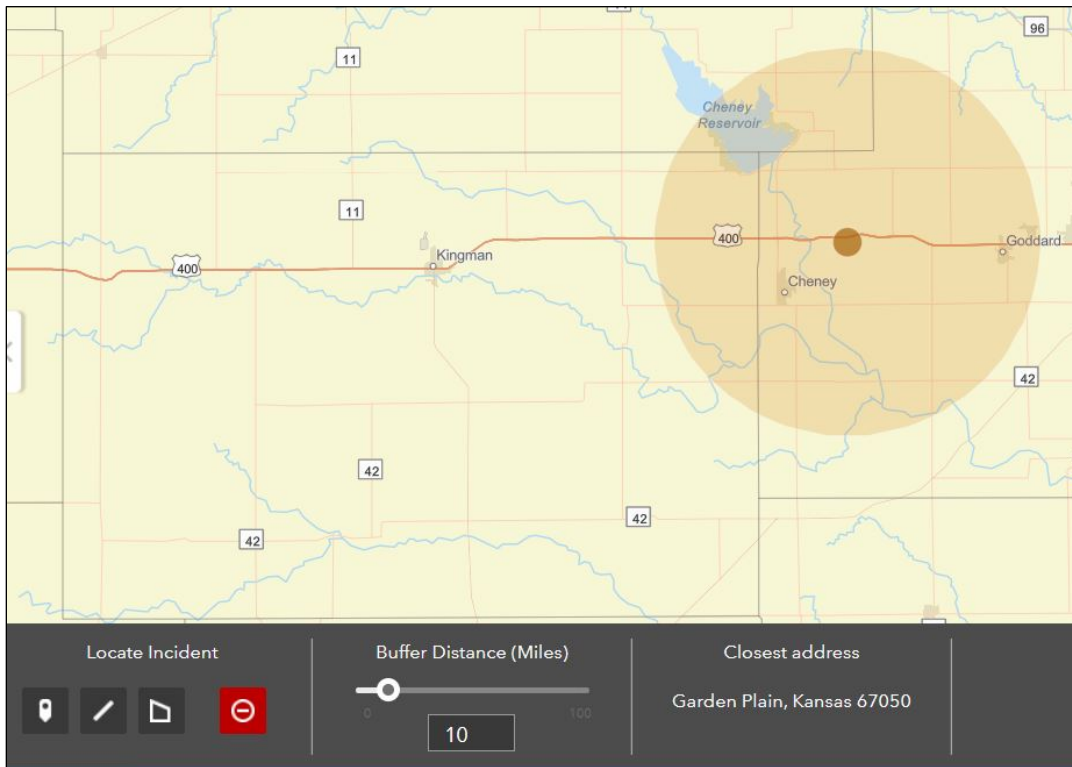
Incident Analysis Tool

The Incident Analysis Tool allows you to create a buffer zone around an incident or area of interest (single point, linear, and polygonal) and identify and visualize infrastructure entities within this zone. This tool can provide a comprehensive list and visuals of the locations of infrastructure entities within the buffer zone. A video tutorial for the incident analysis tool can be found [here](#).

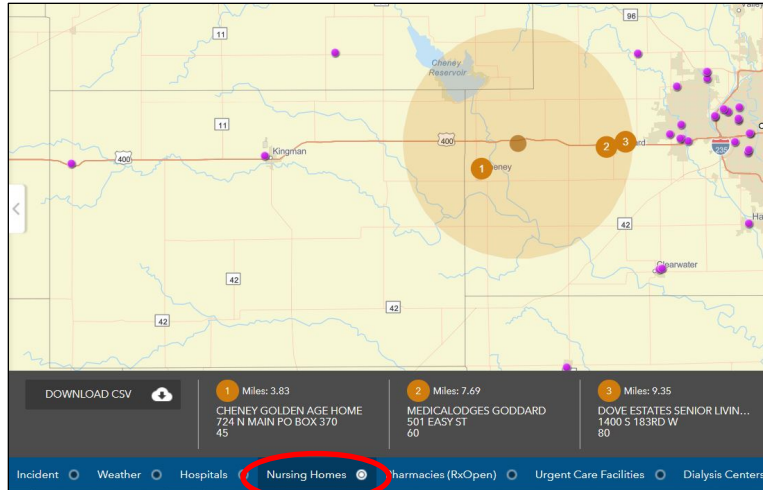
- Click on the Incident Analysis Tool icon  (you may need to click the “more” icon in the upper right  to find the tool) and the tool will open at the bottom of the page.
- Set the buffer distance by moving the scale to the desired distance or clicking inside the box, typing the desired value, and hitting “Enter.”



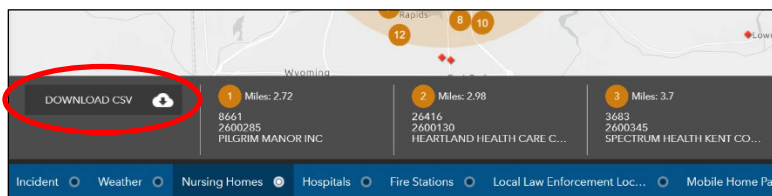
- Select the desired type of buffer (single point, linear, or polygonal). In this example, single point is used.
- Click on the map to draw the buffer zone. The map will zoom to the affected area.



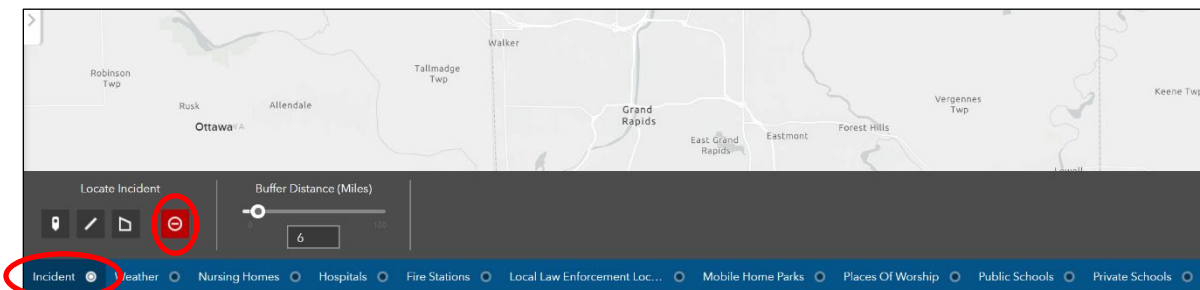
- Once the buffer zone is drawn, select infrastructure entities by clicking on the infrastructure name.
 - NOTE: Infrastructure entities are listed in order of closest to furthest from the center of the buffer zone. Only the infrastructure entities in the buffer zone will be listed, although the map will show all infrastructure entities outside the buffer zone as well.
 - NOTE: You can only select one infrastructure layer at a time, but the buffer zone will not disappear as you toggle between layers.
 - NOTE: You can only create one buffer zone at a time.



- To export the list of entities, click on “DOWNLOAD CSV” and the list will open in Excel.





- To erase the current buffer zone and create a new one, select “Incident” and click the red box.
- Once you erase a buffer zone, the entities on the map and the list will disappear.

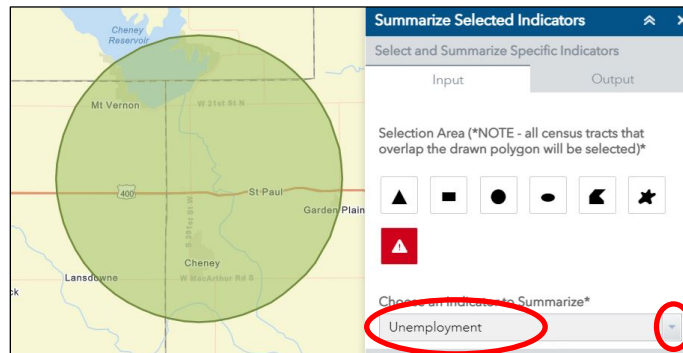


Summarize Selected Indicators Tool

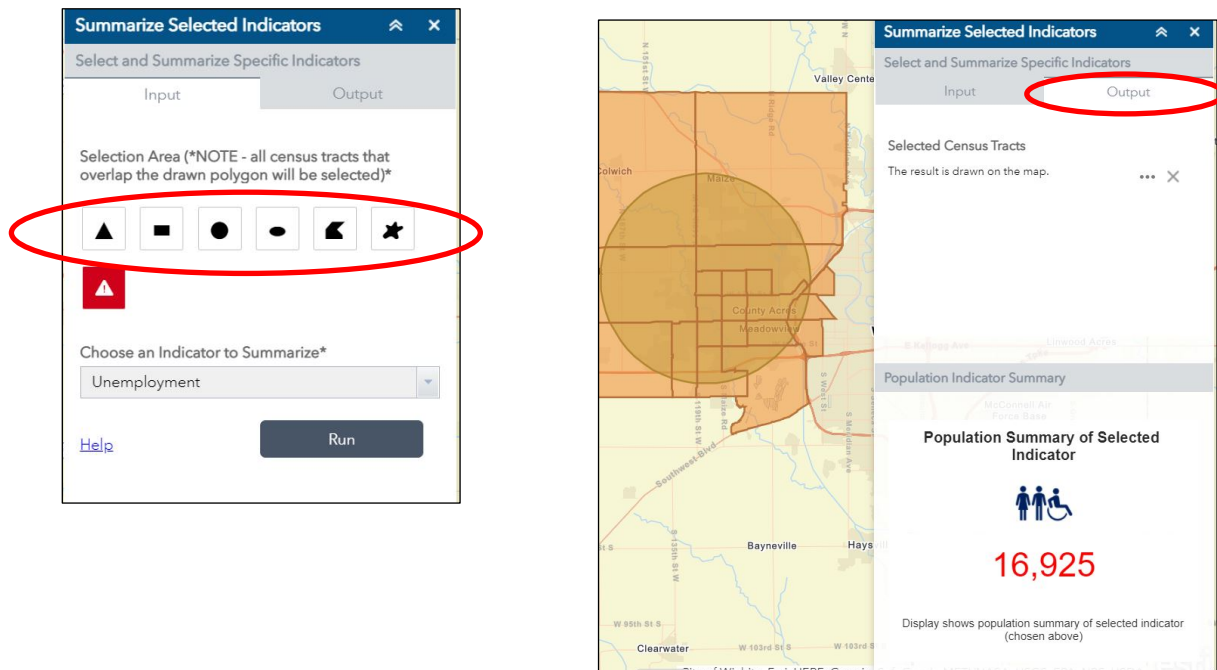
The Summarize Selected Indicators Tool allows you to draw a specific shape on the map (circle, rectangle, polygon etc.), select all the census tracts within or touching that shape, and calculate the population of individuals with specific resilience indicator characteristics (age over 65, disability, unemployment, etc.) in those selected census tracts. This tool can provide a visual and comprehensive list of census tracts located in the shape, as well as the total number of individuals with your desired indicator characteristic. A video tutorial for the summarize selected indicators tool can be found [here](#).

- Click on the Summarize Selected Indicators icon  in the upper-right corner (you may need to click the “more” icon in the upper right  to find the tool). The Summarize Selected Indicators tool opens on the right side of the screen. Click the desired shape you want to draw on the map (triangle, rectangle, circle, etc.).

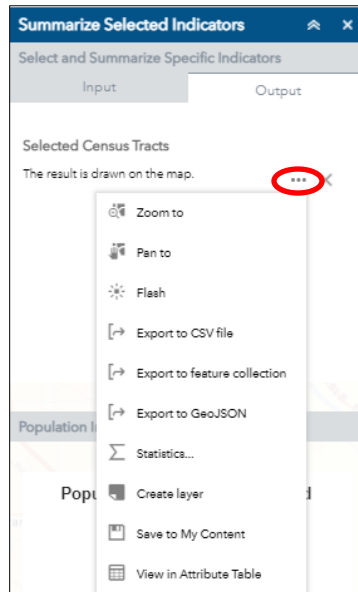
- Place your mouse over the map after selecting the shape, and a box appears with instructions on how to draw the shape.
- After drawing the shape, select the indicator characteristic you wish to summarize from the drop-down list and click “Run.”
- NOTE: You may have to scroll down slightly to see the “Run” button, depending on your browser display settings.



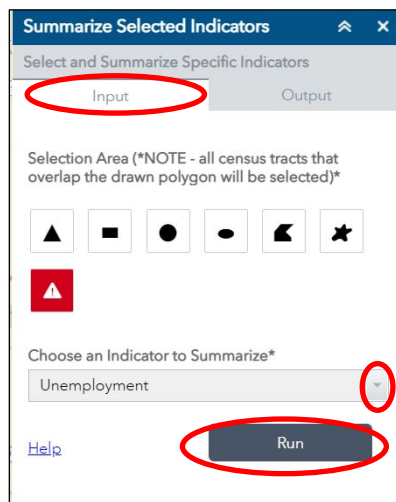
- The tool will take you to the “Output” tab, produce a visualization of the all the census tracts within or touching the shape, and show the number of individuals with the selected resilience indicator characteristic in the “Population Indicator Summary” section.
- In the example below, the number of unemployed individuals within the selected census tracts is 16,925, displayed in the “Population Summary of Selected Indicator” section.



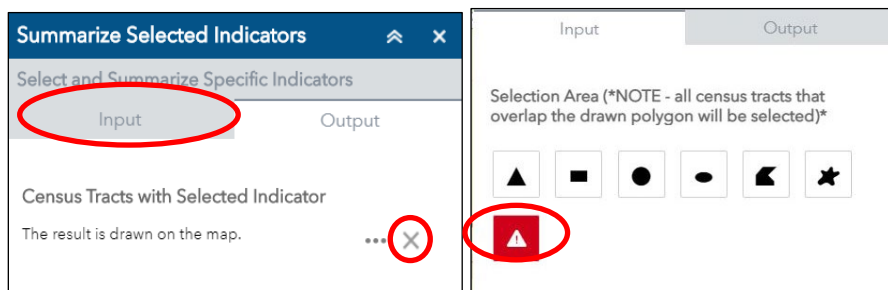
- To export, save, or view this information in the Attribute Table, click the three dots under “Selected Census Tracts” and select the desired action.



- To maintain the same area of analysis but summarize a different indicator characteristic, click on the “Input” tab in the tool, select the new indicator characteristic from the drop-down list, and click “Run.”



- To select a different area for summary, click on the “X” to clear the results in the “Output” tab. Then, go to the “Input” tab, and click on the red box to start the tool with a new area.



At the Bottom: The Attribute Table

You have the option to “View in Attribute Table” for all infrastructure, hazard, and indicator features in RAPT.

- Click the dark grey tab at the bottom of each web page to open the Attribute Table for all the indicators currently selected. A window will pop up showing data in a table format.



- Initially, the table will include only the counties and census tracts displayed on the screen (within the extent of the map on the screen). To include all counties and census tracts in the database, deselect “Filter by Map Extent.”
- Select one or more counties or census tracts of interest by clicking on the grey “Selection Handle” box to the left of the row.
- Use CTRL-click to select additional counties or census tracts.

The table has columns for all of the CRIA resilience indicators (all 20 with the county data, as well as 12 indicators with census tract data).

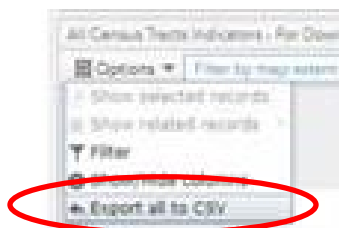
OBJECTID	AFFGEOID	County	State Name	FEMA Region	Age: Population Age 65 and Older	Disability: Percent of the Population with a Disability	Educational Attainment: Lack of High School Diploma in Adults over Age 25	Unemployment Rate: Percent of the Labor Force That is Unemployed
04	0500000US26133	Osceola	Michigan	Region V	20.62	19.57	11.31	6.90
15	0500000US55135	Waupaca	Wisconsin	Region V	20.39	14.59	8.16	2.60
19	0500000US26085	Lake	Michigan	Region V	27.74	25.67	17.56	8.90
177	0500000US26165	Wexford	Michigan	Region V	18.63	16.11	10.40	6.20
178	0500000US26113	Missaukee	Michigan	Region V	20.34	18.50	10.49	6.40

52 features selected

The bar at the bottom of the screen shows how many counties or census tracts (labeled as features) are included in the dataset on the screen.

From the Attribute Table, you can download data into an Excel document, sort by name/title, and filter by state or county.

- Click on the Options tab to export the data to a csv file, which can be easily saved as an Excel file. The options table also allows you to filter the data by specific properties (by state or county, for example) and show or hide specific columns.
- Sort by state or county to make it easier to look at specific areas within the map.
 - NOTE: The list of counties within a state is not in alphabetical order.



At the Top Left: RAPT Tools

There are three additional RAPT tool at the top left: Query Tool, the Selection Tool, and the Population by Census Tracts Tool.



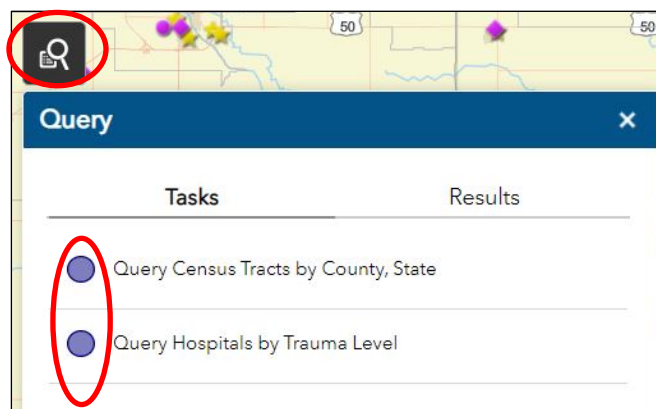
Query Tool

The Query Tool can be found in the upper left underneath the search bar and includes two different queries:

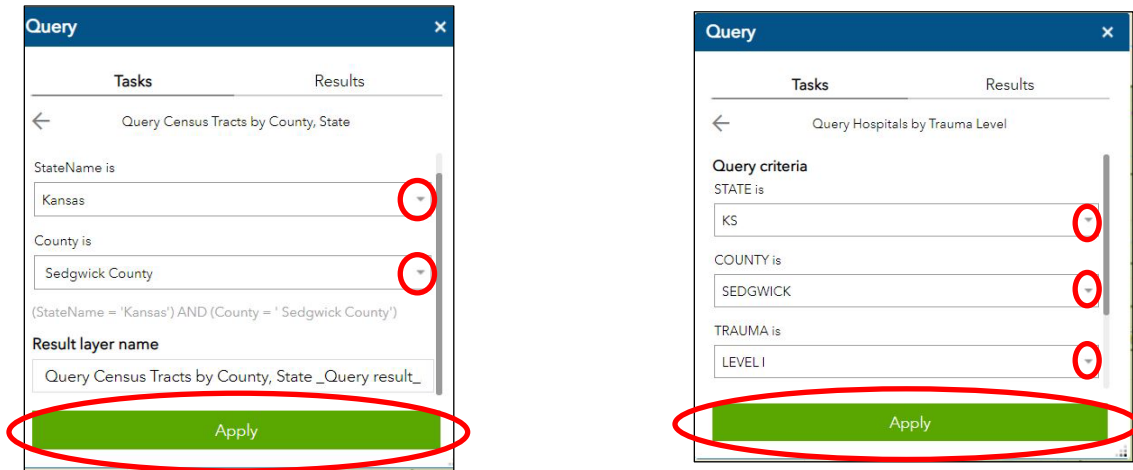
- The first allows you to zoom in and see all the census tracts in a specific county or state.
- The second provides specific information on the hospitals in a county or state, such as the trauma level.

Each tool provides a list of all desired entities with their census tract or hospital information and allows you to export the information to an Excel file, see averages/statistics across the selected entities, and view the results in the Attribute Table. A video tutorial for the query tool can be found [here](#).

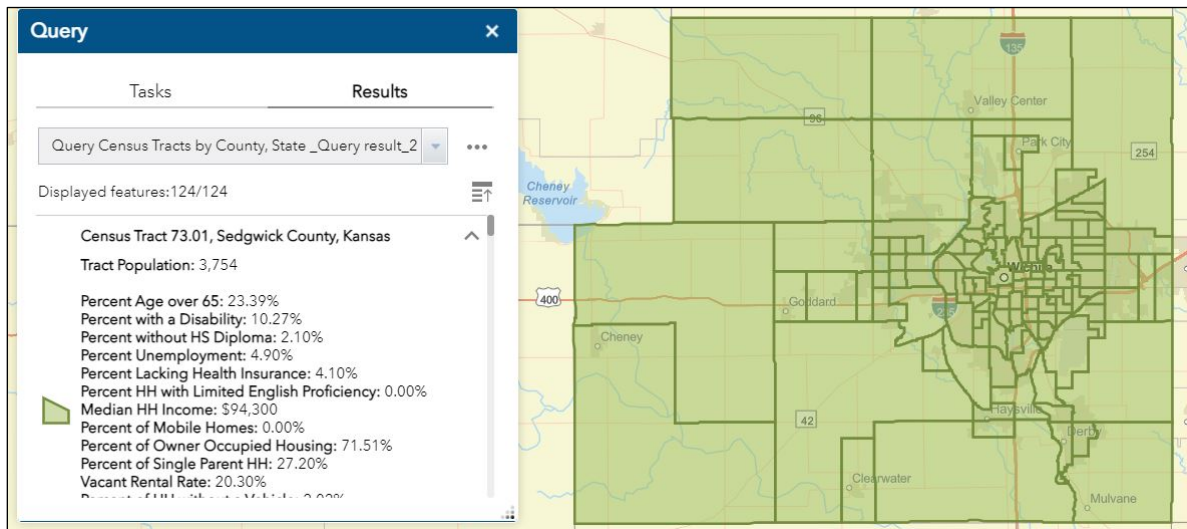
- Click on the Query icon in the upper left of the map and choose whether you want to select census tracts or hospitals.



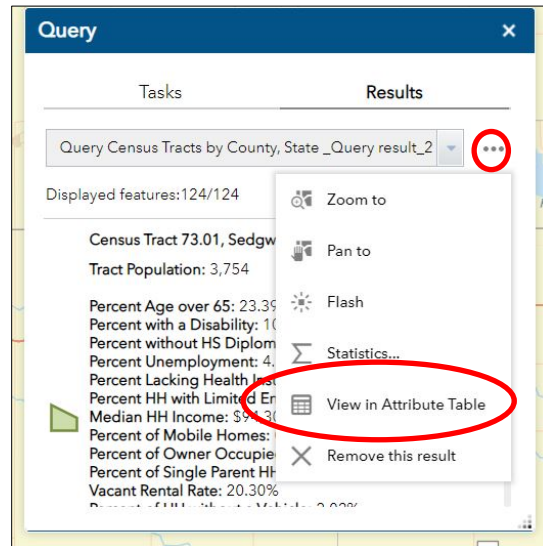
- If you select “Query Census Tracts” (left image below), select the state and county from the drop-down boxes and click the Apply bar at the bottom. If you select “Query Hospitals” (right image below), select the state, county, and trauma level from the drop-down boxes and click Apply.



- The map will zoom to that area and the list of selected features appears in the tool pop-up.



- To export, save or view this information in the Attribute Table, click the three dots at the top of the sidebar and select the desired action.



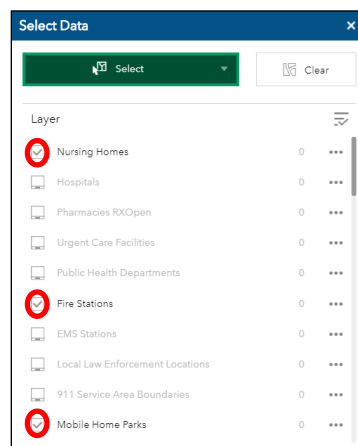
- To start another query, click the three dots and select “remove this result.”



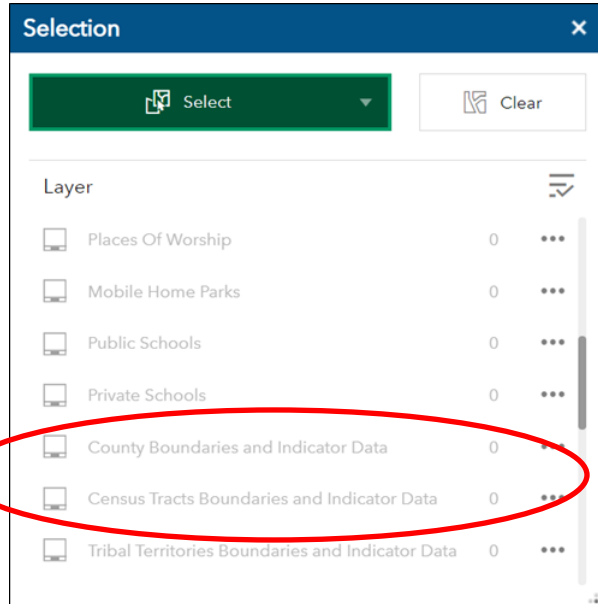
Selection Tool

The Selection tool can be found in the upper left of the map and allows you to select multiple infrastructure, hazard, county, or census tract datasets in a specified region (rectangle, polygon, circle etc.). The output provides a number, visual, and comprehensive list of those multiple datasets. You may export, save, or view these datasets in the Attribute Table. A video tutorial for the selection tool can be found [here](#).

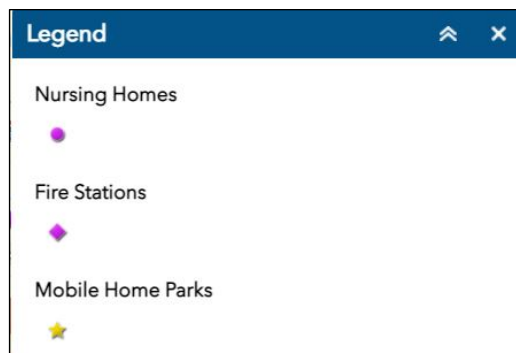
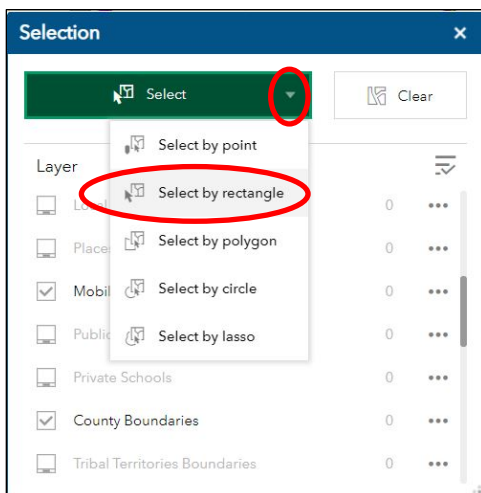
- Before using the Selection tool, turn on the infrastructure and hazard layers to be included in the output.
 - NOTE: Refer to the Infrastructure and Hazards sections on how to toggle on/off these layers.
- Click the Selection icon and the tool pop-up box appears. Select the infrastructure layers you wish to analyze by clicking on the boxes next to their names.
 - NOTE: Only the infrastructure layers you have turned before opening the tool can be selected and summarized. All other layers will be greyed-out as shown below and will not be included in the summary of entities.



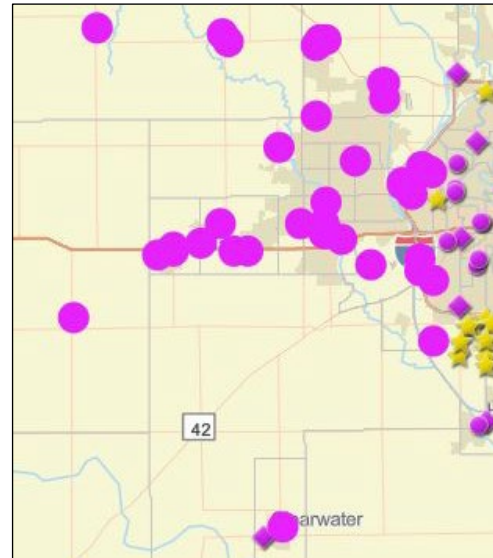
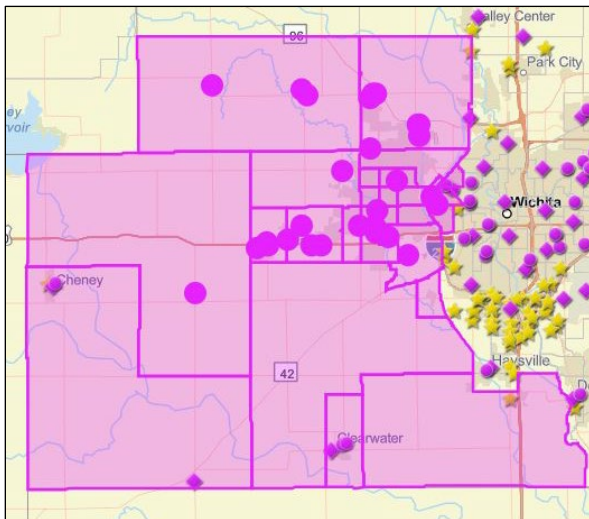
- If you have the “County Boundaries” or “Census Tracts Boundaries” layers toggled on, they will also appear in the results of the Selection Tool. If you do not want to look at the counties or census tracts, and instead want to focus on infrastructure or hazard layers, turn off the “County Boundaries” and “Census Tracts Boundaries” layers listed in the layer list. Sometimes it is easier to see individual infrastructure entities with the county or census tract layers turned off.



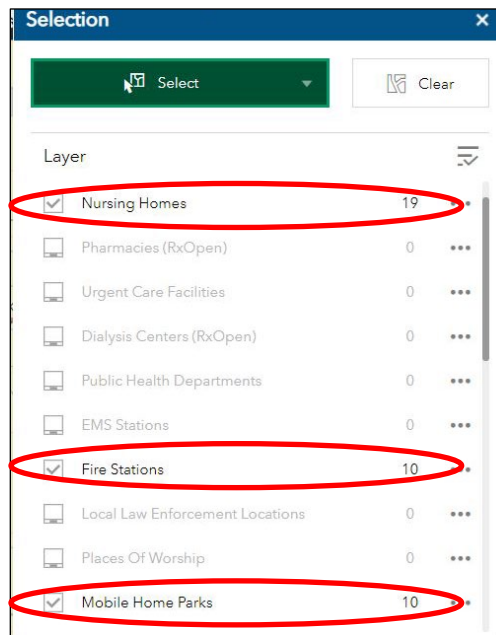
- Click the arrow in the green “Select” box and select your desired shape from the drop-down list.
 - NOTE: When you place your mouse over the map after selecting the shape, a box will appear with instructions on how to draw the shape.
 - The Legend includes information about which infrastructure layers are turned on; the legend for this example is below.



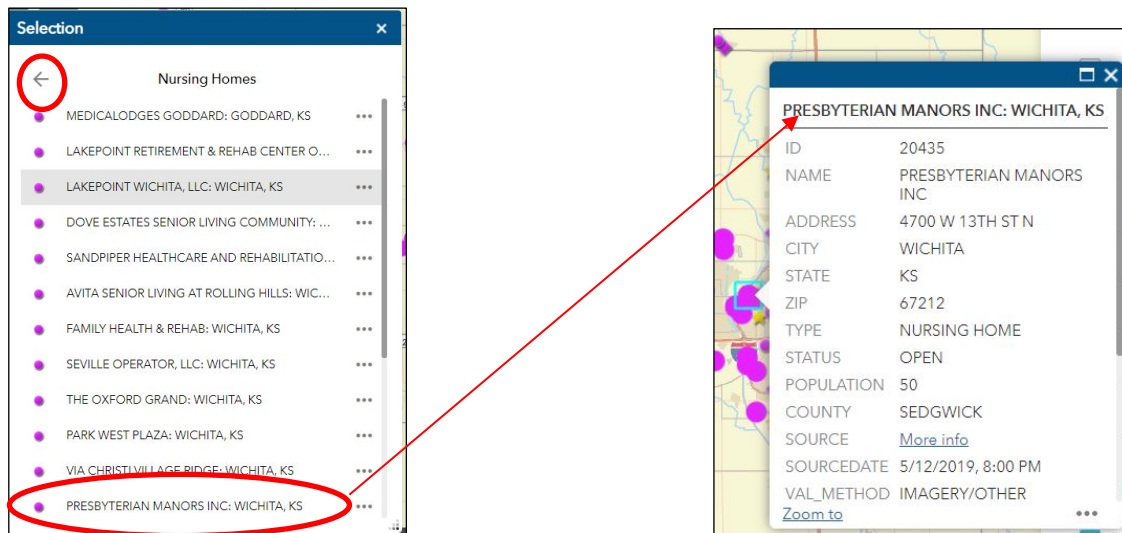
- After drawing the shape, you will see the infrastructure, hazard, county, and census tract entities selected within the shape.
- The image on the left shows the results of a rectangular drawing when census tracts are on. The image on the right shows the same drawing results when census tracts are off. The purple circles identify the various infrastructure entities within the selected area.



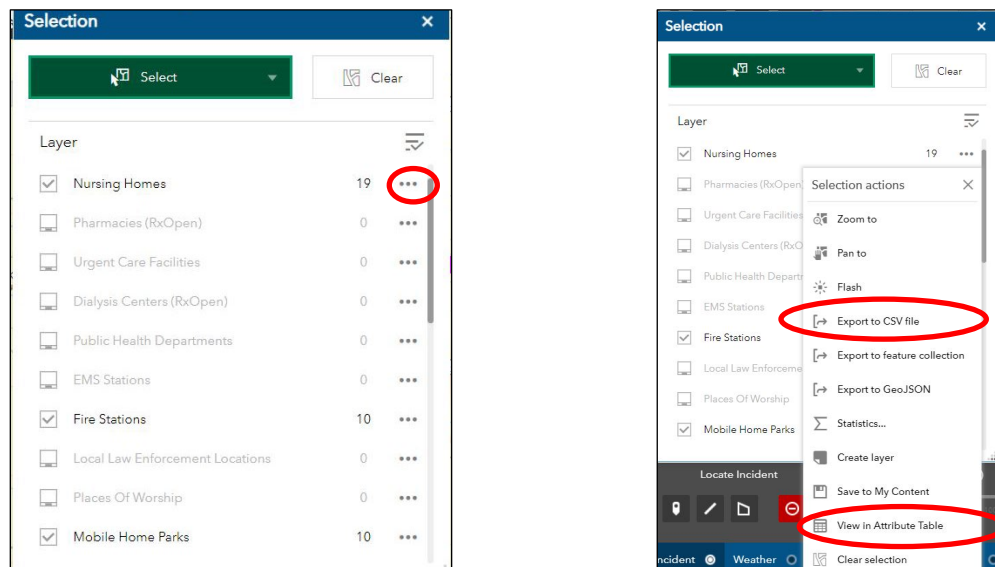
- The layer list displays the number of infrastructure entities and the number of counties and census tracts in the selected area.
 - In the example below, the area has 19 nursing homes, 10 fire stations, and 10 mobile home parks.



- Click on a specific layer to see a list of those entities within the area.
 - The image below shows the 19 nursing homes from the example above.
- Click on one of the nursing homes in the list to display a pop-up on the map with that nursing home's information.
- To go back to the layer list and view other infrastructure entities, click on the arrow in the top left of the tool.



- To export, save, or view this information in the Attribute Table, click the three dots to the right of the specific layer you want to focus on and select the desired action.



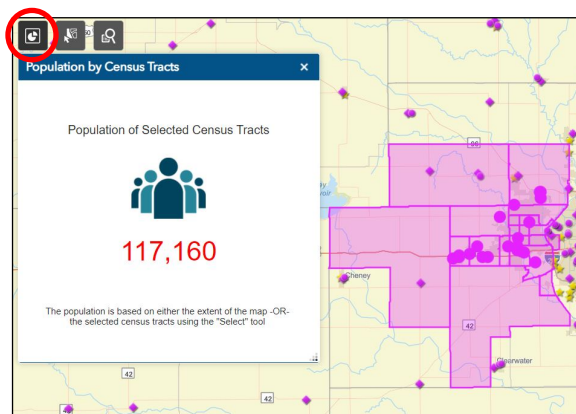
- To clear the results and select different entities or a different area, click the “Clear” button at the top of the Select Data tool.
- NOTE: If you wish to use the Population Count tool to calculate the total population within the selected census tracts as described below, do not click the “Clear” button.



Population by Census Tracts Tool

The Population by Census Tracts, or Population Count, tool is located at the top left of the map and calculates the total population of the census tracts that are selected by the Selection tool. A video tutorial for the population count tool can be found [here](#).

- NOTE: For this tool to work, you must have turned on the “Census Tract Boundaries” layer within the Census Tract Indicators list when using the Select Data tool. If this layer was turned off, you will need to clear your results in the Select Data tool, turn on the “All Census Tracts” layer, and re-select the census tracts.
- After selecting several census tracts with the Selection tool, click the Population Count icon.
- The total population of the selected census tracts appears.



ANY QUESTIONS?

If you have questions or would like additional support in using the Resilience Analysis and Planning Tool, please email FEMA-TARequest@fema.dhs.gov.

Please send us examples of how you are using RAPT, as well as recommendations for future improvements.

ISRC/StateBook Resilience Scorecard

Prepared for the Texas Economic Council

By the International Sustainable Resilience Center, Inc.

Current Situation

The combination of COVID19 and a record number of natural disasters have wreaked havoc on the global economy, and have changed the way potential investors view communities. No longer is it enough to provide skilled workers, available buildings and/or sites, transportation and communication infrastructure, a business-friendly environment, and investment incentives. Both new and resident companies are now including disasters in their risk profiles, and want to know that communities are actively taking action to reduce that risk. Of course, now pandemics must be added to natural and man-made disasters, and the ability to adapt to potential future disease-related disasters will be a factor.

But how can a community both assess its' readiness for disaster and provide potential resident and new businesses with validation that it has reduced disaster risk? Is there a method to first assess, then if needed, take steps to lower risk to an acceptable level? What entity is qualified to make those assessments, and how can communities prove their level of resilience to site location professionals and owners/managers of resident companies?

A Solution

The International Sustainable Resilience Center and StateBook have partnered to develop a thorough assessment of economic resilience for communities and regions. The assessment comes in the form of a questionnaire that should take no more than an hour to complete. As questions are answered, an automatic score is generated based on the type of question, and once complete the total score is confidentially transferred to the economic development organization taking the assessment.

1. To provide businesses, investment/site location executives, and other job-creating investors with an **Objective** assessment of a community's disaster risk—the level of ability to withstand and recover from adverse incidents

The Scorecard Serves Two Primary Purposes for Community Economic Development:

2. To enable development of new, or renewal of existing, disaster resilience strategic actions

Benefits

Communities who utilize the resilience scorecard can realize seven benefits:

1. Establishment of a baseline for current disaster resilience capacity
2. increased awareness and understanding of resilience challenges
3. Enable dialogue and consensus building by key stakeholders on resilience
4. Lowers short term and long-term investment risk for both new and resident businesses
6. Provides an opportunity for competitive advantage through increasing or maintaining the score
7. Ultimately, enables setting priorities for investment and action to increase resilience

Process

The Scorecard is developed and updated through a five-step process that takes eight weeks to complete:

1. An comprehensive electronic self-assessment questionnaire that evaluates resilience in 5 areas
2. An of the 5 specific elements of the questionnaire
3. Scoring, based on the questionnaire an review, followed by a one-day session to address challenges and lay the groundwork for a new or revised resilience strategic action agenda
4. Drafting and review of the agenda, agreement on 1, 3, and 5 year actions to increase resilience
5. Digitizing the action agenda to enable ongoing updating of the scorecard as actions are completed

Scorecard Components

The scorecard has three components:

1. A comprehensive, automated questionnaire
2. An automated weighting system to calculate scores based on type of scorecard questions
3. An automated set of recommendations that is generated based on answers to scorecard questions

After the questionnaire is completed, should the organization/community/region desire to receive an analysis with recommendations on how to increase its score, one can be prepared for an additional fee. Once the analysis is delivered, should the organization desire more specific direction and support, a virtual session can be held to review recommendations and decide on a course of action. Should further assistance be required, a customized proposal can be generated.

Score Weighting System

Just as not all communities are alike, not all hazards are alike. The scorecard will be weighted according to the relative importance of the individual questions, based on the estimated overall impact of the plan or initiative in question on ability of the affected area's economy to withstand and recover. They are grouped into five categories, and each score is made depending on the percentage of the act completed:

1. Foundational resilience, universally applicable and necessary for economic risk reduction from any adverse incident. Each of these is scored from 1-50.
2. Natural disaster resilience, ability to withstand and recover from incidents caused by nature. Each of these is scored from 1-40.
3. Pandemic resilience, ability to adapt to changes brought about by pandemics, and ability to respond and recover from acts of terrorism. Each of these is scored from 1-30.
4. Cyber resilience, ability to withstand and recover from cyber-attacks and cyber-crime including critical infrastructure. Each of these is scored from 1-20.
5. Societal Resilience, ability to adapt to geopolitical, societal, and technological changes. Each of these is scored from 1-10.

As questions are answered, an automatic assessment is generated that provides recommendations for developing and implementing actions to increase the community score. Should an EDO wish to implement the recommendations, a flexible, individualized proposal will be prepared that begins with foundational resilience and allows the EDO to improve all or selected categories. The final score will be kept strictly confidential.

The questionnaire:

#	Action	Complete?	Underway? % Complete?	Weight (1-5)_
1	Established an economic resilience committee/task force			
2	Drafted a resilience action plan specifically for Economic Development, including resilience of the ED Organization			
3	Established a business emergency operations center and a business recovery center (either stand-alone or integrated)			
4	Built an economic risk profile including identification and frequency of specific types of disasters and past impacts			
5	Developed and share resilience best practices of key resident industries and/or targeted industries			
6	Integrated economic resilience into other types of planning efforts (land use, economic development, redevelopment)			
7	Integrated federal, state, and regional/local public sector emergency management and disaster recovery into planning			
8	Ensured engagement of stakeholders including community organizations/nonprofits, workforce organizations, private infrastructure providers (85% is private), and regional EDOs			
9	Developed a system for implementation and monitoring of the economic resilience strategy (#2 above)			
10	Provided for Public Private Partnerships to increase the effectiveness of physical and systematic resilience			

#	Action	Complete	Underway? % Complete?	Weight (1-5)
10	Provided for Public Private Partnerships to increase the effectiveness of physical and systematic resilience			
11	Developed funding mechanism for incentives to businesses to encourage their development of continuity plans			
12	Provided methods to justify public and private investment in resilience such as FEMA's Benefit Cost Analysis tool			
13	Organized resources to protect and restore essential services such as power, water, and telecom infrastructure			
14	Developed emergency funding sources for small businesses to survive and reopen until federally-backed funding (SBA Disaster Loans, CDBG-Disaster Recovery) arrives			
15	Provided information to small businesses on types and importance of insurance protection by type of hazard			
16	Used valuation of built and natural assets to finance both resilience and recovery through securities and insurance			
17	Developed close working relationships between the EDO and public and private critical infrastructure organizations			
18	Has a strategy to increase transportation and supply chain resilience through Public Private Partnerships			
19	Implemented education and awareness initiatives for businesses on response and recovery operations/resources			
20	Have developed close working relationships with local, state, and federal response and recovery agencies			
21	Developed assistance for local businesses in securing response and recovery contracting/selling opportunities			

#	Action	Complete	Underway? % Complete?	Weight (1-5)
22	Have ready-to-implement buy local awareness campaigns to help businesses in recovery-including digital marketing			
23	Ensure local businesses maintain access to supply chains through pre-incident contingency planning			
24	Developed a program to assist businesses in proper record-keeping to meet public recovery assistance requirements			
25	Created resilience hubs for business training before disasters, and as a shelter and source of information after			
26	Developed resilience networks for businesses to collaborate and cooperate (space, marketing, production)			
27	Worked with local and state agencies to streamline zoning/ permitting after disasters to hasten business recovery			
28	Identified and positioned workforce training programs to quickly train workers in filling critical skill positions			
29	Include training/information in individual resilience and strategies (transportation, childcare) so employees can better withstand incidents and return to work more quickly			
30	In overall EDO strategy, include diversification via key industry clusters to enhance overall economic resilience			
31	Identified specific vulnerabilities in key resident and targeted prospective industries, took action to mitigate			
32	Provided information on most likely hazards, and specific efforts to mitigate them, to both residents and prospects			
33	Charted industry interdependencies and opportunities to enhance resilience via industry/government partnerships			

#	Action	Complete	Underway? % Complete?	Weight (1-5)
34	Actively promote ongoing research, innovation and actions to strengthen resilience, and recruit and/or grow a base of companies in the disaster recovery and resilience industries			
35	Have a mechanism to provide a live, updatable resource guide for businesses both prior to and after incidents			
36	Work with local/state government developed a detailed response effort to help adapt businesses and citizens to changes brought about by pandemics, including social distancing, digital business models, and similar measures			
37	Created a contingency plan for infrastructure adaptation such as expanding healthcare and education facilities, caused by pandemics using public private partnerships			
38	Have pre-registration programs for businesses, individuals and community organizations in advance of major disasters and pandemics so that they may return immediately after areas are declared safe			
39	Mapped and developed contingency plan for critical infrastructure interdependencies such as redundant power for telecommunications, ensuring fuel can be provided to generators, emergency medical facility resilience, etc.			
40	Have established a real-time, ongoing monitoring system to ensure all disaster resilience efforts are current and change them to effectively address ongoing changes in disaster risk			
41	Created and implemented a comprehensive cyber-security strategy including critical infrastructure and public services			
42	Created training and assistance for business and industry to create their own cyber-security plans and attack responses			
43	Have developed alternative sources of power, such as microgrids, in the event of an cyber-attack on the grid			

#	Action	Complete	Underway? % Complete?	Weight (1-5)
44	Worked with emergency management agencies to create a contingency plan for businesses in case of terrorist attacks			
45	Have a plan to provide supplies of water in case of severe drought or terrorist-related water contamination			
46	Has a program to incentivize/assist businesses to create a continuity plan specifically for cyber or terrorist attack			
47	Developed an economic response and recovery strategy for industrial incidents such as oil spills, explosions, etc.			
48	Created an initiative to help businesses respond to global geopolitical incidents such as trade, war, and civil unrest			
49	Created strategies for business adaptation to disruptive technology (energy sources, digitization, AI, robotics, etc.)			
50	Developed a public relations response plan for incidents of any type to inform and reassure businesses and citizens, and conversely created a public relations/marketing strategy that features economic resilience as a competitive advantage			

Score Weighting System

Just as not all communities are alike, not all hazards are alike. The scorecard will be weighted according to the relative importance of the individual questions, based on the estimated overall impact of the plan or initiative in question on ability of the affected area’s economy to withstand and recover. They are grouped into five categories, and each score is made depending on the percentage completed:

1. Foundational resilience, universally applicable and necessary for economic risk reduction from any adverse incident Each of these is scored from 1-50.
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As questions are answered, an automatic assessment is generated that provides recommendations for developing and implementing actions to increase the community score. Should an EDO wish to implement the recommendations, a flexible, individualized proposal will be prepared that begins with foundational resilience and allows the EDO to improve all or selected categories. The final score will be kept strictly confidential.



Unit 1: Basic Concepts in Benefit-Cost Analysis (BCA)



Unit 1 Overview

- Introduce students to the basic concepts behind Benefit-Cost Analysis (BCA).
- Introduce students to the role of the BCA in Hazard Mitigation Assistance (HMA) grants.
- Introduce students to the basic terms used when discussing BCA.

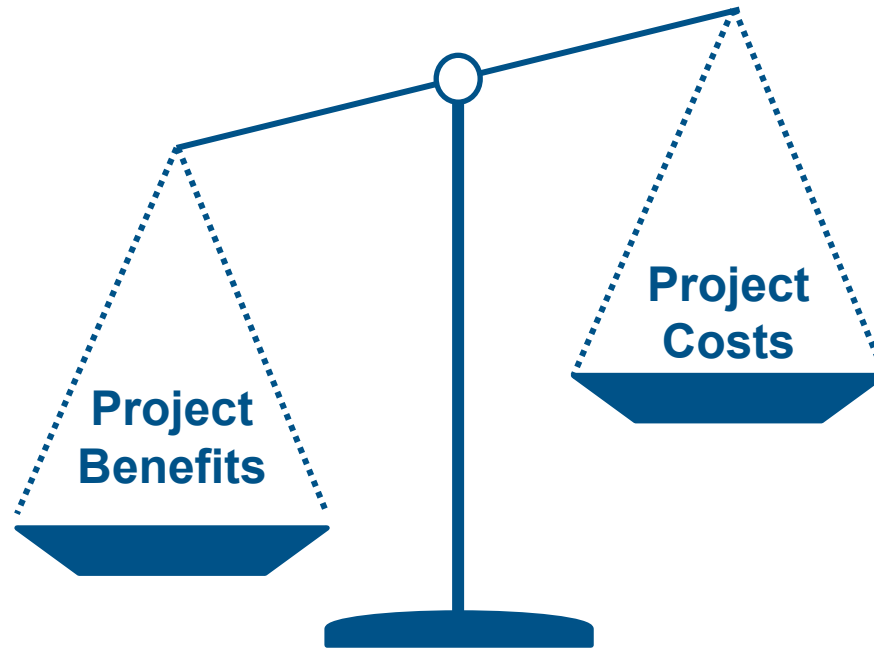


Unit 1 Objectives

- Students should be able to describe the basic terms used in Benefit-Cost Analysis (BCA).
- Students should be able to explain how to determine when to do a BCA and when it will be cost effective.

What is Benefit-Cost Analysis (BCA)?

- **Benefit-Cost Analysis (BCA)** is the process of quantifying the advantages (benefits) of an action and comparing it to its drawbacks (costs).





What is Benefit-Cost Analysis (BCA)? (cont.)

Although BCA may seem like a difficult concept, you probably already practice it almost every day.

- Examples:
 - Is a warehouse club membership worth it?
 - Should I fix that leaky toilet in my house?
 - Should I buy or rent a house?
- What factors go into your decision?



Benefits and costs

We'll discuss benefits and costs in relation to hazard mitigation projects more in Unit 3, but for now let's consider the example of the leaky toilet.

- What are the **benefits** of replacing it? How would I quantify these benefits?
- What are the **costs** of replacing it?



Benefits and costs (cont.)

- Benefits:
 - Lower water bills
 - Reduced damage to floor
 - Less worry about damage?
 - Reduced time spent fixing leak or cleaning up mess?
- Costs:
 - Cost of new toilet + materials
 - Pay someone to install toilet
 - Take time off work to supervise installation of toilet
 - Maintenance?



How do we know if something is “worth it”? (1 of 3)

- If an action’s benefits are greater than its costs, then it is considered **cost-effective**.
- Once we add up the benefits for an action, we divide that value by the costs, which gives us the **Benefit-Cost Ratio (BCR)**.

$$\frac{\text{Benefits}}{\text{Costs}} = \text{BCR}$$

If the BCR is greater than or equal to 1.0, then the action is cost-effective.



How do we know if something is “worth it”? (2 of 3)

- Is it worth \$1 million to:
 1. Protect one vacation home?
 2. Protect one government building that floods infrequently?
 3. Protect a flood-prone hospital or wastewater treatment plant?
 4. Protect 150 flood-prone houses?

Probably	Probably Not



How do we know if something is “worth it”? (3 of 3)

- Is it worth \$1 million to:
 1. Protect one vacation home?
 2. Protect one government building that floods infrequently?
 3. Protect a flood-prone hospital or wastewater treatment plant?
 4. Protect 150 flood-prone houses?

Probably	Probably Not
	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	



Applications of BCA

- BCA can be used to determine if a single action is cost-effective in comparison to the status quo:
 - Should I replace that leaky toilet, or leave it as-is?
- Or it can be used to determine the most cost-effective option out of several:
 - Should I (1) replace the leaky toilet, (2) try to repair it, or (3) remodel my entire bathroom?
- For hazard mitigation projects, we are usually doing the first way, since we do not require applicants to show that they are choosing the most cost-effective option.



Why should I do a BCA?

- Required component for HMA projects
- Required for some 406 (Public Assistance) mitigation projects
- Helps communities and subapplicants make informed decisions about their risks and money and prioritize projects

Other common BCA terms

- **Discount rate**
- **Net present value**

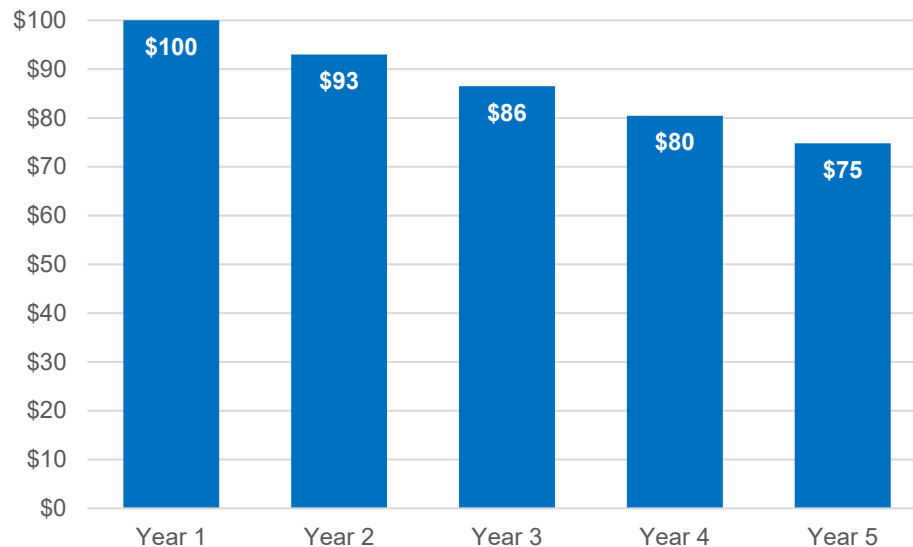


Discount rate

- If I offered you \$100 today, or \$100 one year from now, which would you choose? Why?
 - \$100 invested today might result in \$106 one year from now.
 - \$100 one year from now might only buy \$97 worth of goods.
- Because benefits are worth more if they are experienced sooner, future benefits must be discounted. The rate at which benefits decline in value each year is the **discount rate**.
 - Federally-funded mitigation projects must use a discount rate of 7%, which is set by the U.S. Office of Management and Budget (OMB). We'll discuss this more in Unit 3.

Discount rate (cont.)

- Example: Let's say I have a mitigation project with \$100 in benefits in Year 1. With a discount rate of 7%, my annual benefits would be as follows:





Net present value, 1 of 6

- **Net present value (NPV)** is the value today of benefits that you will receive in the future, minus the value today of costs that you will incur in the future.
- A positive NPV indicates that something is a good investment.

$$\begin{array}{r} \text{Future benefits} \\ \text{(in today's} \\ \text{dollars)} \end{array} - \begin{array}{r} \text{Costs} \\ \text{(in today's} \\ \text{dollars)} \end{array} = \begin{array}{r} \text{Net Present} \\ \text{Value (NPV)} \end{array}$$



Net present value, 2 of 6

- Example: Let's say I would like to rent out my basement. In order to make the space rentable, I will have to spend \$25,000 to renovate it and get a certificate of occupancy. The basement will rent for \$1,000 per month, and I plan to rent it out over a period of 3 years.
- Is this a good investment? How can I figure this out?



Net present value, 3 of 6

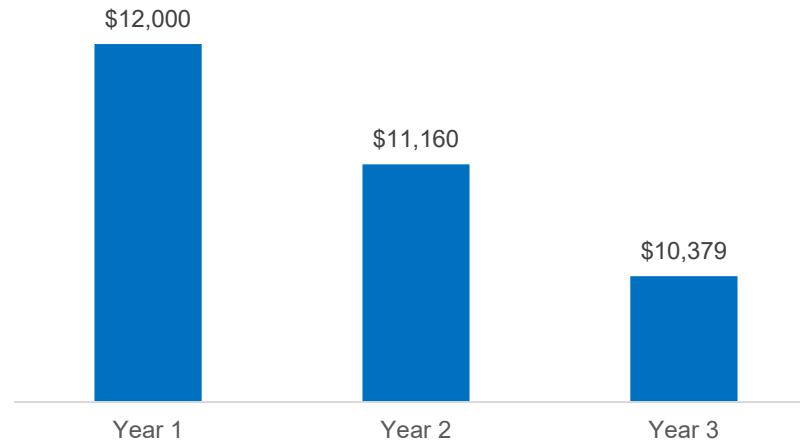
$$\text{Future benefits (in today's dollars)} - \text{Costs (in today's dollars)} = \text{Net Present Value (NPV)}$$

- In Year 1, my benefits from renting out my basement are \$1,000 x 12 = \$12,000.
- What are my benefits in Year 2 if I assume a 7% discount rate? (Hint: The answer is not \$12,000.)

Net present value, 4 of 6

$$\text{Future benefits (in today's dollars)} - \text{Costs (in today's dollars)} = \text{Net Present Value (NPV)}$$

Benefits are reduced by 7% each year over the 3-year period:



Sum = \$33,539

Net present value, 5 of 6

$$\begin{array}{c} \text{Future benefits} \\ \text{(in today's} \\ \text{dollars)} \end{array} - \begin{array}{c} \text{Costs} \\ \text{(in today's} \\ \text{dollars)} \end{array} = \begin{array}{c} \text{Net Present} \\ \text{Value (NPV)} \end{array}$$

- In this very simplified example, my costs are my original investment:

\$25,000



Net present value, 6 of 6

$$\begin{array}{r} \text{Future benefits} \\ \text{(in today's} \\ \text{dollars)} \end{array} - \begin{array}{r} \text{Costs} \\ \text{(in today's} \\ \text{dollars)} \end{array} = \text{Net Present Value (NPV)}$$

- For this example:

$$\$33,539 - \$25,000 = \$8,539$$

- Did I make a good investment?

Unit 1 Review

- Key terms:
 - **Benefit-Cost Analysis (BCA)**
 - **Benefit**
 - **Cost**
 - **Benefit-Cost Ratio (BCR)**
 - **Cost-effectiveness**
 - **Discount rate**
 - **Net present value (NPV)**

FEMA BCA Toolkit 6.0 Installation Instructions

This page features installation and launch instructions for FEMA's Benefit-Cost Analysis (BCA) Toolkit Version 6.0. You can use BCA Toolkit 6.0 in Excel Desktop or in Excel Online.

Excel Desktop

The following directions are for using BCA Toolkit 6.0 in the desktop version of Excel. (Excel 2013 or newer is required.)

1. Click the "Download the BCA Toolkit Version 6.0" button on the [Benefit-Cost Analysis page](#) and open the Excel file.
2. (FEMA computers should skip this step) In the Insert tab, in the Add-ins section, click on My Add-ins. Select the Store option and search for FEMA Benefit-Cost Analysis Calculator. Click Add.
3. On the Home tab, you should now see the FEMA BCA V6.0 icon in the upper righthand ribbon.
4. Click on the FEMA BCA V6.0 icon. A sidebar will open.
5. Click Open Calculator to begin your BCA.
6. The add-in window will open and take you to the home screen. From here you can start a new project by clicking Add Project.
7. To save your work, click "Finish" on the second screen, close the add-in window, and save the Excel file, renaming it as desired.

Excel Online

The following directions are for using BCA Toolkit 6.0 in Excel Online. Excel Online works best in Firefox and Chrome browsers.

1. Click the "Download the BCA Toolkit Version 6.0" button on the [Benefit-Cost Analysis page](#) and save the Excel file to your machine or OneDrive.
2. If you do not already have one, create a free [Office 365 account](#).
3. Once logged in, open Excel Online by clicking on the Excel icon under Apps.
4. Open the file BCA_Toolkit_6.xlsx in Excel Online by clicking Upload a Workbook.



5. In the Insert tab, click Office Add-ins. Select the Store option and search for FEMA Benefit-Cost Analysis Calculator. Click Add. (If you get a message saying Microsoft 365 has been configured to prevent individual acquisition of Office Add-ins, you can sign out and sign in using a personal account.)
6. You should now see the FEMA BCA button in the top righthand side in the Home tab.
7. To launch the Toolkit, click on the FEMA BCA button. A sidebar will open.
8. Click Open Calculator. You may be asked if you want to allow your browser to open another window. Click Allow.
9. The add-in window will open and take you to the Home screen. From here you can start a new project by clicking Add Project.
10. To save your work, click “Finish” on the second screen and close the add-in window. **IMPORTANT:** You must make sure to save a copy of the file to your local machine by clicking File, Save As, Download a Copy, and choosing the “Open with Microsoft Excel” option. Once the file opens, click File, Save As, and save a copy to your local machine. To reopen the file in Excel Online, click Upload a Workbook and navigate to the file on your local machine.

Technical Assistance

FEMA’s BCA Helpline is available to provide assistance using the BCA Toolkit, including with troubleshooting technical issues. The BCA Helpline cannot review or perform benefit-cost analysis. For help reviewing or performing BCA, or to ask eligibility or policy questions, please contact your local state hazard mitigation officer.

The BCA Helpline’s hours are 9 a.m. – 5 p.m. (EST), Monday through Friday. Email questions to bchelpine@fema.dhs.gov or call toll free at 1-855-540-6744.



BEOC Quick Start Guidance for COVID-19 Response and Recovery

A Business Emergency Operations Center (BEOC) can provide a consistent integration point for private and public coordination for sustained response and recovery operations throughout the COVID-19 pandemic, with no requirement for physical contact.

Background

As communities work to implement reopening plans aligned to the President's [Guidelines for Opening Up America Again](#) and informed by available [Community Mitigation Guidance](#) and [guidance for businesses and workplaces](#), engagement and integration of businesses and other organizations in a community is critical. This quick start guidance provides states, locals, tribes and territories with foundational concepts for establishing a BEOC to support their response and recovery operations for COVID-19.

Benefits of a BEOC

Establishing a BEOC provides a jurisdiction with a framework for structured engagement with local businesses, industry and other private sector partners to manage risk, respond to and recover from the COVID-19 pandemic. The BEOC processes and the information technologies it uses support shared operational outcomes for mitigation and response actions and support reopening the jurisdiction. A BEOC can facilitate remote coordination and assistance; information sharing and data analysis; community lifeline, supply chain and market stabilization; community health mitigation; economic response coordination; joint planning; and economic and community recovery.

Figure 1 provides an at-a-glance view of the three steps to quick-start a BEOC, with additional detail for each step.

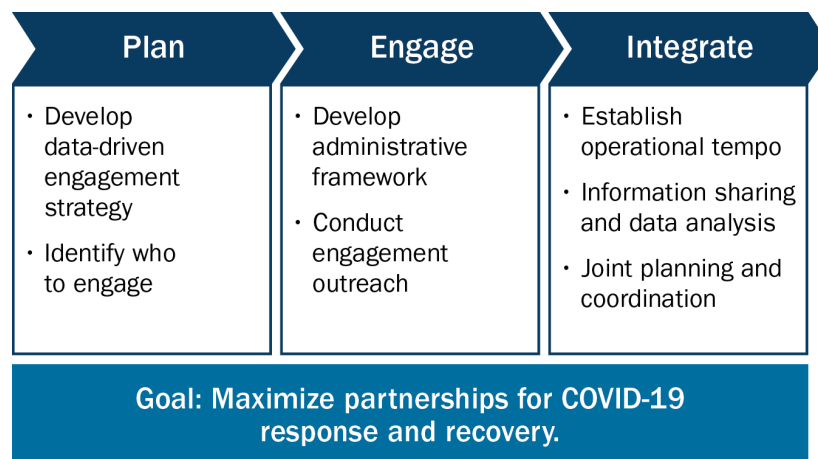


Figure 1: BEOC Quick Start at a Glance



Steps for a BEOC Quick Start

1. Plan (Administrative Planning)

- Develop a startup checklist. Use the jurisdictional business and industry profile to develop a data-driven engagement strategy. Create contact lists with designated points of contact and designated emails (e.g. beoc@yourdomain.gov). Establish rules of engagement and BEOC lines of effort. Select a designated web conference and information exchange platform and provide recurring calendar invitations.

2. Engage (Stakeholder Engagement and Outreach)

- COVID-19 Response – Initial outreach should include the owners and operators of [community lifelines](#) and [critical infrastructure](#) businesses. Use the economic profile of your community to inform targeted data-driven outreach to industry associations, chambers of commerce and small businesses.
- COVID-19 Recovery – Outreach should include representatives from response, plus local economic development districts, community health organizations, and the economic base of the jurisdiction.

3. Integrate (Integrated Operations)

- Establish an operational tempo – Align the BEOC battle rhythm with your jurisdiction emergency operations center. Initiate a coordination call and draft a meeting purpose, desired outcomes and an agenda.
- Share information and analyze data – Share official communications and organized situational briefings via email distribution and during coordination calls. Invite partners to provide situation reports and risk assessments, conduct data analysis and participate in the resource coordination process.
- Plan and coordinate jointly – Use the BEOC to facilitate joint operational planning and identify, triage and develop solutions for the most significant challenges shared by private and public partners.

Additional BEOC activities may include supporting community health mitigation efforts, economic response planning, informing safe reopening of businesses and informing community planning needs to ensure adequate capacity for testing, personal protective equipment, local healthcare and contact tracing.

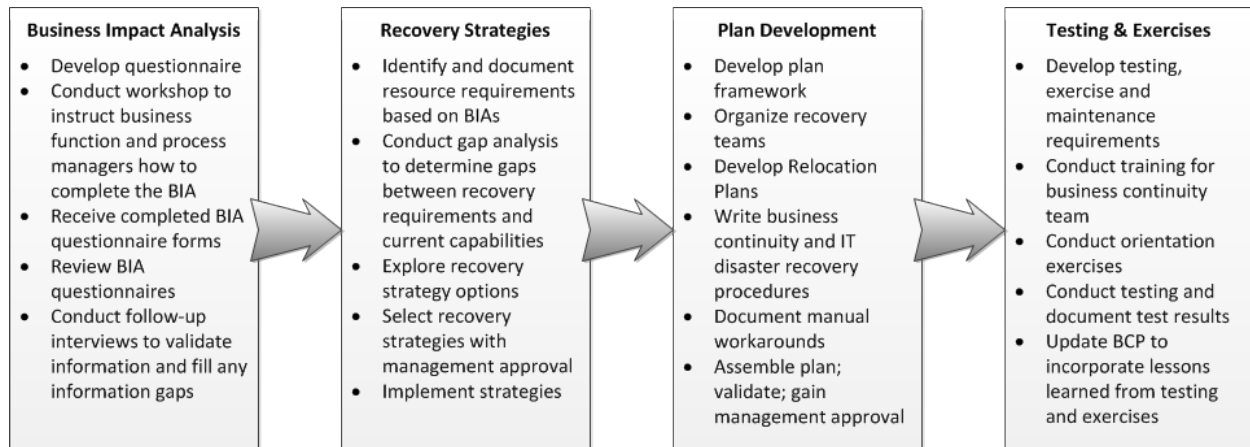
Next Steps

Jurisdictions should continue to foster community-based private-public partnerships and refine engagement based upon local needs. Jurisdictions should leverage existing business alliances, affinity groups and organizational structures (e.g. emergency support functions) to maximize life safety, economic security and community resilience.

For More Information

- **On quick start resources and economic profile reports** – visit the FEMA National Business Emergency Operations Center (NBEOC) at [fema.gov/nbeoc](https://www.fema.gov/nbeoc)
- **On Cross-Sector Business and Infrastructure Coordination** – visit the updated [National Response Framework](#) - to learn more about the new [emergency support function \(ESF\) #14](#)
- **On COVID-19 Guidance for Businesses** – visit the Centers for Disease Control and Prevention (CDC) at <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/businesses-employers.html>

Business Continuity Plan Guide



When business is disrupted, it can cost money. Lost revenues plus extra expenses means reduced profits. Insurance does not cover all costs and cannot replace customers that defect to the competition. A business continuity plan to continue business is essential. Development of a business continuity plan includes four steps:

- Conduct a [business impact analysis](#) to identify time-sensitive or critical business functions and processes and the resources that support them.
- Identify, document, and implement to recover critical business functions and processes.
- Organize a business continuity team and compile a [business continuity plan](#) to manage a business disruption.
- Conduct [training](#) for the business continuity team and [testing and exercises](#) to evaluate recovery strategies and the plan.

Information technology (IT) includes many components such as networks, servers, desktop and laptop computers and wireless devices. The ability to run both office productivity and enterprise software is critical. Therefore, [recovery strategies for information technology](#) should be developed so technology can be restored in time to meet the needs of the business. Manual workarounds should be part of the IT plan so business can continue while computer systems are being restored.

Resources for Business Continuity Planning

- [Standard on Disaster/Emergency Management and Business Continuity Programs](#) - National Fire Protection Association (NFPA) 1600
- [Professional Practices for Business Continuity Professionals](#) - DRI International (non-profit business continuity education and certification body)
- [Continuity Guidance Circular](#) - Federal Emergency Management Agency
- [Open for Business® Toolkit](#) - Institute for Business & Home Safety

Business Continuity Impact Analysis

Business continuity impact analysis identifies the effects resulting from disruption of business functions and processes. It also uses information to make decisions about recovery priorities and strategies.

The Operational & Financial Impacts [worksheet](#) can be used to capture this information as discussed in [Business Impact Analysis](#). The worksheet should be completed by business function and process managers with sufficient knowledge of the business. Once all worksheets are completed, the worksheets can be tabulated to summarize:

- the operational and financial impacts resulting from the loss of individual business functions and process
- the point in time when loss of a function or process would result in the identified business impacts

Those functions or processes with the highest potential operational and financial impacts become priorities for restoration. The point in time when a function or process must be recovered, before unacceptable consequences could occur, is often referred to as the “Recovery Time Objective.”

Resource Required to Support Recovery Strategies

Recovery of a critical or time-sensitive process requires resources. [The Business Continuity Resource Requirements worksheet](#) should be completed by business function and process managers. Completed worksheets are used to determine the resource requirements for recovery strategies.

Following an incident that disrupts business operations, resources will be needed to carry out recovery strategies and to restore normal business operations. Resources can come from within the business or be provided by third parties. Resources include:

- Employees
- Office space, furniture and equipment
- Technology (computers, peripherals, communication equipment, software and data)
- Vital records (electronic and hard copy)
- Production facilities, machinery and equipment
- Inventory including raw materials, finished goods and goods in production.
- Utilities (power, natural gas, water, sewer, telephone, internet, wireless)
- Third party services

Since all resources cannot be replaced immediately following a loss, managers should estimate the resources that will be needed in the hours, days and weeks following an incident.

Conducting the Business Continuity Impact Analysis

The worksheets [Operational and Financial Impacts](#) and [Business Continuity Resource Requirements](#) should be distributed to business process managers along with instructions about the process and how the information will be used. After all managers have completed their worksheets, information should be reviewed. Gaps or inconsistencies should be identified. Meetings with individual managers should be held to clarify information and obtain missing information.

After all worksheets have been completed and validated, the priorities for restoration of business processes should be identified. Primary and dependent resource requirements should also be identified. This information will be used to develop recovery strategies.

Recovery Strategies

If a facility is damaged, production machinery breaks down, a supplier fails to deliver or information technology is disrupted, business is impacted and the financial losses can begin to grow. Recovery strategies are alternate means to restore business operations to a minimum acceptable level following a business disruption and are prioritized by the recovery time objectives (RTO) developed during the [business impact analysis](#).

Recovery strategies require resources including people, facilities, equipment, materials and information technology. An analysis of the resources required to execute recovery strategies should be conducted to identify gaps. For example, if a machine fails but other machines are readily available to make up lost production, then there is no resource gap. However, if all machines are lost due to a flood, and insufficient undamaged inventory is available to meet customer demand until production is restored, production might be made up by machines at another facility—whether owned or contracted.

Strategies may involve contracting with third parties, entering into partnership or reciprocal agreements or displacing other activities within the company. Staff with in-depth knowledge of business functions and processes are in the best position to determine what will work. Possible alternatives should be explored and presented to management for approval and to decide how much to spend.

Depending upon the size of the company and resources available, there may be many recovery strategies that can be explored.

Utilization of other owned or controlled facilities performing similar work is one option. Operations may be relocated to an alternate site - assuming both are not impacted by the same incident. This strategy also assumes that the surviving site has the resources and capacity to assume the work of the impacted site. Prioritization of production or service levels, providing additional staff and resources and other action would be needed if capacity at the second site is inadequate.

Telecommuting is a strategy employed when staff can work from home through remote connectivity. It can be used in combination with other strategies to reduce alternate site requirements. This strategy requires ensuring telecommuters have a suitable home work environment and are equipped with or have access to a computer with required applications and data, peripherals, and a secure broadband connection.

In an emergency, space at another facility can be put to use. Cafeterias, conference rooms and training rooms can be converted to office space or to other uses when needed. Equipping converted space with furnishings, equipment, power, connectivity and other resources would be required to meet the needs of workers.

Partnership or reciprocal agreements can be arranged with other businesses or organizations that can support each other in the event of a disaster. Assuming space is available, issues such as the capacity and connectivity of telecommunications and information technology, protection of privacy and intellectual property, the impacts to each other's operation and allocating expenses must be addressed. Agreements should be negotiated in writing and documented in the business continuity plan. Periodic review of the agreement is needed to determine if there is a change in the ability of each party to support the other.

There are many vendors that support business continuity and information technology recovery strategies. External suppliers can provide a full business environment including office space and live data centers ready to be occupied. Other options include provision of technology equipped office trailers, replacement machinery and other equipment. The availability and cost of these options can be affected when a regional disaster results in competition for these resources.

There are multiple strategies for recovery of manufacturing operations. Many of these strategies include use of existing owned or leased facilities. Manufacturing strategies include:

- Shifting production from one facility to another
- Increasing manufacturing output at operational facilities
- Retooling production from one item to another
- Prioritization of production—by profit margin or customer relationship
- Maintaining higher raw materials or finished goods inventory
- Reallocating existing inventory, repurchase or buyback of inventory
- Limiting orders (e.g., maximum order size or unit quantity)
- Contracting with third parties
- Purchasing business interruption insurance

There are many factors to consider in manufacturing recovery strategies:

- Will a facility be available when needed?
- How much time will it take to shift production from one product to another?
- How much will it cost to shift production from one product to another?

- How much revenue would be lost when displacing other production?
- How much extra time will it take to receive raw materials or ship finished goods to customers? Will the extra time impact customer relationships?
- Are there any regulations that would restrict shifting production?
- What quality issues could arise if production is shifted or outsourced?
- Are there any long-term consequences associated with a strategy?

Resources for Developing Recovery Strategies

- [Professional Practices for Business Continuity Professionals](#) - DRI International (non-profit business continuity education and certification body)
- [The Telework Coalition](#) (America's leading nonprofit telework education and advocacy organization)

Manual Workarounds

Telephones are ringing and customer service staff is busy talking with customers and keying orders into the computer system. The electronic order entry system checks available inventory, processes payments and routes orders to the distribution center for fulfillment. Suddenly the order entry system goes down. What should the customer service staff do now? If the staff is equipped with paper order forms, order processing can continue until the electronic system comes back up and no phone orders will be lost.

The order forms and procedures for using them are examples of “manual workarounds.” These workarounds are recovery strategies for use when information technology resources are not available.

Developing Manual Workarounds

Identify the steps in the automated process - creating a diagram of the process can help. Consider the following aspects of information and work flow:

Internal Interfaces (department, person, activity and resource requirements)

- External Interfaces (company, contact person, activity and resource requirements)
- Tasks (in sequential order)
- Manual intervention points

Create data collection forms to capture information and define processes for manual handling of the information collected. Establish control logs to document transactions and track their progress through the manual system.

Manual workarounds require manual labor, so you may need to reassign staff or bring in temporary assistance.

Resilience & Mitigation Resources (Federal & Philanthropic) June, 2021

The following resources are identified for general informational purposes only and are compiled with publicly available information or with information provided by sources that are publicly obtainable. Please view this document as only a starting point for individual research. The user should always directly consult the provider of a potential resource for current program information and to verify the applicability of a particular program.

Federal Resources

Eligible State(s)	Program/Website	Deadline if posted	Description	Eligibility	Award Ceiling if posted
National	CARES Act: FY21 Community Health Workers for COVID Response & Resilient Communities: Evaluation & Technical Assistance (93.495)	May-24-2021	Supports efforts to train and deploy community health workers (CHWs); and to build/strengthen community resilience to fight COVID-19 through addressing existing health disparities in the population.	Local Government & Authority, State, Territory, Tribe	5000000
National	CARES Act: FY21 Community Health Workers for COVID Response & Resilient Communities (93.495)	May-24-2021	Supports efforts to train and deploy community health workers (CHWs); and to build/strengthen community resilience to fight COVID-19 through addressing existing health disparities in the population.	Local Government & Authority, State, Territory, Tribe	\$5,000,000 (per budget period)
Texas	FY21 State Conservation Delivery Technical Assistance: Louisiana (10.931)	May-24-2021	To solicit partnerships to help enhance the implementation of key natural resource conservation objectives and priorities. To enhance conservation delivery in Louisiana.	Local Government & Authority, Nonprofit Organizations, Public/Indian Housing Authorities, Public/Private Institutions of Higher Education, State, Territory, Tribe	\$3,000,000
National	FY21 Climate Adaptation & Mitigation Program (CAMP) (11.431)	May-24-2021	For improved scientific understanding of the changing climate system & impacts; including assessments, stewardship, mitigation, adaptation, & a climate-literate public that understands its vulnerabilities to a changing climate & makes informed decisions.	Nonprofit Organizations, Public/Private Institutions of Higher Education	\$75,000,000
National	FY21 COVID-19 Private Sector Engagement & Partnership Fund (19.301)	May-28-2021	The Fund seeks to support private sector interventions and build upon private sector investments in response to COVID-19 strengthening efforts internationally.	For-Profit Organizations, Nonprofit Organizations, Public/Private Institutions of Higher Education	\$10,000,000
National	FY21 Cooperating Technical Partners Program (97.045)	May-31-2021	The CTP Program is an innovative approach to partnerships between FEMA and participating NFIP communities, regional agencies, state agencies, tribes and universities that have the capability to become more active participants in the flood hazard mapping.	Local Government & Authority, Nonprofit Organizations, Public/Indian Housing Authorities, Public/Private Institutions of Higher Education, State, Territory, Tribe	
National	FY21 Archives Collaboratives (89.003)	Jun-09-2021	Together, the partners would develop a mission, work plan, and timeline to carry out a shared project or develop a shared best practice, tool, or technique that will increase public access to historical records.	Local Government & Authority, Nonprofit Organizations, Public/Private Institutions of Higher Education, State, Territory, Tribe	\$100,000
National	FY21 Individual State Earthquake Assistance (ISEA) (97.082)	Jun-15-2021	The purpose is to support the establishment of earthquake hazards reduction programming and the implementation of earthquake safety, mitigation, and resilience activities at the state and local level.	State, Territory	\$900,000
National	FY21 Multi-State & National Earthquake Assistance (MSNEA) (97.082)	Jun-15-2021	To mitigate earthquake losses in the United States through basic and directed research and implementation activities in the fields of earthquake science and engineering.	Nonprofit Organizations, Public/Private Institutions of Higher Education	\$450,000
Arkansas, Louisiana, New Mexico, Oklahoma, Texas	FY21 National Dam Safety Program (NDSP): Region 6 (97.041)	Jun-18-2021	The purpose of the NDSP State Assistance grants is the establishment and maintenance of effective State programs intended to ensure dam safety, to protect human life and property, and to improve State dam safety programs.	State, Territory	

Resiliency & Mitigation Resources (Federal & Philanthropic) June, 2021

Eligible State(s)	Program/Website	Deadline if posted	Description	Eligibility	Award Ceiling if posted
National	FY21 Tribal Public Health Capacity Building & Quality Improvement Umbrella Cooperative Agreement (93.772)	Jun-21-2021	Funding will be used to optimize the quality and performance of tribal public health systems - including infrastructure, workforce, data and information systems, programs and services, resources and communication, and partnerships.	Tribe	\$300,000
National	FY21 Water Resources Research Act Program National Competitive Grants (15.805)	Jun-24-2021	Focusing on water problems & issues of a regional or interstate nature that promote collaboration between the USGS and university scientists in research on significant national and regional water resources issues.	Local Government & Authority, Public/Private Institutions of Higher Education, State, Territory	\$250,000
Arkansas, Louisiana, New Mexico, Oklahoma, Texas	FY21 Community Assistance Program - State Support Services Element (CAP-SSSE): Region 6 (97.023)	Jun-28-2021	Helps states proactively identify, prevent and resolve floodplain management issues in participating communities before a flood event even occurs.	Local Government & Authority, State, Territory	
National	FY21 Gaining Early Awareness & Readiness for Undergraduate Programs: Partnership Grants (84.334A)	Jun-28-2021	Supports partnerships to assist eligible low-income students in obtaining a secondary school diploma (or its recognized equivalent) and to prepare for and succeed in postsecondary education.	Local Government & Authority, Nonprofit Organizations, Public/Private Institutions of Higher Education, State, Territory	\$5,000,000 (maximum award of \$800 per student for a single budget period of 12 months).
National	FY21 Administration for Native Americans (ANA) Social & Economic Development Strategies (SEDS) (93.612)	Jun-30-2021	For community-driven projects to grow local economies, strengthen Native American families, including preservation of Native American cultures, & decrease current challenges caused by lack of community-based businesses/social & economic infrastructure.	Nonprofit Organizations, Territory, Tribe	\$400,000
National	FY21 Social & Economic Development Strategies: Growing Organizations (GO) (93.612)	Jun-30-2021	Focused on assisting Growing Organizations in reaching their full potential as highly functioning entities able to effectively serve their Native American communities.	Nonprofit Organizations, Tribe	\$200,000 (per budget period)
National	FY21 Native American Business Development Institute (NABDI) Grant (15.032)	Jul-02-2021	Soliciting proposals from Tribes for technical assistance funding to hire consultants to perform feasibility studies of economic development opportunities. This may include Tribal businesses recovering from the economic impacts of the COVID-19 pandemic.	Tribe	\$75,000
National	FY21 FEMA Regional Catastrophic Preparedness Grants (RCPPG) (97.111)	Jul-16-2021	To build regional capacity to manage catastrophic incidents by improving and expanding collaboration for catastrophic incident preparedness.	Local Government & Authority, State, Territory	\$1,000,000
National	FY21 Federal Energy Management Program: Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) (81.117)	Jul-16-2021	Supports the viability and adoption of climate change mitigation and adaptation actions entailing energy efficiency, clean energy, and operational resilience at U.S. Federal government-owned facilities.	State, Territory	
National	FY21 Advancing National Space Weather Expertise & Research toward Societal Resilience (ANSWERS) (47.050)	Aug-23-2021	To address some of the most challenging problems in solar and space physics and space weather.	For-Profit Organizations, Nonprofit Organizations, Public/Private Institutions of Higher Education	\$2,500,000
National	CARES Act: FY20 Coronavirus Relief Fund (CRF) for States, Tribal Governments, & Certain Eligible Local Governments	Dec-31-2021	\$150 billion to States, Territories, and Tribal governments for unbudgeted expenditures incurred due to the COVID-19 health emergency, allocated by population proportions, min. \$1.25 billion for states with relatively small populations.	Local Government & Authority, State, Territory, Tribe	
National	FY21 NIOSH Support for Conferences & Scientific Meetings (93.262)	Dec-15-2025	Supports high quality scientific meetings, conferences, and workshops that are relevant to NIOSH's scientific mission and that promote occupational safety and health, NIOSH program priorities, and public health.	For-Profit Organizations, Local Government & Authority, Nonprofit Organizations, Public/Indian Housing Authorities, Public/Private Institutions of	\$20,000

Resiliency & Mitigation Resources (Federal & Philanthropic) June, 2021

Eligible State(s)	Program/Website	Deadline if posted	Description	Eligibility	Award Ceiling if posted
				Education K-12, Public/Private Institutions of Higher Education, State, Territory, Tribe	
National	CARES Act: FY20 Community Development Block Grants - Coronavirus (CDBG-CV)		Targets public health, coronavirus, housing and economic disruption needs. Funds may also be used for public facilities and food delivery efforts.	Local Government & Authority, State, Territory	
National	CARES Act: Addendum to EDA's FY20 Public Works & Economic Adjustment Assistance Programs (11.300)		EDA's CARES Act Recovery Assistance is designed to provide a wide-range of financial assistance to communities and regions as they respond to, and recover from, the impacts of the coronavirus pandemic.	Local Government & Authority, Nonprofit Organizations, Public/Private Institutions of Higher Education, State, Territory, Tribe	\$30,000,000
National	CARES Act: FY20-21 Election Security Grants		Election Security Grants made available to states to prevent, prepare for, and respond to the coronavirus for the 2020 federal election cycle.	State, Territory	\$36,485,465
National	CARES Act: FY20-21 Low Income Home Energy Assistance Program (93.568)		Additional funds for Low Income Home Energy Assistance Program. LIHEAP assists low-income households with their heating and cooling energy costs, bill payment assistance, energy crisis assistance, weatherization and energy-related home repairs.	State, Territory, Tribe	
National	Plant Materials Program (10.905)		Program aims to find plant solutions to solve conservation problems. Plants hold soil in place, protect stream banks and shores, filter pollutants, offer food for livestock, and cover for wildlife.	Local Government & Authority, State, Territory, Tribe	
National	National Coastal Zone Management Program		Addresses the nation's coastal issues through a voluntary partnership between the federal government and coastal and Great Lakes states and territories. Authorized by the Coastal Zone Management Act.	State, Territory, Tribe	
National	National Flood Insurance Program (97.022)		The National Flood Insurance Program provides insurance to help reduce the socio-economic impact of floods.	Individuals & Households, Local Government & Authority, State	
National	Public Assistance: 406 Mitigation		Funds work to protect damaged facilities against future damage, restore facilities, encourage hazard-resistant design, relocation of facilities (from hazardprone areas).	Local Government & Authority, Nonprofit Organizations, State, Territory, Tribe	
National	Emergency Community Water Assistance Grants Program (10.763)		To help rural residents who have experienced a significant decline in quantity or quality of water, due to an emergency event (ex. drought, earthquake, hurricane or tornado), to obtain adequate quantities of water.	Local Government & Authority, Nonprofit Organizations, State, Territory, Tribe	\$1,000,000
National	Farm Ownership Loans (10.407)		To help farmers and ranchers purchase or enlarge family farms, improve and expand current operations, increase agricultural productivity, and assist with land tenure to save farmland for future generations.	Agricultural Producers, Individuals & Households, Local Government & Authority	\$600,000
National	Hazard Mitigation Grant Program (97.039)		Funds provided to state, local, tribal and territorial governments so they can rebuild in a way that reduces, or mitigates, future disaster losses in their communities.	Local Government & Authority, Nonprofit Organizations, State, Territory, Tribe	

Resiliency & Mitigation Resources (Federal & Philanthropic) June, 2021

Philanthropic & Non-Federal Resources

Eligible State(s)	Program/Website		Description	Eligibility	Award Ceiling <i>if posted</i>
National	Hazard Mitigation Grant Program (97.039)		Funds provided to state, local, tribal and territorial governments so they can rebuild in a way that reduces, or mitigates, future disaster losses in their communities.	Local Government & Authority, Nonprofit Organizations, State, Territory, Tribe	
National	Kresge Foundation - FY20-21 Climate Change, Health, & Equity Initiative		Mobilizing equitable climate action by health care institutions, health practitioners and community advocates in ways that reflect the needs and priorities of low-income communities in America's cities.	Healthcare Institution, Nonprofit Organizations, Public/Private Institutions of Education K-12, Public/Private Institutions of Higher Education	
National	Emergent Fund - COVID-19 Rapid Response Grant Program (Rolling Deadline)		Supports emergent strategies that help communities respond to rapidly changing conditions. This includes resisting new or amplified threats and building power to move a proactive agenda.	Nonprofit Organizations, Territory, Tribe	\$30,000
National	School Safety Grant		This organization provides funding through grants for emerging technologies that will significantly accelerate law enforcement response times to active shooter calls at schools nationwide.	Individuals & Households, Local Government & Authority, Nonprofit Organizations, Public/Private Institutions of Education K-12	
National	Salvation Army - Emergency Disaster Services		In partnership with other agencies offerings 7 services: training, food service, emotional/spiritual care, emergency communications, disaster social services, donations management, disaster recovery.	Individuals & Households, Local Government & Authority, Nonprofit Organizations	
National	Agroecology Fund: COVID-19 Emergency Response		Emergency grants for humanitarian efforts that strengthen community-based, agroecological food systems, and to support advocacy which holds governments accountable.	Agricultural Producers, Nonprofit Organizations, Territory, Tribe	
National	AbbVie Foundation		AbbVie Foundation supports organizations responding to natural and man-made disasters. It supports housing and homelessness as a result of such disasters as well as other research such as healthcare, education, science, and equity.	Healthcare Institution, Local Government & Authority, Nonprofit Organizations, Public/Indian Housing Authorities, Public/Private Institutions of Higher Education, Territory, Tribe	
National	Women of Color in Fundraising & Philanthropy (WOC)		To celebrate, inspire, and champion women of color in fundraising, philanthropy and related fields through building community and providing personal and professional development resources.	Nonprofit Organizations, Territory, Tribe	
National	National Congress of American Indians - COVID-19 Relief (Rolling Deadline)		Supporting the needs of Native American communities through small targeted grants.	Nonprofit Organizations, Tribe	\$5,000

Public Private Partnerships for Resilience-Three Case Studies

Prepared for the Texas Economic Development Council

By the International Sustainable Resilience Center, Inc.

1. Resilient Health Facility

Hurricane (Typhoon) Katrina struck the U.S. gulf coast in 2005, flooding the city of New Orleans, Louisiana and causing catastrophic damages. Of the 1,170 deaths from Hurricane Katrina, an estimated 520 were in acute medical care prior to the storm.

Low-income and minority citizens were severely adversely affected due to severe damage and ultimate closing of the largest public charity hospital in the state. In response, the State of Louisiana entered into a public private partnership with the Children's Hospital Foundation, a nonprofit, to build a new charity hospital complex. University Medical Center New Orleans, a state-of-the-art facility, was designed and built for disaster readiness and resilience. The resilience measures incorporated in the design allow the hospital to continue operating under extreme weather conditions, and include the following measures:

- All critical components and services including patient rooms, the emergency department, the helipad and decontamination facilities are located on Level 2 and above flood level while noncritical public, conference and office functions occupy the ground floor
- The infrastructure including power generation, food and water supplies allow the facility to survive off the electrical grid for seven days.
- The glass façade is capable of withstanding the impact of a major hurricane including the force of a 2x4 hitting the exterior at 200 mph.
- The emergency room has redundant critical instruments and machines, can hold up to 200 people, and has enough food and water for two weeks.

This level of resilience was accomplished through the injection of \$143 million by the private foundation in partnership with the State and its flagship university's medical school, totaling \$1.064 Billion. Under the public private partnership agreement, the foundation operates and maintains the facility.

1. Affordable Housing for Disaster Recovery and Beyond

Disasters by hurricanes and flooding can particularly affect low-to-moderate income neighborhoods where pre-disaster housing is already inadequate. A pilot project was developed in the Rio Grande Valley of the U.S. State of Texas in an impoverished region on the border with Mexico, with the objective of building resilient temporary shelter (core) that could be easily expanded into a quality affordable home.

Utilizing pre-assembled components for the core provided significant cost savings, (\$25,000 vs \$125,000 for a mobile unit) proved very resilient (can withstand hurricane strength winds) and allows additional rooms to be added in converting the shelter into a quality affordable home.

The PPP solution was chosen because the U.S. Federal Government's policy is not to fund permanent home construction. The core unit is not considered a permanent home; however, utilizing a case management system to provide private financing and construction, the units

were able to be converted into permanent homes. In this pilot project, 20 core units were converted into permanent homes.

The project was funded through a public private partnership between the Texas Land Commission and three nonprofits, who managed the entire project including assembling the core units, providing case management for victims including architects to work with victims in converting shelters to homes, financial counseling to ensure victims were able to afford their new homes, and ongoing maintenance of the neighborhood. The pilot project was implemented in 2014, and all 20 homes are still occupied.

Resilient Supply Chain & Transportation Systems

The Louisiana Supply Chain & Transportation Council (LSCTC) was formed as a response to severely disrupted commerce in the wake of severe flooding events in the U.S. State of Louisiana. At one point in this disaster, every major transportation system (Highways, Ports, Airports, Railroads) were disabled, some for weeks or months. The LSCTC has been in continuous operation for five years and has no plans to disband.

This “soft” public private partnership includes representatives of private sector transportation associations (ports, railroads, water transport, trucking, airport operators) and public sector agencies (State and Federal transport agencies, the US Army Corps of Engineers, State and Federal Economic Development Agencies) has led to several “hard” infrastructure projects, with the goal to increase the overall effectiveness of transportation and reduce impacts on commercial and agricultural interests from future events.

As of March 2021, the LSCTC has accomplished the following:

--2018--Secured \$350,000 for development of an analysis of Louisiana’s transportation system with recommendations to increase resilience.

--2019—Based on the Resilience Analysis and recommendations, secured \$4.5 million for road and waterway flood protection improvements, with a match provided by private members

--2020—In response to record number of hurricanes, and after the City of Lake Charles was destroyed by two hurricanes within 5 weeks, created a response and resilience task force to meet both immediate needs and long-term resilience investments. The first of these is a Public Private Partnership to reconstruct, operate, and maintain a 2-km long bridge on Interstate 20 over the major transport waterway Calcasieu River, estimated to cost \$600 to \$800 million.

--2021—The Council is submitting recommendations to the Louisiana legislature for increased transportation resilience in the face of continuing increases in number and intensity of natural disasters, including several public private partnership projects.

 An official website of the United States government
[Here's how you know](#)



FEMA

Building Resilient Infrastructure and Communities (BRIC)

Before You Apply for Building Resilient Infrastructure and Communities (BRIC) Funds

Funding

Eligibility

Capability- and Capacity-Building Activities

Technical Assistance & Resources

Cost Share & Pre-Award Costs

Building Resilient Infrastructure and Communities (BRIC) funds may be used for:

- Capability- and Capacity-Building (C&CB) Activities
- Mitigation Projects
- Management Costs

Existing project types detailed in the [Hazard Mitigation Assistance Guidance](#) for the Pre-Disaster Mitigation grant program are still eligible under BRIC. Projects must:

- Be cost-effective
- Reduce or eliminate risk and damage from future natural hazards
- Meet either of the two latest International Building Codes (i.e. 2015 or 2018)
- Align with the applicable hazard mitigation plan
- Meet all environmental and historic preservation (EHP) requirements



A sampling of eligible project types is profiled in the [BRIC Mitigation Action Portfolio \(MAP\)](#) and serve as case studies in innovative mitigation at a variety of project scales.

Funding

For FY20, FEMA will distribute up to \$500 million through the BRIC program in the following manner.

State/Territory Allocation

\$33.6 million (up to \$600,000 per Applicant). All 50 states, the District of Columbia, and U.S. territories may apply under the State/Territory Allocation.

Tribal Set-Aside

\$20 million. All Tribal governments (federally recognized) may apply under the Tribal Set-Aside.

National Competition for Mitigation Projects

\$446.4 million (estimated). Remaining funds that are not awarded from the State/Territory Allocation or Tribal Set-Aside will be included in the national competition.

Eligibility

Eligible states, territories, and Tribal governments (federally recognized) can submit applications on behalf of subapplicants for BRIC funding via [FEMA Grants Outcomes \(GO\)](#), the new grants management system to support FEMA grant programs.

Homeowners, business operators, and non-profit organizations cannot apply directly to

FEMA, but can be included in a subapplication submitted by an eligible subapplicant. For more information please contact your local government or state to apply for BRIC funding.

Who is eligible for BRIC funding?

Applicants:

- ✓ All 50 States
- ✓ U.S. territories
- ✓ Federally recognized Tribal Governments
- ✓ District of Columbia

Alaska

Hawaii

American Samoa

Guam

Northern Marianas

Puerto Rico

U.S. Virgin Islands

District of Columbia

Federally recognized Tribal Gov'ts.

Subapplicants:

- ✓ Local Governments
- ✓ Tribal Governments
- ✓ State Agencies
- ✓ Tribal Agencies

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while targeting specific mitigation projects beneficial to their communities.

Entities interested in creating BRIC **subapplications** may contact town/city/county managers, planning, and/or emergency management offices within local governments, including cities, townships, counties, special district governments, and tribal governments. For local governments, please contact your [State Hazard Mitigation Officer](#) to learn about the applicant's priorities, deadlines, and additional requirements.

APPLICANT ELIGIBILITY REQUIREMENTS

- Applicants may include states, the District of Columbia, U.S. territories, and Tribal governments (federally recognized). Federally recognized tribal governments are those under the Federally Recognized Indian Tribe List Act of 1994.
- Each state, the District of Columbia, territory, and Tribal government (federally

recognized) shall designate one agency to serve as the Applicant for BRIC funding. Each Applicant's designated agency may submit only one BRIC grant application to FEMA. An application can be made up of an unlimited number of subapplications.

- Applicants must have a FEMA-approved State or Tribal Hazard Mitigation Plan by the application deadline and at the time of obligation of grant funds.
- **State or territory:** Must have received a major disaster declaration under the Stafford Act in the 7 years prior to the annual grant application period start date. Currently, all states, the District of Columbia, U.S. territories, and Tribal governments (federally recognized) meet this requirement.
- **Tribal government (federally recognized):** Must have received a major disaster declaration under the Stafford Act in the 7 years prior to the annual grant application period start date or be entirely or partially located in a state that received a major disaster declaration in the 7 years prior to the annual grant application period start date. Currently, all states, the District of Columbia, U.S. territories, and Tribal governments (federally recognized) meet this requirement.

SUBAPPLICANT ELIGIBILITY REQUIREMENTS

- Local governments, including cities, townships, counties, special district governments, state agencies, and Tribal governments (including federally recognized tribes who choose to apply as subapplicants) are considered subapplicants and must submit subapplications to their state/territory/tribal applicant agency.
- Subapplicants must have a FEMA-approved Local or Tribal Hazard Mitigation Plan by the application deadline and at the time of obligation of grant funds for mitigation projects and C&CB activities (with the exception of mitigation planning).
- Tribal governments (federally recognized) and non-federally recognized tribes can choose to apply as a subapplicant to an eligible state or territory.
- If a tribe requests to apply through the state, the state must have received a major disaster declaration under the Stafford Act in the 7 years prior to the annual grant application period start date.

Capability- and Capacity-Building (C&CB) Activities

Capability- and Capacity-Building (C&CB) activities enhance the knowledge, skills, expertise, etc., of the current workforce to expand or improve the administration of mitigation assistance. This includes activities in the following sub-categories:

- Building codes activities
- Partnerships
- Project scoping
- Mitigation planning and planning-related activities
- And other activities

FY 2020 Funding for Capability- and Capacity-Building (C&CB)

C&CB activities can only be submitted under the State/Territory Allocation and Tribal Set-Aside.

The **State/Territory Allocation** includes \$33.6 million (up to \$600,000 per Applicant) for all 50 states, the District of Columbia, and U.S. territories.

The **Tribal Set-Aside** includes \$20 million under which all Tribal governments (federally recognized) may apply. Each tribal applicant may apply for up to \$600,000 for C&CB activities under the Tribal Set-Aside.

C&CB Subcategories

Building codes activities are a sub-category of C&CB activities, and applicants can apply their entire \$600,000 allocation for C&CB activities to building code activities under the State/Territory Allocation and Tribal Set-Aside.

Project scoping (previously known as Advanced Assistance) is a sub-category of C&CB activities, and applicants can apply their entire \$600,000 allocation for C&CB activities to project scoping under the State/Territory Allocation and Tribal Set-Aside.

Mitigation planning activities are a sub-category of C&CB activities and can be submitted under the State/Territory Allocation and Tribal Set-Aside. Under the allocation, only up to \$300,000 may be used for mitigation planning and planning-related activities. The Tribal Set-Aside includes \$20 million under which all Tribal governments (federally recognized) may apply. Under the Tribal Set-Aside, up to \$300,000 of the C&CB activities cap (federal share) may be used for mitigation planning and planning-related activities per Applicant.

TECHNICAL ASSISTANCE AND RESOURCES

FEMA offers technical assistance resources to communities including:

- Videos on [FEMA's YouTube channel](#)
- [BRIC Mitigation Planning Activities](#)
- [BRIC Direct Technical Assistance](#)
- [BRIC Building Code Activities](#)
- [BRIC Partnership Activities](#)
- [BRIC Project Scoping Activities](#)

Visit the [Building Resilient Infrastructure and Communities \(BRIC\) page](#) for more program information.



Contact us by calling the HMA Helpline at 1-866-222-3580, or finding your [State Hazard Mitigation Officer \(SHMO\)](#).

Cost Share Requirements and Pre-Award Costs

A non-federal cost share is required for all subapplications funded under BRIC and may consist of cash, donated or third-party in-kind services, materials, or any combination thereof. The cost share for BRIC is as follows:

- Generally, the cost share is 75 percent federal/25 percent non-federal.
- Small impoverished communities are eligible for an increase in cost share up to 90 percent federal/10 percent non-federal.
- For insular areas, including American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands, FEMA automatically waives the non-federal cost share for the Recipient when the non-federal cost share for the entire Award is under \$200,000. The Applicant may request the waiver in its Application.

Applicant may request the waiver in its Application.

- One exception to the cost share requirement is FEMA will provide 100 percent federal funding for Applicant and subapplicant management costs.

Pre-Award Costs

Pre-award costs are directly related to developing the BRIC grant application or subapplication. Applicants and subapplicants who are not granted awards or subawards will not receive reimbursement for the corresponding pre-award costs.

Pre-award costs are incurred prior to the date of the grant award. There is no start date for when they can be incurred. They can be incurred any time prior to award.

Examples of pre-award costs include gathering National Environmental Policy Act (NEPA) data, developing a Benefit-Cost Analysis (BCA), preparing design specifications, or conducting workshops related to development and submission of subapplications. Costs associated with implementation of proposed projects in the submitted grant application or subapplication that are incurred prior to the date of the grant award are not allowed. Activities initiated or completed prior to the date of the grant award are generally not eligible.

To be eligible for BRIC funding, pre-award costs must be identified and labeled pre-award as an individual line item in the cost estimate of the subapplication.

Last updated April 13, 2021

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Resource List for the Building Resilient Infrastructure and Communities Grant Program

These Program Support Materials provide important information on various activities under the new Building Resilient Infrastructure and Communities (BRIC) grant program to support building codes, partnerships, project scoping, mitigation planning, direct technical assistance, competition criteria and more. The materials listed below can be found under [Additional Resources](#) on the [BRIC webpage](#) on FEMA.gov.

Program Support Materials:

[Mitigation Action Portfolio](#)

This portfolio has been created to introduce stakeholders to the BRIC program and the array of eligible hazard mitigation activities that can benefit stakeholders.

[BRIC Building Code Activities](#)

The adoption and enforcement of building codes is an important mitigation activity that provides significant resilience benefits. This program support material provides applicants and subapplicants of the BRIC program with information relative to eligible building code-related activities under the state or territory allocation and tribal set-aside.

[BRIC Partnership Activities](#)

FEMA promotes partnerships and provides financial assistance as an eligible capability- and capacity-building activity. This program support material provides information about partnership activities eligible under the state or territory allocation and tribal set-aside of the BRIC program.

[BRIC Project Scoping Activities](#)

Project scoping is the successor to Advance Assistance and designed to develop mitigation strategies and obtain data to prioritize, select, and develop complete applications in a timely manner. Project scoping may result in either an improvement in the capability to identify appropriate mitigation projects or in the development of an application-ready mitigation project for BRIC or another funding opportunity.



FEMA

BRIC Mitigation Planning Activities

Under BRIC, mitigation planning activities should result in a FEMA-approved hazard mitigation plan or contribute new information to an existing hazard mitigation plan. This program support information provides applicants and subapplicants eligible mitigation planning activities under the state or territory allocation and tribal set-aside. Subapplicants are required to have a FEMA-approved Local or Tribal Hazard Mitigation Plan by the application deadline and at the time of obligation of grant funds for mitigation projects and capability-and capacity-building activities, with the exception of mitigation planning.

BRIC Direct Technical Assistance

FEMA will provide non-financial Direct Technical Assistance to up to 10 selected communities to support the mitigation outcomes outlined and referenced in the BRIC NOFO. This includes providing technical assistance to communities to build a community's capacity and capability to improve its resiliency to natural hazards and to ensure stakeholders are capable of building and sustaining successful mitigation programs, submitting high-quality applications, and implementing new and innovative projects that reduce risk from a wide range of natural hazards.

BRIC Technical Criteria

FEMA uses technical evaluation criteria to score subapplications submitted to the national competition. This program support material provides detailed information about the eight technical evaluation criteria that will be used in the BRIC national competition and explains how to meet the criteria.

BRIC Qualitative Criteria

FEMA will convene a national review panel to score subapplications submitted for consideration under the national competition based on a qualitative review. The program support material is intended to increase transparency in decision-making and discusses the six scoring criteria. Additionally, application instructions are included for each respective criterion to guide information submission in FEMA Grants Outcomes (FEMA GO).

Hazard Mitigation Assistance (HMA) Cost Share Guidance

This guidance is a tool for applicants, subapplicants and FEMA to assist with understanding match requirements for FEMA's HMA grants. The guide encourages early coordination for cost share strategies and provides helpful examples for various approaches such as donated resources for the non-Federal cost share.

Additional Resources

General questions about the BRIC program can be directed to the appropriate State Hazard Mitigation Officer (SHMO), which can be found on the [SHMO webpage](#) on FEMA.gov, or you can contact the FEMA Regional Office, which can be found on the [FEMA Regional Office webpage](#) also on FEMA.gov.

FEMA GO Helplines:

femago@fema.dhs.gov or 1-877-611-4700

Environmental and Historic Preservation:

EHPHelpline@fema.dhs.gov or 1-866-222-3580

BCA Helplines:

BCHelpline@fema.dhs.gov or 1-855-540-6744

HMA Helplines:

1-866-222-3580

Feasibility and Effectiveness Helpline:

FEMA-BuildingScienceHelp@fema.dhs.gov

[BRIC webpage](#) and [NOFO webpage](#) on FEMA.gov (FY20 BRIC Fact Sheet and NOFO)