Advancing Maryland Economic Resilience:
Lessons Learned from the Central Maryland 2018 Flood

REPORT AND PLANNING GUIDE
October 1, 2021

Institute for Sustainable Development

HOWARD COUNTY
ECONOMIC
DEVELOPMENT
AUTHORITY
Grow. Here's how.

Table of Contents

Executive Summary

In response to the recent disasters that have affected Maryland, particularly the 2018 thousand-year flood event, the Institute for Sustainable Development (ISD) and the Howard County Economic Development Authority (HCEDA) organized a series of thematic workshops and consultations with key stakeholders to address the top issues affecting the region's economic resilience and disaster recovery processes.

The following report captures and summarizes the issues that were raised, key findings and continuing questions that need to be addressed. These include:

- The last five years have accounted for more than $1.015 billion in losses directly attributable to major disasters in the state of Maryland.

- $1 invested in resilience may save $4-$7 in post-disaster costs, but this depends on sound forecasting, careful planning, stakeholder buy-in, good design, and prudent decisions at the individual, business and community levels.

- Developing an effective economic risk management support system is imperative to support existing businesses retention, growth and attract outside investment.

- At the state level, many changes have begun to take place to support and enable economic resilience at the county level. These include:

  ✓ Elevation of state emergency management director to cabinet-level position

  ✓ The creation of a $25 million Revolving Loan Fund for Resilience

  ✓ The Private Sector Integration Program at MEMA

  ✓ Development of a state Chief Resilience Officer concept

  ✓ The completion of the 2021 Hazard Mitigation Plan

  ✓ Support for flood mitigation plans at the county level

  ✓ Support for enhanced cybersecurity

  ✓ Support for expansion of broadband and internet access

- At the County level, multiple programs have been developed and built on dating back years. Examples include:

  ✓ Howard County has benefited from a long-standing working relationship between the Howard County Economic Development Authority and the Howard County Office of Emergency Management

  ✓ Frederick County has reaped many safety, security and economic benefits from its Carroll Creek Park project dating back to the 1970s

  ✓ Baltimore County has expanded rural access to high speed internet services to 12,000 households over the past two years reaping significant resilience, economic, and educational rewards

  ✓ Washington County has instituted targeted crisis relief grant programs for restaurants, farmers, exporters, and other small businesses, including non-profits

Workshop experts also made the following recommendations for ongoing economic resilience improvements:

- Enhancing economic resilience begins with sound planning. Resilience objectives should be incorporated into Comprehensive Economic Development Strategies (CEDS). County and state economic objectives should be incorporated into Hazard Mitigation Plans.

- Stakeholder mapping and engagement is a vital tool for helping over-stretched emergency managers and economic development leaders increase their capacity through all phases of disasters.

- Public-private logistics coordination on issues ranging from debris removal, restoration of services, rapid response, and supply chain replenishment can help to stretch the capacity of emergency responders significantly.

- Local communities may not have sufficient resources to rapidly "build back better" critical infrastructure, heritage, environmental features, and other community assets that took years to accumulate. Local jurisdictions may need state support to access federal funds that require matching budgets, especially for those that can only be accessed on a reimbursement basis.

- Recovery functions work better and happen much faster when there is local, state, and federal coordination.

- Emergency funds for private sector and volunteer organizations active in disasters (VOADs) and longer-term small business recovery loans and grants should be pre-planned and pre-authorized based on the severity of the disaster.

- To support the economic resilience of vulnerable communities, both "high tech" and "high touch" solutions should be developed. The "high touch" process has to go through stages including outreach and engagement, listening, trust-building, addressing of equity issues, and investment. High tech solutions include GIS mapping, use of satellite capabilities, investment in rural broadband and modernized IT and communications platforms, mobile apps.

- Public-private partnerships (PPPs) are currently under-utilized but could be key to sharing the costs of future disasters and helping to scale up needed services and enhanced safety, security, and response.

This program was made possible by a grant from the U.S. Economic Development Administration.

1.0 Embedding Economic Resilience Across the Disaster Management Cycle

> **"Disasters are making us come together now more than ever."**
>
> — Kelly Schulz, Secretary, Maryland
> Maryland Department of Commerce

The Institute for Sustainable Development (ISD) and the Howard County Economic Development Administration (HCEDA) began a dialogue over two years ago about the economic challenges that emerged from the extreme rain event in 2018. The flood was not only disruptive and costly, but it also came on top of another 1,000-year flood event that had happened just two years prior in 2016. The partners conceived a series of workshops that would examine different aspects of how to incorporate emergency managers and economic developers in working jointly on the recovery and resilience of the four counties (Baltimore, Frederick, Howard, and Washington) impacted by the 2018 flood. Issues on the table included:

- What do emergency managers need to know about economic development?
- What should economic developers know about emergency management?
- How can impacted communities protect the region's small business base?
- How can communities build up communication, coordination and collaboration capacity with public and private sector partners at the local, state, and national levels?
- What adaptations are needed to reduce the future economic impacts of disasters on the region?

The good news for Maryland is that the state GDP has more than doubled over the past 20 years.

> **"Mitigation is the center of the universe. We cannot respond beyond our capabilities."**
>
> — Russell Strickland, Executive Director,
> Maryland Emergency Management Agency

Maryland Gross Domestic Product (GDP) in Millions of Dollars from 2000-2020
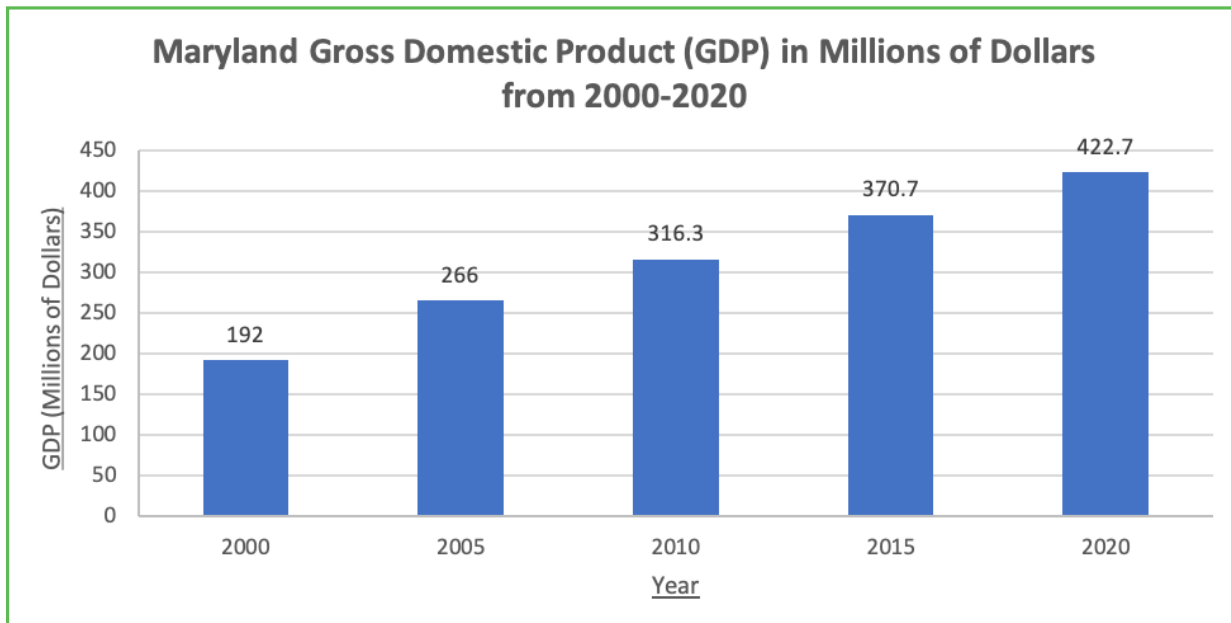
Figure 1: Source: U.S. Bureau of Economic Analysis

The bad news is that over the last 10 years, Maryland has borne at least part of the brunt of nine billion-dollar disasters from weather and other extreme situations. These include the aftermath of tropical storms and depressions, hurricanes, and other types of severe weather. The most glaring, has been the effect of the COVID-19 global pandemic. In just the last five years, disasters have accounted for more than $1.015 billion in losses for the state of Maryland. Projecting forward, Maryland is projected to incur four to eight billion dollars more in disaster costs by 2050.
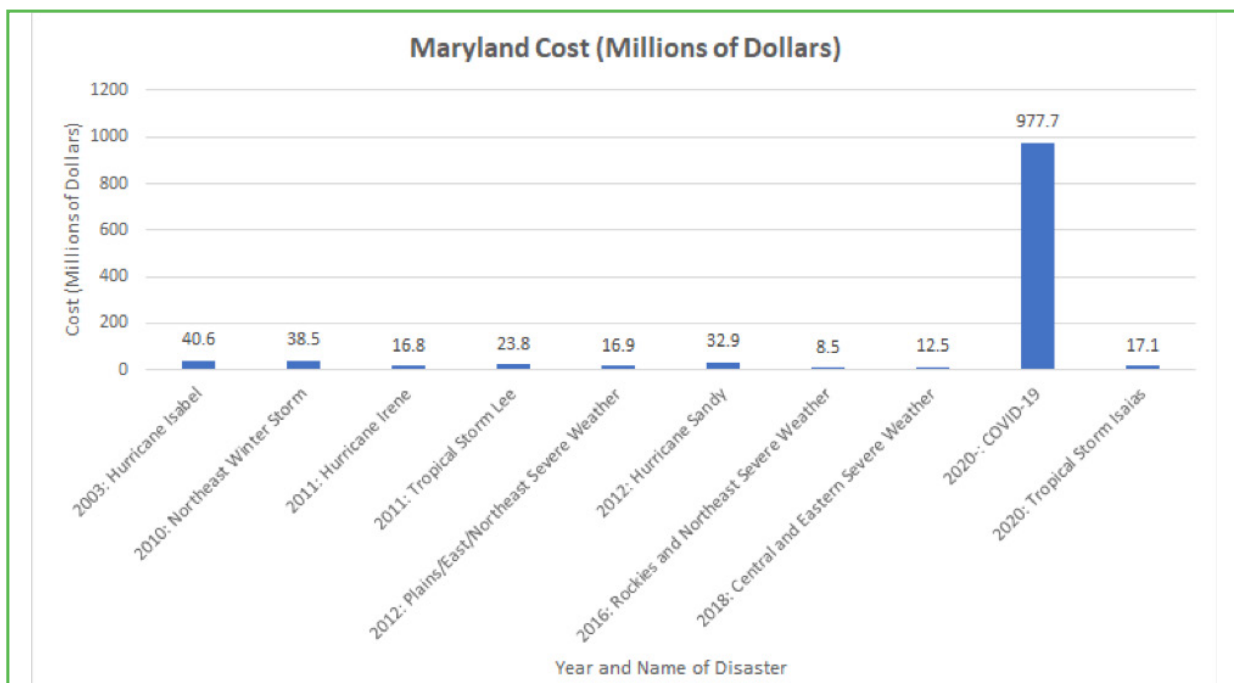
Maryland Cost (Millions of Dollars)

Figure 2: Source: NOAA and FEMA

According to Federal Emergency Management Administration (FEMA), in national studies, every dollar invested in resilience saves four to seven dollars in post-disaster costs, but this depends on sound forecasting, careful planning, stakeholder buy-in, good design, adequate financing, and prudent decisions at the individual, business, infrastructure, and community levels.

Developing an effective economic risk management support system is imperative to support existing businesses, economic growth and attract outside investment. But sometimes this is easier said than done. Some resilience investments can take years to come to fruition due to their complexity, cost, and disruptiveness.

At the state level, many changes have begun to take place to support and enable economic resilience at the county level. These include:

- Elevation of state emergency management director to cabinet-level position
- The creation of a $25 million Revolving Loan Fund for Resilience
- The Private Sector Integration Program at MEMA
- Development of a state Chief Resilience Officer concept
- The completion of the 2021 Hazard Mitigation Plan
- Support for flood mitigation plans at the county level
- Support for enhanced cyber security
- Support for expansion of broadband and internet access

At the County level, multiple programs have been developed and built on dating back years. Examples include:

- Howard County has benefited from a long-standing working relationship between the Howard County Economic Development Authority and the Howard County Office of Emergency Management
- Frederick County has reaped many safety, security and economic benefits from its Carroll Creek Park project dating back to the 1970s
- Baltimore County has expanded rural access to high speed internet services to 12,000 households over the past two years reaping significant resilience, economic, and educational rewards
- Washington County has instituted targeted crisis relief grant programs for restaurants, farmers, exporters, and other small businesses, including non-profits

1.1   Why a Holistic View of Economic Resilience Matters

To reduce economic costs, disaster management needs to focus not just on the ***immediate impacts*** of disasters, but their ***long-term impacts*** and the ***duration of the recovery*** period.

The figure below illustrates the typical pattern of economic effects of each of these metrics.
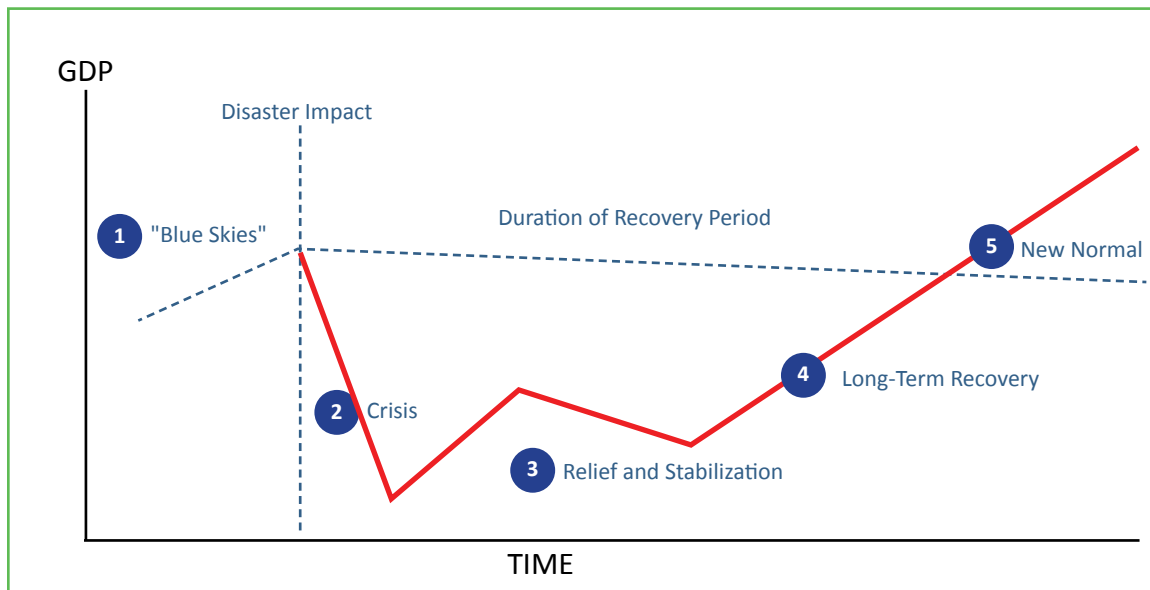

Figure 3: The Economic Pattern Caused By Disasters

1 **During Normal times, Steady State, Business as Usual or "Blue Skies"** (the nomenclature for normal operating conditions varies), the economic baseline of the community pre-disaster captures the area GDP, assets, and opportunities for future growth. The figure above is for a community that was experiencing positive growth before the disaster. However, in some cases, communities may be going through a period of decline pre-disaster, or they may have pre-existing debt or other vulnerabilities. Often, the baseline is reduced to Housing assets or per capita GDP, but this under-reports the community's economic wherewithal.

2 **The Crisis or Emergency Stage** defines the period immediately after a disaster occurs. Disasters can cause a short-term massive shock to the economy, but they can also create second order economic impacts that unfurl over the long-term. Power, water, and telecom disruptions, bridge, road, building closures, and housing damages are immediate and obvious. Disasters can also cause cascade effects that manifest over time. For example, many small businesses are dependent on residents within up to five square miles of their location. If housing takes six to eight months to recover, and small businesses have 30 to 90 days of cash flow, the full economic impact of the disaster may not be felt all at once. Communities not directly affected by disasters can also have shocks as fleeing residents book up hotel rooms, send prices higher, and create scarcities in "receiving cities" or "secondary impact" cities.

This stage is the most scrutinized and well-established. Emergency Support Functions have been defined in Maryland's State Response Operations Plan and FEMA's National Response Plan. The private sector is integrated into MEMA's operations at multiple levels. None of the other stages have anything remotely close to this kind of formal operational support system.

3 **The Relief and Stabilization Stage** does not begin all at once – rather different facets become stabilized at different times, and the degree of their stability may be in question. Short-term restoration of service does not mean long-term function – the same way that a spare tire isn't meant to run for more than 50 miles.

After disasters, communities can receive an outpouring of support at the state and federal level, and also from individuals, volunteer organizations active in disasters (VOADs) like the Red Cross, UMCOR, big businesses, and foundations. These funds and the unusual repair, replacement, and reconstruction costs that disasters cause can lead to a "disaster economy" where in some ways, the community may look like it is prospering, even if the normal economic drivers of the community are closed, disrupted, or diminished.

This is why stabilization – the process of getting the community to a place where it can chart a pathway back to a new normal – is so important. Businesses do not do well with uncertainty. Openings followed by closures, variations in access, congregation capacity, and other mixed messages can have a paralyzing effect. Getting to a point where businesses know what to expect and can forecast future conditions is vital for catalyzing private sector investment.

4 **The Long-Term Recovery stage** begins well before the short-term disaster economy runs its course. The process of repairing and upgrading infrastructure, replacing inventory and equipment, arranging financing, re-opening, and marketing can take years, particularly if there are significant housing losses or if the community is dependent on travel and tourism or needs to reconfigure traffic patterns or service deserts open up due to business failures.

5 Finally, a disaster recovery process can be said to be completed when a **New Normal** has been established. It is unfair to say that a community is only fully recovered once it has returned to the population, GDP, or quality of life that it had pre-disaster. People frequently move out of areas when housing and employment are disrupted. Some environmentally sensitive areas or financially insolvent properties should not be rebuilt and should be allowed to return to nature. Also, if a community was struggling pre-disaster, the shock may over-tax its resources to come back. On the flip side, if long-term recovery and resilience investments are pre-planned or ready to go during the early stages of a disaster, a community may receive significant funding to upgrade itself and its future prospects.

Historically, disaster managers and economic developers functioned in relatively disconnected siloes. Emergency managers focused on the crisis phase of disasters and health and safety issues. Economic developers on the other hand, tended to focus on the stabilization and long-term r ecovery phases. Restoration of service and repair and renewal of the area's economic base were their priorities.

What the emergent economic resilience perspective does is view successful disaster management as getting the community to a positive New Normal. The outcome is a successful Stage 5 process, not just a successful Stage 3 process. In this view, emergency managers (EMs) and economic development officers (EDOs) are natural partners.

This changes the way resilience is framed. Instead of looking at resilience in terms of preparation or mitigation of potential disasters, resilience is about bringing the community back to a level equal to or better than it was before. This means analyzing the threats and vulnerabilities to the community that the disaster might expose, and developing tools and strategies to reduce them. This more holistic and systemic approach illustrates why investing $1 in resilience may not just save $4-$7 in post-disaster costs it may lead to enhanced quality of life and future prosperity. Case studies featured in this report that illustrate this approach include the Carroll Creek project in Frederick and the Ellicott City Safe and Sound project in Howard County.

Resilience is becoming more of a priority at the federal level. FEMA's [Building Resilient Infrastructure and Communities (BRIC) program](#) was developed and first launched in 2020 to assist emergency management and economy recovery in:

- Supporting communities through capacity-building measures
- Encouraging and enabling innovation
- Promoting partnerships
- Enabling large projects
- Maintaining flexibility
- Providing consistency

Incorporating resiliency principles is essential for preventing further losses and economic impact, but this responsibility has to be shared and internalized — not just by emergency managers and economic development leaders. As one workshop participant noted, this should apply not just at the community level, but also at the business level. Business owners and community leaders must ask themselves, "Are we prepared?"

As the charts illustrate, the state cannot afford to continue on the current trajectory of escalating disaster costs. Advancing Maryland's economic resilience will pay enormous dividends in terms of harm and cost reduction, better community design, and increased communication, coordination, and collaboration between emergency managers and economic development officers, key stakeholders, and the general public.

1.2 How to Use this Report

This report is designed to assist Maryland state and local emergency managers and economic development leaders with current disaster recovery and future economic resilience challenges.

The Institute for Sustainable Development and Howard County Economic Development Authority were able to convene leading county, state, and national experts over the course of 2020-2021 to discuss the status of current recovery efforts, and what could be done to assist the state's future economic resilience, so that future disruptions are not as painful as they have been in the past.

Figure 4: Recovery Support Function (RSF) expert panelists at ISD's Maryland resilience conference.

Each workshop in the series focused on one or two critical aspects of economic resilience, but the discussions were fluid and wide-ranging. It was found, for example, that public-private partnerships could be a tool that could be used in all stages of disaster management, and that small business recovery did not just depend on the efforts of small businesses themselves, but on the actions of the community around them.

Each section synthesizes:

- Presenting Issues
- Objectives
- Analysis
- Strategies and Solutions

The discussions were conducted under the Chatham House Rule to promote the exchange of ideas, but where possible we have sought to pull quotes (with prior permission) and identify presenters to capture the flavor of our expert perspectives.

We hope you will find these tips and insights helpful as you develop your own plans for future economic resilience, preparedness and mitigation.
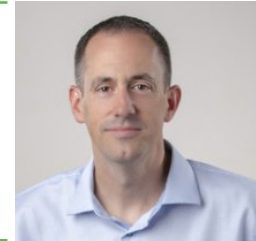

Figure 5: Towson, Maryland

2.0 Economic Resilience Keys for Emergency Managers

> **"Once we engaged with our economic development team —**
> **we accessed a whole new level of expertise and capability**
> **I wished I had known about sooner."**
>
> — Ryan Miller, Former Director, Howard County OEM

The first workshop zeroed in on the role of economic resilience across the disaster management cycle and raised many questions about the relationship of emergency managers (EMs) and economic development officers (EDOs). These included:

- What do emergency managers need to know about economic development?
- What do EDOs need to know about disaster management?
- What needs to be done to build trust and develop relationships between EDOs and EMs?

Emergency managers are increasingly being judged not just by their crisis management and coordination skills, but also by the disruption, dislocation, and expense of disasters. This is causing mission creep, difficulties in multi-tasking and/or meeting priority objectives, and in some cases, a sense that EMs have to somehow achieve unfunded mandates with resources that are already stretched thin.

In Howard County, this sense of larger responsibility was a motivating factor for the emergency management department to reach out to HCEDA to explore ways to create enhanced communication, coordination and collaboration. As Ryan Miller put it, "At the beginning, with Tropical Storm Lee, the Main Street train derailment, and a derecho, I kept running up against business and economic issues where I could use some help."

In business continuity there is a concept known as "Recovery Time Objective" (RTO). What is the tolerance for restoration of operations? Expanding this concept to the community level, the RTO is becoming shorter and shorter. Community tolerance for services being down is declining because people, businesses, and organizations are interdependent; therefore, reliability is becoming more essential. To shut down power, a rail line or a fiber optic cable might not just be a local problem. It can also affect regional operations, and in some cases it can even be a global problem.

2.1   Objectives

Economic development insights can help emergency managers in the following ways:

- Leverage private and non-profit resources

- Help emergency managers recognize and leverage readily available economic development expertise and business and financial tools and resources

- Establish points of contact to troubleshoot business issues as they arise

- Create information channels for emergency managers to learn about business needs

- Enhance communication with business and economic interests about EM needs

- Help emergency managers integrate economic and business needs into their planning and operations

- Minimize disruption and potential impacts and enhance reliability and continuity

2.2   Analysis

Emergency managers have to coordinate disasters, liaise with government officials, engage with the community, prepare for future disasters, often with limited staff and resources so they might not have time to reach out to others as much as they would like.They may not be aware of economic development resources that could help them.

Many businesses and EDOs do not engage in resilience planning because of their own capacity limitations, resources, and other issues. When businesses are flooded or destroyed, they will be forced to make the time; the risk of not implementing resilience projects should encourage businesses to make the time, but this awareness cannot be counted on.

The longer infrastructure and essential services such as power are down or access is restricted, the more likely businesses fail, consumer patterns change, laid off employees may leave the area, and the economy can change. These developments can happen surprisingly fast.

Creating and strengthening EM and EDO relationships can help to enhance coverage of the many post-disaster management issues either party may not have subject matter expertise to address on their own. Delegating certain functions to EDOs can reduce stress and leverage EMOs' capacity to communicate to the business community.

There is a need to understand interdependencies and cascading effects and the potential consequences of certain kinds of decisions — e.g. if power goes down, what does this mean for health care, and essential goods and service providers? What does a transportation disruption mean for emergency access? Are agreements in place with local contractors for emergency debris removal and restoration of services?

Hazard mitigation and risk reduction must be done on a community level where the most local knowledge resides.

2.3   Strategies

2.3.1   Develop a working economic resilience framework for:

- Assessing economic hazards, risks, vulnerabilities, and threats
- Identifying essential community assets
- Developing tools to assist with forecasting, economic risk assessment - e.g. digital dashboard or "Fitbit for the Community"
- Engaging partners
- Pre-planning for disasters

2.3.2   Gather Information

- Conduct a stakeholder map (not just once - has to be regularly updated)
- Survey businesses and economic officials about threats, vulnerabilities, large capital investments, key assets, etc. for ways to sharpen objectives
- Benchmark other counties, states for ideas and effective practices
- (Post-disaster) conduct direct outreach to those outside counties or states that have experienced similar disasters to learn from their experiences

2.3.2   Build Relationships

- Create framework for working with your counterpart EDO
- Create a formal or informal economic advisory group
- Work with regional federal government agency representatives to identify areas of possible collaboration
- Build some level of communication, coordination, and collaboration between EMO and EDO counterparts
- Conduct regular training, teaching, and exercises

2.3.4   Identify infrastructure and other projects and investments to reduce economic risks and enhance future resilience

- Examples: Containment ponds, levees, elevations, permeable surfaces, integration of green infrastructure

2.3.5   Pre-plan for business reentry. Few communities plan for who to let back into a disaster zone, but this can be a critical factor in shortening disaster recovery times

- Develop a credentialing and reentry system for businesses to get back to their locations after a disaster to address damage, recover inventory and records, deal with cleanup and repairs
- Pre-authorize private sector and non-profit partners to provide surge capacity
- Work with EDOs and Community Foundations to incorporate emergency small business grants into their appeals

CASE STUDY: ELLICOTT CITY

The hardest hit area by the 2016 and 2018 thousand-year floods in terms of human population and economic impact was Ellicott City, an unincorporated portion of Howard County, Maryland, less than five miles southwest of Baltimore. With a population of over 72,000, the city rests on the banks of the Patapsco River and includes three peak discharge channels (Hudson, Tiber, and New Cut branches) through which runoff from precipitation is distributed.

According to the US Geological Survey (USGS) the watershed surrounding Ellicott City is "approximately 31.6 percent forested and 65.2 percent developed land." A remaining 30 percent is classified as impervious, where groundwater and runoff from storms is not able to seep into underground aquifers. As a result, "…large areas of impervious surfaces near these small streams can cause the stage and corresponding discharge to fluctuate quickly during storms, contributing to flashing surface-water hydrology that is characteristic of urban streams."

Ellicott City's location makes it a prime target for continual flooding from severe weather events.

July 2016 Flood

On July 30, 2016, a series of thunderstorms hit a swath of Maryland stretching from Washington D.C. to Baltimore. The increased precipitation clogged the three tributaries that run through Ellicott City, creating a major flood event.

Within the span of three hours, 6.6 inches of water fell on the area. In its wake, significant damage to infrastructure along Main Street in downtown Ellicott City, which included flooding and hundreds of displaced vehicles. According to FEMA, two fatalities occurred, and 90 homes and 104 businesses were affected. The area lost $67.2 million (USD) in reduced economic activity, $1.3 million in reduced revenue for Howard County, and between 151 and 500 jobs.[4]

May 2018 Flood

Less than two years later, another 1000-year flood event occurred on May 27, 2018. Similar to the 2016 event, downtown Ellicott City and surrounding regions received 6.56 inches of rain in the span of three hours, making it almost an exact carbon copy of the event two years prior. Despite the fact that the city's main tributary, the Patapsco River crested at three feet lower than in the July 2016 storm, authorities surmise that the river provided backwater that prevented quick drainage of the area surrounding Main Street in downtown.

The Howard County Economic Development and Emergency Management Economic Resilience Game Plan

The relationship between the Howard County Economic Development Authority (HCEDA), led by Larry Twele since 2013, and the Howard County Office of Emergency Management (HCOEM), led by Ryan Miller from 2013-2019 and Mike Hinson (2019-present) is noteworthy in the formulation of new strategies for long-term resiliency. Beginning in 2014, both departments started building each other into their respective plans. In addition, the new partners launched unique joint campaigns such as "Ready HOCO" that included business preparedness guides, and the HCEDA created a "shark tank" event that exposed entrepreneurs in HCEDA's business incubator to feedback from Howard County OEM staff.

The Howard County example is a best practice of what can happen when local organizations coordinate with one another to mitigate the effects of disasters.

3.0 Emergency Management Considerations for Economic Development Professionals

> **"Integration of the economic development and emergency management sectors are a key step toward developing better recovery plans and more resilient systems."**
>
> — Larry Twele, HCEDA

Economic development professionals measure their success based on business attraction, existing business retention and growth, and the number of start-ups that are encouraged and assisted in the community. The economy depends upon a certain level of commerce, as well as exports. When there is a disaster, years worth of work can suddenly disappear and a jurisdiction may remain depressed — and even sink further in a prolonged period after the disaster — if enough attention is not paid to restoring business and getting people back to work.

Disasters set back economic development in a number of ways:

- Temporary or long-term shift of customer patterns away from the community and reduced sales that support businesses and the local government
- Less discretionary spending in the community as residents focus resources on home repairs
- Damaged perceptions and image of the community
- Stress on the tax base and public services
- Small business failures
- Discouraged new business formation
- Disrupted supply chains
- Opportunity costs (resources going to repair existing infrastructure instead of going to improving infrastructure or creating other opportunities for future growth)

3.1　Objectives

Build good relationships between EDOs and EMOs to understand:

- Community threats, vulnerabilities and safety concerns
- When utilities (power, water, internet) can be restored
- What resources are available to help with economic recovery
- Gain priority for economic considerations
- Minimize the economic impact of sudden onset extreme events
- Reduce the duration of economic dislocation due to extreme events

> "Resilience is a community-wide endeavor. It is important to engage with community members beyond the emergency management sector, including those in the economic development and business sectors, as well as other those in those community groups."
>
> — Jack Markey, Frederick County Division of Emergency Management

3.2   Analysis

As a result of the many serious disasters that have occurred in America in the past decade, EDOs are increasingly being urged to learn about emergency management, economic recovery programs and how to use them. EMs and EDOs have two different missions and different vocabularies. EMs need to keep people safe. EDOs are concerned about restoring and promoting commerce. Economic recovery is essential for disaster management, but it's not the first thing that EDOs necessarily focus on.

For these reasons, EDO frustrations can mount when the power is shut off or access is denied, delaying the return to community normalcy. The good news is EDOs can learn how to work with emergency managers to reduce the time it takes for recovery.

When EDOs have insight into emergency management considerations and take the time to develop good working relationships, the pay-offs can be significant. Howard County was able to swiftly provide businesses with access back to their properties because the emergency managers were aware of the benefits of accelerating this process. In turn, disruptions were minimized, and downtown Ellicott City was able to re-open more swiftly. This was especially important with repetitive events when everyone was more familiar with each other's procedures and the needs and objectives of key stakeholders.

- EDOs need to respect EM mission — which is safety, and have patience
- Need to gain trust from EMs to have authority to speak on behalf of businesses
- Raise awareness that getting businesses open is essential for cash flow for government services
- Promote the fact that resilience is a community-wide endeavor and a core value. This means simply that the sphere in which EMs operate must incorporate a wider segment of EDOs as well as the economic sector to reduce costs.
- Trust-building is a two-way street. EDOs should have a seat at the table at EOCs. Exchanging business cards before a disaster strikes and working problems together can go a long way toward building trust.
- EMO may not know that XYZ construction company has a bulldozer that can be used. EDOs can't assume that EMs have access to the same information as they do and need to be available as a resource to the EMs.

- Many businesses DO NOT want to be involved in emergency management or anything outside of their core competencies, but after a disaster this means they may be confused about the process. EDOs have important awareness, education and technical assistance capabilities to address these issues.

3.3   Strategies

3.3.1   Pre-Plan for Economic Damage Assessments

- Conduct regular surveys of business community and economic assets

3.3.2   EDOs need to develop post-disaster mechanisms for

- Information-gathering
- Assistance with filling out forms (a tedious and confusing process when filling out multiple government and insurance claim forms)
- Financing mechanisms for loss of business, inventory

3.3.3   EDOs need to pre-plan for financing needs of businesses

- Special loan types
- e.g. pay-out based on percentage of revenue
- Microloans
- Bridget loans
- Low-interest revolving loan funds (RLF) through community development finance institutions (CDFIs)
- Emergency business grants
- Accessing U.S. Small Business Administration support

3.3.4   EDOs need to pre-plan for long-term issues and technical assistance

- Helping organizations pivot to new business models
- Real estate development and redevelopment issues
- Support for online marketing
- Community marketing to dispel stereotypes about damage and closures

Figure 6: Downtown Baltimore at night

4.0 Planning for Economic Resilience

In the second workshop, participants discussed several of the systemic challenges facing economic resilience and sustainability of Maryland communities. These kinds of issues include geography, history, climate, planning, culture, socio-economic status and more.
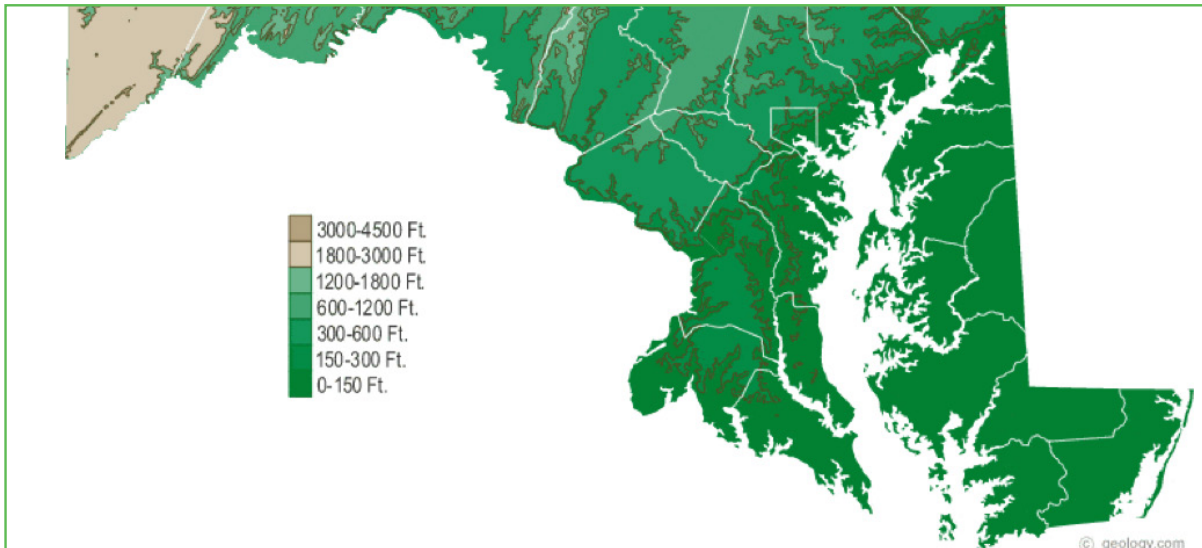

Figure 7: Map of Maryland

Workshop participants highlighted the following:

1. **The Geography and Natural Environment** — Ellicott City lies in the valleys of the Tiber and Patapsco rivers. The historic downtown was laid out in the eighteenth century when access to waterways outweighed other considerations to selecting sites for development. Communities that had not experienced extreme weather events in the past, and had built and evolved accordingly, might become increasingly vulnerable as climate changes affect the ecosystem, changing drought, flooding, wind, storm, and water conditions.

2. **The Economy and Built Environment** — community infrastructure was shaped by previous eras — ranging from colonial times to car culture in the 1950s, not just today. The economy, housing, buildings and infrastructure did not spring up overnight.

3. **The Social Environment** — neighborhoods and communities have their unique characteristics based on the people who live in them. Whether they are rich or poor, environmentally vulnerable or secure, heritage, culture, family, and other considerations can anchor people to places.

These three co-existing systems do not exist in a vacuum either — both past decisions and future innovations need to be taken into account. Workshop participants discussed how certain communities evolved due to previous decisions that either improved their long-term sustainability, such as in Frederick, or caused them to fall behind due to underinvestment. Similarly, technologies and innovations like broadband internet and 5G cellular service could be enormously helpful for businesses operating in vulnerable communities to transition to more web-based businesses.
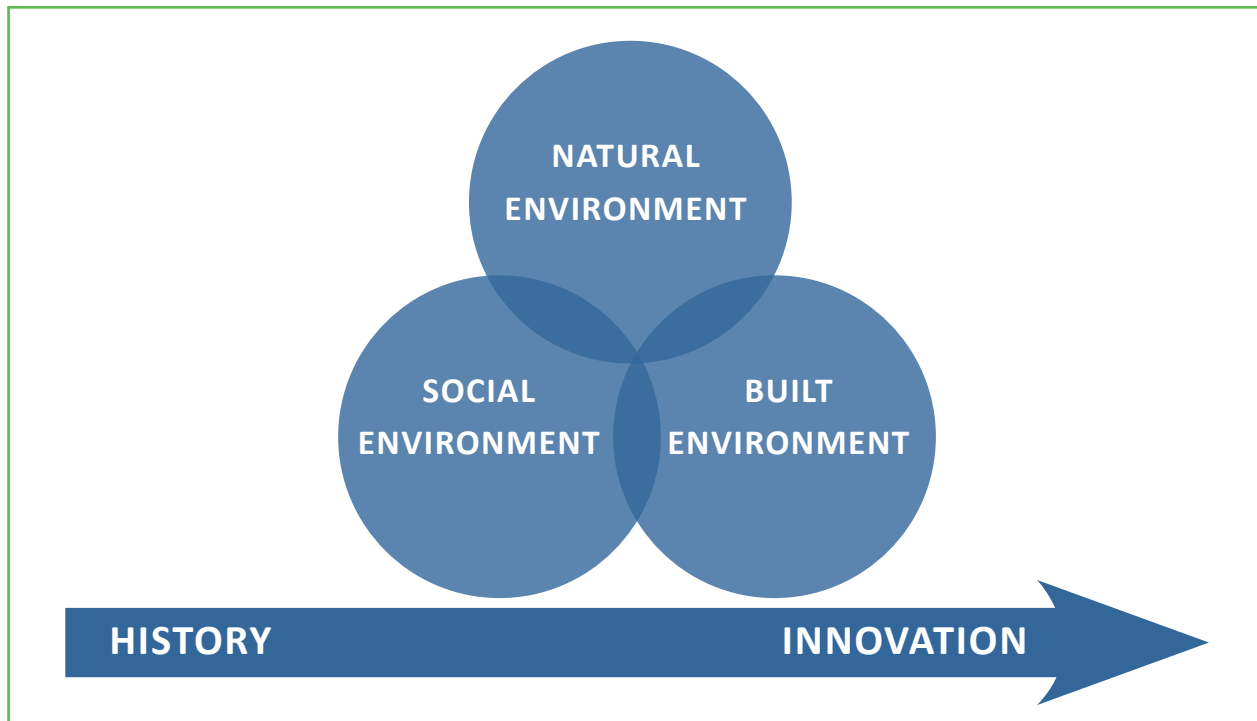
Figure 8: Planning for Pre-existing conditions

EMs and EDOs have to work with these pre-existing conditions, which makes community planning and design, essential tools in the economic resilience arsenal.

4.1   Objectives

- Incorporate systems thinking into economic resilience strategies, including environmental, social, historical and technology factors.
- Ensure that EDOs and EMs have a seat at the table in community planning discussions
- Include evaluation of how natural environment factors can contribute to sustainable development and economic resilience, and how failing to curate the natural environment may increase economic vulnerabilities in the future.

In the course of the second workshop, Michael Gallis outlined the concept of "Coevolution" – the ways in which the natural system (nature) and the human network (the total sum of all human activity) are colliding. As human economies and cities grow, so does our need for resources from the natural system. However, humanity and nature rely on the same resources, and so long as the human network expands, it will continue to disrupt the needs, patterns, and processes of the natural system.

> **"We're witnessing a change between the natural and built environments."**
>
> — Michael Gallis, Michael Gallis and Associates

Maryland's track record of disasters and their impacts over the last 15 years indicates that the state is experiencing *de-evolution*, i.e. the human network and natural system are negatively impacting the patterns and processes of one another. To take one example, as climate change worsens, so would habitat conditions for Maryland's aquatic species, which could harm the fishery business. De-evolution in Maryland is evident in the following indicators and effects of climate change in the state:

- Sea levels have risen more than one foot in the last century, which has led to increased coastline flooding and erosion
- Higher water temperatures in the Chesapeake Bay are diminishing suitable habitat for blue crabs and oysters
- More frequent rain and flooding events have flooded downtowns, including Ellicott City
- Worsening heat waves and drought have led to damaged crops, higher energy bills, and increased risk for vulnerable populations, such as those with asthma
- Less opportunities for winter snow sports and reduced beach coastline could decrease tourism

Maryland's 3,100 miles of tidal shoreline, which includes the Chesapeake Bay, its tributaries, and the state's Atlantic coast shoreline and coastal bays are threatened by rising sea levels. Approximately 70 percent of Maryland's residents live within the coastal zone.

A [2018 report by the University of Maryland Center for Environmental Science](#) states that the likely range of the relative mean rise of sea level in Maryland is 0.8 to 1.6 feet between 2000 and 2050. If global greenhouse gas emissions continue to increase into the latter half of the 21st century, Maryland could witness a rise of 2.0 to 4.2 feet. Even if global emissions are reduced to zero, the like range for 2100 is still 1.2 to 3 feet. Since the 1850s, upwards of 500 islands have been lost beneath the Chesapeake Bay. On the Eastern Shore, some communities already lie low enough that water in ditches along the streets rise and fall naturally with the tides.

Conversely, David Guignet, Maryland State National Flood Insurance Program (NFIP) Coordinator, has noted that, "Ninety percent of the people that have called me over the past 20 years want to get out of paying for flood insurance."

> **"Resilience is not just environmental, but should incorporate social and economic development as well."**
>
> —Allegra Tartaglia, Private Sector Integration Program

Maryland's government has responded to the need to address climate change robustly. The Greenhouse Gas Emissions Reduction Act (GGRA), was created in 2009 and most recently amended in 2016. The 2016 amendment required a 40 percent decrease in emissions from 2006 levels by 2030, which was included to guarantee continued progress after 2020 in pursuit of the state's long term greenhouse gas emission reduction goals.

A 2020 report by the World Resources Institute asserts that Maryland leads the nation in reducing emissions (38 percent) while generating simultaneous growth of GDP (18 percent).

Building on the Coevolution analysis, shifting the focus from "preventing loss" to "creating value" instead would create a new framework for thinking about resilience and moving forward in multiple arenas. Resilience planning needs to take into account five ways the built environment can cause the natural environment to degrade. These include:

1. Fragmentation
2. Depletion
3. Pollution
4. Erosion
5. Extinction

These degrading processes can lead to the following consequences:

- Restructuring of wind and flood vectors to threaten previously "safe" areas
- Accelerated velocity of storm water runoff
- Decline in individual quality of life
- Decline in community vitality
- Decline in biodiversity
- Reduction of evacuation and emergency support capabilities
- Increased risk to community economic assets
- Changes to flood zone maps
- Higher insurance costs

4.3   Strategies

4.3.1   Strengthen "natural defenses." This may include ideas such as:

- Tree plantings
- Dune and river bank protection
- Buy-outs
- Conversion of blighted buildings to green space

4.3.2   Strengthening "built resilience" may include ideas such as:

- Multi-use infrastructure design (e.g. Frederick example)
- Housing elevation
- Review of building codes and standards for hazard risk reduction factors

4.3.3   Build Resilience into Comprehensive Economic Development Strategies

Workshop #2 also featured an important presentation by Lynn Knight explaining how creating a Comprehensive Economic Development Strategy (CEDS) is an excellent way to prioritize initiatives and projects with greater certainty. It also demonstrates to the community that its leaders value diversity of opinions and are including citizens and businesses in economic development leadership.

Governed by federal regulations, the CEDS (see 13 C.F.R. § 303.7) is also a way to maximize opportunities to tap into grant opportunities of the U.S. Economic Development Administration and other federal agencies. This is important, especially in light of the need to recover the economic damage from past disasters including the COVID-19 pandemic, as well as building long-term resilience as more extreme weather events are anticipated.

What's in a CEDS? The following sections must be included in the plan:

- **Summary Background:** A summary background of the economic conditions of the region;
- **SWOT Analysis:** An in-depth analysis of your economy's strengths, weaknesses, opportunities and threats (commonly known as a "SWOT" analysis);
- **Strategic Direction/Action Plan:** This should build on findings from the SWOT analysis and incorporate/integrate elements from any other regional plans you may have (e.g., land use and transportation, workforce development, hazard mitigation plans, community comprehensive plans, etc.). The action plan should also identify who will be responsible for implementation, timetables, and opportunities for the integrated use of resources from your community, the private sector and federal government;
- **Evaluation Framework:** Performance measures used to sort priorities and evaluate the implementation of the CEDS and its long-term impact on the economy.

In addition, the CEDS must incorporate a section on resilience, which is the ability to avoid, withstand, and recover from economic shifts, natural disasters, the impacts of climate change, and any other disruptive events. This section should describe what it would take to do things like mitigation for flooding and other hazards. Communities might also think of putting in place measures to help businesses in the event of a disaster, such as re-entry procedures with credentials for business owners, programs to help small businesses with recovery technical assistance and creative financing. For more information about CEDS plans and their requirements, see US EDA's website at https://eda.gov/ceds/. and any other disruptive events. This section should describe what it would take to do things like mitigation for flooding and other hazards. Communities might also think of putting in place measures to help businesses in the event of a disaster, such as re-entry procedures with credentials for business owners, programs to help small businesses with recovery technical assistance and creative financing. For more information about CEDS plans and their requirements, see US EDA's website at https://eda.gov/ceds/.

5.0 Stakeholder Engagement:
An Essential Tool for Fostering Community Resilience

> **"Communication is always a challenge, whether it be during a disaster or a steady-state period. Spending time developing a clear communication strategy before launching a comprehensive stakeholder engagement process is time well spent."**
>
> — Leann Hackman-Carty, CEO, HackmanCarty & Associates
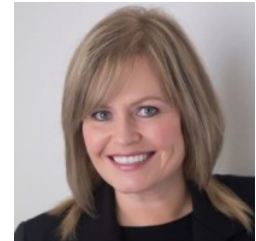
The third workshop pivoted from focusing on how the built and natural environment affect each other to looking at the human system and social dynamics that affect economic resilience management. At its heart, a community is made up of people who have a stake in how it develops, so at its most basic, everyone is a stakeholder in economic resilience. Most of the time however, people are focused on their own lives, families, and goals, so who are the key stakeholders that need to be involved in improving community economic resilience and disaster management?

The World Bank describes stakeholders as *persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals, and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations, groups with special interests, the academic community, or other businesses. The "stake" that each of these different individuals or groups has in a project or investment will vary. For example, there may be people directly affected by the potential environmental or social impacts of a project. Then there are those who might have great influence over the project, such as government regulators, political or religious leaders, and others active in the local community. There are also stakeholders who, because of their knowledge or stature, can contribute positively to the project, for example, by acting as an honest broker in mediating relationships.*

> **"Stakeholder engagement is vital to resilience. It is important to reach out to and engage with partners from outside the emergency management community. It is important to bring people into resilience work who are willing to stick it out over the long term."**
>
> — JaLeesa Tate, MEMA

Figure 9: City of Frederick - Carroll Creek

The City of Frederick resisted having to restructure its downtown stormwater runoff system for years because it was cost prohibitive, but eventually the City invested in the Carroll Creek Park project. The park began as a flood control project in the late 1970s and was an effort to remove downtown Frederick from the 100-year floodplain and restore economic vitality to the historic commercial district. Today, more than $150 million, from private investments, is being used or is currently planned in new construction, infill development, or historic renovation along the park.

The first phase of the park improvements, totaling nearly $11 million, run from Court Street to just past Carroll Street. New elements to the park include brick pedestrian paths, water features, planters with shade trees and plantings, pedestrian bridges, and a 350-seat amphitheater.

The final phase of improvements, totaling $15.7 million, run from the Delaplaine Visual Arts Education Center on Carroll Street to East Patrick Street and were completed in 2016. This included the addition of more pedestrian paths, water features, bridges, seating and lighting.

Economic Development Catalyst

While providing an obvious recreational and cultural resource, Carroll Creek Park also served as an economic development catalyst. Private investment along Carroll Creek Park is a key component to the park's success. More than 400,000 square feet of office space, 150,000 square feet of commercial / retail space, nearly 300 residential units, and more than 2,000 parking spaces were planned or under construction as of 2021.

5.1   Why is stakeholder engagement important?

Effective stakeholder engagement can make or break a project. When done properly, it can allow various parties to identify concerns, risks, opportunities, options, and potential solutions that surround an issue, ultimately leading to a range of tangible benefits and long-term results like:

● A shared vision of resilience

● Increased trust and transparency amongst stakeholders

● New ideas and expertise

● Greater input and feedback on priorities/future resilience-related activities

● Increased understanding of ongoing community issues, needs and concerns

● More effective, informed decisions, policies, and service delivery ideas

● Strengthened relationships between various stakeholders, and additional community capacity

● Better ability to identify, mitigate, and manage risks

● Reduced conflict

● Improved accountability and long-term buy-in

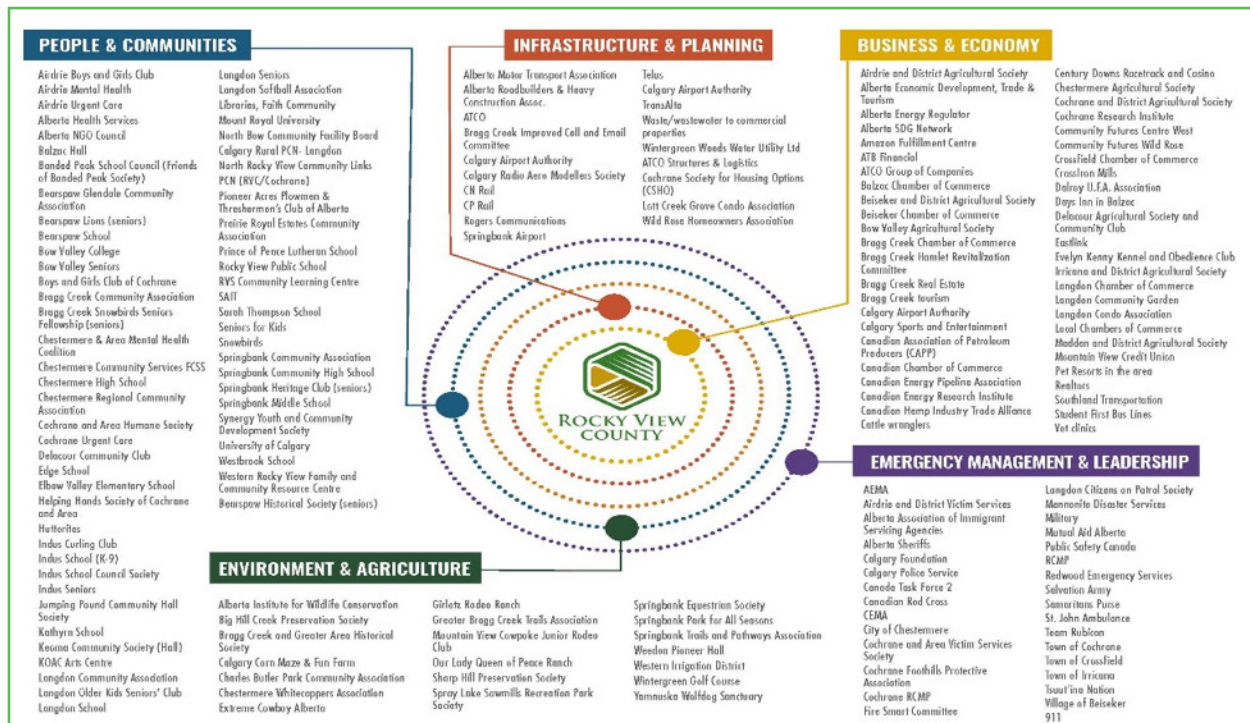● Overall cost savings

Example of a Baseline Stakeholder Map

Figure 10: Baseline Stakeholder Map

5.2   Strategies

5.2.1   Identify, Analyze and Prioritize Stakeholders

Engagement in community resilience building activities requires that a broad range of stakeholders should be involved in order to mobilize and maximize resources. At the community level, local government tends to be the logical convener of resilience planning initiatives. While this may begin with a smaller group, ultimately the goal should be to engage as many stakeholders as possible in ongoing resilience building activities. This can either be a formal or informal process.

Identify as many potential stakeholders as possible up front. Find authentic community leaders and driversi. Include emergency management and economic development officials. As part of this process, it is important to ensure stakeholders are representative, diverse, and relevant. Make sure to seek out diverse representation and opinions. Not everyone should agree! Consider representation from various cultural, geographic, demographic, and gender backgrounds to ensure a broad, diverse stakeholder group. Ideally it will mirror the community, helping to provide a more holistic perspective, and engaging all community stakeholders in the process.

Create a space where there can be respectful, thoughtful, meaningful discussions. Canvassing stakeholders will help to identify pitfalls, potential challenges, and gain buy-in from groups *that might not otherwise be engaged. One way to segment stakeholders is to sort them based on specific functions or themes. For example, the Institute for Sustainable Development's Resilience READI$^©$ approach segments stakeholders based on FEMA's six Recovery Support Functions:*

1. **Community Planning & Capacity Building —** Emergency personnel, planners, developers, Red Cross and other disaster response/recovery organizations, police and security personnel, state and federal officials, other adjacent communities

2. **Economic —** Business, industry and trade associations, commercial and industrial realtors, research institutes, post-secondary training institutes, banks/investment firms, internet providers, logistics companies, insurance companies,

3. **Health & Social Services —** Hospitals, nursing homes, charities, non-profit organizations, schools, community/neighborhood associations, sport associations

4. **Housing —** Realtors, developers, builders, planners, planners, housing departments and non-profits

5. **Infrastructure Systems —** Transportation infrastructure operators (e.g., Airports, rail, bridges, highway etc.), utility companies (e.g., Telecom, electricity, water, sewer, wastewater treatment etc.), logistics services

6. **Natural & Cultural Resources —** Outdoor recreation clubs, environment groups, arts, cultural associations, museums, venues, historical sites

Figure 11: Downtown Hagerstown, Maryland

5.2.2.   Develop a Communications Strategy

As part of this strategy, it is important to be transparent. Be clear on what is needed from stakeholders. Be concise in messaging.

- What are the key messages?
- What does the effort hope to achieve?
- What is needed from stakeholders? What is in it for them? What is expected of them?
- Where and how will stakeholders be engaged?
- What methods of formal and informal communications will be used? For example: email, print materials (brochures, newsletters, fact sheets, articles etc.), advertisements, media releases, websites, information hotlines, social media, letters, phone calls/surveys, polls, forums, community events, community steering groups, engagement apps, face to face meetings, print, online, questionnaires, one on one interviews, crowdsourcing, focus groups, workshops, town hall meetings, surveys etc.
- Have different languages, cultures, or geographic regions (rural vs. urban) been taken into account?
- How often will stakeholders expect communications? What are the objectives each time?
- What is the timing, process, deliverables?

5.2.3   Engage Stakeholders

In addition to soliciting input, consider activating stakeholders and creating experiential opportunities that help illustrate the importance of resilience. A critical method for engaging stakeholders is through cross-sector exercises. According to Kathy Fulton, Executive Director for the American Logistics Aid Network (ALAN), exercising together makes us more resilient. In what she refers to as a Crisis Simulation exercise, participants would react to a crisis by playing the role of a responding entity and providing survivors with critical resources. This entails navigating geographical areas, considering population demographics, assessing resources, and working together to achieve a desired result. Those who initially view the situation as a *collaborative* effort are typically more successful, as they believe that there are enough resources.

Holding a meeting, scheduling a phone call, or adding a stakeholder to a mailing list is not engagement. Real, authentic engagement is a two-way process. View stakeholders as customers and the organizer as the customer service representative. In taking this approach, it will help one to better design and implement the engagement process.

Fostering community resilience is an ongoing process. It requires stakeholders to adapt and/or reposition, anticipate and/or withstand risks, respond, and recover. Engaged communities are also much more resilient, with more resources available to them. The following chart is an overview of the resilience process.
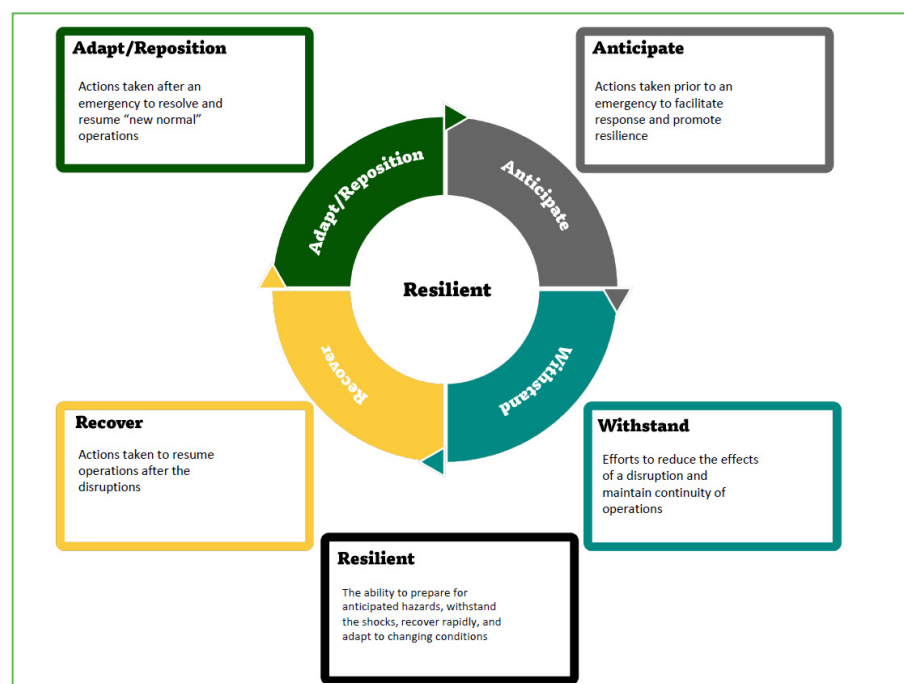

Figure 12: Resiliency Process

6.0 Communications for Resilience

Throughout the workshop series, experts across the spectrum underscored the importance of good communications for successful resilience and recovery. This needs to be worked at every stage of the stakeholder engagement communications continuum as outlined in Figure 13.
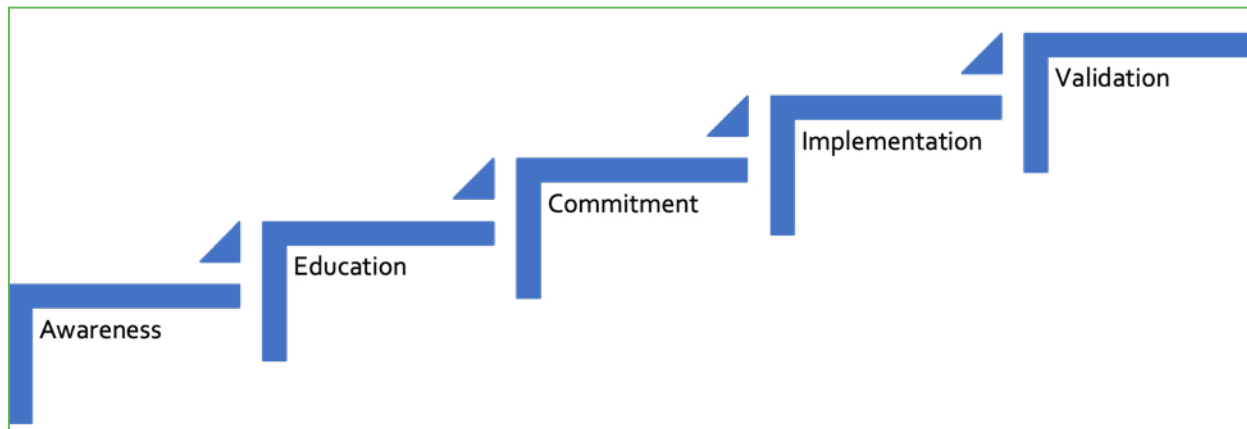

Figure 13: Resiliency Process

Awareness - At both the county and state levels, Marylanders can access an extensive suite of tools for preparedness, mitigation, business continuity, government assistance, volunteer and donations opportunities and a host of other disaster management tools. However awareness of these resources varies greatly across communities, between and among sectors, and even within individual organizations.

The average person sees 4,000-10,000 ads a day. People are so bombarded by ads and other communications messages that important disaster management information can get lost in the noise. How can resilience, response and recovery messages break-through? How do you develop communications that effectively reach people in ways they want to hear or read or see?

Education - Just generating awareness is not enough. Among stakeholders that are aware of various resilience, response, and recovery messages, multiple problems and issues have also surfaced. It is one thing to be generally aware that resources exist, but it is another thing to know specifics - what websites to visit, what tools to use, what to do in different situations. Particularly at the beginning of disasters there is often missing information, rumors, and conflicting messages. What can be done to help the general public and key stakeholders who are not disaster experts, develop a minimum proficiency to help them navigate resilience, response, and recovery issues when the time comes?

Commitment - It's one thing to raise awareness and educate the general public and key stakeholders about disaster management issues, it's another thing to generate buy-in and commitment to actually make changes at the individual, business, system, community or state level. Small businesses in particular struggle with this challenge because they often have so little bandwidth and resources before disasters to consider resilience, and they are so vulnerable after they happen. Workshop participants were concerned about "business as usual" attitudes leading to future high cost shocks. How do you motivate people to commit to a culture of resilience, preparedness and mitigation?

Implementation - Commitment is not enough. You can be committed to risk management, but still not know how to go about it operationally or cost-effectively. It is one thing to know the "what" and the "why", it's another thing to know the "how." How can ideas and plans be converted into practices most effectively?

Validation and Encouragement - Workshop participants surfaced several problems on this front. Resilience can be thankless. Major risks and extreme events may not happen for five years or longer in any given place. Complacency can set in. Alternatively, as in the case of COVID-19 or major post-flood repairs, the recovery process can take years to finish. What can be done to validate and encourage resilience and recovery implementers so that they stay the course and feel rewarded for doing so?

Other challenges that were flagged include:

- How to ensure that EDOs and EMs communicate effectively with the general public and key stakeholders during times of crisis

- How to swiftly raise awareness about support resources in terms of helping consumers who might not know who to call

- How to make sure to keep front line workers apprised of swiftly changing developments

- How to educate the general public about the disaster recovery process - what to expect and how to plan for it.

- How should vulnerable communities communicate with EDOs and EMs so that their concerns are heard?

6.1   Objectives

- To build awareness of the importance of resilience in the general public, small business, key stakeholders and vulnerable communities
- To improve communications before, during, and after a disaster happens between and among EMs, EDOs, key stakeholders and the general public
- To avoid and reduce confusion, uncertainty, and mixed messages throughout the disaster management cycle

6.2   Analysis

All four counties and the state have robust websites and media relations departments. The content that they have available is robust, relevant, and timely. Currently, they have all created COVID assistance portals.

Baltimore County's Homeland Security and Emergency Management Department has a "Get Ready for Emergencies" page that includes assistance for people with disabilities, people with pets, and a decision tool to help residents decide if they should evacuate or shelter in place.

Howard County offers preparedness tips against a wide range of possible extreme events and in multiple languages including Spanish and Korean.

Frederick County has a highly structured Severe Weather Communication portal.

Washington County offers Public Safety information across seven categories including: safety and security, health and medical, food, water and sheltering, energy, transportation, communications, and hazardous materials.

At the state level, the Maryland Emergency Management Agency has resources to assist individuals, homeowners, and businesses before, during, and after disasters.

Industry associations like the Maryland Manufacturing Network offer an online portal for buyers across the state and the Maryland VOAD also offers a robust library to support individual preparedness.

At both the state and the county levels, there is significant resilience content encompassing preparedness, mitigation, planning, and processes for the general public and key stakeholders to follow. This content and past experience with disasters form strong building blocks for future resilience communications plans.

> **"Stop thinking about how WE like to communicate, and think instead about how people like to be communicated TO."**
> — Dave Minifie, ISD Board Member and Senior Advisor for Communications

6.2.1   Communicating with Minority, At-Risk, and Under-Served Communities

Resilience leaders need to recognize that interactions with minority, at-risk, and under-served communities may be challenging for a number of reasons. These include failure to take into account historical experiences, lack of shared language or perspective, and lack of trust. Even if a decision is the right one, the delivery and communication package as a whole is extremely fragile and crucial. For example, relocating minorities from environmentally fragile areas may be the right decision to reduce their vulnerability in the future, but how it is communicated is vital because of past harms and suspicions about current intent. This is why authorities need to take into account not just what they are saying, but how they are perceived. The more trust is broken, the more resilience advocates need to show up in the community. They have to "make it real" in order to get through. In this context, language matters, inclusiveness matters, and making sure that spokespeople look and talk and act like they connect to the community is vital as well. Some of the key success ingredients include empathy, respect, dignity, and humility.

6.2.2   Communicating with Business

Business communications challenges vary across industries and by size. Industry sectors like retail, manufacturing, insurance, travel & tourism, logistics, healthcare and utilities face unique challenges in times of crisis. Similarly, small business and large business profiles are very different. Business leaders identified the following communications principles as helpful:

- Take into account that businesses have to forecast supplies, operations and demand. Certainty and transparency help them with their planning processes.
- Businesses, particularly in critical infrastructures, need to be included in planning processes and have the opportunity to provide input about what is feasible. Briefings like the ones the

PSIP program holds, can be very helpful in terms of providing insight about what is going on, and establishing comfort with the level of information exchange.

- Threat and vulnerability information exchange is very sensitive. Safeguards need to be put in place to make sure that such information is protected from disclosure to potentially bad actors.

6.2.3 General Considerations

Workshop participants identified a number of general considerations that resilience leaders should take into account:

- Today's elected officials and community leaders are using a wide variety of channels, including social media, email, website, phone recordings, TV, radio
  - Social media is free and direct
  - Leaders are often judged on timeliness and accuracy of info
    - ☐ Disseminate relevant information widely when dangerous situations are imminent
- Sometimes there is too much information, and it can be confusing and overwhelming.
- Not everyone needs everything- there is some information that can't be shared
- Do not default to communications channels that are comfortable for you. Take into account how your intended audience consumes information and tailor your communications accordingly.
- Be careful of information overload – just because you have it, does not mean you need to share it
- The timeliness, accuracy and actionability of information - weigh how useful, relevant, and urgent is to your audience
- Analysis can be more important than information - be sure to provide information in context
- Build a sense of empathy and common cause. We're all human - We are stronger together than we are apart

6.2.4   Strategies

As Figure 14 summarizes below, communications strategies can be organized around four key pillars:

       (1) Based on the Audience
       (2) Based on the Message
       (3) Based on the Messengers, and
       (4) Based on the Media

Message	Messengers	Media	Audience
What to expect What to do What EMs and EDOs can do	Authorities Spokespeople Celebrities Peers Experts	Social Media (Facebook, Twitter, LinkedIn) Radio, TV, Newspapers Video Culture-Specific	Within the organization Inter-Agency, Cross-Sector Key Stakeholders General Public

Figure 14: Pillars of Communications Strategies

6.3.1   Strategic Elements

Workshop participants identified the following core strategic concepts for future resilience communications:

- **Coordination of Consistent Messaging** - it's important for local and state (and where possible federal) officials to coordinate with each other to deliver consistent messaging. Mixed messaging was flagged as a significant problem that led to public confusion and friction.

- **Frequency and Ubiquity** - resilience leaders cannot just post content on a website and expect people to find it. There needs to be a commitment to getting the word out, both through repetition and by making it available across different media.

- **Keep It Simple Stupid (KISS)** - People are not stupid, but they are busy. Messages need to be free of jargon as much as possible and easy to understand. Complex problems and issues need to be broken down to their core elements, and responses need to be simple and easy to implement.

- **Leverage Public, Private and Community Channels**
  - Faith-based, nonprofit and community groups are trusted in the communities they serve. They have insights and credibility that can be very helpful.

- Leverage schools and people who will actually be listened to, like a school superintendent. Communicating with students means their parents hear about it too.

- Leverage business partners. Working adults spend 40 hours of their lives communicating with their companies. Local banks and supermarkets can put simple messaging on receipts and other communications to their customers. Media companies are experts at communicating and often have robust public service programs.

Pre-Plan Communications Through-Out the Business Cycle

- Best crisis communications are planned during "blue skies"
  - Need to communicate w/ stakeholders and leverage private sector
  - Economic development orgs, industry associations, and Chambers are vital resources for informing local government about business needs

- Incorporate business and industry communications early
  - Local government leaders make emergency decisions that directly impact businesses, e.g., business re-entry, access to property
  - Communicating w/ businesses is essential and has a big impact on their ability to recover
    - ☐ Rumors spread quickly, slower economic recovery
    - ☐ Businesses may delay opening or move
    - ☐ They will attempt to contact you for info

- Ask yourself, if your lights go out tomorrow - what would you need?
  - Communication, financial tools, etc. - have those pieces in place

- When planning, be sure to:
  - Designate a spokesperson
  - Update contacts
  - Create a fact-gathering process to assure quality of information during a crisis
  - Draft statements
  - Anticipate tough questions
  - Maintain contact w/ businesses

- Establish a shared mechanism to coordinate communications
  - Government departments and state and federal agencies should operate out of one place
  - Invite your economic development and business organizations to work there
  - Consistent, accurate messaging inspires confidence among residents and businesses

☐ Enforce organizational roles and procedures for communicating

☐ Designate your spokesperson, someone you trust

    Someone who can talk about economic as well as health and safety issues

☐ Consider the central themes of your messages

    ◆ Publicize milestones

    ◆ Be ready for the media cycle – news outlets will revisit disasters at anniversaries

    ◆ Consider hiring a PR firm

☐ Brainstorm "what ifs"

    ◆ Practice answers to the tough questions

    ◆ Develop "must air" points = things your spokesperson will say no matter what anyone asks

- Consider the Communications Needs of Visitors
  - How you care for visitors affects your future reputation and economy
  - Evacuation plans, safety procedures
  - Is the airport open? Are flights departing?
  - Which businesses are open

- Leverage Social media
  - Leverage Facebook, Twitter, Instagram, LinkedIn, TikTok and other social media channels for specific reasons

- Connect with Business Before, During and After
  - Businesses need to hear how you're advocating for their needs
  - Determine your emergency business contacts and how to reach them
    - ☐ Get home and office contacts for business leaders and media
  - Re-entry procedures
  - Pre-plan directories for reputable services providers (cleanup, financing, business counsel, rebuilding efforts)
  - Have an expo, fair or exercise ahead of time to help w/ community planning and capacity building
    - ☐ Invite business owners, company owners, suppliers, resilience servicers, etc.

7.0 Critical Infrastructure and Economic Resilience

"We'll get five inches of rain in a three- to four-hour period, when in the past, our design standard was to design for five inches of rain that falls over a 24-hour period... That volume, in that shorter time period, is something that our systems designed 50, 70 years ago... it's not big enough to convey and remove that amount of rainfall that quickly."

— Tracy Coleman, City of Frederick

Critical infrastructure issues were raised throughout the workshop series. If people make up the heart and brains of the community, critical infrastructure is like the bones, arteries, nerves, and lungs of the community. Nowhere do emergency management and economic development interests intersect more than when it comes to critical infrastructure. Over 80% of many critical infrastructures and their supply chains in Maryland are owned and/or operated by private sector and nonprofit entities, including:

- Energy
- Financial Services
- Food and Agriculture
- Health Services and Public Health
- Information and Communications Technology (ICT)
- Transportation and Logistics
- Water and Wastewater

Workshop participants also suggested that the natural environment should be treated like a critical infrastructure - particularly the Chesapeake Bay, but also parks and green space, clean air, "natural defenses" like trees and dunes that can reduce extreme wind speeds, and catchment ponds and other permeable surfaces that can absorb stormwater run-off.

Other critical infrastructures like law enforcement, public safety and first responders depend on these private and non-profit assets implicitly.

The Ellicott City Safe and Sound program is an example of taking a systems-based approach to integrating critical infrastructure investments with support for business and property owners, and other social, environmental, and cultural objectives. As can be seen from Figure X - Howard County's flood mitigation projects align with the Main Street and Route 29 arteries, sending a message to current and future business and property owners that the Howard County leadership is committed to their future resilience.
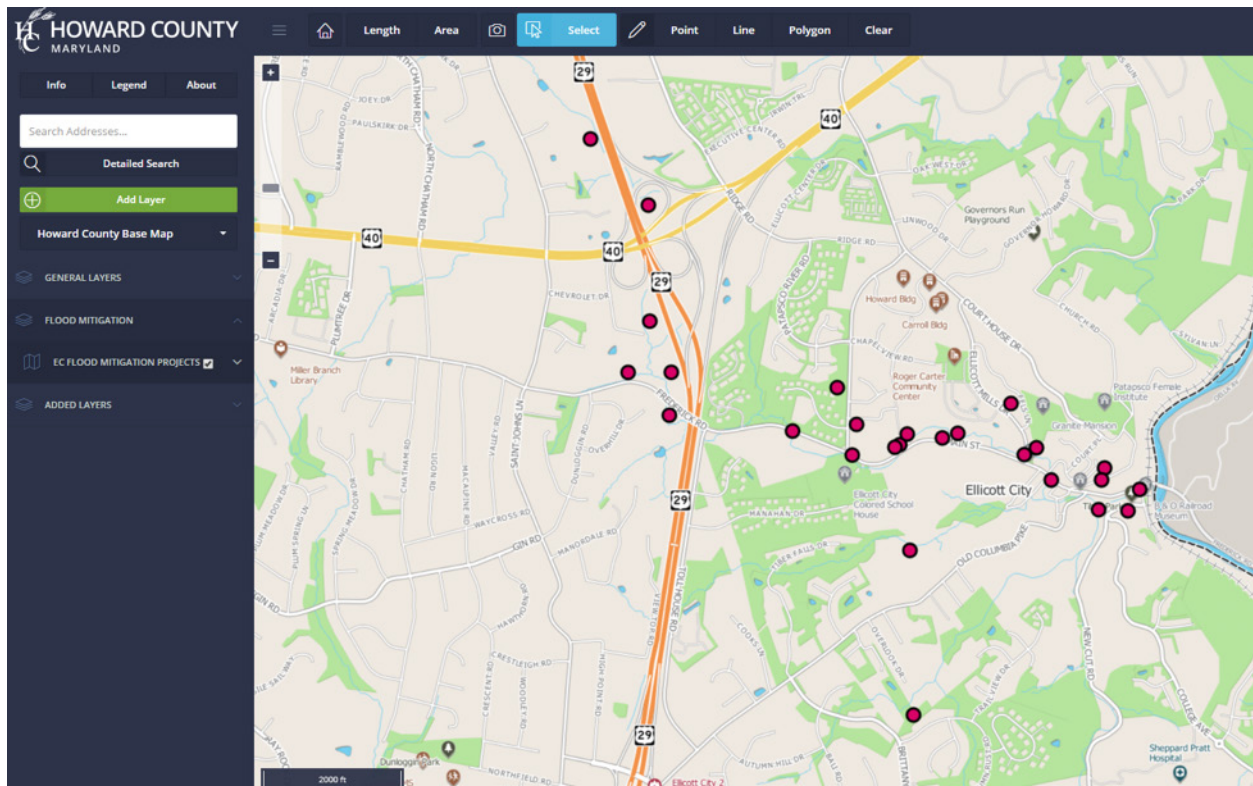
Figure 15: Howard County's Flood Mitigation Projects

7.1   Critical Infrastructure Economic Resilience Objectives

- Preserve and protect critical infrastructures
- Ensure integrity, reliability, and swift restoration of services
- Enhanced adaptiveness of critical infrastructures in light of climate change
- Enhanced ability to "build back better" when critical infrastructures are damaged
- Send a message to current and future business and property owners about the community's commitment to resilience

7.2   Analysis

Vulnerability to cyber attack and online failures - the reliance of so many systems on information and communications technology has been a game changer for good and for ill. Connectedness supports early threat detection, helps to pinpoint challenges and triage response, but on the other hand, cyber connectedness is itself a threat. It can be as obvious as a hack or a distributed denial of service (DDOS) attack or as insidious as a vendor data breach leaking credit cards onto the internet.

- From the Maryland citizens' perspective problems include: affordability and accessibility particularly for information and communications technology

- Some people in vulnerable communities are unable to afford connectivity

- Children can't keep up with classwork due to no access

- In some places in rural MD, there is limited or poor access to internet access

- How to enhance communication, coordination and collaboration? Government and industry have different missions – they view risk and allocate resources differently. Trust is hard to earn and easy to lose. Misunderstandings may happen for a variety of reasons, which is why patience and a willingness to recognize differences is important for long-term success.

- Many firms in the private sector have a lack of bandwidth outside of their core competencies. They are happy to help on public issues to the extent possible, but their constraints need to be recognized, and the most successful joint operations focus on issues of shared expertise, interests, and priorities, and don't try to take on too much.

- Managing interdependencies - One of the biggest challenges for communities is that different critical infrastructures have different ownership and operational structures and they depend on each other to function. A nonprofit health system may need public help to coordinate traffic lights, which are dependent on the electric grid functioning, which may be waiting for critical parts from their supply chain, and so on.

7.3 Strategies

7.3.1 Establish either formal or informal information sharing and advisory councils

- Focus on core challenges

- Do not flood the communications channel with less important information

- Protect the sharing of threats and vulnerabilities from public disclosure

- Ensure that the range of critical infrastructures and the suppliers they depend on have a seat at the table

- Not everyone needs everything- there is some information that can't be shared

- Understand the needs of your partners – information needs of a large company are not the same as a small business

- Be careful of information overload

- Timeliness and actionable – analysis can be more important than information

7.3.2 Explore and build partnerships

- Montgomery County partnered with Elon Musk to bring satellite service to agricultural areas where connectivity had been historically low. Providers originally didn't invest in these areas because subscribership was low, but by combining forces to address the public safety, education, and other benefits as well as the market opportunity, both sides were able to leverage resources and accelerate the delivery of services.

- Montgomery County also partnered with Microsoft for a job development program for displaced individuals. It is not enough to have the hardware in place, the workforce to support, maintain and build it out has to be there as well.

- Becoming a partner with your vendors can be beneficial for your community, especially if you have an open mind for developing cooperation and collaboration outside of contractual relationships

- Treat industry representatives as equals working together for the shared cause of assuring the community's safety and security

7.3.3   Conduct regular threat and vulnerability assessments

- County/state officials should do regular analysis of their infrastructure and look for opportunities for continuously improving and expanding infrastructure

- Consider cyber threats as well as physical threats

7.3.4   Set up an ongoing critical infrastructure modernization program

Participants flagged the following infrastructures for continuous improvements:

- Water and wastewater (critical for avoiding scenarios like the Flint, Michigan water crisis)

- Roads and bridges (to avoid the I-70 bridge collapse scenario in Minnesota)

- Broadband and advanced internet access in under-served areas (to assist EMs and economic objectives)

- "Dumb" infrastructures — infrastructures that have not benefited from technology upgrades in recent years

8.0 Small Business Resilience and Recovery

The fifth workshop zeroed in on issues affecting small business resilience and recovery. Studies have shown that small businesses in a disaster impact zone can face a range of disruptions including lost sales, temporary suspension of operations and even permanent closure. However, small businesses play a vital role in the sustainability of local communities, providing jobs, goods and services, innovations, taxes, and other benefits. This is particularly true for vulnerable communities that are often under-served to begin with. For these reasons, small business resilience is a critical factor driving overall economic resilience and community resilience.

Small business failures can stem from a variety of factors including:

- Infrastructure failures — power outages, washed out bridges, inaccessible roads, contaminated water, internet and communications failures can have a significant cascade effect. In fact, power outages are the leading cause of business failures after a disaster.

- Employee absenteeism and presenteeism — Absenteeism and permanent departures of employees after disasters can occur because they are either victims or caring for victims. Distracted employees can also be a significant problem. They may return to work, but may still be coping with stress due to losses, disruptions in child care, elder care, housing repairs, financial challenges and more. In periods of unemployment as businesses are closed, people may leave the area to find jobs in unaffected regions

- Business continuity failures — ruined inventory due to flooding or leaks, lost records, damaged equipment, building damage can create thousands of dollars in unexpected expenses

- Community challenges — schools are closed, hospitals are over-taxed, first responders are overwhelmed, law and order breaks down

- Climate and weather changes — agribusiness, fishing, travel and tourism and other industries are particularly sensitive to environmental challenges

- Changes in customer patterns — small businesses often report that disasters can affect customer shopping patterns and discourage customers due to the lack of disposable income among regular patrons in their immediate trading area

- Supply chain disruptions — additional lost sales may be due not only to a disaster striking the business directly, but also to the effects on suppliers and their ability to provide the goods and services they are supposed to offer, particularly when there are transportation challenges

8.1 Objectives

- To encourage small businesses to develop business continuity plans and invest in insurance and back-up systems during "Blue Skies"

- To allow swift re-entry and access for small businesses to assess damages, recover inventory and initiate repairs once the crisis stage has stabilized. Particularly when there is flooding, business owners may need to immediately remove standing water and dry out facilities before additional damage from mold sets in. Oftentimes such after effects can create additional hardship beyond the effects of the initial event

- Incorporate local small businesses in the relief and stabilization period as early as possible

- If public closures are mandated, assist businesses in securing interim financing to avoid employee layoffs and fund repairs, replenishment of inventory

- If pre-disaster business models do not make sense anymore, provide assistance to help small businesses transition and remain part of the community

8.2 Analysis

Ideally, every business has adequate insurance, cash flow, and a business continuity plan, but post-disaster, businesses typically fend for themselves. The challenge that many small businesses report is that they are so focused on building and staying in business during normal operations, that they do not have time to develop their business continuity plans or to implement or practice them.

According to a nationwide JPMorgan Chase study, 47% of small businesses have less than 27 days of cash on hand, and the average small business cash balance is $12,100. Community economic policy makers should know that just three months of operations shut downs (or the equivalent in diminished sales) can lead to up to 40% of small businesses never re-opening their doors.

Businesses that are the most vulnerable include:

- Young/new firms

- Minority or women-owned, which may need childcare

- Those that lease, versus own, their location as they may not have control over how quickly the premises are repaired. In a worst-case, they may be asked to vacate for repairs

- Those that face disrupted supply chains

- Tourism, retail, wholesale

- Those that rely on the local market or have little market diversity

- Those located in vulnerable and under-served communities — there is a flaw in the current system of evaluating business loans from a community fabric perspective. Consider five small businesses operating in a strip mall in a distressed area — one might go to one bank, the second to another, the third to still another bank. All of these banks only have the numbers that they are presented with, and may each deny their individual clients, creating a service desert and raising the costs and reducing the access of local residents. This is why if community preservation is a goal, economic resilience leaders need to have their finger on the pulse of neighborhood dynamics, not just of individual businesses.

CASE STUDY: TERSIGUEL'S STORY

Tersiguel's was a restaurant situated at the higher end of Main Street in historic Ellicott City. It employed 29 people before the 2018 flood, and it has been a town fixture for over 45 years. The prix fixe menu at Tersiguel's is a combination of authentic French-style cooking and rustic country fare reminiscent of cuisine found in Tersiguel's original home of Brittany, France. Tersiguel's cuisine is reflective of the seasons, with a garden that produces lettuces, herbs, vegetables, fruits and edible flowers. When the garden is not producing, Chef Michel Tersiguel will personally go and hand pick all fruit and vegetables at a wholesale market. Tersiguel's is quintessential French Country "from the farm to your plate soul food".

Tersiguel's wa able to get back after the two floods, but then COVID-19 hit. "What really made me get out of bed was my faith, and personally, thousands of people messaging us about their memories of the restaurant – their first time, or where they got engaged. We thought, 'what about the future people who want to have those same memories?'"

The deep roots in the community brought them back. As Angie Tersiguel framed it: "We are stronger than we ever believed possible."

Small businesses may also need assistance in ways that might not be obvious.

- **Mental Health** — many small businesses are stretched too thin during normal operating conditions as it is. Losing their inventory, equipment, life savings, while coping with loved ones in harm's way can be enormously stressful. Psychologists have long known that disasters can cause PTSD, depression, anxiety and other forms of mental trauma. Mental health support can mean the difference between entrepreneurs and small business owners committing to rebuilding in the community or deciding to move on to other opportunities or places.

- **Day Care, Elder Care and Animal Care** — many small business owners and employees report absenteeism or presenteeism, not necessarily because their loved ones are sick, but because they have no one else to provide them with care.

- **Pivoting to online business models** — Not every small business is driven by ambitions for growth. Lifestyle businesses often grow up to serve the local community or to help the proprietor finance something he or she loves to do. Not every business has or wants a virtual presence during Blue Skies so when an emergency forces a business to transition its business model, tech expertise and counseling can be enormously helpful.

- **Access to Information** — The amount of motivation and money needed to keep a small business running is immense and so is the process. The most confusing part is having to lay people off and small businesses do not necessarily know where to go when it comes to accessing emergency relief and recovery resources.

- **Simplification of Information Sharing Process** — After disasters happen, small businesses are often bombarded by well-meaning service providers. Small businesses are asked to fill out local, state, and federal forms. The bank wants another form. The insurance agent has a questionnaire. Nonprofits, foundations, potential business partners all need information. If a common damage assessment form can be developed, this would be enormously helpful.

Businesses typically need under $100,000 to get by post-disaster (most under $5,000). Financing options include bridge loans, emergency microloans, forgivable loans and grants. Examples of assistance options:

- US EDA — technical assistance grants to fund economic development efforts aimed at recovery, seed money for revolving loan funds, workforce retraining, economic diversification implementation support

- Community Development Block Grants for Disaster Recovery (HUD CDBG-DR)

- State programs, like Florida's Bridge Loan Program which quickly provides a no-interest loan for six months while businesses are waiting for longer-term financing

- IRS Assistance and Emergency Relief for individuals and businesses can provide for extensions of time to file taxes

- Alternative Small Business Financing — forgivable loans that do not need to be paid back if a business stays in business and retains its workforce

- Technical assistance, e.g., case management, workforce retraining, help re-writing business plans

- Free Business Continuity Resources, e.g., Insurance Institute for Business and Home Safety

- Corporate social responsibility programs like Google's $10,000 AdWord grants or eBay's virtual storefront service.

- Large company small business procurement programs

- Visa, AmEx, and Mastercard "Small Business Saturday" promotions, and many others — www.isdus.org offers a number of directories that can be accessed for free.

8.3   Strategies

8.3.1   Recommendations for Small Businesses

- Have a business continuity plan
- Back-up critical information, such as saving files to the Cloud
- Have emergency agreements with suppliers
- Review insurance and be sure it covers the problems the business is most worried about (know the difference between wind versus water damage)
- Have a customer messaging plan

8.3.2   Recommendations for EMs/EDOs and Small Business Assistance Providers

- Create a systematic way to collect business emergency contact information
- Develop a pre-disaster system for badging and credentialing and protocols for allowing businesses to gain access to their facilities after a disaster.
  - ☐ Good example from Louisiana - in Jefferson Parish's Reentry Program businesses are assigned a tier based on how dependent other business and community functions are on them
- Consider creating a statewide business re-entry system
- Touch base with your small business community regularly
- Simplify application process for assistance
- Provide consistent messaging
- Prioritize critical infrastructure repair
- Gather and disseminate information about available small business financing
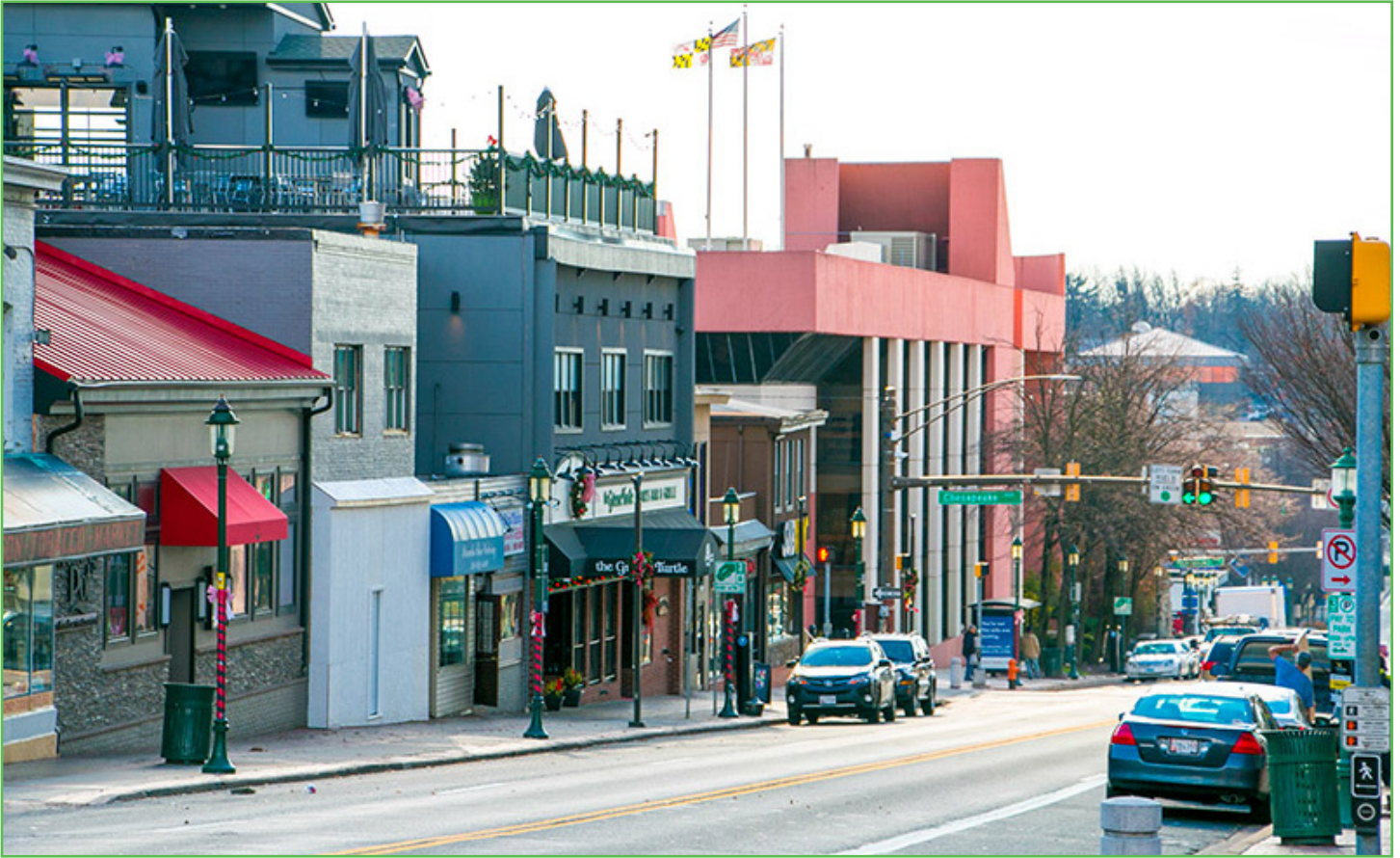- Provide emergency grant opportunities for small businesses

Figure 16: Small businesses on York Road in Baltimore County

9.0 Mitigating the Effects of Disasters on Travel & Tourism

In the fifth workshop, travel and tourism received special consideration. This sector is one of the most vulnerable to disasters. Workshop participants surfaced a number of key issues:

- How to protect and assist tourists who may have been caught in harm's way

- How to preserve, protect, and repair tourist destinations after a disaster

- How to shorten the duration of tourism recovery

- How to communicate that tourism destinations are open for business

- How to reassure tourists that locations and attractions are open and that they consider tourists safety and security a top priority
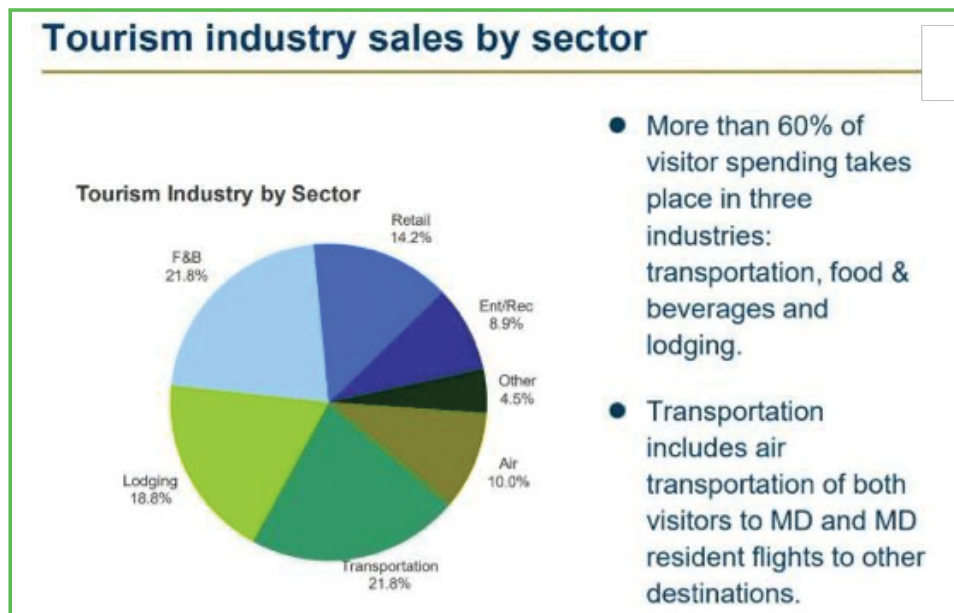

Figure 17: Tourism chart

9.1   Objectives

- To provide for the safety and security of tourists

- To protect, preserve and retain pre-existing community travel and tourism assets

- To generate post-disaster positive media and general public perceptions and awareness of tourism assets

9.2   Analysis

The perceived level of safety and security is a key decision-making factor for travelers in selecting their destinations; with low-probability-high impact events — such as those that hit Maryland in 2018 — causing travelers the most apprehension. According to a 2019 study of natural disaster impacts by the World Travel & Tourism Council, full recovery of tourism can take 19.4 months on average, with a range in recovery from 10 months to 34.9 months. With so much business at stake, the implications of crises increasingly require governments to engage with the private sector to improve crisis preparedness, management and recovery plans.

While some may not think of tourism as a major factor in Maryland's economy, in fact it brings tremendous economic benefits to the four counties that make up the subject area of this report.

Economists consider tourism as an export, where money from outside the region comes in and is spent in the local economy. For purposes of definitions, a "tourist" is someone who travels 50 miles or more to visit a location, typically expecting to spend at least four hours on activities for every hour they spend traveling to the destination. This often includes at least one meal at a restaurant, shopping and some other recreational activity.

As an example, in a 2019 study, $652 Million was spent in Howard County on food and beverages, attractions and retail sales. This supported 11,000 jobs and $3.5 Million in local taxes. In Frederick County, Visit Frederick calculated that Frederick received 2.1 million visitors who traveled from more than 50 miles away, creating $426.1 million in tourism-related revenue, and supporting 6,800 tourism jobs.

With so many choices of places to go, tourism is fragile and communities may need to invest in promotions to let people know that your location is back and open for business. Be truthful about what is open and what is not. More often than not, people have an incorrect perception of which areas were affected and the extent of damage. Posting photos to show current conditions is particularly helpful to dispelling rumors.

The Howard County Tourism Council in 2018 spent much of their budget to promote Ellicott City, including the re-opening of the County Visitor Center, a "What's New in Ellicott City" campaign, holiday promotions and a familiarization tour for meeting planners which proved to be a very worthwhile investment.

The Visit Frederick organization was also extremely active after the 2018 floods to promote special events and attractions of the region which were unaffected and open for business.

9.3   Strategies

Because tourism is such an important economic driver, following a crisis, destinations should consider developing a strategic tourism recovery plan based on the new market situation. Understanding the nuances of travelers and their motivations is critical in the recovery phase. Destinations should work to identify which market segments are likely to come back first after an incident and focus on these source markets.

9.3.1   Open communication specifically for visitors and update messages frequently. Access to information is the antidote to fear. It is important to remember to reach out to visitors who may be in your community and don't know where to go for help when there is a disaster. Tourists in harm's way may be confused and possibly stranded, so any information you can provide on where to go for food, shelter, medical care and transportation will be much appreciated and remembered. Websites and social media can be especially helpful to disseminate travel advisory information, as well as radio and notices disseminated through visitor centers and visitor-focused businesses, such as hotels, restaurants, attractions and rental car agencies.

Figure 18: Frederick, MD

9.3.2   Destinations that have experienced disasters know that strategic communication and effective media engagement during the immediate aftermath of a crisis are critical to the travel and tourism sector's timely recovery. This requires proactive, honest, transparent and factually accurate communication as to the extent of the crisis, with detailed information on ongoing health and safety issues. To build trust and allay concerns, which is essential to visitors returning, it is important for authorities to take control of the story and respond quickly, giving instructions, being consistent, open and accessible and expressing empathy.

9.3.3   Proactively manage accommodations for relief workers. After a disaster, hotels may become fully booked as space is reserved for the visitors who will come to help with recovery. If you don't have a lot of overnight accommodations or if they are deemed very expensive, think about where volunteers will stay. A creative idea from the Florida Keys was to provide a volunteer village using containerized bunkhouses where volunteers and other essential relief workers could stay for a very minimal fee.

9.3.4   Invite the world back when you are ready. After a disaster, communities may experience a temporary bump in spending as relief workers stay in hotels, eat in restaurants, and people shop for essential goods to rebuild. It is also not uncommon for sales of building materials to increase, for example. But remember that the repair and replace economy will not last forever.

9.3.5   Utilize all available resources to help. Wherever possible, local jurisdictions should take advantage
of the expertise and financial resources from the state, such as Maryland's Office of Tourism Development — County Cooperative Grant Program to help supplement local tourism funds. Also, to help combat negative impacts to tourism from the COVID-19 Pandemic, the U.S. Economic Development Administration has a new funding opportunity to restore travel, tourism and outdoor recreation offering grants of $10,000 to $10,000,000 under the American Recovery Act of 2021. Funds are available on a competitive basis to county, city and township governments, as well as nonprofits with 501(c)3 status and public and State controlled institutions of higher education.

10.0 Financing for Resilience

"It is imperative that we consider climate change costs and incorporate sustainability and climate risk assessment into our work."

— Stacy Swann, Climate Finance Advisors, 2020

Financing for resilience and post-disaster recovery does not make headlines, but it is one of the most inhibiting factors affecting both pre-disaster preparedness and mitigation and post-disaster "build back better" programs.

Pre-Disaster — Communities like Hagerstown, Frederick, and Ellicott City have ongoing financial obligations — creating new flood management programs or revising infrastructure and housing can be very costly. Federal funding is available, but many programs require matches and/or state and local contributions.

Immediately after a disaster, when first responders "surge", there can be huge drains on normal operating budgets that need to be recouped in some way.

Stabilization and recovery can generate unique challenges as well. Sometimes counties want to create small business funds in order to retain their businesses, despite dislocations that may have been caused. In other cases, localities may need funding for infrastructure, public safety, debris removal, and "back to normal" requirements. Some federal programs require localities to make upfront investments and then be reimbursed after the fact — a process that can sometimes take months.

Also, Maryland is in the process of converting to less polluting, less carbon-positive fuel processes. Restructuring the energy grid, from production to transmission and distribution is enormously costly.

10.1   Objectives

- Assist counties and municipalities with federal matching dollar requirements
- Create sustainable mechanisms to continue financing infrastructure adaptation and evolution
- Create mechanisms to help small businesses finance disruptions due to force majeure, government-imposed closings and cancellations, and acts of God
- Assist communities that were financially vulnerable pre-disaster to be able to withstand and build back better from disasters

10.2   Analysis

In recent years, several different solutions for green and resilient financing have emerged as well as technical support services to assist with finding financing. These include:

- Expanding the Maryland Commercial Property Assessed Clean Energy (C-PACE) program to include resilience considerations
- Maryland Small Business Development Center — free individualized consulting for entrepreneurs and small businesses; includes how to navigate SBA funding and procurement opportunities
- Depending on the severity of the disaster, the state of Maryland can set up dedicated small business resource pages, such as the one it has established in response to provide small business relief due to COVID-19.

In May 2014, the Maryland General Assembly passed a law enabling local jurisdictions to implement Commercial Property Assessed Clean Energy (C-PACE) programs in order to finance energy efficiency and renewable energy improvements on commercial property. This mechanism has helped localities like Montgomery County and elsewhere to use borrowed capital to pay for the upfront costs associated with energy efficiency or renewable energy improvements. The borrowed capital is repaid over time via a voluntary tax assessment, and the security provided by the tax assessment results in longer term financing and transferability of the repayment obligations to the next property owner.

This program naturally lends itself to some resilience investments as well, and may be available to industrial, commercial, agricultural, multi-family, and non-profit/religious properties. CPACE financing can be used to support:

- Energy Supply projects = help ensure that critical building systems can continue operating during a grid or fuel supply interruption
- Resource Conservation projects = reduce the energy and water demands of a building, increasing the amount of time it can operate on backup power and reducing the impact of disruptions
- Structure Hardening projects = mitigate property damage, injury, and system outages in case of disaster

In 2021, Senator Katie Fry Hester was the lead author of S.B. 901, which created a $25 million revolving loan fund (RLF) for resilience. The purpose is to help:

- Mobilize direct capital investment
- Open up novel financing mechanisms, and
- Leverage federal programs that have matching or reimbursement requirements

The Maryland Emergency Management Agency (MEMA), which administers the fund, must prioritize making loans to projects it determines to have the greatest impact on eliminating hazards. The fund may be used only to provide low- or no-interest loans to local governments and nonprofit organizations for local resilience projects. The loans must be for a fixed loan period. Money expended from the fund is supplemental to and is not intended to take the place of funding that otherwise would be appropriated to local governments for resilience projects. Loans from the fund may be used to satisfy the non-federal match for federal mitigation grants.

The U.S. Department of Housing and Urban Development Community Development Block Grant (CDBG) Program has Disaster Recovery grants to rebuild the affected areas and provide crucial seed money to start the recovery process. These flexible grants help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.

Both the private sector and philanthropic foundations like the Annie E. Casey Foundation and the Howard County Community Foundation have also stepped up in recent years. According to the Center for Disaster Philanthropy, more than 75% of all philanthropic funds mobilized in response to disasters happen in the first ten weeks after the disaster. This is why Community Disaster Funds need to be established during Blue Sky periods. Setting up the machinery after a disaster has happened is too late.

Financing for nonprofit relief organizations may come at the expense of other community organizations that provide education, cultural, heritage, or other benefits.

Financing for community organizations needs to be included in community economic resilience calculations.

Financial responders need to be mindful of equity and justice issues and that funding needs to be made available to the most vulnerable instead of just for those who can pay for it. Creating mechanisms which can help prioritize how money is allocated is very important.

10.3   Strategies

- Establish "credit for resilience" programs that incentivize small businesses to take precautionary steps before disasters happen, and tie these in with either insurance benefits or post-disaster priority access to recovery support funds

- Better integration and sharing of information between the public sector and private and philanthropic funders is needed. Local jurisdictions should contact foundation right away to give them a head-start in money funds distribution

- Possible solutions include "Meeting the Match" initiative, which would pool statewide funding sources which local jurisdiction can pull that would work alongside federal sources. "Meeting the Match" or similar programs could also serve as gap-stops in situations, such as the Howard County case study, where federal emergency management dollars are delayed for significant periods of time

- Funds need to be accessible in multiple ways

- Checks should not be sent through the mail but there should be a place set up for more rapid pick-up

- Expand access outside of electronic means. Consider making paper copies available as some businesses may not have access to power or computers that have been damaged

- Create an advisory committee to support the effort and find other resources

- Create a one-stop application center closer to people and businesses where disaster victims can get help

Figure 19: Hagerstown, MD University Plaza

11.0 High Tech and High Touch Solutions for Connecting with Key Stakeholders

Throughout the workshop discussions, when panelists discussed ways to reduce the costs of disaster recovery and the impact of future disasters, improving information gathering and communications practices was a recurring theme. Furthermore, panelists were insistent that while technology-based solutions are important, they have to be accompanied by "high touch" and relationship-building solutions. These issues were tackled in more depth in Workshop #7. Panelists looked specifically at:

- Forecasting and Visualizing Weather, Climate, and Health Threat Vectors
- Communicating with Minority Stakeholders and Communities
- Supporting Low Income, Disabled, Elderly, Rural and other Vulnerable Communities
- Crisis Communications
- Communicating Effectively After Disasters
- Communicating with Business Stakeholders to Accelerate Recovery

11.1   Objectives

Provide EM and EDO decisionmakers with access to more real-time information about events, issues, trends, developments across systems and how they relate to each other in order to better serve hard-to-reach and vulnerable communities.

Identify hard-to-reach stakeholders that need disaster recovery and economic resilience information and more access to it.

Raise awareness of hard-to-reach stakeholders about essential information for resilience, emergency response, relief and stabilization, and long-term recovery including:

- Community threats and vulnerabilities
- Projected environmental changes
- Personal safety and security (including financial)
- Business continuity
- Evacuation Routes
- Emergency Shelter and other Relief Services
- Public Health
- Family and Animal Care Support
- Small Business Relief and Recovery
- Unemployment Assistance
- Housing Assistance
- Workforce Training
- Taxes and Regulations

11.2   Analysis

When a disaster strikes, it is critical to have communication systems in place that will enable the relay of important messages to the public quickly, accurately, and effectively. Communication tools for emergency managers and economic development officials range from low to high technological requirements, cost, and flexibility/changeability. Table 20 below contains a spectrum of tools for response and recovery communications.

Tool	Technology Requirement	Cost	Flexibility/ Changeability	Comments
Paper flyers	Low	Low	Low	Difficult to change message post-distribution; language barriers
Word-of-mouth/ Door-to-door	Low	Low	Low	Difficult to change message post-distribution and still reach everyone in a timely manner
Sirens/Fixed public address systems	Low	Medium	Medium	Ideal for alerting, whereas greater information delivery is limited
Vehicle-mounted public address systems	Medium	Medium	Medium	Ideal for alerting, whereas greater information delivery is limited
Variable Message Sign (VMS) boards	High	High	Various	Potential issues if needed by multiple parties; some can be changed remotely, while others require a technician
Email list distributions	Medium	Low/ Medium	Medium	Cost depends on platform; only reaches those on the email list
NextDoor (Community discussion platform)	Medium	Medium	Medium	Runs on ad money and deals for local businesses; possible reliability issues; good source of "intel" between users
Paid emergency notification systems	High	Medium	Medium	Not the most accessible option; risk of information overload and expensive maintenance
FEMA's Integrated Public Alert and Warning System (IPAWS)	High	High	High	Sends alerts directly to smart phones in targeted areas

Figure 20: Spectrum of Response and Recovery Communications Tools

> **"It's hard to talk about things without a relationship. To start building those, go to community events, and show up consistently."**
> — Jonathan Moore, RowdyOrb.It

Technology can also be used to help predict disasters ahead of time. According to Dr. John Bolten, Associate Program Manager of Water Resources for the NASA Applied Sciences Program, NASA has worked on leveraging a large constellation of satellite observations for the purpose of bringing in data for better early warnings of flood projections.

Social media is an important tool being used by today's elected officials and community leaders, as it is free, direct, and allows one to control the message, thereby bypassing media interpretation. Emergency managers and economic development officials can make use of social media to widely disseminate information when dangerous situations are imminent.

Crisis communications are most effective when they are planned during "blue skies," or in other words, before a disaster strikes. Since local government leaders make emergency decisions that directly impact businesses (e.g., business re-entry, access to property), communicating with businesses is essential and has a major impact on their ability to recover.

Businesses need to hear how their government leaders are advocating for their needs, for example determining re-entry procedures and access to reputable services providers, such as for clean-up and re-building efforts. Economic development organizations, industry associations, and chambers of commerce are vital resources for informing the local government about local business needs.

How jurisdictions care for visitors and tourists during and after a disaster also affects the community's future reputation and economy. During a disaster, visitors will need to know evacuation plans, whether the airport is open, which businesses are open, etc. For example, during an earthquake in Hawaii in 2006, tourists were inconvenienced by a lack of information. Hotels were without food and power, restaurants, stores and gas stations were closed. One of the lessons learned from this event is that information could have been relayed better to communicate which businesses were open.

Disaster management is often about serving as many people as quickly as possible, rather than focusing on where the greatest need/threat persists. Consider two different areas of the community: one with a median income of $100,000, and another with a medium income of $30,000. It is important to consider where it makes more sense to focus the delivery of assistance and resources to the higher income or the lower income neighborhoods.

> **"We need to reframe our response, which requires good data. Consider community information about incomes, connectivity, pockets of insured vs. uninsured, and so on."**
>
> — Dr. Monica Sanders, Georgetown University

Equitable disaster resilience means focusing on the resilience of individual groups, neighborhoods or communities given their specific context. Data from the community on income, connectivity, insurance status, etc. is important to take into account in crafting specific responses. Addressing these inequity issues empowers the community residents and can provide a road map for future economic resilience and disaster recovery improvements.

Operationalizing equity includes partnering with universities, schools, and communities. Explore options for working with philanthropy. Understand what resources are available in the community and region, and be sure to leverage them. Incorporate diversity in the planning foundation, and be sure to invite everyone to the table who would be important to include in a discussion about disaster plans. Creating a space for conversation will help cultivate relationships and establish trust, which leads to greater investments. Doing so will also help identify and address gaps and unique needs that may otherwise go unnoticed.

There is also value to be found in neighbor-to-neighbor connections. Community-based networks can help actively mobilize social capital and enable entrepreneurs to be more resilient. Effective disaster responses for small businesses can help preserve firm-level entrepreneurial social capital networks. Forming such connections involves building a culture of care and establishing an ecosystem of skill-sharing within the community and its stakeholders. This, in turn, helps interweave social connections for resiliency.

One of the most promising developments is the integration of high tech and high touch solutions to promote social capital and jump start economic activity in hard hit areas. One example of this is the Ying mobile app. In hard hit communities, residents may not be able to afford high priced services, nor may they be aware of what skills exist in the community. Ying, and similar apps, help to identify skills in the community, and creates a mechanism for residents to barter their skills to each other.

Ultimately, higher levels of empathy and engagement will lead to greater resilience, and the more equitable a community, the more resilient it is as well.

> **"It's in the state's best interest to reach out to the business community, and in the business community's best interest to reach out to the state."**
>
> — David Baxter, World Association of PPP Units and Professionals

11.3   Strategies

11.3.1   Keep on top of technology trends

Regularly scan and budget for new information and communication technologies and tools, particularly for:

- Threat and vulnerability detection
- Changes in weather, climate, construction, and economic patterns
- Capturing community sentiment

11.3.2   Use Social Media

Understand how different stakeholders consume information and present it to them accordingly

- Facebook, TikTok, Twitter, spanish (and other language) radio, bulletin boards, and community newspapers all have their audiences.

11.3.3   Be present in communities

- Go to where the people are. Do not expect everyone to go to your offices or find your services on the internet. Be intentional about visiting strip malls, schools, places of worship. Consider setting up temporary offices or deploying a mobile unit.
- Work to build trust. Get to know people. Hear them, don't just talk.
- Use software and technology to help build relationships. Don't build relationships so that you can use software and technology.

> **"There's value in neighbor-to-neighbor connections… Community-based networks help to actively mobilize social capital and help entrepreneurs be more resilient."**
>
> — Karla Ballard, YING

11.3.4   Contextualize communications

- Consistent and accurate messaging will yield confidence among residents and businesses. Enforcing organizational roles and procedures for communicating will facilitate smooth and efficient roll-out of messages. Consider the central themes of messages. Publicize milestones. Even after a disaster is over, make sure that an authorized spokesperson is prepared for the media and news outlets revisiting disasters at anniversaries. Public relations firms might be helpful for executing messages properly in extreme circumstances or when the community does not have the capacity to deal effectively with the media.

- A best practice is to pre-prepare answers to the tough questions. Designate a spokesperson for communications, and be sure to brainstorm "what ifs" and develop "must air" points, which are things the community's spokesperson will be sure to say, regardless of what questions they are asked.

- Properly communicating with the public and other stakeholders goes beyond making sure that the right technology is at hand. Communication is also about being inclusive. Think of ways to ensure that messages get out to every member of the community, including those that may be challenged in the English language.

- Err on the side of over-communicating

- Work with public sector and private sector diversity, equity and inclusion experts to understand specific community sensitivities

- Do not adopt a one-size-fits-all approach to engaging with the community. Different neighborhoods and populations have different perspectives, backgrounds, and experiences.

- Trust issues may have nothing to do with current responders, but date back to issues that happened in previous disasters. Do not wait until the next disaster to reconnect. Engage with under-served neighborhoods on a regular basis.

12.0 Strengthening Public-Private Partnerships (PPPs)
for Successful Disaster Recovery and Resilience

Public-private partnerships, or PPPs (also known as P3s), have been part of the arsenal for promoting economic resilience since the 1990s, and some date back to the 1950s and before. In Workshop #7, presenters showcased many different aspects of PPPs, and how they can be a valuable tool across the disaster management spectrum. Issues raised included:

- What's the value of PPPs?

- What can PPPs do?

- How should they be structured in terms of governance, roles and responsibilities?

- What expectations does the public sector or private sector have of each other?

- What are some good examples of PPPs that have worked?

"There are almost always enough resources — it is just a matter of access, lack of information, or a different location — collaboration helps alleviate this issue."
— Kathy Fulton, American Logistics Aid Network

12.1   Objectives

- Tap into a wider pool of insights, experiences, expertise, resources, capabilities

- Leverage public and private sector resources more effectively to achieve resilience goals

- Build incentives, trust and cooperative frameworks to enhance PPP utility and effectiveness

- Enhance better understanding and relationships between the public and private sectors

- Achieve public goods with more market efficiencies

12.2   Analysis

In a PPP, risk, resources, and innovation are shared between the public and private sectors.
The private sector typically brings in alternative funding, and is compensated based on performance.
PPPs can be created for the purposes of both improving a current project, or developing a new one.

> **"Do your homework and be prepared
> for the formal partnership process."**
>
> — Marcel Ham, Rebel Group

There are several different ways to analyze PPPs.

Formal PPPs are often large capital intensive projects that deliver public benefits, but where there is possible alignment between services rendered and services received. Toll roads are the most obvious example. Academics describe them as "a cooperative arrangement between the public and private sectors that involves the sharing of resources, risks, responsibilities, and rewards with others for the achievement of joint objectives."

Informal PPPs come in a variety of shapes and sizes, but generally involve non-cash transaction arrangements. They can revolve around agreements to share threat and vulnerability information, logistics, debris removal and other types of operational assistance, teaching and training, and other types of technical, functional, and informational exchanges. Informal PPPs can be structured between individual parties, but they can also be formed with business associations, chambers of commerce, VOADs, industry groups, and more narrowly defined coalitions.

PPPs have differing levels of complexity. In some cases, they can be very "basic". These kinds of partnerships can have ad hoc governance, loose information sharing arrangements, and most work is done within the individual partners domains. "Intermediate" partnerships may have a formal cooperative agreement, conduct joint training, exercises and operations, and adopt shared operational and technical standards. "Advanced" partnerships have strong governance, harmonized plans, advanced technology support, and integrated operational roles and responsibilities. See the July 2021 Building Public-Private Partnerships FEMA Guidebook for more background and tools.

Companies operate under different constraints than government agencies do. They do not have unlimited capital. Every dollar they put into a project they have to get back in some way, or it's gone. Similarly companies need to understand the constraints that government agencies have. If policies and procedures do not conform to their authorities, they cannot adopt them. Government agencies have to abide by the laws and regulations that govern them. Timelines for allocating resources, confirming projects, and budgets can be very different. This can lead to disconnects and partnerships not becoming operational.

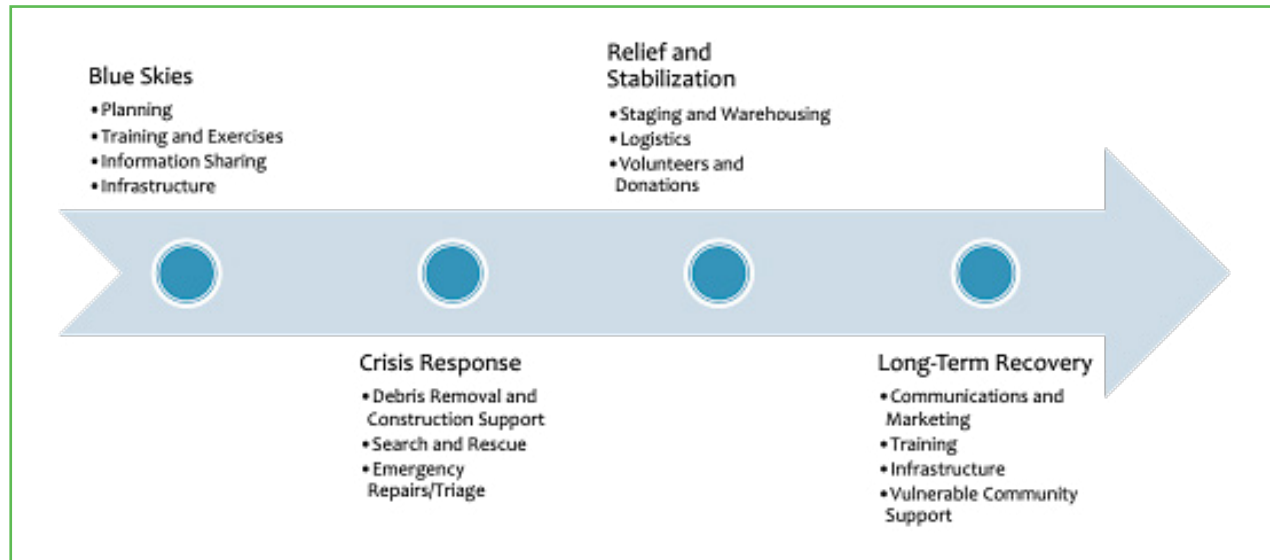Another way to analyze them is to map them against the disaster management cycle:

Figure 21: Disaster Management Cycle

Maryland's Private Sector Integration Program (PSIP) is the state's flagship program for including the private sector in the state's disaster management plans and processes. Private sector participants can receive the following benefits:

Preparedness Resources
- Up-to-date Emergency Alerts
- Virtual Business Operations Center Access
- Access to the Business Operations Center During Activations
- Exercises and Trainings
- Networking Opportunities with Public and Private Sector Colleagues

To make PPPs work, there is an absolute need for information security — partnerships often entail the exchange of sensitive information about threats and vulnerabilities, that if they were to fall into the wrong hands, could potentially threaten the safety and security of the community. Public sector sunshine laws and Freedom of Information Act requests need to be considered in structuring partnerships where this kind of information might be exchanged.

PPPs are not a silver-bullet solution. They do not bring "free money" — financing and funding issues need to be worked out. They are not the best delivery model for every project. They can sometimes fall apart because no one feels a sense of ownership on the one hand. On the other hand, they can be hijacked by a particular party that is too focused on their own objectives at the expense of the other partners. For these reasons, PPPs require careful planning and preparation, and clearly defined expectations and governance.

12.3   Strategies and Recommendations

12.3.1 Identify and benchmark other public-private partnerships that have worked in other states and develop a framework for incentivizing them.

- There are many different types of partnerships out there, but no state in the U.S. has created a standard framework or system for promoting them (there are a few emerging models in South Africa, England and Australia).

- Pre-plan partnerships for disaster recovery around place-based marketing and communications, small business assistance and vulnerable communities.

12.3.2 Both (all) parties should spend a lot of time upfront defining and designing the PPP.

- Partnerships work best if their objectives are well-defined, they are limited in scope, the roles and responsibilities are clearly understood and the costs and benefits are mutually acceptable.

12.3.3 Create a state version of Project Impact to promote public-private cooperation for resilience.

- Project Impact was created by FEMA in the late 1990s to catalyze community resilience programs around the country. FEMA provided some initial seed funding, and localities agreed to bring together key stakeholders at the community level to meet and learn about each other, exchange information, and agree on plans in case of emergencies. Once a year, FEMA would bring together all of the communities to meet and learn from each other. Similarly MEMA in partnership with the Department of Commerce, EDOs, chambers of commerce, and business associations could create a state-level coordinating body, and encourage community level arrangements in the 23 counties and Baltimore City.

12.3.4 Create incentives for private sector engagement

- Work with business associations and chambers to offer resilience programs and access to county or state resilience resources as a member benefit

- Include small businesses in information sharing, training, and exercise partnerships

- Recognize corporate citizens that step up to deliver public benefits over and above their private sector interests

13.0 Volunteer and Donation Management

Even with the smallest of disasters, volunteer and donation management can emerge as a difficult issue for communities to manage. The problem of "unaffiliated volunteers" — people showing up at the scene of an incident without a sponsoring organization or assignment can be very time consuming, and in some cases can lead to safety and security issues.

Similarly, many local individuals, churches, nonprofits, and businesses can be very generous with donations, but they can cause difficulties as well. These donations may not be needed and clog up warehouse space that could be better used. They may suppress the ability of local businesses to get back to business, by offering products or services for free that could be purchased to jump-start the local economy.

Civil society and business have resources, skill sets, experiences, and insights that can be helpful to EMs and EDOs, and should be leveraged in light of the resource constraints that disaster managers have.

> **"There's so much focus on the early response and the immediate management after a disaster...we need sustainability and capability to make a long-term response and be involved in the rebuilding of a community."**
>
> — Phillip Huber, MD VOAD

13.1   Objectives

- Maximize the benefits of volunteers and donations for the disaster management process
- Reduce the safety, security, and nuisance costs of unaffiliated volunteers and unwanted donations
- Minimize distortions and delays in the restoration of normal operations

13.2   Analysis

FEMA has produced a guidebook: Managing Spontaneous Volunteers in Times of Disaster: The Synergy of Structure and Good Intentions that is very helpful in terms of laying out national principles and concepts of operations across mitigation, preparedness, response and recovery.

Maryland VOAD (www.marylandvoad.org) also has significant resources that can be very helpful.

One of the least well-known areas of volunteer and donation management relates to private sector skill-based volunteerism and donations. Businesses are often asked to provide cash donations after disasters, and many of them do, but cash is one of the hardest things for businesses to contribute. Meanwhile, they often give leave to employees to participate in community volunteer efforts and can also donate other types of equipment, storage space, and product within limits. The oldest continuous running public-private partnership – Kansas City's Plan Bulldozer, which was discussed in the 7th Workshop, was designed to specifically create arrangements for law enforcement to work with general contractors on debris removal, demolition, and hazard reduction. These interventions were not meant to supersede debris removal or longer-term construction contracts, but strictly for short-term emergency interventions.

Skills-based volunteerism can assist across the disaster management continuum, but is most likely to be readily available for small/micro businesses after an extreme event (so as not to distort normal economic practices) in the following categories:

- IT (record recovery, hardware technical assistance)
- Real estate/office space decisions
- Supply chain restoration
- Marketing and communications support
- Employee counseling
- Emergency financial counseling

Another under-appreciated actor in promoting economic resilience is the foundation community. Many foundations have as part of their charter, a commitment to help under-served demographics, neighborhoods, and communities. They often have access to real-time information about economically challenged areas and insights about ongoing programs to address them. Because they may already be on the ground prior to a sudden disaster, they may be able to pivot and provide additional resources to make positive changes happen more swiftly. The Annie E. Casey Foundation for example, was working with disadvantaged youth in Baltimore when COVID-19 disrupted the community. They pivoted their work and helped the City hire a coordinator to focus specifically on the emergent challenges they were seeing for impoverished youth and families.

Many people, organizations, and businesses don't plan to get involved after disasters. They are often moved by the act itself. They may not be aware of pre-existing Maryland Voluntary Organizations Active in Disasters (VOADs), how to get in touch with them, and what the protocols are for engagement. They are motivated to help and they react spontaneously.

When economic recovery volunteers do show up, organizations like Maryland VOAD can assist them, but may not have economic recovery intake specialists on hand. Small Business Development Centers (SBDCs), chambers of commerce, and economic development organizations may not be incorporated into the overall picture either.

For safety and security reasons, emergency managers may restrict access to buildings and offices for critical time periods.

From an individual and business perspective, potential contributors may be bombarded with multiple requests for assistance from federal, state, and local government agencies, non-profits, and specific community requests. One of the big challenges for potential private assistance providers is how to prioritize these requests.

Individuals in economically vulnerable neighborhoods and rural areas are often overlooked as potential volunteers.

13.3   Strategies

13.3.1   Have a game plan for volunteer and donations communications both pre- and post-disaster

- Spell out do's and don'ts for volunteers and donations after a disaster happens
- Information should be placed on government, business association and VOAD websites about how to engage. Don't assume that because it is posted on one site that everyone will naturally find it. Spread the word.
- Regularly update information about volunteer and donation needs and opportunities as circumstances change

13.3.2   Pre-plan for needs

- Pre-plan for housing, storage, placement, and logistics
  - o Think of where items will be stored and sorted, how they will be distributed and who will be in charge. Anticipate how to move the items, whether it will be manually or with equipment such as forklifts and hand trucks. How will they be distributed? Will large or small trucks be needed? Are there trained drivers to support logistics?
- Make a list of what you will need and be prepared to ask for donations of things like food, clothing, building materials, etc. Do not accept donations you don't need, such as clothing for the wrong climate, expired food or medicines or items that will not be suitable for the general population. When making your list, remember to think of the healthy food items that will be needed for people with dietary restrictions; many canned and packaged foods contain too much sugar and sodium, for example.
- On donations, do not just accept anything that comes in because then you may have the logistical problem of dealing with things that are not needed that must be discarded later.
- Develop an intake mechanism for handling small/micro business recovery needs

> **"It's important to identify points of alignment.**
> **What do you have in common with that funder?**
> **How are you and they tackling those goals?"**
>
> — Thomasina Hiers, Annie E. Casey Foundation, 2021

13.3.3   Include skills-based labor of volunteers with specific scopes of work, such as surveying businesses, manning hot lines, assisting residents and businesses in filling out claim forms, etc.

- Create guidelines and tools for helping responders to prioritize assistance requests
- Embed controls, quality assurance, and other considerations into plans and guidance for private assistance providers
- Donations and Volunteer Management need to have a paid backbone
- Delivering donations to individuals, businesses, etc. was labor intensive and took seven months
- Disaster donations management providers need compensation for work in order to improve accountability and that there is continuity between volunteer classes

13.3.4   Develop Relationships with VOADS

- Encourage VOADs to help stabilize the local economy by buying local where possible, and not giving away products that might be able to be purchased locally.
- Encourage dialogue between VOADs, EDOs, and the local business community about relief, stabilization, and longer-term recovery needs.
- Chambers and VOADs should consider reciprocal memberships.
- Don't forget to communicate gratitude and appreciation!
- Regularly update stakeholder maps and key contacts for local or regional volunteer organizations VOADs
- Create programs to work with local businesses that might be interested in providing skills-based volunteerism or specialized donations

13.3.5   Explore ways to leverage donation and volunteer programs

- Develop a plan keeping records of volunteer time and donations. A little known fact is that sometimes donations can be considered for their in-kind value – a useful incentive for the organizations that donate them, and also an opportunity to use such donations to meet in-kind matching requirements against certain types of federal grants.

13.3.6   Develop an Acknowledgment and Recognition Program

- Remember that acknowledgements and public recognition of volunteers and donors can go a long way in developing long-lasting relationships, should you need such assistance again.

End Note

"A famous philosopher once said, "it's better to be lucky than good, but if you are really good, you make your own luck." That's how we should feel about investing in resilience."

— Stephen Jordan, Institute for Sustainable Development

Almost every locality in the U.S. is vulnerable to some form of extreme event. Pandemics, black-outs, blizzards, hurricanes, terrorist attacks, industrial accidents do not have any borders. Some places want to minimize these threats and vulnerabilities and pretend they do not exist. Failure to plan is a plan to fail. For Maryland, this is not an option. The stakes are too high.

Our partners and our team focused on helping improve economic recovery and resilience practices across the four counties that were primarily affected by the 2018 floods, but the shadow of COVID colored our thinking. At the time of this writing, while many communities have come back strong, some are still struggling with vacancies, job loss, business closures and future uncertainty. When one disaster bleeds into the next, it's very hard to declare success or failure, but we do know that EMs and EDOs are working more closely than ever before.

Many of the issues that the counties faced had state and federal dimensions as well. Economic resilience works best when the county, state and federal governments work together. One of the benefits of this work was to see this happen in real time.

There's a natural human tendency to want a quick fix, a silver bullet that solves everything, but the more that we worked on these issues, the clearer it became that economic resilience depends on many inter-locking capabilities working together.

At the state level, as mentioned in the introduction, many changes have begun to take place to support and enable economic resilience. These include:

- Elevation of state emergency management director to cabinet-level position
- The creation of a $25 million Revolving Loan Fund for Resilience
- The PSIP Program at MEMA
- Development of a state Chief Resilience Officer concept
- The completion of the 2021 Hazard Mitigation Plan
- Support for flood mitigation plans at the county level like the Howard County Safe and Sound program
- Support for enhanced cyber security
- Support for expansion of broadband and internet access

Figure 22: Economic Resilience

Still others are in the exploratory stage:

- Next steps for Building Codes: What to do about modifying building codes to take into account changing flood plains, sea level rise, and other natural environmental changes that will fundamentally affect the economic environment? The ramifications for insurance, finance, engineering, construction, real estate, travel & tourism, and supporting industries is immense.

- Creating a Statewide Public-Private Partnership for Resilience - institutionalizing a mechanism for the public and private sectors to communicate, coordinate and collaborate in a more streamlined fashion. This would help the private sector inform government decision making processes about their operational needs, challenges, and potential contributions, protect sharing of sensitive information, and help build relationships through regular meetings, planning retreats and exercises.

- Creating a Statewide Business Resilience Center or Community Resilience Center - patterned after the Emergency Operations Center concept that facilitates coordination of the state's Emergency Support Functions - this would assist with implementation of communications, operations, technical assistance, trouble-shooting, and reporting mechanisms.

> "We invested in our state's future sustainability when we established the Resilient Maryland Revolving Loan Fund, but there's still more to do. Resilience isn't about just money or infrastructure — it's about getting the right people, plans, and partnerships in place before disaster strikes."
>
> — The Honorable Katie Fry Hester, Maryland Senate D9

Other emergent recommendations include:

- Creating pre-planned and pre-staged funding mechanisms for private and nonprofit disaster recovery partners
- Investing in a multi-disciplinary digital dashboard that integrates economic, social, and environmental data points for forecasting, trouble-shooting, planning, reporting and other purposes
- Developing an advanced communications strategy for resilience that includes communicating about every step of the disaster management process
- Identifying ways to calculate the economic value of "natural defenses" like dunes, wetlands, permeable surfaces, catchment ponds, trees, and other environmental features; investigating how to strengthen land bank and buy-out fund tools
- Investing in innovative technologies to assist with more advanced forecasting, infrastructure safety, security, and reliability, information sharing, and crisis response
- Developing ways to be present in hard-to-reach and vulnerable communities such as mobile units and partnerships with gathering places like stores, schools, and houses of worship.

Maryland emergency managers and economic development officers have increasingly embraced a culture of resilience. While they are still very much a work in progress, the plans and investments that have already been put in motion should yield significant benefits in the years to come in terms of saving lives, livelihoods and living environments. At both the county and state levels, Maryland is well-positioned to continue to enhance the sustainability of its economic, social, and environmental systems..

Appendix A: Timeline of Significant Maryland Extreme Events

June 2006 — Mid-Atlantic U.S. Flood

September 2006 — Tropical Storm Ernesto

September 2008 — Tropical Storm Hanna

February 2010 — Three North American blizzards, including "Snowmageddon"

August 2011 — Earthquake in Baltimore

August 2011 — Hurricane Irene

September 2011 — Tropical Storm Lee

August 2012 — Heavy rains, prompting sinkhole in Baltimore

October 2012 — Super Storm Sandy

September 2015 — Extreme rain event in Frederick County

January 2016 — Blizzard Event

July 2016 — Extreme rain event in Ellicott City

May 2018 — Extreme rain event in Ellicott City

May 2018 — Severe storms and flooding in Frederick and Washington Counties

November 2018 — Heavy rain, prompting sinkhole in Baltimore

July 2019 — Heavy rain and flooding in Frederick County

January 2020-Present — COVID-19 pandemic

August 2020 — Tropical Storm Isaias

Appendix B: Acronyms

AAR	After-Action Report
BEOC	Business Emergency Operations Center
BLS	Bureau of Labor Statistics
BRAP	Business Recovery Access Program
BRC	Business Resilience Center
CIKR	Critical Infrastructure and Key Resources
COVID-19	Coronavirus Disease 2019
CRC	Community Resilience Center
CRO	Chief Resilience Officer
DHS	Department of Homeland Security
EDA	U.S. Economic Development Administration
EDO	Economic Development Officer
EM (or EMO)	Emergency Manager or Emergency Management Officer
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
ESF	Emergency Support Function
FEMA	Federal Emergency Management Agency
HCEDA	Howard County Economic Development Authority
HHS	Department of Health and Human Services
HMP	Hazard Mitigation Plan
IAEM	International Association of Emergency Managers
ISAC	Information Sharing and Analysis Center
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MEDA	Maryland Economic Development Association
MEMA	Maryland Emergency Management Agency
NACo	National Association of Counties
NADO	National Association of Development Organizations
NBEOC	National Business Emergency Operations Center
NGO	Nongovernmental Organization
NIMS	National Incident Management System
NIPP	National Infrastructure Protection Plan
NRF	National Response Framework
OED	Office of Economic Development
OEM	Office of Emergency Management
P3 or PPP	Private-Public Partnership or Public-Private Partnership
PSIP	Private Sector Integration Program
PSL	Private Sector Liaisons
PULSE	Platform for Understanding Lifeline Stabilization of the Economy
RPC	Regional Planning Commission
SBA	Small Business Administration
SCORE	Senior Corps of Retired Executives
SHMO	State Hazard Mitigation Officer
VOAD	Voluntary Organization Active in Disaster

Appendix C: Economic Resilence and Disaster Management Worksheet

ECONOMIC RESILIENCE AND DISASTER MANAGEMENT WORK SHEET

	SHORT-TERM (5 MONTHS IN ADVANCE)	LONG-TERM (5 YEARS IN ADVANCE)
RESILIENCE CONSIDER: INFRASTRUCTURE IMPROVEMENTS, STAKEHOLDER EDUCATION, TRUST-BUILDING, THREAT AND VULNERABILITY ASSESSMENTS, EXERCISES, ASSIGNMENTS		
CRISIS MANAGEMENT CONSIDER: SEARCH AND RESCUE, DEBRIS REMOVAL, PUBLIC SAFETY, LAW AND ORDER, ACCESS, LOGISTICS, COMMUNICATIONS, DONATIONS, VOLUNTEERS		
STABILIZATION CONSIDER: MESSAGING, WORK-AROUNDS FOR DAMAGED INFRASTRUCTURE, WHAT IT MEANS TO BE ABLE TO SAY "OPEN FOR BUSINESS" (PARKING LOTS, ACCESS, INVENTORY, ETC.)		
LONG-TERM RECOVERY CONSIDER: IMAGE AND REPUTATION, CHANGING CUSTOMER PATTERNS, HOUSING RECOVERY, SMALL BUSINESS VIABILITY, INFRASTRUCTURE REPAIRS AND IMPROVEMENTS, NEW CATALYSTS FOR ATTRACTION AND RETENTION		
GENERAL SUPPORT CONSIDER: PUBLIC-PRIVATE PARTNERSHIPS, PLANNING, DATA COLLECTION, GIS MAPPING		

Appendix D: Useful Resources

American Logistics Aid Network: https://www.alanaid.org/

Baltimore County Department of Economic and Workforce Development: https://www.baltimorecountymd.gov/departments/economicdev/index.html

Baltimore County Office of Homeland Security and Emergency Management: https://www.baltimorecountymd.gov/departments/emergency-management/

BuildStrong Coalition: https://navigatorsglobal.com/case-studies/build-strong/

Bullock & Haddow Emergency Management: https://www.bullockhaddow.com/

C-PACE: https://www.energy.gov/sites/prod/files/2017/10/f39/FL1710_WIP_CPACEv2.PDF

Community Foundation of Howard County: https://cfhoco.org/

Critical Functions LLC Risk and Resilience Advisors: https://criticalfunctions.com/

Cyber Security & Infrastructure Security Agency: https://www.cisa.gov/

Earth from Space Institute: https://www.usra.edu/efsi-our-mission

Ellicott City Partnership: https://visitoldellicottcity.com/item/ellicott-city-partnership/

FEMA Building Resilient Infrastructure and Communities (BRIC): https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

FEMA's Integrated Public Alert & Warning System (IPAWS): https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system

Frederick County Emergency Management: https://frederickcountymd.gov/2001/Emergency-Management

Frederick County Office of Economic Development Resources: http://www.discoverfrederickmd.com/resources

HackmanCarty & Associates Disaster-Resilience Consulting: https://www.hackmancarty.com/

Heavy Constructors Association Emergency Resources Catalog: https://kcheavyconstruction.com/erc.html

Howard County Economic Development Authority Business Support: http://www.hceda.org/business-support/

Howard County Office of Emergency Management: https://www.howardcountymd.gov/fire-and-rescue-services/emergency-management

Howard County Stormwater Management: https://www.howardcountymd.gov/SWM

ICF International: https://www.icf.com/

Institute for Sustainable Development: https://www.isdus.org/

International Association of Emergency Managers: https://www.iaem.org/

"Know Your Zone" MEMA Evacuations: https://mema.maryland.gov/action/Pages/know-your-zone-md.aspx

Maryland Broadband Map: https://geodata.md.gov/BroadbandMap/

Maryland Chamber of Commerce Resources:
https://mdchamber.org/achieving-resilience-recovery-and-growth-in-the-face-of-covid-19/
https://mdchamber.org/wp-content/uploads/2020/05/ReNEWMaryland_FINAL.pdf
 https://mdchamber.org/wp-content/uploads/2020/04/SafeWorkplaceBestPractices_Maryland-Chamber-of-Commerce.pdf

Maryland Department of Commerce Information: https://commerce.maryland.gov/commerce

Maryland Economic Development Association: https://www.medamd.com/

Maryland Emergency Management Agency: https://mema.maryland.gov/community/Pages/Mitigation.aspx

Maryland State Alerts: https://www.maryland.gov/pages/citizen_alerts.aspx

Maryland Transit Administration Purple Line Information: https://www.purplelinemd.com/

Montgomery County Alert System: https://www.montgomerycountymd.gov/OEMHS/AlertMontgomery/

Montgomery County Green Bank: https://mcgreenbank.org/
Montgomery County Low-Cost Internet Access:
https://www.montgomerycountymd.gov/obp/low-cost-internet.html

National Association of Development Organizations - Know Your Region: A Template for Future Prosperity:
https://www.nado.org/kyr-part-1/

NASA Earth Science Applied Sciences Disaster Mapping Portal: https://disasters-nasa.hub.arcgis.com/

National Weather Service Advanced Hydrologic Prediction System:
https://water.weather.gov/ahps2/hydrograph.php?gage=elpm2&wfo=lwx

NextDoor Neighborhood Groups: https://nextdoor.com/

Nixle Emergency Notification System: https://www.nixle.com/public-safety-communications/

Project Impact 2: https://www.projectimpact2.com/

Regional Innovation Acceleration Network - Identifying and Supporting Venture Development Organizations:
http://www.regionalinnovation.org/index.cfm

StatsAmerica: Calculating Innovation Capacity: https://www.eda.gov/ceds/

StatsAmerica: Measuring Distress – A Resource for EDA Stakeholders: http://www.statsamerica.org/distress/distress.aspx

Resilient Cities Catalyst Partnership: https://www.rcc.city/

RowdyOrbit Low-Cost Internet Access: https://rowdyorb.it/

The Information Technology - Information Sharing and Analysis Center: https://www.it-isac.org/

U.S. Chamber of Commerce Foundation Disaster Corporate Aid Tracker:
https://www.uschamberfoundation.org/disaster-corporate-aid-trackers

U.S. Economic Development Administration Resources: https://eda.gov/resources/
"Benchmark Your Incubator Management Practices and Access Tools for Continuous Improvement":
http://edaincubatortool.org/toolkit.html
CEDS Content Guidelines: https://www.eda.gov/ceds/
EDA and Disaster Recovery: https://www.eda.gov/disaster-recovery/

Washington County Department of Business Development Business Resources:
https://www.washco-md.net/dbd/taking-care-of-business/

Washington County Emergency Management Office: https://www.washco-md.net/emergency-management/

What 3 Words Accuracy Locator: https://what3words.com/clip.apples.leap

Appendix E: Acknowledgements