



► INSIGHTS

Going Beyond Boundaries: Building Resilient Communities and Organizations

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There is no denying that our climate is changing. NASA reports that with the exception of 1998, the 10 warmest years in the past century-plus have all occurred since 2000. Along with temperature increases, we're also seeing an uptick in severe weather events, like Hurricane Sandy, droughts in California, and record snowfalls in New England. Unfortunately, a changing climate brings with it related concerns such as the long-term impact of rising water levels and extreme, prolonged heat, which also present very real and critical associated challenges.

No one is immune to these issues. Whether large or small, public or private, all organizations are affected by changing conditions. Communities and infrastructures feel the impact as well.

So what can be done? While we have the science and necessary skills to build resilience to climate change into infrastructures and communities, many organizations are still not certain how to begin employing available knowledge and science to become more resilient.

With this knowledge as our impetus, Haley & Aldrich conducted a year-long research study to better understand how organizations and communities were preparing to face climate change impacts. We interviewed over thirty organizations across a wide range of industries, including infrastructure, municipalities, higher education, real estate, manufacturing, the military and insurance companies. Our questions touched on existing and future vulnerabilities, resilience measures, opportunities, barriers, metrics, and decision makers.

Our findings helped us verify key vulnerabilities faced by different types of organizations. They also identified important trends, successes, and opportunities. Our insights and recommendations are summarized below.

SUMMARY

Our research found that while responses to changing conditions varied widely, most industries and organizations acknowledged that natural hazard preparedness is an issue they need to address sooner rather than later. It was discovered that, on the whole, organizations and municipalities are still in the early stages of understanding resilience issues and implementing responses. Most have started resilience planning, but have not yet implemented those plans. Others are still unsure where they should start.

Many groups don't know what to do with climate-related information or how to implement resilience measures. "There are currently no agreed upon best practices and literature that can be used across the country," said one respondent. Many also reported difficulty finding a balance between planning for and implementing short- versus long-term measures.

The most proactive groups were generally found among municipalities and universities, some of who have already performed vulnerability and risk assessments and are beginning to develop strategies to address their most vulnerable assets and populations.

The following table provides an overview of resilience-related vulnerabilities specific to the market reported by the study participants.

Market	Vulnerabilities
City Governments	<ul style="list-style-type: none"> “The location of buildings and how emergency responders will reach them.” “Really old infrastructures, for example roads, that are more vulnerable to extreme weather events.” “Cities can’t shut down during emergencies.”
Infrastructure	<ul style="list-style-type: none"> “The current poor state of our infrastructure makes it vulnerable to climate change impacts.” “Existing infrastructure, for example water treatment plants, are extremely expensive to build and operate and can’t simply be relocated.” “Water drainage volume will increase during extreme weather events: current infrastructure cannot handle that.”
Ports and Airports	<ul style="list-style-type: none"> “Access to and from the airport/port to ensure business continuity, as well as during emergencies.” “Extreme weather’s impact on utilities and the associated storm water which could back up to runways.”
Real Estate	<ul style="list-style-type: none"> “Existing waterfront properties are particularly vulnerable.” “Tenant’s; demands for business continuity during extreme storms.” “Tenants’ demands for green buildings”
Universities	<ul style="list-style-type: none"> “Some buildings are pushing 100 years – are they resilient enough?” “Short-term emergencies vs. long-term impacts of climate change to university infrastructure.” “Maintaining operations during emergencies while ensuring the well-being of staff and students.”
Military	<ul style="list-style-type: none"> “Huge number of assets: how do we prioritize protection of these?”

CURRENT RESILIENCE MEASURES

Our study found that the resilience measures implemented by most organizations are often minimal and tend to focus on infrastructure, for example, flood defenses. Furthermore, infrastructure-related measures are frequently implemented on a standalone basis. For instance, an organization might incorporate resilience measures when upgrading an existing structure or building a new structure without considering more holistic issues at the organizational level. Resilience measures may relocate vital utilities and infrastructures such as mechanical equipment and storage tanks to safer areas within a building. Other infrastructure-focused upgrades could make assets more resilient by installing new storm drains and backfill preventers.

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The study also found that certain organizations are implementing climate mitigation measures in tandem with

resilience measures, for example, installing on-site renewable energy and green roofs, which reduce climate changing greenhouse gas emissions and provide redundancy measures during extreme events.

Those measures undertaken tended to be location dependent, for example, focused on water scarcity in the western states, or driven by local planning requirements that stipulated climate resilience measures in Boston and the San Francisco Bay area.

Many groups focused on short-term events, such as responding to a recent hurricane, rather than considering incremental change, such as slowly rising seas or increasing temperatures, which might cause severe long-term impacts. Furthermore, plans were largely undertaken at an individual/organization-specific level, rather than community level.

OPPORTUNITIES

Study participants pointed to a number of trends, attitudes, and opportunities that might make it easier to implement resilience measures within their organizations. The fact that corporate social responsibility has become increasingly important to investors, employees, and other stakeholders was noted as a marketing plus and competitive edge. Since resilience is a relatively new concept to many, respondents often mentioned the opportunity to educate stakeholders about its benefits. One respondent noted, “There is an opportunity to help the public

and public officials and educate them on what climate risk means. There is a lot to be done with education but companies have not picked up on this yet.” In particular, some discussed how education could help demonstrate how money can be saved through long-term proactive resilience planning.

Collaboration with community and other related groups was a recurring theme, particularly as it related to the opportunity to share resources and tap into expertise to improve outcomes. One institutional survey respondent referenced its collaboration with its on-site Climate Center to develop a master plan and pointed to the advantages of having experts that could provide specific insights.

Certain states, for example California, Massachusetts, and Maryland, to name a few, and cities, for example Baltimore, are more proactive and provide a regulatory and/or funding environment that encourages organizations and municipalities to prepare for climate change impacts now.

CHALLENGES TO IMPLEMENTING CLIMATE RESILIENCE PLANNING

Respondents reported a number of barriers for implementing resilience plans, chief among them cost, a lack of guidance on how to most effectively move forward in planning, and difficulty comprehending the implications of climate change. At the organizational level, additional concerns were associated with a lack of leadership, management support, or behavioral inertia.

As noted above, respondents also reported a tendency to focus only on individual (rather than community) and short-term needs, meaning that more holistic, community-level, and potentially more effective opportunities were being overlooked. A lack of familiarity with legal and regulatory issues and uncertainty regarding technical and scientific aspects of resilience measures also created barriers for some.

For the most part, organizations did not have any metrics in place, citing difficulty quantifying resilience and/or determining what to measure. Respondents found it difficult to set metrics for things that weren't impacting people yet

(e.g., sea level rise), and few are therefore evaluating the success of resilience measures.

Attitudes at the national level present significant barriers as well; many respondents commented on a lack of political will, which reduces the drive for organizations to proactively prepare for the impacts of climate change.

RECOMMENDATIONS FOR CLIMATE RESILIENCE

Clearly, resilience planning is a complex problem with no “one-size-fits-all” answer. The issues and vulnerabilities are different for every geography and organization. Western communities may grapple with drought and wild fires while east coast communities are concerned with rising sea levels. One organization may have a board of directors open to resilience planning, while another has little understanding of climate change issues.

Get Ahead of the Issue

Whatever stage, geography, or type of organization, the most important advice our experts can provide is to be proactive. Familiarize yourself with any available flood maps and climate projections for your area. Perform vulnerability and risk assessments now to determine how infrastructures, resources, and people might be affected by changing conditions. At first, these assessments may be performed at a high level with qualitative criteria and then further refined once the organization is comfortable with the analysis and results. Consider resilience measures with a long-term view at the start of each and every project, bearing in mind that you may not live to see the changes you plan. Make certain that you're implementing the most cost-effective and meaningful countermeasures, and the return on investment of these solutions will quickly be seen.

Use Linkages, Resources At Hand

Mitigation and resilience are closely linked, so it's wise to incorporate both where possible. Since many organizations are familiar with mitigation and already have climate mitigation goals, mitigation can be used as a stepping stone to introduce resilience and educate stakeholders around the linkage.

Make the Most of Mother Nature

Try to take advantage of ecological resources to fight climate change impacts, whenever possible. For example, use wetlands in concert with “harder” infrastructure measures such as sea walls to absorb wave power during storm events. Use tree cover to provide shade and reduce heat island effects in heavily populated communities.

Include Your Stakeholders in Your Planning

Strategic resilience planning is an organizational, supply chain, and community-wide endeavor, so be certain to look

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at the big picture and collaborate with others both internally and externally. Communicate emergency evacuation procedures to internal (e.g. building occupants, building owners) and external stakeholders (e.g., the local community, local officials, etc.). Ensure safe access and egress from buildings and neighborhoods during extreme weather events, especially for vulnerable populations such as children and the elderly.

Consider multiple systems and infrastructures and how they interact at various levels in a community; if possible learn about plans and measures at the neighborhood level or higher. Familiarize yourself with available municipal and regional resilience plans and ask local organizations if they have a plan in place, and if so, would they be willing to share it. Take into account both on-site and nearby systems: for example hospital facilities are for naught if the roads to access the hospital are flooded during an extreme weather event.

Make sure to engage your supply chain, locally, nationally, and globally. We live in an increasingly global market. Your own business continuity will depend on the resilience of both your facilities and those of your suppliers. If your supply of materials or utilities is suddenly cut off, your organization might not be able to deliver products or services to your customers. For example, supply chains in the United States and the rest of the world were severely disrupted in the aftermath of the Fukushima disaster caused by an unexpected tsunami, causing downstream delays in manufacturing and associated impacts to organization's bottom lines. It is imperative to ensure that your suppliers are protected now and in the future against changing climates.

Use Education, Communication, Metrics to Make Your Case

Educate constituents and communicate with them throughout the resilience planning process; be certain to review the results with them. Engage internal and external stakeholders and educate them on the importance of acting now for long-term change. Perform high-level economic

risk assessments and scenario planning together with stakeholders. Scenario planning should be as holistic as possible and consider all climate risks, e.g., wind, heat and water. Describe how upfront investments in resilience measures will save money in the long-term, and demonstrate these savings when possible, by setting metrics to track resilience measure performance. For example, metrics could relate to the return on investment realized by ensuring business continuity and/or decreasing insurance rates. Have the data needed to make the financial argument needed for your plans.

Don't Forget Insurance

Make sure you are prepared for climate change impacts beyond the physical resources (including resilient infrastructure, mitigation measures, and ecological measures). Check that you have the necessary financial coverage to recover from an event by ensuring that your building and infrastructure insurance policies cover extreme weather events and their secondary impacts such as flooding.

WHAT YOUR ORGANIZATION CAN DO TODAY

It's clear that there are no simple, universal climate change fixes to help protect communities and infrastructure. Organizations know they need to do something, but aren't sure where to start, how to spend, and what to focus on.

If you would like to better understand your organization's vulnerabilities, begin to develop a resilience plan or simply learn more about what resilience means in today's world, please contact:

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