

# **Cambridge Climate Resiliency Tabletop Exercise**

## **Business Continuity Coordination**

After Action Report  
April 25, 2018



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# TABLE OF CONTENTS

**TABLE OF CONTENTS ..... ii**

**EXERCISE OVERVIEW ..... 1**

**ANALYSIS OF CORE CAPABILITIES..... 3**

    Exercise Objectives and Core Capabilities ..... 3

**ANALYSIS OF STRENGTHS AND AREAS FOR IMPROVEMENT..... 5**

**IMPROVEMENT PLAN ..... 10**

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## EXERCISE OVERVIEW

<b>Exercise Name</b>	Cambridge Climate Resiliency Tabletop Exercise
<b>Exercise Date</b>	January 17, 2018
<b>Scope</b>	The tabletop exercise covered business continuity and coordination procedures following a climate-based incident that adversely affected the Cambridge area and caused business interruptions to stakeholders in the City.
<b>Mission Area(s)</b>	<ul style="list-style-type: none"><li>• Protection</li><li>• Response</li><li>• Recovery</li></ul>
<b>Core Capabilities</b>	<ul style="list-style-type: none"><li>• Operational Coordination</li><li>• Supply Chain Integrity and Security</li><li>• Critical Transportation</li><li>• Infrastructure Systems</li><li>• Economic Recovery</li></ul>
<b>Objectives</b>	<ol style="list-style-type: none"><li>1. Discuss interdependencies on systems among Cambridge stakeholders including transportation, vendors, and utilities for Cambridge businesses and organizations of all sizes.</li><li>2. Determine resource sharing needs and obstacles in the aftermath of the disaster.</li><li>3. Practice coordination and communication between Cambridge businesses/organizations as well as with the city and state during a supply chain disruption due to a major disaster affecting the Cambridge area.</li><li>4. Discuss lack of staffing due to transportation infrastructure disruption and care for staff that has stayed in Cambridge to continue operations.</li><li>5. Determine common gaps in resolving the above issues and move forward on planning next steps to resolve these gaps.</li></ol>
<b>Threat or Hazard</b>	Hurricane
<b>Scenario</b>	See scenario summary.
<b>Sponsor</b>	This exercise was sponsored by the Cambridge Compact for a Sustainable Future.

**Exercise  
Planning Team**

MIT, Novartis, Harvard, City of Cambridge, Cambridge Fire Department

**Participating  
Individuals**

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## ANALYSIS OF CORE CAPABILITIES

### Exercise Objectives and Core Capabilities

Aligning exercise objectives and core capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned core capabilities, and performance ratings for each objective as observed during the exercise and determined by the evaluation team.

Exercise Objective	Core Capabilities	Performed without Challenges (P)	Performed with some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
1. Discuss interdependencies on systems among Cambridge stakeholders including transportation, vendors, and utilities for Cambridge businesses and organizations of all sizes.	Operational Coordination  Supply Chain Integrity and Security  Critical Transportation  Infrastructure Systems		X		
2. Determine common gaps in resolving the above issues and move forward on planning next steps to resolve these gaps.	Operational Coordination		X		
3. Practice coordination and communication between Cambridge businesses/organizations as well as with the city and state during a supply chain disruption due to a major disaster affecting the Cambridge area.	Operational Coordination  Supply Chain Integrity and Security			X	

Exercise Objective	Core Capabilities	Performed without Challenges (P)	Performed with some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
4. Discuss lack of staffing due to transportation infrastructure disruption and care for staff that has stayed in Cambridge to continue operations.	Operational Coordination				
	Critical Transportation		X		
	Economic Recovery				
5. Determine resource sharing needs and obstacles in the aftermath of the disaster.	Operational Coordination				
	Economic Recovery		X		

**Ratings Definitions:**

- Performed without Challenges (P): The critical tasks associated with the core capabilities were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- Performed with Some Challenges (S): The critical tasks associated with the core capabilities were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.
- Performed with Major Challenges (M): The critical tasks associated with the core capabilities were completed in a manner that achieved the objective, but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- Unable to be Performed (U): The critical tasks associated with the core capabilities were not performed in a manner that achieved the objective.

**Table 1. Summary of core capability performance**



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## ANALYSIS OF STRENGTHS AND AREAS FOR IMPROVEMENT

The strengths and areas for improvement that resulted from the exercise are described in this section.

### *Strengths*

**Strength 1:** Cambridge has a connected, diverse community of people who are willing to share with and listen to each other.

**Strength 2:** The community is actively thinking about resilience and committed to working on it earlier rather than later.

**Strength 3:** There is a shared recognition that resiliency planning cannot be done in isolation; collaborative planning is critical to the success of any planning effort.

**Strength 4:** There is a shared recognition that the city of Cambridge is a legitimate convening authority that should actively coordinate this planning effort.

**Strength 5:** Many institutions have knowledge of critical personnel and staffing plans in place in case of a natural disaster emergency.

**Strength 6:** Short-term housing and food plans are in place in case of a natural disaster emergency.

**Strength 7:** Many institutions have strong energy back-up systems in place.

**Strength 8:** Many institutions have established relationships with vendors, though there is a need for further understanding of the interdependencies between these relationships.

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## *Areas for Improvement*

**Area for Improvement 1:** Comprehensive understanding of internal systems and plans before beginning to plan at the community level.

**Analysis:** The tabletop exercise underscored the fact that some stakeholders have a deeper understanding of their business continuity and emergency preparedness systems and plans than others. In order to have a meaningful Cambridge-wide discussion about system and plan alignment, it is important that all discussion participants come to the table prepared to speak to their internal capacity. This in turn would facilitate resource and knowledge sharing.

**Recommendations:** Prior to organizing any city-wide discussions or workshops, each stakeholder should prepare an inventory of internal business continuity, emergency planning, and climate resiliency planning capacity. If there is a specific workshop on the table, such as emergency communication management planning, the inventory-taking exercise can be focused on communication systems in place. Stakeholders, including universities, businesses, government agencies, etc., might consider conducting their own table top exercises to identify internal system strengths and weaknesses.

**Area for Improvement 2:** Comprehensive understanding and effective management of dependence on shared vendors (including fuel, food, medical supplies) during supply chain disruptions.

**Analysis:** Cambridge stakeholders rely on many of the same vendors to supply fuel, food, medical supplies, etc. In an extreme weather event, it is likely that the shared vendors will be strapped for capacity, so it will be important to understand vendor dependencies and establish a plan for how to coordinate use of limited resources in the event of an emergency.

**Recommendations:** Create a list of Cambridge-wide critical vendors. Then, host a workshop that invites the most critical vendors to discuss (a) the issue of vendors' internal capacity and contingency/continuity planning, (b) vendor dependencies and stakeholder coordination

**Area for Improvement 3:** Collaboration & information sharing between agencies, institutes and the private sector.

**Analysis:** The tabletop exercise confirmed that stakeholders across the city bring valuable technical expertise to the table. However, that technical expertise is not always shared externally. There was a strong desire among exercise participants to break down those silos

in order to get a complete picture of the city’s capabilities and restrictions – foundational knowledge necessary for advancing the city’s climate resiliency planning efforts.

**Recommendations:** (i) Study the feasibility to establish a “clearinghouse” to share technical expertise and pool resources for different areas e.g. long-term housing for students displaced by a natural disaster, communication infrastructure. (ii) Cambridge Compact for Sustainable future to develop a letter to the state government with top issues coming out of the tabletop exercise and follow up stakeholder discussions to the state in order to solicit support on addressing the most salient issues for the majority of stakeholders.

**Area for Improvement 4:** Communication management plan in emergency scenarios, particularly when power supply & cell phone reception is unavailable.

**Analysis:** Businesses, academic institutions, government agencies and community members all rely heavily on cell phone service and access to electric power for communication. There is a high likelihood of power and cell phone service outages in the hours and even days following an extreme weather event. Therefore, it is important to establish an alternative communication management plan that all stakeholders can access and know how to use.

**Recommendations:** Develop an alternative communication management plan in the event of power and cell phone service outages. Organize a committee with representatives from the main stakeholder groups (businesses, academic institutions, government agencies and community members) to identify (a) alternative modes of communication for use in the event of an emergency and (b) a course of action for activating the alternative modes of communication before, during, and after an extreme weather event.

**Area for Improvement 5:** Representation by general population or “community voices” in climate resiliency planning.

**Analysis:** Several tabletop participants provided feedback that community voices were notably missing from the conversation. Engaging “local, grassroots community voices” would help in evaluating and addressing risks from the community perspective so that the citizens of Cambridge can become more resilient on an individual level.

**Recommendations:** Invite members of local community and business groups or networks to future tabletop exercises and Cambridge-wide climate resiliency planning meetings. Identify community and business-based networks that can help develop community educational programming on emergency management and climate resiliency, as well as manage communication in emergency scenarios.

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**Area for Improvement 6:** Water and sewer vulnerability assessment and management, including management of hazardous materials and contamination.

**Analysis:** Projected flood maps are needed to determine which critical infrastructure is vulnerable and needs to be placed above the water line. For infrastructure that is likely to be impacted by flooding and cannot be moved, there is a need to have a plan in place for managing potential damage and contamination.

**Recommendations:** Establish a working group with the City of Cambridge to understand risks of extreme weather events to critical infrastructure, what it means for stakeholders and steps that can be taken to mitigate these risks. The city's projected flood maps should be leveraged to determine which critical infrastructure can be placed above the water line.

**Area for Improvement 7:** Coordination on shelter locations across Cambridge if needed in the event of a natural disaster.

**Analysis:** Stakeholder organizations have varying capacity to shelter people in the event of an extreme weather event. Limitations to capacity include space, back-up power sources, food supply, and staffing. Having a shared understanding of each stakeholder's capacity, expected utilization, slack would enable better coordination in real time should sheltering be required.

**Recommendations:** Administer survey to stakeholder organizations and agencies to identify shelter capacity, expected utilization, slack, resources, etc., map these metrics, and create a shared resource for available shelter space across Cambridge that can be used should a natural disaster prompt the need to shelter in place during and immediately after the event.

**Area for Improvement 8: Zoning and building codes for new construction and redevelopment projects**

**Analysis:** As extreme weather events can damage public and private infrastructure, the development and implementation of appropriate land use strategies and building codes can help the community and businesses make incremental changes to adapt to climate impacts. Stakeholder engagement on climate resiliency planning including building code updates and financial incentives can encourage climate resilient development.

**Recommendations:** The City is working on a Climate Change Preparedness and Resilience Plan (CCPR) to implement specific strategies in response to climate change threats (heat, flooding from precipitation, flooding from sea-level rise and storm surge). Compact members to participate in the stakeholder process and provide input on (a) strategies and desired

development elements in vulnerable areas that can be incorporated in new construction or redevelopment projects (b) topics related to building codes that are essential to supporting resilience and advocate for changes in the building code at the state level.

## IMPROVEMENT PLAN

Area for Improvement	Corrective Action	Capability Element(s) <sup>1</sup>	Responsible Organization	Target Completion Date
1. Comprehensive understanding of internal systems and plans before beginning to plan at the community level	Members that have a robust BCP can share key components, why it is useful and processes used to help other members prepare and refine their own plans.	Planning, Organization, Training	Individual businesses	March 2019
2. Comprehensive understanding and effective management of dependence on shared vendors (including fuel, food, medical supplies) during supply chain disruptions	(i) Survey stakeholders to create a list of Cambridge-wide critical vendors and (ii) host a workshop to discuss vendor dependencies and stakeholder coordination	Planning, Organization, Training	(i) Compact to carry out survey (ii) City of Cambridge to lead on workshop	(i) July 2018 (ii) September 2018
3. Collaboration & information sharing between agencies, institutes and the private sector.	Study the feasibility of establishing a clearinghouse to share technical expertise and pool resources.	Planning, Organization	Individual businesses, City of Cambridge	September 2019
4. Communication management plan in emergency scenarios, particularly when power supply & cell phone reception is unavailable	Develop an alternate communication management plan in the event of power and cell phone service outages.	Planning, Organization, Exercise	Compact to conduct stakeholder workshop	April 2019

<sup>1</sup> Capability Elements are: Planning, Organization, Equipment, Training, or Exercise.

Area for Improvement	Corrective Action	Capability Element(s) <sup>1</sup>	Responsible Organization	Target Completion Date
5. Representation by general population or "community voices", as well as the business community, in climate resiliency planning	Invite members of local community and business groups to future Cambridge wide resiliency planning meetings and identify networks that can develop programming on emergency management and climate resiliency	Planning, Organization, Exercise	Compact, City of Cambridge	Ongoing
6. Water and sewer vulnerability assessment and management, including management of hazardous materials and contamination	Establish a working group to understand risks of extreme weather events to critical infrastructure and strategies to mitigate these risks	Planning, Organization, Exercise	City of Cambridge, individual businesses	June 2019
7. Assess stakeholder capacity to shelter people and availability of resources in the event of a natural disaster	Survey stakeholders to identify their shelter capacity and associated resources in the event of an extreme weather event	Planning, Organization	Individual businesses	July 2018
8. Zoning and building codes for new construction and redevelopment projects	The City is working on a Climate Change Preparedness and Resilience Plan (CCPR) to implement specific strategies in response to climate change threats. Compact members to participate in the stakeholder process to provide input on strategies to build climate resiliency in new construction or redevelopment projects. Compact to	Planning, Organization	City of Cambridge, Individual businesses	2019 (Aligned with City of Cambridge Climate Change Preparedness Plan)

Area for Improvement	Corrective Action	Capability Element(s) <sup>1</sup>	Responsible Organization	Target Completion Date
	also advocate for changes in the building code at the state level.			
9. Collaboration on advocacy	Advocate at the state level on salient issues of interest to a majority of stakeholders	Planning, Organization	City of Cambridge, Individual businesses	Ongoing