THE RESILIENCE OF AMERICA'S URBAN FOOD SYSTEMS: EVIDENCE FROM FIVE CITIES

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of Health and Human Services. As a result, some of the food system resilience planning has lost momentum. Within the OFI, resilience competes with their core focus on nutrition, food access, urban farming, and food truck licensing. The OFI has committed to following through on one of the study's recommendations, which is to support research on food access in neighborhoods with high rates of poverty and food insecurity.[181]

Boston reminds us that even with widespread support within the City, including from the Mayor's Office, resilience planning of any type is complicated and it takes a long time to build sustainable coalitions that can ultimately implement the plans. In addition, long-term planning always competes with the numerous urgent, immediate issues facing public agencies and the Mayor's Office. And, finally, food system resilience planning involves many agencies and does not fit neatly into a single agency, meaning that it always competes with core agency priorities.

PLAYBOOK STRATEGIES

1. Conduct a food system resilience assessment

As our study shows, every city will have unique food system vulnerabilities and an assessment of the entire food system is needed to inform resilience plans. Urban food systems remain largely unstudied and there is a lack of data on the origin of food, distribution paths and food retail. The framework utilized for this report could provide city leaders with a high-level assessment and point to specific areas requiring in-depth analysis. Additional research will also be needed to identify solutions to mitigate risks associated with a city's unique vulnerabilities.

Many cities are investing in infrastructure improvements to make their cities more resilient overall to natural disasters. A food system resilience study could help cities prioritize investments that directly impact the food system, such as improving the primary roads and bridges used for food distribution, identifying alternative food supply pathways that could include use of ports and railways, and strengthening, protecting or moving food distribution facilities out of "at risk" locations.

FOOD SYSTEM INFRASTRUCTURE INVESTMENT: NEW YORK CITY

As part of its resilience strategy, New York City has prioritized investments in bolstering the resilience of the Hunts Point Food Distribution Center. Resilience investments are guided by Hunts Point Lifelines, a design proposal for the Distribution Center and surrounding neighborhood that was selected as one of the winners of Rebuild by Design, a 2013 competition launched by the Department of Housing and Urban Development to improve coastal area resilience in regions impacted by Superstorm Sandy. The City allocated $45 million to advance concepts from the Hunts Point Lifelines proposal and implement a resiliency pilot project.[182] In 2015, the New York City Economic Development Corporation (NYCEDC) and the Office of Recovery and Resiliency convened the Hunts Point Advisory Working Group, consisting of Hunts Point industry and community stakeholders, to develop resilience priorities for Hunts Point. As a result of this effort, the City has prioritized flood risk reduction and resilient energy and the first pilot project will be to build a resilient energy grid at the Distribution Center.[183] In addition to the Hunts Point pilot project, the City allocated $150 million in funding in 2015 for a 10-year investment to upgrade Distribution Center facilities.[184]

Given the global nature of our modern food system, research is also needed to understand the impact of a natural disaster in food-exporting cities on food supply to other cities. For example, the Port of New Orleans is a major hub for global food distribution, including coffee and frozen poultry, and New Orleans Cold Storage (NOCS) is one of the largest suppliers of beef, poultry and pork exports in the nation.[185] We know that Katrina damaged NOCS, which lost 52 million pounds of product in three warehouses, but more research is needed to understand the type of impact this had on the supply of beef, poultry and pork to domestic urban markets.[186]

2. Incorporate food systems into resilience planning initiatives and prioritize resilience on urban food agendas

Most cities overlook food systems in their resilience plans. One notable exception is New York City. Food system resilience is a key component of New York City's 2015 resilience strategy, *One New York: The Plan for a Strong and Just City.*[187] The City also plans to integrate findings from the new *Five Borough Food Flow* study into its ongoing resilience planning.

In order to effectively incorporate food systems into resilience planning initiatives, representatives from all parts of the food system (including food businesses, food banks, and public agencies at the state and local levels) should be included in the process. This will ensure that all facets of this complex system are explored and connections across the entire food system are strengthened.

Likewise, most urban food agendas do not currently prioritize resilience planning. There are approximately 200 food policy councils in the U.S., which are designed to influence local and state food policy and typically include representatives from across the food system.[188] In addition, as mentioned above, the U.S. Conference of Mayors has a Task Force on Food Policy. Including food system resilience on the agenda of these policy councils would create an efficient platform to advance resilience policies and initiatives and help them avoid supporting initiatives that may unintentionally create a more vulnerable food system. Food policy councils that are independent public-private partnerships could be especially effective, since resilience planning and implementation is ongoing, and changing administrations and mayoral priorities could disrupt the process. Many cities also have some type of office of food initiatives that could be encouraged to focus on food resilience planning.

Including food system resilience on the agenda of food policy councils would create an efficient platform to advance resilience policies.

3. Develop neighborhood food resilience plans

City leaders should prioritize planning for neighborhoods where food access would be disproportionately impacted by a natural disaster. For example, in Los Angeles, we find that 17 percent of all neighborhoods have vulnerable food access—meaning that food retail is at risk in neighborhoods with relatively high food insecurity rates. One of the neighborhoods has no food retail stores. In New Orleans, a quarter of all neighborhoods have vulnerable food access and 12 of the neighborhoods have no food retail stores.

In the long-term, two key underlying causes of neighborhood food vulnerability—food insecurity (and the poverty that produces it) and a lack of food retail stores, especially grocery stores—need to be addressed. The City of Boston has been a national leader on this front. It has been committed to establishing a grocery store in every neighborhood since the early 1990s when four large supermarkets left underserved neighborhoods. Most residential neighborhoods in Boston currently have at least one grocery store. Madison has also started to address this issue through the Healthy Retail Access Program, discussed above, which seeks to increase food retail stores in vulnerable neighborhoods.

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In the short-term, making sure grocery and corner stores have adequate business continuity plans and insurance and increasing the resilience of food banks, the backbone of food safety nets, should be priorities. All food banks in the Feeding America network have adopted a disaster preparedness plan. According to a representative from Feeding America, food banks have increasingly engaged in multi-agency feeding plans developed prior to disasters in conjunction with local and state governments, the American Red Cross, the Salvation Army, and other hunger relief organizations. For example, Food Bank for New York City is working with its member organizations to improve communications during a natural disaster and ensure that they are prepared to remain operable during future disruptions. However, food banks also need to manage the risks associated with their location (e.g., flooding or earthquake damage) and strengthen the resilience of their food and donation supply chains.

As highlighted above, food banks are likely to experience a sustained increased in demand from a greater number of food insecure households well after the disaster, which would create a significant challenge for many food banks that struggle to meet the needs of existing food insecure populations. State and local governments should work with food banks and the private sector to develop a plan for securing more food donations and establishing funding for food banks to support more food purchases after a disaster.

4. Strengthen food business resilience

Supply chain resilience is a food industry priority and many larger food businesses already have business continuity plans in place. Smaller food companies, however, may be underprepared for business disruptions and may have inadequate business continuity plans and insurance coverage in place. These businesses may not be clear about the potential impact a disaster could have on their business, they may not believe that a disaster is likely to happen, or they may not fully understand their insurance policies.[189] They may need to establish or revisit and update their business continuity plans and insurance policies to ensure that they fully cover a wide range of potential disruptions.

Cities should work with the food industry to review business continuity plans and insurance coverage for all food businesses to gain insight into their plans and help them to address any shortcomings. In New Orleans, the City has taken a step in this direction and convened private-sector businesses and emergency manag-

ers to share lessons learned from Hurricane Katrina and other disasters to improve planning for future disruptions.[190] As noted above, trade associations can also help to catalyze and provide resources to their members to improve business continuity plans. For example, Food Marketing Institute, a national trade association for the food retail industry, provides resources and holds forums for sharing best practices on business continuity, crisis management and building organizational resilience.[191]

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City leaders could also leverage the expertise of large organizations. Walmart, for example, has always been concerned with the resilience of its supply chain, although Katrina heightened awareness about the issue, according to representatives from the company. Walmart has an Emergency Operations Center (EOC) that monitors weather and other disruptions to business operations. The EOC serves as a hub to engage operations teams throughout the business and ensure that stores are prepared for a disruption. Walmart is able to pre-position supplies in emergency warehouses strategically located throughout the country to ensure ready access after a disaster. Walmart works to restore store operations as soon as possible and can get most stores up and running within 24 hours, depending on the severity of the disaster and its impact on transportation routes. Walmart has leveraged its logistics expertise to support community recovery after disasters, including Hurricane Katrina, Superstorm Sandy and the 2016 Louisiana floods.

In 2015, Walmart also launched a pilot project focused on building community capacity to respond to a disaster, working with local government and non-profit organizations. BRIDGe Corps (Building Resiliency in Disaster-prone Geographies) New Orleans was a short-term volunteer initiative that matched senior level Walmart employees with the City of New Orleans to improve emergency management operations related to emergency food supply storage (e.g., water and Meals Ready to Eat) and warehouse logistics.[192]

New York City has gone a step further and called on their state legislature to mandate larger food retailers (20,000 square feet or more of floor space or 60 or more full- or part-time employees) to install electric generators or to make sure that they have the ability to hook up to a mobile generator or other alternative power source to ensure that food retailers have power to process transactions and operate emergency lighting and fire and security systems during a disaster.[193] As of 2016, this legislation had not yet passed.

5. Establish government policies and practices that help food businesses quickly return to normal operations

We analyzed three government policies that could pose significant barriers to a quick recovery for food businesses: food safety inspections, the construction permit process, and transportation restrictions. Government agencies should develop a protocol for streamlining the food business inspection and construction permit process in the aftermath of a disaster and for effectively communicating the requirements to every food business. In addition, a process should be developed for identifying additional inspectors with the appropriate training, who can be quickly mobilized to ensure all inspections are completed in a timely manner.

State governments also should have a policy in place for coordinating with the federal government to temporarily suspend federal Hours of Service regulations for food distribution drivers in the aftermath of a disaster. The regulations may be temporarily suspended under declared states of emergencies for drivers providing vital supplies and transportation services to a disaster area. State governments should also pass legislation that designates food distributors and owners of food businesses as "essential" to emergency recovery. For example, in April 2016, Florida passed legislation (SB 1288 – Post-Disaster Re-Entry) enabling businesses that provide "essentials in commerce" to transport their products during a declared emergency. Under this legislation, the Florida Division of Emergency Management will develop a certification system and permit certain activities by certified drivers or employers during a curfew, and authorize law enforcement officers to specify permissible routes for certified persons in a declared disaster area.[194] Food retailers and distributors would be eligible for this certification. Its supporters, including the Florida Retail Federation, anticipate that the law may allow for faster distribution of food supplies in the aftermath of a disaster, potentially decreasing recovery time and thereby improving Florida's food system resilience.[195]

PLANNING FOR INCREASED FOOD BUSINESS INSPECTIONS: LOS ANGELES

The County of Los Angeles, Department of Public Health, Environmental Health Division is responsible for food safety inspections for restaurants, food retail stores and wholesale food processors. The Division is planning for an efficient and effective response in the event of a natural disaster (e.g., earthquake). As part of this effort, it has created an Emergency Response Unit to work across all county departments and coordinate with federal, regional and state emergency management offices. Typically, restaurants, retailers and wholesale food processors are required to pass an inspection prior to re-opening. But in the aftermath of a natural disaster, the County Board of Supervisors may declare a provision to suspend routine inspection requirements, allowing the Division to focus on thoroughly assessing establishments to ensure public health safety. The Division will prioritize its response to impacted businesses to allow them to quickly recover and re-open for business.

Multiple layers of communication between federal, state and local governments coordinating with food distributors and retailers can create confusion in the aftermath of a disaster. Trade associations, which typically operate at a state level, could provide a single point of contact for government agencies. As we learned with this study, some state emergency management offices may already have mechanisms in place to coordinate with

food retail trade associations during natural disasters to improve emergency response and recovery efforts. City leaders should establish similar relationships with food retailers at the local level, such as the relationship in New Orleans between the New Orleans Office of Homeland Security and Emergency Preparedness and the city's private grocery industry. Further, not all grocery stores, especially small grocery stores and corner stores, are members of these trade associations. Non-member stores need to have established lines of communication with government agencies in the aftermath of a natural disaster.

State and local government can also marshal resources to support the recovery of food businesses that lack sufficient capital to reopen. As we learned in both New Orleans and New York City, smaller grocery and corner stores that were severely damaged were slow to reopen in part because of a lack of financial resources and insufficient or delayed insurance payments. While New York City and New York State quickly moved to create new small business recovery loan programs in the aftermath of Sandy, the time it took to implement the programs (seven months after the storm for the City's program) could have been shortened if the programs were put in place in advance of the disaster. For example, Florida has established a Small Business Emergency Loan Program to support small businesses after disasters. The program, managed by the Florida Department of Economic Opportunity provides short-term, interest-free loans to small businesses that experience physical or economic damage from a disaster to help bridge the gap between the time damage is incurred and when a business secures other financial resources, including insurance claims and long-term loans.[196]

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FINAL THOUGHTS

Not all natural disasters pose the same threat to urban food systems. Our analysis of Boston, Los Angeles, Madison, New Orleans and New York City suggests that hurricanes and earthquakes pose a greater risk to urban food systems than a tornado or severe winter storm. We also find that Madison, Wisconsin, has already built the foundation for a resilient food system. The essential elements of their urban food system resilience include: very few warehouse supplier facilities located in "at risk" areas, redundant transportation networks that are not vulnerable to extended closures, a strong food safety net with capacity to meet increased demand, and very strong partnerships between state and local governments and private food businesses.

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The five practical recommendations we set forth can help city leaders, including Chief Resilience Officers, begin to strengthen the resilience of their urban food systems to natural disasters and thereby ensure that food access in all neighborhoods returns to pre-disaster levels as quickly as possible. Every city will ultimately need more research to identify the unique vulnerabilities of its food system, and target appropriate short- and long-term solutions that address response and recovery challenges as well as underlying issues such as food insecurity. Successful implementation of food system resilience initiatives will require broad public- and private-sector coalitions and strong state and local government leadership.

A truly resilient city will be able to withstand not only natural disasters, but also social upheavals and significant economic shocks such as severe recessions. Our study of Portland contributes to a broader understanding of economic resilience by focusing on the implications of expanded local food sectors. We find that an expanded local food sector did not make Portland's economy more vulnerable to an economic shock, but this was due to Portland's strong, traditional food cluster. Other cities that create a food-based urban economy may be less resilient if they lack the same types of competitive advantages.

Finally, our research begins to integrate two disparate policy discussions: food waste reduction and resilience planning. Diverting edible food from landfills can increase the availability of meals for the food insecure, while diverting non-edible food can create environmental benefits, both of which strengthen a city's resilience. The net impact of food waste initiatives on food donations (critical to food banks and other organizations in the food safety net) is unclear. Food waste reduction goals could increase donations to food banks, but this could be offset by increased supply chain efficiencies that lead to less surplus food. However, food banks are partnering with food processors and retailers to increase the efficiency of the food donation process, which means that more surplus food should make its way to food banks and pantries. Any reduction in food donations would be critical for donation-dependent food banks. More research is needed to fully understand the interplay between food waste reduction and food system resilience.

Climate change will only increase the occurrence and severity of natural disasters in U.S. cities, and city leaders need to be prepared to respond. As this report highlights, natural disasters could create extended food supply disruptions, especially in neighborhoods with limited food retail options and food insecure populations. Our pivotal research on urban food system resilience advances both theory and practice and we hope it will catalyze city leaders to begin to address food system vulnerabilities in their resilience planning.

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