

HayWired Scenario
**FACILITATOR
TOOLS**

Food **Access & Insecurity**


Planning & Preparedness

Discussion Guide

Version 1.0



Facilitator Tool: Food Access & Insecurity



This Facilitator Tool is a companion document to the HayWired Scenario Exercise Toolkit. It provides additional guidance and support material for leading a discussion-based exercise focused on food access and insecurity post-earthquake using the HayWired Earthquake Scenario.

Discussion Objective: Understand how a major earthquake could impact employees, volunteers, and customers' ability to access food, and identify ways our organization can help mitigate food insecurity in the aftermath.


Discussion Scenario: A magnitude 7.0 earthquake strikes the Hayward Fault with an epicenter in Oakland, CA. The mainshock ruptures 52 miles of fault from San Pablo Bay to Fremont, with ground shaking felt well beyond the Bay Area. Aftershocks, though decreasing in frequency, continue for more than two years, causing additional infrastructure damage. Together, the mainshock and aftershocks disrupt critical services such as power, water, transportation, and communications, while displacing tens of thousands of households.

Issue for Discussion: Earthquakes can worsen existing socio-economic vulnerabilities, such as food insecurity, while creating new barriers to food access through supply chain disruptions, infrastructure damage, business closures, and population displacement.

Information from HayWired Scenario Report & Other Reports

The following information from the HayWired Scenario Report provides additional context for this discussion. The volume, chapter, and page information (Vol, Ch, p) is included so that you can find more details, if desired. This facilitator tool also references material from two additional reports external to the HayWired Scenario Report:

- 1 Judanne Lennox-Morrison's A Grassroots Approach to Food Insecurity- Lessons for Earthquake Resilience: Engaging the HayWired Scenario to Develop Best Practices, 2023: <https://hazards.colorado.edu/uploads/documents/lennox-morrison-food-security-final-min.pdf>), cited as (Food Insecurity, page number)
- 2 The Bay Area Urban Security Initiative's' (UASI) Supply Chain Resilience Playbook: Making Time and Space for Flow, September 2023, cited as (Playbook, page number)

Visuals such as maps, charts, and figures are available for some of the information (marked with ) and can be used to further support your discussion. These visuals can be found both in PDF and PowerPoint slide deck formats at EarthquakeCountry.org/haywired.

Please keep in mind that while this information is based on a plausible scenario built on extensive research and expertise, a real event may unfold differently. Changes in the location of the epicenter, extent of fault rupture, variations in shaking intensity, details of actual buildings and their occupants, and mitigation measures taken since the Scenario was created can change the damages and impacts.

Food Demands & Supplies: The broader Bay Area, including the 9 counties addressed in the HayWired Scenario (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma), plus Monterey, San Benito, and Santa Cruz, requires a minimum of 72 million pounds* of food per day, with highest demand in the highest population counties: Contra Costa, Alameda, and Santa Clara. The sources for the food commodities are largely from within the state of California: 35% from within the region and another 30% from elsewhere in California. The Pacific Northwest, Midwest, and other regions make up the remainder (Playbook, p 10). Moving this amount of food requires a minimum of 1,650 truck trips per day (Playbook, p 16). The two major areas of concentration for distribution centers serving the Bay Area are located in Tracy-Stockton and Sacramento. As a result, flows concentrate on a few key truck routes into the area. Coming from the distribution centers in the Tracy-Stockton area, Interstate-580 represents the most important food freight route into the Bay Area representing about half of the flow into the region. Interstate-680 is an important connector for San Jose and Interstate-880 for Oakland. Coming from the distribution centers in the Sacramento region, I-80 is an important route for inbound food (Playbook, p 12). * Calculated as pounds per day demand = estimated population times the average of 5.02lb per person divided by 0.6 to account for food waste and loss.

Roadways: More than 100 highways, secondary roads, and surface streets cross the Hayward Fault rupture zone. Road network and bridge repair times of three months or longer are possible along Highways 37 and 24 and Interstates 880, 580, and 680 (Vol 3, CH U, p 302).

Fuel Availability: Damage to marine terminals, oil refineries, fuel storage tanks, fuel transmission lines, and gas stations is likely in a large Bay Area earthquake. As a result, there will likely not be enough transportation fuel supplies available after a large earthquake (Vol 3, Ch T, p 161).

Food Security: Food security has four main dimensions: food availability, access to food, stability of supply, and safe and healthy use of food. These four dimensions are often drastically disrupted after a disaster as existing vulnerabilities and hazard exposure combine to create disparate impacts on certain demographic groups. (Food Insecurity, p 17) Food insecurity tends to be lower in neighborhoods with higher rates of home ownership. Households in neighborhoods that have been historically underinvested in are disproportionately likely to experience food insecurity (Food Insecurity, p 15). Food insecurity may also vary within households (Food Insecurity, p 14).

Food Access: In many grocery markets it is not unusual for up to 80% of grocery transactions to occur at fewer than 20% of local grocery retailers. Losing one or more of these high-volume retail nodes can have significant impacts. Further, losing just one grocery store in many non-urban locations can seriously reduce the ability to fulfill demand, effectively creating a “food desert” (Playbook, p 18). After a disaster, food systems can experience a series of disruptions that interfere with their ability to provide food supplies. Food pantries and other community-based food organizations play a critical role during the emergency response and recovery periods for food insecure households. Many food assistance organizations, especially at the grassroots level, are not federally funded and are at much higher risk of being disrupted due to unreliable funding and limited personnel and resources (Food Insecurity, p 18).

Damages to and Livability of Homes and Neighborhoods: Estimates of potential population displacement show that more than 150,000 households and 410,000 people could be temporarily or permanently uprooted as a result of the Scenario’s mainshock. This equates to about 6% of the nine-county region’s total population (counties touching the Bay). When considering utility outages as an additional source of residential displacement, these numbers increase to around 180,000 households (495,000 people), which is about 7% of the region’s population. Integrating fire damage further increases displacement to 210,000-265,000 households (570,000-720,000 people), about 8-10% of the region’s population. In total the combined effects of potential residential building damage, neighborhood damage, and utility outages results in a range of 61,000 to over half a million households (170,000 to 1.451 million people) at risk of displacement from the magnitude 7.0 mainshock, or 2 to 20% of the nine-county region population. This

population displacement is also not equally distributed, for example, in Alameda County the percentage of people at risk of displacement ranges from 10% in areas of concentrated damage to single-family/duplex occupancies up to 54% in areas of concentrated damage to multifamily occupancies (Vol 3, Ch U, p 228).

Food Loss & Storage Challenges: In the event of a large earthquake, households would suffer energy loss and property damage that can cause loss of food, prevent food preparation, and impact healthy and sanitized food storage (Food Insecurity, p 18-19). Approximately 1.4 million households lose power long enough that, once the electricity is restored, they must replace the spoiled food (Vol 3, Ch V2, p 393).

School Closures: Since the early 1930s, public schools in California have been subject to special design requirements, regulations, and seismic retrofit programs that are likely to substantially reduce damage to many public primary, secondary, and higher education facilities in the Scenario. However, some public school buildings may still sustain shaking-related damage—from both structural and nonstructural elements—that renders them inoperable. Others could be impacted by any combination of liquefaction, landslides, and fires. Furthermore, the seismic regulations for private school buildings have been significantly less stringent and, unfortunately, there is evidence that some private school buildings in the Bay Area could have significant damage in a major earthquake (Vol 3, Ch U, p 306). Also, while fire increases the risk for all sectors, it disproportionately affects education. For the fires following the 1994 Northridge earthquake, school laboratories were the primary source of fires in schools (Vol 3, Ch V4, p 535). After the 2011 Christchurch earthquake, the closure of hundreds of public schools affected 70,000 students and the reopening of schools was delayed by water and wastewater services. Most schools reopened a month after the 2011 earthquake and school sites were shared to accommodate students from schools that remained closed (Vol 3, Ch V4, p 525). Some families depend on free and subsidized school meal programs.

Water Systems: Whereas considerable investment has been made in upgrading the regional water transmission system, extensive damage to the water distribution systems in Alameda, Contra Costa, and Santa Clara Counties is likely. In particular, the potential damage to the water distribution system in the East Bay could cause the average customer in Alameda County to be without water for six weeks, and some customers may lack water service for six months. (Vol 3, Ch U, p 302, Table B6).

Cascading Neighborhood Impacts: Past disasters have shown that areas of geographically concentrated building damage are likely to experience more extended and complicated recoveries with cascading effects on more residents than those directly impacted. Research has indicated that 20% was an appropriate tipping point at which spatial concentrations of housing and building damage can lead to systemic and cascading consequences to more residents than those directly impacted. This is what happened in neighborhoods across Los Angeles after the 1994 Northridge earthquake. Neighborhoods with concentrations of damaged multifamily housing became blighted as more and more residents left (Vol 3, Ch U, p 224).

6.11 Aftershocks: In the Scenario, the mainshock is followed by a series of aftershocks that occur over the course of 2 years. The aftershock sequence includes 175 magnitude 4.0 or larger earthquakes that occur in the vicinity of the mainshock fault rupture, as well as in the South Bay and North Bay areas (Vol 1, Ch G, p 91). This includes 2 aftershocks of magnitude 6.0 or greater in Santa Clara County and 14 aftershocks of magnitude 5.0 to 5.9 near the Hayward Fault, near Vallejo, and in Santa Clara County (Vol 1, Ch G, p 97). Many of these aftershocks cause additional damage to infrastructure and buildings.

Individuals to Consider Including in the Discussion

Who you include in your exercise should be determined by who can add value to the discussion. This could include key information about your organization's facilities, vulnerabilities, plans/policies/practices, etc. The size of the group will also influence the quality of the discussion; in a large group important points may be lost, while a small group may not have the needed information.

Consider including person(s) with knowledge of/responsibility for:

- human resources
- catering/food services (if your organization has a cafeteria and/or food services)
- community relations
- emergency management and/or business continuity planning

Suggested Questions for your Discussion

Depending on who is participating and how long you have, you may decide to use all of these questions or only a few. The list of questions is not all inclusive and you may decide to adapt some to better fit your organization. An in-depth discussion of just a few questions may have more value than covering and only scratching the surface of many questions.

- How many of our employees currently live in areas considered food deserts or otherwise with limited food availability? How many would be at risk of losing access if a single retailer closed for an extended period?
- What socio-economic vulnerabilities exist among our employees that could make it harder for them to access dietary-need or culturally appropriate foods post-earthquake? What about for volunteers? Customers?
- Which groups among our employees, volunteers, and customers are most vulnerable to food insecurity in the aftermath of an earthquake?

- How might we as an organization help employees and volunteers living in food deserts or low-access areas obtain food after an earthquake?
- How can we incorporate communication about the Disaster CalFresh program, local food banks, and other food assistance programs into our post-earthquake messaging?
- How can we connect employees, volunteers, and customers with neighborhood-scale food assistance resources (e.g., faith-based organizations, mutual aid groups, community kitchens)?
- What role might our organization play in partnering with local food banks, grocery stores, or emergency managers to support food access during recovery?
- How might an earthquake affect households' ability to safely store and prepare food (e.g., refrigeration loss, lack of clean water, limited cooking fuel)? How might these impacts differ across demographic groups represented by our employees, volunteers, and customers (e.g., families with infants, elderly, unhoused individuals)?

Additional Elements to Consider

Here are some additional factors and variables you may want to take into account during your discussion.

- **Workforce Nutrition Impacts:** Food insecurity among employees could reduce workforce availability, focus, and morale during recovery.
- **Non-Linear Recovery of Food Access:** Food access following an earthquake is not always a steady or predictable process. Households and individuals may temporarily regain access to food only to lose it again due to aftershocks, infrastructure setbacks, or ongoing supply chain disruptions. Financial strain caused by property damage, lost wages, or other disaster-related expenses can also limit the ability to purchase food, even when stores are operational.
- **Point-of-Sale Transactions:** Most retail stores are dependent upon software to calculate costs as items no longer have individual price stickers. Additionally, processing payments via credit/debit cards or mobile wallets requires internet connectivity and power, unless the store has an offline-capable system allowing them to process it later. This means that some stores without power and/or internet connectivity may not be operational even if otherwise undamaged.
- **Supplemental Nutrition Assistance Programs (SNAP) Benefits/Food Stamps:** SNAP provides food benefits to low-income families to supplement their grocery budgets. Food retailers, such as grocers, need to sign up to participate in the program; therefore, individuals cannot use their SNAP benefits at just any food retailer. California no longer uses paper stamps/coupons, instead all benefits are administered via an Electronic Benefit Transfer (EBT) card. This means SNAP recipients are dependent upon functioning telecommunications infrastructure to allow stores to process the EBT cards (similar to a debit or credit card transaction).

- **Store Closures Due to Damage:** Even undamaged buildings may close for hours or days for cleanup (fallen items, refrigeration failures, broken shelving).
- **Restocking:** Damages to roads and fuel disruptions can make it more difficult for stores and food assistance organizations to receive supplies to restock. This can result in stores/food assistance centers that are open and operational, but have limited food commodities available. For example, they might have milk, but no infant formula or have bread, but no gluten free options.
- **Supply Chain Disruptions:** In addition to damages to road infrastructure, supply chain disruptions can also be caused by staffing shortages and damages to other infrastructures such as power and telecommunications.
- **Fuel:** The refineries in the Bay Area supply the fuel for most of Northern California and parts of northern Nevada. There are no inbound refined fuel pipeline connections into the Bay Area from outside the region. Bringing goods and materials in from outside the region also increases transit mileages and uses more fuel, which may be in short supply.
- **Water Usability:** Even after water service resumes, boil water or “do not drink” notices may persist, limiting safe food preparation at home and restaurant operations.
- **Access and Functional Needs Considerations:** The California Office of Emergency Services identifies individuals with access and functional needs as individuals who are or have: physical, developmental or intellectual disabilities; chronic conditions or injuries; limited English proficiency; older adults; children; low income, homeless and/or transportation disadvantaged (i.e., dependent on public transit); and pregnant women. Learn more at <https://www.caloes.ca.gov/office-of-the-director/policy-administration/access-functional-needs/>