

HayWired Scenario FACILITATOR TOOLS

Economic Impact

Recovery

Discussion Guide

Version 1.0



Facilitator Tool: Economic Impact

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 using the HayWired Earthquake Scenario to discuss how the economic impacts of an earthquake affect an organization's recovery.

Discussion Objective: Identify how impacts to our organization's customer base could affect our financial recovery in the months and years following a significant earthquake.

Discussion Scenario: Several weeks have passed since a magnitude 7.0 earthquake on the Hayward Fault with an epicenter in Oakland, CA. Several large aftershocks have caused additional damage and disruption in the region. The earthquakes have displaced hundreds of thousands of residents from their homes and workplaces, forced school closures, and left some areas facing prolonged utility outages. A Major Disaster Declaration was issued shortly after the mainshock, but the application and disbursement process for federal assistance and insurance payouts has been slow. Since earthquake damage is not covered in most standard property insurance, a large portion of the earthquake damage is uninsured.

Issue for Discussion: Population displacement, disruption of daily life, and uneven recovery has direct and indirect impacts on an organization's recovery in the mid- and long-term.


Before Your Exercise...

See Section 4 of the Toolkit for instructions on how to facilitate a discussion-based exercise, including how to incorporate the theme-specific information compiled below.


Review Section 5 of the Toolkit so you are prepared to make use of insights and ideas captured during the discussion.


Related Information from HayWired Scenario Report


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.

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.

 **Macroeconomic Impacts:** Damages to hundreds of thousands of vulnerable buildings (residential, commercial, and industrial) and months to years of disrupted transportation systems (for example, major highways and transit) result in job and production (output) losses similar to a moderate to severe recession. The cumulative output loss effects from transportation network and commuting flow interruptions could spread economic losses throughout the Bay Area and be as large as the output loss associated with building damage. Most of the economic losses occur within the first 6 months to one year after the magnitude 7.0 earthquake, although the losses continue for a few years beyond, and it takes many more years to rebuild damaged buildings and infrastructure. Bottlenecks from labor, material, and funding shortages and higher construction costs could stretch recovery times for several additional years (Vol 3, Ch V1, p 361).

 **Population Displacements:** Nearly 61,000 to over half a million households (170,000 to 1.451 million people) are estimated to be at risk of displacement from the magnitude 7.0 earthquake, or 2 to 20% of the nine-county region total (Vol 3, Ch U, p 228). Over 152,000 households are estimated to be displaced because of building damages caused by ground shaking and liquefaction. Displacement estimates for aftershocks are substantially lower, with the largest displacement of about 2,000 households resulting from the aftershocks occurring about six months after the mainshock. The potential population displacement caused by damage from landslides, fires, lifeline infrastructure damage and outages, or environmental threats are not included in these estimates and could increase the population displacement substantially (Vol 3, Ch U, p 226).

 **Building Damages:** Of the total buildings exposed to the HayWired Scenario, approximately 11% of the residential and 15% of the nonresidential building square footage sustain extensive and complete damage that may prevent its use for many months to years until repairs or rebuilding are completed. Multifamily dwellings and

group-living uses sustain proportionally higher damage levels than single-family/duplex dwellings (Vol 3, Ch U, p 222-223).

❖ Cascading Neighborhood Impacts: Past disasters have shown that areas of geographically concentrated building damage are likely to experience more extended and complicated recovery trajectories with cascading effects on more residents than those directly impacted. Research has shown that 20% is an approximate 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). For businesses, past disasters have shown that neighborhood recovery (or decline) can have a stronger influence on business recovery months after the disaster than direct physical damages to the business (Vol 3, Ch V5, p 591).

❖ Families with School Aged Children: Past disasters have shown that families with school-age children have higher rates of protracted or permanent displacement or relocation, especially if they find better schools or more affordable housing elsewhere. When neighborhood schools close, some families may move to other parts of the community, the region, or even outside the region in order to keep their children in school (Vol 3, Ch U, p 306). After the 2011 Christchurch earthquake, the closure of hundreds of public schools affected 70,000 students and the reopening of schools was delayed by disruptions to 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).

Population Migration: A major regional disruption to housing, jobs, and transit, could be the tipping point for many people to voluntarily relocate to another city or region. Young and moderate- to high-income renters may be especially likely to do so if they can continue working for the same company, if their employer sustains significant damage or disruption, or if their employer chooses to relocate for some other reason. After the 1994 Northridge earthquake, a few of the more affluent neighborhoods of Sherman Oaks, CA, that suffered heavy damage to multifamily rental units and condominiums experienced voluntary outmigration by residents, even from undamaged properties (Vol 3, Ch U, p 229). Household-level decisions to stay and rebuild depend on more than just housing damage and access to recovery resources. Other important factors include: the speed, strength, and certainty of economic recovery; availability of jobs and businesses; speed with which utilities, critical community services, and nearby business are restored; and regulatory changes to inspections, planning, construction, or zoning (Vol 3, Ch U, p 237).

Demographic Shifts: Past disasters have also shown that population recovery in some communities does not necessarily equate to a return of pre-disaster residents. Post-disaster changes in the demographic composition of impacted communities is common, with new people, notably recovery workers and the reconstruction

labor force, moving in, sometimes permanently (Vol 3, Ch U, p 234). After the Christchurch earthquake, for business sectors that typically benefit from an influx of new residents (potential customers), only the arts, entertainment, and recreation sectors did not gain from new construction workers moving into the area (Vol 3, Ch V4, p 525).

Financial Constraints: Money fuels disaster recovery and its availability largely determines the pace and scope of community recovery. In a major earthquake sequence like that in the Scenario, it will be difficult for residents, businesses, and governmental and nongovernmental agencies to quickly assemble the substantial resources necessary to fund repairs and rebuilding (Vol 3, Ch U, p 235). It can also take considerable time for Congress to make allocations, for receiving States and communities to design and implement funding programs, and, thus, for recipients to actually receive the funds. Also, after major disasters, Congress or the President may authorize tax credits and other forms of temporary relief or incentives to help stimulate rebuilding. Studies from past disasters have shown, however, that race, ethnicity, gender, income, language fluency, and cultural differences can differentially influence the accessibility and distribution of formal disaster assistance, especially from government sources. Even with insurance payouts and disaster funding from both the Federal and State government, a considerable amount of private investment would also be required to finance a recovery effort of this magnitude, depleting individual savings and business reserves and with socioeconomic ripple effects to follow for many years (Vol 3, Ch U, p 236).

Mortgage Defaults: Mortgage defaults could also present added difficulties for housing recovery in some neighborhoods. Residential home loans in California are typically “non-recourse” loans, whereby the lender’s interest is secured by liens on the property, but the borrower is not personally obligated to repay the loan. Borrowers may default on loans if they do not have the resources to repair and rebuild or these costs significantly exceed the value of their investment. There were many instances of mortgage defaults after the 1994 Northridge earthquake, particularly among the owners of damaged condominium units whose property values had already declined significantly before the earthquake occurred (Vol 3, Ch U, p 342). Decision-making priorities and spending choices will likely be heavily influenced for any customers dealing with mortgage defaults or who are at risk of defaulting.

¶¶ **Highway Repairs:** Several major highways have four or more months of estimated repair time in the Bay Area, which may hamper recovery after the Scenario’s mainshock, having it take longer than anticipated (Vol 3, Ch T, App 5, p 213-214).

¶¶ **On-Going Disruptions from Aftershocks and Fault Afterslip Hampering Recoveries:** Dozens of significant aftershocks and fault afterslip causes additional damage, requiring repeated repairs of infrastructures. The impacts to these infrastructures can affect otherwise undamaged structures. For example, the repair challenges and repeated damages to water infrastructure could cause water

supplies in regions to be disrupted for months. The lack of running water can hinder household and business recovery even for otherwise undamaged buildings (Vol 1, Ch A, p 6-7).

Psychological Impacts: After the 2010–11 Canterbury, New Zealand, earthquake sequence, semi-annual surveys of the wellbeing of the region’s residents identified major individual and household stressors that included anxiety caused by ongoing aftershocks and added pressures resulting from living in a damaged environment, insurance settlement issues, difficult transport, and additional work-related demands (Vol 3, Ch U, p. 318). Additionally, seeing damaged structures can raise concerns about safety (real and/or imagined) that deter customers visiting areas (Vol 3, Ch Z1, p 522).

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:

- operations
- sales and marketing
- community engagement
- finance and accounting
- 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.

- What are the demographics of our customer base, and how might the earthquake affect them differently (e.g., income, age, housing stability, access to transportation)?
- How dependent are we on customers living/working in the Bay Area?

- How might the earthquake affect our customers' decision-making and spending habits in the weeks, months, and years after the mainshock earthquake? How might these change over time?
- How likely are various customer groups to permanently relocate outside the region? If they do, how likely are they to remain customers?
- If we must relocate operations (temporarily or permanently), how might that affect customer loyalty and engagement?
- With road repairs potentially taking months, how might changes in commute and travel patterns affect our customer traffic?
- For Business-to-Business (B2B) organizations: how might disruptions to our customers' customers cascade back to us?
- What messaging strategies will be needed post-earthquake to encourage customer retention under different operational conditions (e.g., temporary closure, limited service, irregular hours, access challenges)? Through which communication channels (digital, broadcast, in-person networks) can we most effectively reach customers post-earthquake?
- What new customer needs or opportunities might emerge post-earthquake? How can we capture and document these potential opportunities now, so they are not overlooked during earthquake recovery?
- What partnerships with neighboring businesses, community groups, or local government could help mitigate customer loss and improve post-disaster communications?

Additional Elements to Consider

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

- **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/>
- **Insurance:** Most earthquake damage is not covered under standard policies. With low uptake of earthquake insurance, large portions of losses will remain uninsured, slowing economic recovery.

- **Social Vulnerability and Inequality:** Disasters amplify existing inequities, with vulnerable populations facing the longest recovery timelines and greatest barriers to returning as customers.
- **Workforce Recovery:** Customers are only one side of recovery—if our workforce is similarly displaced, injured, or financially burdened, this will affect our ability to serve customers.