

# Lessons learned from the Napa quake



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August 24, 2014, a moderate-sized earthquake struck the Napa, California region. The resulting infrastructure damage, business disruption and economic impact, estimated at \$1 billion, provided a real-life laboratory from which to observe and learn. As we gain appreciation for another community's experiences, we can be better prepared for an earthquake in our own backyard.

## Structural damage

As expected, many older buildings, especially those constructed of brick and mortar without internal steel reinforcement, fared very poorly. Several of these types of buildings suffered collapsed exterior walls and roofs, leaving piles of debris on the sidewalk and gaping holes that exposed interior spaces. Many of these buildings, primarily in the historic downtown area, were "red tagged," preventing entry or use until the building could be repaired. Depending on the nature of the damage and the costs of repair, demolition may prove to be the most appropriate course of action. With a few notable exceptions, newer buildings performed better than similar, older buildings. Newer buildings generally exhibited less damage, and were typically "green tagged" or "yellow tagged," allowing faster re-entry and representing a much less challenging repair task. In some cases, however, re-entry to undamaged buildings was prevented because of the risk presented by an adjacent, typically taller, damaged building. Often the recognition of structural damage, or the implications of observed damage, was not immediately apparent until an inspection by an engineer could be completed. Given the high demand for such inspections, many building owners were forced to wait for an inspection until a qualified engineer became available.



## Non-structural damage

Though structural damage to buildings was widespread, extensive economic loss was also suffered because of non-structural building systems damage, such as to water lines, ceilings, windows and gas lines. Buildings that avoided structural damage often still suffered extensive interior damage, typically rendering the building inhabitable due to flooding, debris and disarray to building contents. Often broken overhead windows, with dangling glass shards, prevented access through doors below or to adjacent sidewalks until the risk was removed. Broken storefront windows also created a security risk for business owners.



Extensive damage occurred to many buildings when unbraced water lines ruptured, extensively damaging building contents, ceilings, floors and wall finishes, and rendering the building unusable for an extended period of time. Several flooded retail stores, for example, suffered extensive content damage, expensive repairs and costly cleanup, and prolonged downtime. Many office buildings, restaurants and other commercial businesses were forced to close as they dealt with the fallout of non-structural damage to their buildings. A large grocery store suffered a near-complete loss of its contents when store shelves toppled and electric power was lost, leaving the perishable food to rot.

## Business interruption

Businesses housed in structurally damaged buildings were closed and unable to serve their customers. Many storefronts exhibited hastily written signs informing potential customers that the business was closed, often indicating that a re-opening date was uncertain. Water damage, broken glass, downed ceilings or toppled contents, loss of electric power and water service often exacerbated the plight of businesses closed by structural damage. Some fortunate buildings and business that escaped unscathed were still forced to close as they waited for power and water to be restored. Entire blocks of businesses were left dark, often with chain link fences forming a stark barrier to would-be customers. How, or if, these businesses will recover from the cost of repairs, prolonged closures, customer attrition and lost inventory will likely rival any past challenge these businesses have faced.



## Repairing the damage

Hundreds of buildings, both commercial and residential, were structurally damaged, and many more impacted by post-earthquake collateral damage. The pressure and urgency to clean up, repair and restore functionality was readily evident. A limited supply of local construction labor, building materials and professional engineering services created an abnormal market for these scarce resources. Competition amongst building owners for these services and products left some building owners confused, frustrated and paying top premiums in exchange for more timely assistance. The city of Napa scrambled to develop an expedited permitting process for those owners who were ready and able to enact repairs. Eventually the demand for construction labor, engineering services and construction materials was satisfied as outside sources entered the Napa marketplace. Yet building owners were challenged as they were left to decide for themselves how to judge the pricing and competency of out-of-town contractors. Building owners with pre-existing relationships with local engineers and contractors enjoyed more timely responses than those who did not have these relationships already established.

An extensive volume of debris was generated as businesses and homeowners attempted to clean up earthquake damage. With trash service disrupted and overwhelmed, some parking lots became impromptu dumping grounds. Some citizens took advantage of these dump sites to unload non-earthquake generated refuse, resulting in an even larger volume of garbage. The city of Napa appeared challenged to control these developments, often bringing in heavy equipment to haul away debris and posting city personnel as sentinels charged with preventing further dumping.



## A matter of when, not if

The Napa earthquake was not the “big one,” yet it still caused significant and costly damage. A similar, moderate-sized earthquake could strike our area. However, because of our proximity to the Cascadia Subduction Zone, off the Pacific Coast, our “big one” will dwarf what Napa just experienced. As we learn from the aftermath of the Napa earthquake we should keep in mind that our level of earthquake preparedness should be as complete as possible. Every business is presented with unique circumstances. As you contemplate your own professional earthquake preparedness, consider the following:

How well is the building in which your business is located prepared to withstand an earthquake?

How long could your business tolerate being out of its building?

Are the contents, water lines, gas lines and ceiling of your business braced, secured or otherwise able to withstand prolonged shaking?

How well would your business be able to tolerate a loss of electricity and water service?

How will your business continue to serve its customers following an earthquake?

To whom can your business turn for post-earthquake recovery assistance?

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