



Chapter X: Infrastructure & Building Back Better

Introduction

Among the many challenges in recovering from a disaster is repairing and redeveloping damaged buildings and infrastructure. Depending on the type and scale of disaster, infrastructure damage may be underground (water pipes, natural gas lines or telecommunications cables), above ground (electricity lines, bridges, roads, levees and water treatment plants), or both. In addition to infrastructure, the buildings where people live, work and play – residences, businesses and community facilities – also may be damaged or destroyed. Residences might need to be removed out of a flood plain, structures rebuilt to better withstand earthquakes or hurricanes, and community rebuilt in a different location.

Though enduring and recovering from a disaster is a difficult process, in many cases, leaders find the opportunity for community improvement. Redevelopment after disasters in the U.S. has been used to revitalize downtowns, reduce vulnerability to future damage, replace damaged and inadequate infrastructure, replace affordable housing and preserve historic buildings.⁴³ These and other rebuilding strategies also can be unprecedented opportunities to leverage economic growth.



Yet post-disaster redevelopment planning presents a paradox: The need to act quickly to restore normalcy, reduce uncertainty and build confidence co-exists with the need to make carefully considered decisions about land use, risk, and infrastructure. The rehabilitation of public facilities is needed to attract private investment, yet the decisions made in the first 18 months after a disaster will impact a community's growth patterns for decades.⁴⁴

Source: FEMA

⁴³ Olshansky, R. B. (2005). *How do Communities Recover from Disaster? A Review of Current Knowledge and an Agenda for Future Research*, University of Illinois at Urbana-Champaign. Presented at 46th Annual Conference of the Association of Collegiate Schools of Planning Kansas City, October 27, 2005. Retrieved from: <http://cbr.tulane.edu/PDFs/ACSP%20Disaster%20Recovery%20Oct05%20Olshansky.pdf>

⁴⁴ City of Grand Forks, North Dakota (2011). *Grand Forks Flood Disaster and Recovery Lessons Learned* [Working Document]. Retrieved from: <http://www.grandforksgov.com/home/showdocument?id=528>



The economic developer has an important role to play in this process. After a disaster, public officials most immediately are concerned with public safety and cleanup, and rightly so. Economic developers can help maximize the potential for community improvement in the recovery and rebuilding process by focusing on larger, long-term strategies for economic growth and business success. They can, for example, advocate that when a damaged bridge is rebuilt, it includes the secondary access road needed to make a local industrial park more marketable; or for the implementation of a long-desired street redesign when water and sewer lines are replaced downtown; or that a new parking garage is planned in a damaged area to accommodate denser future development.

Getting a Plan in Place

Chapter 9 - Strategic Planning for Disaster Recovery of this toolkit outlines the action steps to create a pre-disaster recovery plan, with a focus on the business community and the local economy. The plan defines roles and lays out action steps that economic recovery stakeholders can take in the face of a disaster. Having a plan in place before a disaster enables a community to respond more quickly and efficiently in order to help jumpstart the recovery process and limit the disaster's negative impacts.

Exercises such as an economic vulnerability analysis and scenario planning for community redevelopment can help provide information about a community's potential exposure to risk factors and help evaluate alternative redevelopment scenarios. It can also be exceptionally useful to have the (appropriately) lengthy discussions of redevelopment planning near known hazards *before* a disaster occurs. This way, the community has already gone through the deliberative process of knowing and accepting that when the next major incident (e.g., flood, fire or tornado) occurs, the infrastructure or building will be re-purposed, redeveloped, or hardened in predefined ways.



Source: FEMA

As noted in Sarasota County's draft Post-Disaster Redevelopment Plan (PDRP), advanced planning allows the community to make deliberate decisions about redevelopment that they may be unable to do after a disaster, during the rush to rebuild.⁴⁵ (PDRPs – required of all coastal counties and municipalities in Florida – identify policies, operational strategies, and roles and responsibilities for implementation that will guide decisions that affect long-term recovery and redevelopment of the community after a disaster.)

For example, Sarasota County's PDRP "emphasizes seizing opportunities for hazard mitigation and community improvement – such as upgrading or even relocating infrastructure or public facilities during repairs – consistent with the goals of the local comprehensive plan and with full participation of the citizens."

⁴⁵ Sarasota County Government (2014). *Sarasota County Draft Post-Disaster Redevelopment Plan*, p. 63. Retrieved from: <https://www.scgov.net/PDRP/Documents/October%202014%20DRAFT%20Post-Disaster%20Redevelopment%20Plan.pdf>



Simply put, any economic recovery planning that can be done before a disaster strikes is likely to result in more strategic redevelopment decisions that are consistent with the community's long-term vision. Such plans also help communities save critical time by enabling them to make funding requests early in the recovery process.⁴⁶ Economic developers will find it useful to become familiar with their county or state hazard mitigation plan. Often developed by the state or county office of emergency management, the plan is required by FEMA to guide future hazard mitigation actions (e.g., structural elevations, housing buy-outs, etc.). Knowing how the hazard experts view the greatest risks in your community is helpful when considering whether some of your economic development assets could be vulnerable.

Key Principles for Post-Disaster Redevelopment and Infrastructure Planning

Determine your list of economic recovery challenges

After a major disaster, the full consequences to the local and regional economy may be very difficult to determine for days, weeks, and even months after the incident. Often, the consequences are not readily or reliably known through common economic indicators (e.g., unemployment, GDP, or tax revenues) because of delays in the collection of these indicators and the difficulty in determining causality. Instead, redevelopment and infrastructure planning should be informed by the issues currently impacting the community and the region so that addressing them may provide some relief. The odds are that infrastructure or redevelopment issues that arise after one disaster will reappear after a later disaster if they aren't addressed.

Quickly develop your list of strategic projects

These projects, ideally, stem from the recovery plan developed ahead of time, and are linked to your existing comprehensive land-use plans, economic development strategy and mitigation plan. However, if the community does not have a post-disaster redevelopment plan in place, Chapters 6 and 9 of this toolkit review the data needs and public participation process for creating a redevelopment plan. An efficient, timely process is critical for developing a list of projects and making funding plans and requests.

A US Government Accountability Office review of recovery plans from six major disasters between 1995 and 2009 found three shared characteristics of successful plans: clear goals for recovery, detailed information to facilitate implementation, and timely development of the plan. For example, the city of Grand Forks, North Dakota, approved a recovery plan approximately three months after the 1997 flood of the Red River.

Incorporate Critical Infrastructures

Critical infrastructures support the security, public health, and safety of the community. Critical infrastructures are the assets, systems, and networks necessary for a fully functioning community. They will include the following:

- Power grids and networks,

⁴⁶ Olshansky, p. 8.



- Water and sewer systems,
- Transportation corridors, and
- Communication systems.

Restoration of critical infrastructures often comes with additional assistance from the Department of Homeland Security and the state. The EDO should seek ways to use that momentum to support economic disaster recovery. There may have been inadequate infrastructure servicing key areas prior to the disaster, for example. The cost-effective time to upgrade that power system, or that water or sewer main, is during rebuilding. Or alternatively, the EDO may have knowledge of information and communication networks that would better support economic development. The disaster may present the opportunity to install infrastructure like broadband or fiber optics to support more advanced communications. A disaster is an opportunity to build back better.

Build Public-Private Partnerships

Since the private sector owns between 80 and 90% of critical infrastructure,⁴⁷ there are often opportunities for the public sector to partner, provide assistance, and even access to financial incentives for owner-operators to rebuild more quickly and/or to consider certain public good outcomes in their recovery, such as incorporating resiliency.

Plan to build back for resiliency

The opportunity to redevelop in a way that increases public safety, protects critical infrastructure and mitigates hazards is a silver lining after a disaster. The Infrastructure Security Partnership (TISP) Regional Disaster Resilience Committee, comprised of more than 100 practitioners, policy makers, and technical and scientific experts from across the nation, developed *Regional Disaster Resilience: A Guide for Developing an Action Plan*. The Guide provides a highly detailed way to look at resiliency, providing a strategy to develop the necessary level of preparedness for communities to manage major disasters in today's complex and interdependent world.

- Resilience, increasing a community's resistance to costly damages and disruptions to life and property, strengthens a community and its potential for economic growth. Here are some examples:
- After the Loma Prieta earthquake, which struck Santa Cruz, California, in 1989, five bridges across the San Lorenzo River were replaced in order to reduce their chances of failure in a future earthquake. They also were built higher to decrease the risk of flooding in downtown. In addition, historic masonry buildings that survived were reinforced, and new structures built to meet the seismic code.
- Following the 2008 flooding of Cedar Rapids, Iowa, the city successfully lobbied the Iowa state legislature for the creation of the Flood Mitigation Program, which allows the recapture of sales tax growth to help fund flood protection projects on both sides of the river. Also in Cedar Rapids, EDA provided \$4 million for the construction of new steam production facilities for Mercy Medical Center, in order to curb rising energy costs and to locate above 500-year flood levels.

⁴⁷ The Telecommunications Industry Association (n.d.). *Securing the Network: Cybersecurity Recommendations for Critical Infrastructure and the Global Supply Chain*. Accessed at <http://www.tiaonline.org/policy/securing-network-cybersecurity-recommendations-critical-infrastructure-and-global-supply#i>



- When the Red River flooded Grand Forks, North Dakota, in 1997, approximately 12,000 homes and properties were damaged. To prevent future property damage, houses and streets that once abutted the river were bought out and replaced by a greenway. The greenway was part of a new, permanent flood-protection project that also included a sophisticated system of water diversion and a larger, higher earthen levee system.

Plan to build back for economic impact

Besides the opportunity to build back for greater resilience, post-disaster redevelopment offers a chance to improve the quality of development and the coordination of land uses and infrastructure in a way that can leverage economic growth. The EDO should focus on finding those opportunities to build back for economic impacts that will persist beyond the rebuilding period. The difference between economic impact and economic *activity* are often confused as interchangeable after a disaster. This is not the case! There are often very noticeable and high-expenditure rebuilding efforts that produce substantial economic activity through construction, hiring tradespeople, and replacing lost inventory or equipment.

- In the case of Santa Cruz, where 27 commercial buildings in the historic downtown had to be demolished, the community wanted to maintain the downtown's historic character and role as a social and cultural center, but also to bring in a weekday population to support small retailers and restaurants. As a result, one of the city's redevelopment goals was to rebuild as much office space as possible downtown. Part of its strategy was to increase height limits to five stories; EDA helped with this strategy by providing funding for a parking garage. Santa Cruz also rebuilt its downtown streets with wider sidewalks, outdoor public spaces and other improvements, and included a conduit for easy installment and repair of telecommunication lines in the future (later to be used for broadband Internet delivery).
- In Cedar Rapids, its flood protection system (currently under construction) will raise the flood wall at the Quaker Oats plant to protect it against flooding similar to that suffered in 2008.
- In Grand Forks, the city built a two-building "corporate center" to replace burned-out office space, to provide a downtown anchor and to encourage others to rebuild.
- Corridor improvements proposed for Lyons, Colorado, after its devastating flood in 2013 are planned to improve the aesthetics of the town, improve safety, increase bicycle use and improve parking, and provide multi-modal paths that will connect blighted commercial areas and residential neighborhoods to the central business district.

Combine federal resources for maximum impact

The majority of federal funding available to restore and repair infrastructure and facilities after a disaster is often limited to restoring the asset to its pre-disaster conditions. However, these funds can be coupled with other federal resources (or state, local or private funds) to improve impacted infrastructure and mitigate damage from future disasters.⁴⁸

Though it varies based on the type of disaster, typical federal funding sources for post-disaster infrastructure repair, improvement and redevelopment include FEMA's Public Assistance Program and Hazard Mitigation Grant

⁴⁸ U.S. Department of Transportation (n.d.). Federal Funding Resources for Transportation Recovery – Overview [Webpage]. Accessed at <http://www.dot.gov/highlights/disaster-recovery/funding/federal>



Program; HUD's Community Development Block Grants-Disaster Recovery Assistance; the U.S. Army Corps of Engineers, and EDA Public Works and Economic Adjustment Assistance grants.

Yet there are other sources of federal funds that can be used for disaster recovery besides these most common sources. For example, HUD allows grantees to reprogram previously awarded CDBG and HOME funds to disaster recovery activities. As well, the Federal Highway Administration's Federal-aid Highway Emergency Relief program supplements state, local and other federal resources "to help pay



Source: FEMA

for unusually large expenses resulting from extraordinary conditions."⁴⁹ It does not require a presidentially declared disaster.

- EDA and HUD-CDBG dollars (\$18 million and \$5.3 million, respectively) both are helping fund Minot, North Dakota's ambitious "Imagine Downtown" plan following the city's 2011 flood. The plan encompasses both business and residential renewal projects and the replacement of destroyed or damaged public downtown infrastructure such as streets, curbs, storm sewers, water mains, street lights, traffic lights and other projects, as well as creating new infrastructure to support future growth.
- In Vermont, following flooding from Hurricane Irene, communities needed funding both for the local share of FEMA-approved projects and for many recovery projects that were deemed ineligible for FEMA Public Assistance Program funding. CDBG-Disaster Recovery funding is filling the gap in many of these instances, for infrastructure and community facilities projects such as a child care center in Waterbury, new municipal offices in Waitsfield and Moretown, and a feasibility study for the relocation of fire and police departments.
- In other cases in Vermont, communities are working with combined funding from FEMA, the Vermont Division of Emergency Management & Homeland Security, the Federal Highway Administration and the Vermont Agency of Transportation to repair or replace roads, bridges, culverts and municipal buildings.

Use federal dollars to leverage state and local dollars

As noted in Chapter 2, disaster recovery and redevelopment is expensive. Typically, the cost must be shared among multiple levels of government (often among multiple agencies at each level), and supplemented by private funds.

- In Santa Cruz County, residents approved the passage of a half-cent sales tax for six years, which generated approximately \$12 million for the city of Santa Cruz, \$15 million for the city of Watsonville, and \$17 million for unincorporated areas of the county. Officials used the money generated to meet matching requirements for FEMA's Public Assistance Grant Program and to finance various other recovery projects.⁵⁰ (Though the strategy of raising local taxes may not work in many communities,

⁴⁹ Ibid.

⁵⁰ U.S. Government Accountability Office (2008, September). *Disaster Recovery: Past Experiences Offer Insights for Recovering from Hurricanes Ike and Gustav and Other Recent Natural Disaster* [Report to the Committee on Homeland Security and Governmental Affairs, U.S. Senate], p. 18. Retrieved from: <http://www.gao.gov/new.items/d081120.pdf>



there are some in which it will be practical and appropriate.) As well, the city of Santa Cruz's redevelopment agency was a funding partner with the Corps of Engineers in rebuilding the bridges across the San Lorenzo River.

- In Grand Forks, FEMA agreed to pay to replace flooded water meters with an equivalent system, so the city paid the incremental additional cost to upgrade and automate the system.⁵¹ In addition, the Bank of North Dakota provided a \$44 million line of credit to Grand Forks for the city to use to meet FEMA matching requirements.⁵²
- In Cedar Rapids, Iowa, the \$264 million secured from the state-created Flood Mitigation Program will be supplemented by another \$70 million in federal funding, at least in part from the U.S. Army Corps of Engineers.
- The town of Lyons, Colorado, suffered flooding that destroyed the town's electrical, sewage and potable water services, damaged or destroyed nearly 30 percent of its housing stock, and destroyed the town hall and library building. As part of Lyons' recovery efforts, leaders have proposed creating a new multipurpose magnet library and community center. A low-interest loan from the U.S. Department of Agriculture is one option for financing the library, which can be paired with local funding mechanisms available in Colorado such as building authorities, downtown development authorities, business improvement districts and tax allocation bonds.

Conclusion

The time just after a disaster is difficult under the best of circumstances, and depending on the magnitude of the event, can continue to be so for months or even years. In this time of stress and uncertainty, however, is a window of opportunity to make changes that result in a more physically resilient, economically vibrant community over the long term. By remaining focused on the big picture and the potential impact of catalytic infrastructure and redevelopment projects, economic developers can ensure that this opportunity isn't missed.

⁵¹ *Grand Forks Flood Disaster and Recovery Lessons Learned* (2011), p. 8

⁵² *Disaster Recovery: Past Experiences Offer Insights for Recovering from Hurricanes Ike and Gustav and Other Recent Natural Disaster* (2008, September), p. 6