Building Resilient Utilities: 
Protecting and Preparing Your Infrastructure

By Alex Shannon - Economist, Bellevue, WA and Teresa Platin, P.E. - Senior Project Manager, Bellevue, WA

THE RESILIENT UTILITY

In 2018, natural disaster related financial losses topped $150B worldwide, with the United States alone seeing $91B from wildfires, hurricanes, flooding, earthquakes, landslides, volcanic eruptions and extreme weather. These harrowing tragedies remind us of the incredible power of nature, and the importance of basic, life-sustaining services when all else seems to be crumbling around us. Adding to this responsibility, utilities must also protect our resources from malevolent forces seeking to disrupt and terrorize.

In our dynamic, connected, and technology-driven world, public service utilities play a more important role than ever before. Gone are the days when people expected or patiently waited-out regular service disruptions in water, wastewater, power, transportation or other services that we now take for granted. Recovery from outages was often slow, and the return to normal service highly unpredictable. Yet today, not only do communities rely more heavily on utilities than ever before, climate variations can compound events, and our aging infrastructure is often more vulnerable as owners struggle to keep up with costly renewal and replacement needs.

Mitigation involves strengthening high risk facilities to better withstand a severe hazard and allow faster rebuilding, while preparedness recognizes that failures can and will happen and puts plans, tools, and processes in place for emergency response and long-term recovery.

It’s unrealistic for utilities to eliminate all risk. They must prioritize concerns regarding level of service goals that often encompass utility values like health and human safety, environmental impacts, and service outage times. Many utilities are also considering equity and social justice when prioritizing impacts and developing mitigation.

We are in a time of unprecedented expectations that utilities should be able to provide service 24 hours a day, 365 days a year, no matter what. The average person would be shocked to hear that recovering services in a large natural disaster in the United States could take weeks, months, or even years!
The first step to becoming a resilient utility is to identify the risk - starting with the Probability of Failure (what could happen, how likely it is to occur, and how vulnerable the facility is) and the Consequence of Failure (what happens at the facility and throughout the system if a failure does occur).

**UTILITIES CREATE A CLEAR UNDERSTANDING OF THEIR ABILITY TO WITHSTAND AND RECOVER FROM DISASTER AT VARIOUS SCALES**

Risk mitigation measures can be large or small, sweeping or specialized. They cover a broad range from capital improvements like seismic retrofits or the relocation of electrical equipment from flood-prone substructures, to programmatic efforts like securing unbraced plumbing and piping within pump stations or developing a regular tree-trimming program around critical facilities. Mitigation measures also include operational improvements to promote redundancy, as well as barriers, detection systems, response technology, and cyber security to thwart would-be malevolent actors.

Utilities are also working to be more proactive in adopting comprehensive asset management and condition assessment programs to identify their infrastructure assets, evaluate the remaining life of those assets, document the investments necessary to continue providing reliable service, optimize operations and maintenance, and determine effective financial strategies. Quantitative, data-driven approaches are the foundation for making informed decisions and developing a schedule of improvement activities. Data allows a utility to prioritize and optimize investments in resiliency considering everything else they must accomplish and afford. This forecast lets you plan ahead financially for major investments and regulations, generate efficiencies, and maximize the value of improvements.

**UTILITIES ALSO BUILD SUPPORT AND EXCITEMENT FOR RESILIENCY BY PLANNING, TRAINING, AND DEVELOPING CREATIVE STRATEGIES FOR LONG-TERM RECOVERY**

Resiliency planning isn’t limited to facility improvements. Embracing the need for preparedness and recovery enables a utility to put mechanisms in place and develop strategies before a disaster to better manage the emergency response and recovery. While emergency response plans and regular training lay the foundation for the immediate reaction post-disaster, thoughtful longer-term response planning is also necessary. For example, utilities are strengthening their resiliency by implementing pre-approved emergency contracting mechanisms and pre-qualifying service providers. They are forming inter-jurisdictional aid agreements with neighboring communities and taking steps to develop the necessary financial reserves, build knowledge of grant-funding opportunities, and understand federal and local disaster assistance benefits, limitations, and compliance requirements. All of this can lead to reduced recovery timelines, improved fiscal outcomes, and considerable reduction in social stress to the affected communities.

**WE CAN HELP DRIVE A CHANGE IN CULTURE TOWARD RESILIENCY AND RISK REDUCTION**

There are many benefits of making resiliency improvements including:

- Life safety and human health
- Protection of the environment, particularly sensitive water bodies and habitats
- Future savings realized by avoiding higher repair costs from a more catastrophic failure later
- Successful regulatory compliance, eliminating penalties and cleanup and social costs
- Market stability and job security
- Increased consumer confidence

The definition of a resilient utility is one that is forward thinking and expanding its planning to make wise, affordable decisions regarding preparation for extreme conditions and events. At HDR, we can help make your utility more resilient. Our team provides expertise in natural hazard risk assessments and mitigation, emergency response and recovery planning, and is well-versed in the requirements of America’s Water Infrastructure Act of 2018.

**NEW Regulation Alert: America’s Water Infrastructure Act of 2018**

In late 2018, the “America’s Water Infrastructure Act” was signed into law, including a statute requiring drinking water utilities to conduct Risk and Resiliency Assessments with due dates ranging from 2020 to 2021 based on utility size. Utilities will be expected to update these assessments every five years. The statute also requires that utilities prepare Emergency Response Plans within 6 months of completing their Risk and Resiliency Assessments. While not strictly required, AWIA encourages wastewater utilities to follow suit. Check out this AWIA fact sheet.