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# DHS Science and Technology Directorate

## Standards for Drinking Water Resilience: Infrastructure Resilience Assessment Project

### The Drinking Water Resilience Project

Each week, major water main breaks disrupt commerce and traffic in major cities across the United States.

The American Society of Civil Engineers' 2013 Report Card for America's Infrastructure gave most sectors, including drinking water, dams, power, and roads, a "D" rating. The Drinking Water Resilience Project (DWRP) is an assessment methodology intended to reduce the risk of failure of drinking water systems in the United States.

### Wise investment requires consistent metrics

While challenges to infrastructure systems are easy to see, prioritizing investment of limited resources to fix those problems can be difficult. Is drinking water more critical and in greater need of repair than crumbling highway overpasses? Should our investment go to areas with the highest population, or is the most expensive public works project also the most important?

In 2013, DHS S&T began developing a nationally recognized and accredited standard for infrastructure resilience assessment to:

- Standardize and streamline threats and hazards to consider
- Define "risk," "resilience," "consequence," "frequency," "likelihood," and standard risk calculation methods
- Incorporate models and data to streamline analyses
- Produce a simple, standardized report for decision-making at all levels of responsibility

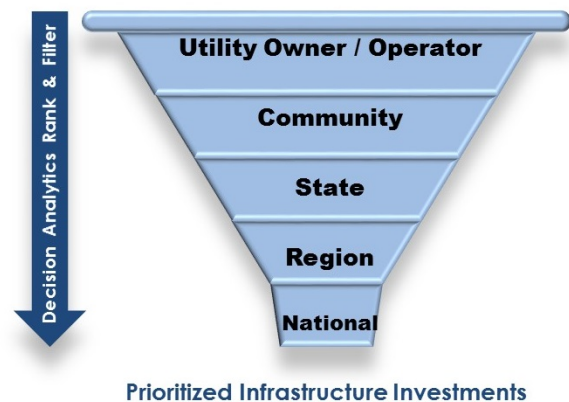
Lifeline Infrastructure Risk Assessment (LIRA) method  
Clean, safe drinking water is essential to life, welfare, commerce, and emergency response. DHS chose drinking water to prototype the Lifeline Infrastructure Risk Assessment (LIRA) method and evaluation tools, producing:

- A draft standard, tested against historical data
- A simple user interface for data entry and reporting
- Links to important data such as earthquake frequencies, flood and drought predictions, etc.
- An interface with pre-existing assessment tools such as EPA's Voluntary Self-Assessment Tool (VSAT) and the private sector J100-10 ANSI-certified water resilience assessment tool.

### Prioritizing resilience improvement guides infrastructure investment decisions

The Drinking Water Resilience Project (DWRP) enhances decision support for utility owners, community managers, regional risk managers, and state and federal agencies. It helps utility owners and communities assess risk by:

- Improving consistency across water, power, fuel, and communications infrastructure sectors
- Reducing time and cost, and increasing use, of risk assessments
- Enabling national-scale risk assessments



*Prioritizing infrastructure risk assessments from the owner to national decision makers.*

### Accomplishments and Milestones

In FY2016, privately and publicly-held drinking water utilities participated in field trials of the risk assessment interface and analysis methods.

A draft of the LIRA standard was positively received at national and international symposia.

In FY2017, the LIRA standard was verified and validated and the interface was extended to electrical power systems.

### Key DWRP stakeholders and research partners

- Oak Ridge National Laboratories
- Sandia National Laboratories
- The University of Tennessee, Knoxville
- Colorado State University (Colorado Springs)
- Utility asset owners



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To learn more about standards for infrastructure resilience assessment, contact Philip Mattson, director, Office of Standards, at [Philip.mattson@hq.dhs.gov](mailto:Philip.mattson@hq.dhs.gov).