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## The road to resiliency

*Well-established standards, long-term thinking and industry best practices can help strengthen infrastructure to better withstand catastrophic events*

Dramatic weather events continue to have a more profound impact on the long-term stability and sustainability of communities across the country. As a result, government agencies and transportation leaders are rethinking the design and construction of infrastructure, including transportation systems and the surrounding environment, by building with flexibility and resiliency in mind.

Making resilient infrastructure a reality requires the establishment of industry standards along with forward-looking approaches that allow infrastructure to act as a natural buffer, thus lessening negative impacts of a catastrophic event and allowing for quicker recovery time.

### Resiliency creates additional benefits

Smart resiliency investments can reduce long-term costs. Looking beyond reactive disaster-recovery plans to adopt proactive, prioritized plans can lead to more creative solutions.

- New Jersey Transit has taken steps toward creating a proprietary micro-grid power system that could power ongoing transit operations should there be a failure in the commercial power grid.
- Following Superstorm Sandy and other significant weather events that affected the region, the State of New York developed a community-based recovery and resiliency program that distributes federal dollars to help fund a variety of projects that will allow municipalities to better withstand future storms. This includes retrofitting of critical facilities so they continue to operate during severe weather.

Investments like these can help expedite the return of government and agency operations and provide economic and social benefits such as stabilized property insurance premiums for businesses and individuals, lower energy costs and more secure transportation systems that maintain movement and enhance community cohesiveness.

There are a variety of funding sources that can help agencies and communities work towards a more resilient system, including Community Development Block grants distributed by the U.S. Department of Housing and Urban Development, and FEMA's Pre-Disaster Mitigation Grant Program, which provides needed dollars to strengthen systems so they can better withstand damage from natural disasters.

### Risk Analysis

It is important for agencies to conduct a thorough risk assessment that not only looks at how to strengthen infrastructure, but also how to address cataclysmic events when they occur. This approach evaluates potential consequences and establishes a rapid recovery plan that focuses on:

- Reducing environmental impact by implementing sensors, monitoring crucial infrastructure and periodically inspecting safety systems and containment structures for signs of deterioration.
- Reducing property damage by maintaining redundant facilities and hardening essential facilities in advance of an extreme event.
- Reducing recovery time with prioritized plans and procedures to quickly restore critical infrastructure to operability.

### Latent Damage

While the goal of resilient infrastructure is to ultimately better withstand the impacts of dramatic events, it is a given that there will be damage to repair following a catastrophe. In these cases, fixing only apparent damage is not enough. Latent damage – which can't always be seen or detected – is a huge issue that must be addressed. For example, flood waters from a major coastal storm can create mold and corrosion that weakens essential structures over time.



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Stromsted has more than 43 years of civil engineering and management experience across all phases of public infrastructure planning, development, design, construction, turn-over, operations and maintenance. This includes knowledge and experience related to innovative, long-term resiliency and sustainability issues, policies, stakeholder coordination and engineering solutions that protect people and assets.

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Public agencies should consider partnering with private-sector firms to establish processes and procedures that identify, repair and remediate latent damage. By doing so, they can ensure the continuity of services following major events that will better help protect the local economy and utility systems, while establishing a proactive strategy for dealing with significant impacts.

While communities have no control over when and where disasters take place, these dramatic events do provide an opportunity to rethink our critical infrastructure systems so they are fortified to better withstand future catastrophes, ultimately saving lives, time and money. ■