

R E S I L I E N C E R E P O R T

2021



# RESILIENCE

## PROTECTING OUR COMMUNITIES

There are many definitions of “resilience” as the concept applies to the ability of communities to withstand storms, natural disasters, and other threats to homes, businesses, and infrastructure. The first definition that comes to mind for me is the simplest (with credit to a Timex commercial of my youth): the ability to “take a lickin’ and keep on tickin’.”

I had an opportunity to serve as a co-author of a National Academy of Engineering report entitled *Enhancing the Resilience of the Nation’s Electricity System*. During the research for this important report one observation became clear: resilience is not the same thing as reliability. A resilient power system, for example, is one that not only minimizes large-area, long-duration outages, but also acknowledges that such outages will occur, prepares to address them, minimizes their impact, restores service quickly, and draws lessons learned from each experience to improve future performance.

Achieving an effective level of resilience requires sound planning, improved design standards, and constructive solutions. Communication and collaboration are key: we often see communities stumble during crisis events—such as the “big freeze” in Texas earlier this year that caused more than 200 deaths—if they haven’t involved all of the necessary agencies and stakeholders in planning and implementing resilience measures.

The lessons learned are vital. When broad experience helps shape solutions, the results are much more effective. That all-important experience is what Dewberry brings to the table when working to enhance resilience. For more than 40 years, we’ve assisted communities in responding to disasters, and have seen the impact of that devastation close-up all across the U.S. Our most critical work today—across a wide range of services—is helping communities anticipate and plan for future threats and challenges.

This *Dimensions: Resilience Report* reflects that expertise, addressing resilience in energy, transportation, facilities, coastal communities, asset management, and more. Whether it’s helping to secure funding, facilitate plan development, or design mitigation measures, Dewberry stands ready to support communities from coast to coast as they prepare to “keep on tickin’.” 🍷

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# DIMENSIONS® RESILIENCE REPORT

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## IN THIS REPORT

<b>1</b>	Resilience Begins with Leadership	<b>9</b>	Power Grid Resilience: Opening the Door to Sustainable Energy Sources and Infrastructure	<b>15</b>	New Mitigation Funding Targets Resilience
<b>3</b>	Enhancing Resilience in Coastal Communities	<b>11</b>	Defining System Integrity: Applying Resilience to Plumbing, Mechanical, and Electrical Systems	<b>17</b>	Resilience in the Workplace: Focusing on Creativity, Collaboration, and Culture
<b>5</b>	Looking at Dependable Transportation Networks Through the Lens of Resilience	<b>13</b>	How Asset Management Provides Resilient Master Planning Expertise	<b>19</b>	Protecting Public Safety Officials Through Resilient Design
<b>7</b>	Sustainable Water: Piloting Potable Reuse in Polk County	<b>14</b>	Rebuilding Paradise: Making Communities More Resilient in the Face of Disaster		

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## ON THE COVER

Elizabeth River Living Shoreline Norfolk, VA

## IMAGE TO THE LEFT

Central Florida Expressway Authority Multiple Counties, FL

# RESILIENCE BEGINS WITH LEADERSHIP

by Carol Holland, PE, CCM, LEED AP  
Associate Vice President

While much of our work centers on helping communities become more resilient, we also focus on our own workplace here at Dewberry. We recognize that organizational strength and adaptability are critical to providing our best service to clients, and regularly challenge ourselves: how can we create a more resilient work environment—one that is increasingly resourceful, collaborative, and supportive? How can we enhance retention, diversity, and professional growth and opportunities for our team members? The answer begins with resilient leadership.



## KEY ATTRIBUTES OF RESILIENT LEADERSHIP

I've held management roles for more than 25 years, both in the military and the private sector. A few key attributes for successful leadership have always been clear to me, including flexibility, humility, and trust. Situational leadership requires that we be flexible, and that we recognize that every person and every situation is different. It's vital to bring out the best in each employee—to identify their special skills and provide motivation and recognition to draw out those talents.

Humility requires that we understand that, as leaders, our way is not the only way. We can't stop learning and growing, no matter our leadership stature. We must remain open to new ideas and approaches. Letting go of a long-established practice or procedure can be difficult, but fresh eyes and perspectives can introduce unforeseen benefits, from efficiencies in productivity and cost-savings to breakthrough solutions for clients. Whether a new idea works out or not, we should celebrate rather than inhibit ingenuity and the willingness to speak up.

## TURNING TO NATURE FOR INSTRUCTION

I often think of how resilience works in nature. We see plants and animals store up in times of plenty, and disperse in times of scarcity. Trust and respect in leadership work in a similar way. We strive to build trust with our clients and team members, and when confronted with challenges—such as working through a pandemic—we are able to retain their confidence and keep projects running smoothly.

Nature also teaches us the importance of diversity, where we see vast ecosystems that are interwoven and dependent upon one another in order to thrive. Similarly, diverse perspectives and life experiences strengthen our teams and our relationships.

## ORGANIZATIONAL STRUCTURE THAT SUPPORTS FLEXIBILITY

Strong leadership goes beyond individual style and interaction. We must also think in terms of structure, systems, policies, and training. As one example, for many years Dewberry was organized around "service lines," which tended to be vertical and somewhat limited. Under the leadership of our executive management, we have transitioned instead to a market-facing, client management focus. This allows us to be more collaborative and proactive, and to think holistically about what each client needs, as well as the market forces affecting their decisions. We are more creative and responsive as a result.

Today, as a nationwide enterprise, we are also more transparent than ever before. Our employees understand our plans, goals, and overall mission, and they are active contributors. Through strong two-way communications, intensive training opportunities, and employee resource groups, our staff members understand the importance of their role and their voice. Above all, resilient leaders value productive teamwork—we know that we can't do it alone. 🍷

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# ENHANCING RESILIENCE IN COASTAL COMMUNITIES

by Brian Batten, PhD, CFM  
Senior Associate

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Scientists have been predicting the dire consequences of sea level rise for decades, but we are now frequently seeing the tangible evidence of increasing flood events in our coastal communities. Resources such as the U.S. Sea Level Rise Report Cards, produced by the Virginia Institute of Marine Science and based on tide-gauge data, provide clear indicators of sea level heights that continue to rise along our coasts. No longer a distant scenario, allowing communities to defer resilience planning, the constant threat of coastal flooding has spurred many governments at the state and local levels to initiate hazard risk assessments and develop appropriate resilience measures and design guidelines.

Coastal communities are challenged not only by the predicted impacts of sea level rise, but by extreme heat and frequent heavy rainfall events as well, threatening both coastal development as well as inland areas. Climate change, combined with aging infrastructure and overburdened drainage systems that were not designed to withstand these events, has created extreme vulnerabilities in many coastal areas. Addressing these threats requires a long-term, interdisciplinary approach involving staff across multiple government agencies, together with planners, engineers, and community members.

## ADVANCES IN DATA SCIENCE

Fortunately, the urgent need for resilience planning coincides with considerable advances in the quality of climate models as well as the development of innovative green infrastructure measures to mitigate storm impacts. We are also seeing an increase in regional cooperative efforts led by state governments and planning district networks, which lead to significant economies of scale and cost savings.

Modeling and data science are proving to be essential tools in anticipating the potential impacts of climate change, enabling us to understand the physical processes that cause flooding at a regional or local scale. Many of these models would have been difficult to create just a few years ago, but now can be generated at a variety of scales with ease. Input from meteorologists, statisticians, data analysts, programmers, geospatial analysts, mitigation planners, engineers, and crowd-sourced data applications further enables us to assist communities with cost-benefit analyses and comprehensive resilience planning and solutions.

One example involves our work for the City of Virginia Beach. We performed an analysis to determine rainfall non-stationarity (addressing whether rainfall is the same or increasing), which confirmed that heavy rainfall events in the city were increasing. We then developed an ensemble of regional climate models to project future conditions. Information from this effort was incorporated into the city's Public Works Design Guidelines and integrated into municipal stormwater models. The Virginia Department of Transportation conducted an independent study, which validated our findings. Subsequently, the state increased funding for an ongoing study of the Chesapeake Bay watershed to include future rainfall projections for all of Virginia, and joined with other states to update Atlas 14, a National Weather Service study of historical rainfall that is used for infrastructure design.

## EQUITABLE, COST-EFFECTIVE SOLUTIONS

We are currently at work on a Coastal Resilience Master Plan for Virginia, aimed at protecting communities, businesses, and infrastructure. This plan will recommend strategies that are equitable and cost-effective in addressing sea level rise and coastal flooding. Virginia is the third state in the nation to create such a plan, following the lead of Texas and Louisiana. This whole-of-government approach, aligning community, state, and federal programs and addressing integration, equity, and funding, represents a historic effort to create a more resilient commonwealth and should prove instructive to other states and communities as they embark upon similar planning efforts. 🍷

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# LOOKING AT DEPENDABLE TRANSPORTATION NETWORKS THROUGH THE LENS OF RESILIENCE

by Alaurah Moss Jordan, Project Manager and Don Hammack, PE, Vice President

The term resilience is often associated with building infrastructure, storm protection, and community preparedness. However, it's also applicable to transportation assets of various kinds, including highways, bridges, and interchanges; aviation facilities; freight rail, passenger rail, and mass transit systems; and port and intermodal facilities. Creating a resilient

transportation network implies that when something unexpected happens—a storm, an accident, a power outage, traffic congestion, or a data breach—systems can continue to operate. This can be critical during a disaster event, as transportation systems are relied upon to support safe evacuations, emergency vehicle access, and the delivery of fuel and other vital supplies.

## RESILIENT TRANSPORTATION FROM COAST TO COAST

Defining resilience is unique to each mode of transportation. A team based in our Virginia Beach office recently completed a living shoreline restoration project, where our experts stabilized the shoreline along the Elizabeth River near Norfolk Southern Railway Company's Lamberts Point Coal Terminal. Working with two other consultants, Coastal Marine Structures and Emerald Forest, we designed a series of segmented rock breakwaters with a half-acre of native wetland habitat extending the length of three football fields to buffer the shoreline from wind, waves, and ship wake. Norfolk Southern voluntarily funded this living shoreline project, a testament to a transportation company advancing local and regional resilience initiatives. For a region that is wrestling with sea level rise and adaptation, this project is a great model for others on how to restore a vibrant industrial shoreline and simultaneously contain future erosion.

Further down the East Coast in Florida, through our general engineering contract, we are helping the Central Florida Expressway Authority pursue an Envision® Platinum award for the proposed Lake Orange Expressway. Envision was created by the Institute for Sustainable Infrastructure to provide

a consistent, consensus-based framework for assessing sustainability and resilience in infrastructure. The 3.75-mile connector, which is a new alignment tolled roadway between U.S. 27 and State Road 429, is located in Orange and Lake counties, just west of Orlando. Features included for Envision scoring involve an in-road electric vehicle charging pilot project, the elimination of traffic signals through the use of free-flow interchanges, and the development of a zero-scape landscaping program, which will include the installation of native plants and require no irrigation systems.

In California, our transportation engineers are focusing on creating resilient infrastructure that supports critical operations during natural disasters, including earthquakes and wildfires. You can read more about one example on page 14.

Resilience is a critical consideration that is gaining importance as we continue to advance and adapt infrastructure. Our built environment is expanding, and whether it's environmental implications up and down the East Coast, creating sustainable transportation networks in the Southeast, or mitigating weather-related power outages that impact traffic lights in the West, creating a dependable transportation network is necessary for resilient operations. 🌱

Envision credits are issued for projects meeting certain thresholds for categories, including quality of life, leadership, resource allocation, natural world, and climate and resilience.



# SUSTAINABLE WATER

## PILOTING POTABLE REUSE IN POLK COUNTY

by Amy Tracy, Associate  
and Matt O'Connor, PE, Associate  
co-author: Tania McMillan, Polk County Utilities



Water scarcity is a reality. Many areas around the U.S. are experiencing sustained severe drought conditions, impacting potable water supply and environmental health. There are many contributing factors to potable water scarcity, including climate change, growing populations, overuse, and increased pollution, leading researchers, scientists, and engineers to ask: "How can we create a more sustainable water supply?"

Some parts of our nation are implementing resilient approaches to expand sources of potable water supply and meet growing demand through the implementation of recycled water as a source of water. In recognition of supply challenges and the role of alternative water supply, the Environmental Protection Agency (EPA) released its draft water reuse action plan (WRAP) to guide the effective use of our nation's water resources and foster the consideration and implementation of water reuse. For example, a desalination plant valued at more than a billion dollars is being developed in California to treat ocean water for consumption. In Colorado, we designed the nation's first, large-scale potable water treatment facility to use ceramic membrane filter technology, which removes any remaining particles larger than 0.1 microns in size.

The Rueter-Hess Water Purification Facility treats multiple sources of water, including local surface water, alluvial water, and water recycled from reclamation plants.

### ALLEVIATING STRESSED AQUIFERS IN FLORIDA

Numerous Florida communities are examining nontraditional water sources, including wastewater, saline or brackish water, agricultural drainage, stormwater, and water containing toxic elements, that can be cleaned and used as a source for potable supply to address concerns such as stressed aquifers from overpumping and population growth. The process of using treated wastewater for drinking water is called

potable water reuse. Direct potable reuse (DPR) is the treatment and distribution of water without an environmental buffer.

Polk County Utilities evaluated water resources in its Northwest Regional Utility Service Area during master planning and determined that DPR was a viable option to increase the resilience of its water supply capacity within the service area. The concept was then developed for a DPR demonstration system to be constructed on the same property as its Cherry Hill Water Production Facility (WPF). Highly treated effluent, or public access reuse, will be transferred from Polk County's Northwest Regional Wastewater Treatment Facility to Cherry Hill. At the WPF, the demonstration project, with a capacity of 10 to 20 gallons per minute, further treats the water through a series of processes, utilizing a multi-barrier treatment approach that includes technologies such as enhanced coagulation, advanced oxidation, ultrafiltration, granular activated carbon, and UV disinfection. This process scrubs the recycled water to remove any remaining trace chemicals, pharmaceutical residue, hormones, bacteria, protozoa, and viruses.

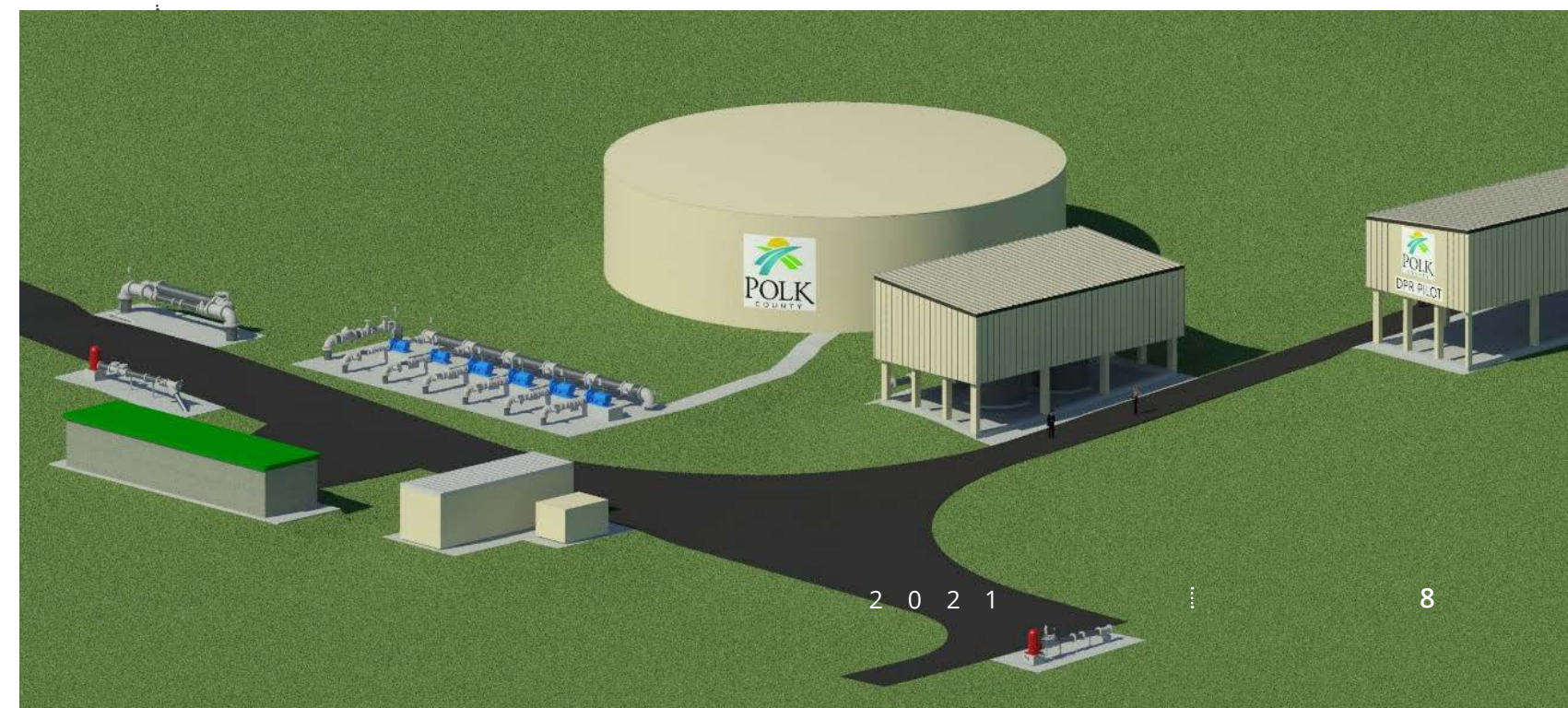
While potable reuse and various combinations of treatment methods have been used before by way of several pilot projects in other parts of the country, Polk County is the first in Florida to conduct a DPR feasibility study at a water plant instead of a wastewater plant. The goals of the DPR project are to verify that

contaminants specific to Polk County's wastewater supply can be effectively removed while adhering to rigorous state guidelines and meeting all state and federal drinking water standards. Ultimately the project will test the development of innovative methods to treat up to 1.5 million gallons per day of reclaimed water to supplement traditional groundwater sources in the future. This \$2.5-million alternative water supply project is made possible by a funding agreement between the Polk County Board of County Commissioners and the Southwest Florida Water Management District.

### LEGISLATIVE SUPPORT FOR IMPROVING WATER

The concern for creating a sustainable and resilient water supply has garnered the attention of not just those in the science and engineering fields, but also government leaders. Federal legislation is beginning to change in favor of these cutting-edge treatment methods, which is necessary for pilot studies to continue into larger scale water treatment facilities and then construction. The Drinking Water and Wastewater Infrastructure Act of 2021 allocates \$54 billion for addressing drinking water supplies contaminated by per- and polyfluoroalkyl substances (PFAS), as well as other priorities, including modernizing water, wastewater, and stormwater systems. These are exciting steps in moving toward a more sustainable water future. 🍷

The direct potable reuse (DPR) feasibility study and education/testing pilot project by Polk County is intended to test the development of a future DPR project for a new potable water supply. The state of Florida is using this project as an opportunity to launch an educational campaign about the need for water resilience.



# POWER GRID RESILIENCE

## OPENING THE DOOR TO SUSTAINABLE ENERGY SOURCES AND INFRASTRUCTURE

by Doug Sullivan  
Senior Associate

According to the U.S. Energy Information Administration, the U.S. consumed about 17% of the world's primary energy in 2018. In order to supply energy on such a grand scale, our power grid needs to be resilient to climate stressors such as extreme storm events. One critical aspect of energy resilience is creating redundancy in our power grid to keep the duration of power outages for consumers at a minimum. Utility companies have spent a lot of time and money to install circuits so that when a power line goes out in a storm event, for example, the number of impacted consumers is minimized. In addition to upgrades to the circuits and grid, utility companies have also hardened their structures to prevent power stoppages. These resilient factors will need to be carried over as the power grid expands to make way for sustainable power sources such as offshore wind and solar energy, as well as for expanding energy infrastructure such as electric vehicle charging stations.



We assist utility companies with the design of electric vehicle charging stations such as the Park & Ride in Havre De Grace, Maryland.

### INTEGRATING SUSTAINABLE POWER SOURCES INTO A RESILIENT GRID

Traditionally, utilities have used a one-way model for power distribution that involved distributing electrons to commercial and residential users for consumption directly from generation plants. As renewable energy sources such as solar energy and offshore wind continue to expand, utility entities and engineers need to find ways to integrate these power sources into the grid. Energy storage options must also be considered for some of these projects to improve electrical load management.

At Dewberry, we support a number of power utility companies along the East Coast, including New Jersey, Maryland, Virginia, North Carolina, South Carolina, and Florida, to help maintain the transmission and distribution grid system. By incorporating the latest design and technology, whether in stormwater practices, site/civil design, survey/mapping, environmental assessments, or permitting, we are able to assist utility companies in designing and constructing portions of the grid and the support infrastructure around it to be more resilient.

In Northern Virginia, for example, we are designing concrete-encased underground electrical duct banks with 8-inch conduits and the capacity to carry multiple lines. These duct banks frequently connect from electrical substations directly to customers, including growing residential communities and the region's

proliferation of data centers. Underground duct banks, as well as the "strategic undergrounding" of overhead lines, reduce power disruption to customers during severe weather events. In some cases, we have helped design onsite substations to serve data centers and other customers requiring a high capacity of power, providing critical assets as close to the demand as possible to limit infrastructure costs and potential for failure.

### ACCOMMODATING THE GROWING NUMBER OF ELECTRIC VEHICLE INSTALLATIONS

The growing number of electric vehicle charging stations throughout the country will also require a resilient power grid structure. As with solar array installations, we are helping electric vehicle project developers coordinate with utilities to get approval to tie their new installations into the grid. We assist utility companies in collaborating with private developers and nationwide corporations that own electric vehicle fleets and are seeking to reduce their greenhouse gas emissions. We also help utility companies design their own charging stations.

By incorporating sustainable energy infrastructure into the initial planning and coordination of our utility projects, we can better navigate the challenges and complexities of an ever-expanding energy grid. 🌱



# DEFINING SYSTEM INTEGRITY

## APPLYING RESILIENCE TO PLUMBING, MECHANICAL, AND ELECTRICAL SYSTEMS

by Carol Johnson, CPD, LEED AP, CFI  
Senior Associate



If life has taught us anything, it's that we are guaranteed change. As design professionals, however, we value facts, codes, science, and consistency. This dichotomy pushes us to develop out-of-the-box solutions that not only meet the needs of our clients, but surpass basic code and regulatory requirements to achieve optimal building performance. The resilience of plumbing, mechanical, and electrical systems is key to providing these solutions, leading to adaptable systems that have the ability to overcome extreme circumstances, such as a natural disaster or a health pandemic.

The events of the last 18 months—the chaotic and unusual weather patterns in Texas, the heatwave and wildfires in the West, and COVID-19—make clear that clients need design leaders who consider challenges beyond code requirements and thoroughly evaluate risks against budget.

### PROTECTING BUILDING SYSTEMS FROM THE IMPACTS OF SEVERE WEATHER EVENTS

Infrastructure failure is a key consideration when designing resilient buildings. Keeping buildings safe and operable during a disaster may require adjusting existing systems or including resilient measures in new construction. For example, selecting equipment with dual fuel sources will help mitigate the risks of system failure during a disaster or unexpected interruption.

When evaluating the risks associated with natural disaster and weather events through the lens of plumbing systems—such as when a storm cuts power to the building—there are important questions to address, including:

- Does the building require multiple water entries from multiple sources, or does it need an emergency water fill connection?
- Does the hot water equipment need to be dual fuel, allowing for multiple fuel sources and minimal downtime when a system fails?
- Does the building need an emergency domestic storage tank to allow for maintained occupancy when the domestic water source has failed?

It isn't just disaster and weather events we should be considering. While these can create serious impacts, we've learned from COVID-19 that building systems can have their own associated risks related to virus transmission.

### HOW PLUMBING FIXTURES AND DESIGNS CAN HELP REDUCE VIRUS TRANSMISSION

It's important to consider the impacts of existing fixtures, including plumbing fixtures, on occupants. Reducing the need to touch fixtures or mitigating potential risks associated with splash are now at the forefront of design, resulting in increased demand for sensor-operated fixtures and automated bottle fillers at water coolers. These measures require specialized plumbing designs.

### IMPROVING AIR QUALITY THROUGH HVAC DESIGN

The baseline for heating, ventilation, and air-conditioning (HVAC) design may change in favor of more resilient measures as professionals continue to assess the pandemic. Airborne pathogens have opened the door for air handling changes, inline filtration, isolation areas, and equipment selection. Filtration and ventilation are the foundation for healthy building air flow, which means turning over the air to keep the viral load down, which reduces the risk of airborne-pathogen transmission. As mechanical engineers consider the impacts of the pandemic on design, more protective measures may come from systems with enhanced mechanization, including higher air changes and disinfection technology. COVID-19 has also brought about new challenges related to building controls, such as the unintended implications when a facility goes from occupied to unoccupied in a matter of days without preparation.

## MITIGATING RISKS OF THE CRITICAL ELECTRICAL SYSTEM

The electrical system is arguably the most critical to bring back online during a disruption. Electrical engineers can define the integrity of the electrical system by identifying the interdependencies of the systems and mitigating failure risks. These systems include security, power, fire alarm, and lighting and are critical for the comfort and safety of occupants.

Electrical systems have many components to consider for resilience, including diesel or natural gas generators, efficient lighting systems, and multiple power supplies

from a stable mini-grid. Electrical systems also have design considerations for airborne pathogens, including light fixtures and lamps with germicidal ultraviolet light; antimicrobial devices, such as light switches, receptacles, and faceplates; and touchless operation or motion detectors for lighting controls, hand dryers, and faucets.

Overall, resilience-focused design considerations for plumbing, mechanical, and electrical systems will provide healthier environments for building occupants. While design professionals meet the codes, science, and needs of the client, going the extra mile in considering resilient design techniques will continue to improve adaptable systems. 🌱

## HOW ASSET MANAGEMENT PROVIDES RESILIENT MASTER PLANNING EXPERTISE

by Heather Platt Gullledge, PE, CHC  
Senior Project Manager

In 2016, Forsyth Medical Center, a part of the Novant Health system, asked our asset management group for assistance in evaluating the existing infrastructure campus-wide. Novant's facility managers wanted to verify that the medical center maintained robust systems without single points of failure, that operations would not be disrupted by emergency events, and that the infrastructure would remain reliable for many years to come. Our team conducted a full facility condition assessment, which led to a complete master plan.

The purpose of the facility condition assessment was to evaluate infrastructure in an effort to move toward a more resilient MEP system. We recommended more than 40 projects, including:

- Upgrading the domestic hot water system. This involves upgrading two towers and connecting the systems to the main system serving the general tower, allowing for cross-connection. In the event of a failure, the systems will be interconnected, and each tower will still have domestic hot water.
- Migrating the electrical system in the west tower to the central generator plant, which will allow for four generators, resulting in significant capacity and redundancy for the campus.

- Expanding the current central chilled water plant, which involves adding additional chillers with N+1 capacity to the existing three chillers that are still within their useful lives.
- Replacing air handling units (AHUs) that have deferred maintenance with new AHUs with fan arrays. This will allow them to remain operational if a fan motor fails.
- Connecting the chilled water loop around the exterior of the campus, allowing for sections of the system to be shut down or isolated while maintaining chilled water flow to the rest of the facility by feeding it from multiple and opposite directions.
- Adjusting some spaces throughout the facility by adding emergency power systems for critical AHUs, which will keep them functioning in the event of a power failure.

While it's important for facilities to have resilient MEP systems, healthcare facilities are uniquely important as service disruptions can be life-threatening. Facility condition assessments can be a key tool in optimizing system resilience. 🌱

## REBUILDING PARADISE MAKING COMMUNITIES MORE RESILIENT IN THE FACE OF DISASTER

by Emad Ehsani, PE  
Project Manager



In November 2018, the town of Paradise and many rural communities in Butte County, California, were devastated by an unprecedented wildfire. The Camp Fire was one of the deadliest, most destructive, and most expensive in California's

history; damaging more than 90% of the town's infrastructure, including homes, businesses, utilities, and transportation systems. Caused by a failure of electrical transmission equipment on a day with high winds and dry fuels, most of the Camp Fire's damage occurred in less than 18 hours from ignition.

### OPPORTUNITIES FOR A SAFER PARADISE: THE ROAD TO RECOVERY

As one of the first steps to recovery, the town reached out to residents by hosting online surveys, community workshops, and public meetings. Through this community engagement process, residents had an opportunity to reflect on the town's strengths and weaknesses, along with opportunities for a stronger and safer Paradise.

Priorities included an evaluation of the town's comprehensive street network to assess the need for sidewalks, wider roads, additional multi-use trails, and streetlights. As part of this effort, Paradise also began further study and master planning for early warning systems and evacuation routes, including identifying opportunities for enhancement of the road systems.

### MAKING CHANGES TO TRANSPORTATION INFRASTRUCTURE

Utilizing available funding and outside partners, the town was able to expedite its Long-Term Community Recovery Plan. Due to our local presence in California and experience with disaster response and relief, including large transportation projects, we were among five teams selected to provide engineering services for rehabilitation of the town's off-system roadway network.

We are assisting with one of the three off-system zones, consisting of approximately 20 miles of roadway pavement rehabilitation, including striping and curb ramp improvements to meet Americans with Disabilities Act (ADA) requirements. The design requires the flexibility to meet an expedited schedule while coordinating other infrastructure improvements taking place in the community.

### LOOKING AHEAD: APPLYING MORE RESILIENT DESIGNS TO PROTECT COMMUNITIES

It is inspiring to see the community excited and working together to rebuild Paradise. The goal is to construct new homes and businesses, and help build a stronger, more welcoming and safe Paradise. As we consider the frequency of fires now occurring throughout the West, we are reminded of how important it is to plan and incorporate resilient measures into infrastructure design. This includes focusing on safe evacuation routes to accommodate growing populations during an emergency and effective warning systems to allow time for communities to prepare. Though natural disasters will continue to occur close to home, we want our communities as safe as possible and able to thrive again. 🌱

# NEW MITIGATION FUNDING TARGETS RESILIENCE

by Jay Harper  
Vice President



In August, the Biden Administration announced that an additional \$3.46 billion dollars will be dispersed among states and tribes to invest in mitigation projects around the country. Each state is eligible to receive 4% of their COVID-related disaster costs to invest in projects that will further reduce risk from disasters. When coupled with the \$1 billion dollars recently announced for the 2021 Building Resilient Infrastructure and Communities Grant Program, there has never been more funding available to state and local governments for mitigation and resilience projects.

To put this spending in perspective, here is a snapshot of the allocations headed for just a few states around the country:

- **California:** \$484,383,864
- **District of Columbia:** \$17,379,665
- **Florida:** \$185,056,086
- **Louisiana:** \$78,005,056
- **Maryland:** \$93,289,392
- **Massachusetts:** \$110,760,576
- **New York:** \$378,128,107
- **North Carolina:** \$63,758,987
- **Oklahoma:** \$10,562,604
- **Texas:** \$666,134,283
- **Virginia:** \$62,005,907

## MINIMIZING RISKS TO COMMUNITIES

These funds will have the same eligibility and restrictions as other projects under the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP) and the Building Resilient Infrastructure and Communities (BRIC) program. However, unlike the BRIC program, these new funds are not competitive at the federal level, so this is a great opportunity to fund projects that will reduce risks to life and property.

Communities are encouraged to prioritize investments that benefit economically disadvantaged populations and communities disproportionately vulnerable to disasters. The new funding can also be used to scope projects that can be implemented through other programs, such as BRIC.

## FUNDING FLEXIBILITY: SUPPORTING INNOVATION

From a practical perspective, what can governments do with this funding? The answer is straightforward: a lot!

The funding is flexible, so states can be creative in their projects. The hazard mitigation assistance allows for innovation wherever a clear link to risk reduction can be made. Potential uses for communities include:

- Retrofitting or elevating government facilities and other critical infrastructure
- Flood risk reduction projects
- Climate adaptation plans
- Buy-outs for communities prone to hazards
- Addressing building codes
- For western states, funds can be used for removal of brush in areas that are prone to wildfires and seismic retrofits for certain buildings

To learn more about the types of projects that may be funded under this program, [FEMA's Mitigation Action Portfolio](#) is an important resource. The portfolio catalogs projects that the agency has funded in the past and that are suitable for future funding.

Our team of mitigation experts can assist in administering these funds for state and municipal clients and in providing the engineering and architecture expertise to implement the projects. I am excited for the opportunities that this funding provides to make our communities more resilient and create stability across community lifelines in the years to come. 🍷

An additional  
**\$3.46 BILLION**

will be dispersed among states and tribes  
to invest in mitigation projects  
around the country

**\$1 BILLION**

for the **2021 Building Resilient Infrastructure and Communities Grant Program**

# RESILIENCE IN THE WORKPLACE

## FOCUSING ON CREATIVITY, COLLABORATION, AND CULTURE

by Lisa Cochran, PHR  
Regional HR Manager



As consultants to a wide variety of clients, we know that it's important to practice what we preach. For many years, as we've assisted clients in developing their own resilience plans, we have also explored this concept within our own practice. As a result, we have actively embraced resilience measures in our leadership, policies, programs, and ultimately, our culture.

### CREATING AND MAINTAINING CONNECTIONS

The last year has not been easy for anyone, but it has pushed us to think more creatively, work collaboratively, and focus on what makes us who we are—our culture. We've challenged workplace norms and realigned resources, creating opportunities for some fundamentally positive changes.

As a human resource professional, I am constantly interacting with our employees, through training, onboarding, and simply getting to know people. Over the past year, I have become more resourceful in connecting with staff. This has included facilitating virtual trainings, such as our project management training and work style evaluations. At first I felt somewhat disconnected, but I was able to adjust and reach more staff in a virtual environment.

### FOCUSING ON HEALTH AND WELLNESS

In light of rising stress, uncertainty, and the overall toll the pandemic has taken, we put a heavy emphasis on employee mental health and wellness. Increased isolation and a lack of normal routine has underscored the benefits of our employee assistance program. The program provides professional counseling and referral services to support employees' individual needs.

At the height of quarantining and social distancing, we established a family resource group. A regular venue open to all employees, participants share ideas and discuss the challenges they are facing, including juggling childcare and distance learning with their work responsibilities. The family resource group is a place where colleagues can listen, learn, and know that they aren't alone by sharing stories and resources. I have personally learned a lot about resilience from watching my two young children adapt to a virtual learning environment and finding our rhythm as we figured out how to co-exist at home for several months.

Culture is the bedrock of Dewberry, and I believe our culture is what keeps us all connected and resilient in times of adversity.

### SUPPORTING POSITIVE CHANGE: INTERNAL TRANSFERS AND REMOTE WORK

During this challenging time, many people have reflected on what is important to them in their personal lives and careers. There is no one-size-fits-all approach to how our staff want to see their careers move forward. With the rise in flexible work schedules,

many employees are working with managers to discuss what is best for them and their career trajectory, which has increased the number of recent internal transfers. To some this means working closer to home to be near family or making a move to a different market segment or geographic area. We encourage flexible work arrangements that result in a win-win for employees to pursue their personal and professional goals and allow the firm to retain valuable talent. We believe this is vital to continuing to provide exceptional client service and maintaining our success as an organization.

Culture is the bedrock of Dewberry, and I believe our culture is what keeps us all connected and resilient in times of adversity. Our ability to bounce back, adapt to change, and never lose sight of who we are as a company has been evident in our employees—from leadership to new hires. Our leadership has demonstrated genuine compassion as they listen to and support their teams with managing the changes we've been facing.

Perseverance is one of our core values. We believe in thinking big, focusing on the long haul, and staying flexible. Like a lighthouse, our culture guides our employees in the right direction, even during the most turbulent of storms. It seems like nothing since March 2020 has been normal, but one thing has remained the same: our commitment to our people. We don't know what the future will bring, but by fostering a collaborative and supportive environment for our staff, I have no doubt we will come out of this more resilient than before. 🌟



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# PROTECTING PUBLIC SAFETY OFFICIALS THROUGH RESILIENT DESIGN

by Larry Hlavacek, AIA  
Principal

There is a growing need to offer public safety clients sustainable and resilient-focused facility design. Design concepts should balance safety and security for staff, while providing the opportunity to build transparency between the department and the local community. To strike that balance, we employ active and passive resilient design approaches. A great example of a facility that incorporates both elements is the state-of-the-art Cleveland Division of Police Headquarters in Ohio. Our approach included:

- Designing distinct public and secure motor court areas
- Utilizing crime prevention through environmental design (CPTED) planning principles that include physical landforms, a visual overwatch, and purposeful activities in areas adjacent to the building to increase control
- Using the dense building core as a naturally strengthened feature to house critical communications, surveillance, and security
- Designing a clear and obvious entry location and pathway to prevent unintentional violation of secure areas while still inviting the public into the facility grounds
- Distributing calming spaces with exterior views and biophilic elements that connect people and nature within the built environment to reduce officer stress levels and increase passive security functions
- Designing physical features between the building and the public to serve as an invitation to engage in the facility grounds while doubling as layered security buffers
- Supplementing passive strategies with technological and mechanical solutions, including video surveillance and active control systems

We can best serve the community and clients by recognizing public safety facilities as critical public assets. With that buy-in, we can design to support a community's mission while also implementing critical safety measures for facility staff. 