

# ENGINEERING A RESILIENT NEW ORLEANS



New Orleans has some of the world's most sophisticated systems to manage storm water. But the city is sinking because these systems prevent groundwater recharging. Could a more natural approach tackle both problems while making the city more resilient to climate change?

**Dan Grandal** reports



**G**rowing numbers of coastal cities are becoming all too familiar with flooding and the negative impacts associated with climate change. Changes in precipitation patterns have had a significant impact on our low-lying, coastal communities.

These changes, combined with ageing, undersized, and overworked infrastructure, have created increasingly soggy communities. Building resilient, adaptive systems that account for existing and future demand is a difficult challenge – but will be critical to the future of New Orleans.

Resilience is often defined as the capacity to adapt to changing conditions and to maintain or recover functionality

in the face of stress or disturbance. More plainly stated, resilience often means the ability and strength to bounce back after a disturbance or an interruption.

For New Orleans, resilience is built through improvements to the stormwater management and drainage systems, but also through addressing New Orleans' social resilience. Successful urban water-management strategies that promote resilient and adaptive design require us to open our minds, to a new norm, treating water as a resource instead of a nuisance or threat.

The traditional approach focuses on collecting stormwater in a pipe network and conveying – or pumping – it away from a developed area to be managed elsewhere.

In New Orleans, stormwater is collected in pipes during wet weather, pumped into canal systems, and discharged over levees to Lake Pontchartrain.

Over the years, in reaction to flooding, the city's water-management system has been improved with higher levees and with increased pumping capacity to get the water out of the city as fast as possible. Even though New Orleans has some of the largest stormwater systems in the world, these powerful systems are often overwhelmed by storms that, due to climate change, are becoming more intense and frequent.

Unfortunately, the unintended consequence is to prevent groundwater recharge, drying out the organic soils,

which increases rates of subsidence. New Orleans is sinking.

To address these concerns, the city has launched Living with Water, which aims to manage stormwater where it falls, using infiltration-based practices and strategic storage systems. This approach demands unique resident partnerships and community education since these innovative stormwater-management practices are often placed within the public right of way.

At its core, Living with Water means safeguarding an area from flooding by introducing natural methods of water management, at the same time beautifying the neighbourhood, which creates a spark for redevelopment. This allows residents to reconnect with water, making it a resource and amenity for them to enjoy.

### A NEW COURSE

In 2015, the City of New Orleans submitted a proposal to the US Department of Housing and Urban Development's National Disaster Resilience Competition (NDRC) to create the city's first resilience district. The competition required the city authorities to identify the biggest threats, risks, and vulnerabilities and to present opportunities to enhance resilience.

The city landed more than US\$141 million worth of funding through the NDRC, supplementing previously allocated investments funded through FEMA's Hazard Mitigation Grant Programme.

The Blue and Green Corridor project is the backbone of Gentilly Resilience District, aiming to reduce flood risk, slow land subsidence, and revitalise the neighbourhood. The project creates a network of canals, recreational parks, complete streets, walkways, bike paths, and community spaces along eight linear miles of arterial roadways and right of ways.

Surrounded by water, New Orleans was founded due to its proximity to the Mississippi river and Gulf of Mexico. Today, however, most residents live behind levees and flood walls and have lost that connection with water. That creates one of the toughest tasks for the city; convincing generations of residents to reverse their received wisdom, that water needs to be removed and kept out of the city, and that they should now keep it in.

Since these projects were announced in 2018, the city and the public have been building a relationship of trust and mutual learning. These infrastructure projects are like nothing residents have seen before, making it critical to explain the networks' benefits.

Throughout the design phase, community organisations and residents have discussed environmental concerns and community needs to guide the project. The unique perspective about their neighbourhoods and streets creates a consultant-community partnership that centres and improves the end product.

### TRANSFORMATION

Many areas of Gentilly are low- and moderate-income communities that have been de-prioritised since Hurricane Katrina. They have ageing infrastructure and lack community amenities. This project will invest heavily in the community to create vibrant, attractive public spaces. It will enhance and beautify the area and spur reinvestment into the neighbourhood – eventually improving quality of life, job creation, increased economic conditions and higher property values.

### Living with Water means safeguarding an area from flooding by introducing natural methods of water management, at the same time beautifying the neighbourhood

Along the streets slated as blue corridors, the city will construct open recreational waterways within the wide neutral grounds, or medians, between vehicle travel lanes to receive and store runoff, and relieve stress on the pumping system, allowing it to catch up. On an average day, the waterway functions as a recreational amenity alongside a welcoming, park-like space. During storms it acts as strategic storage for the drainage system.

Along the streets slated as green corridors, the city will construct several green infrastructure features – such as bioswales and permeable pavement – to store stormwater runoff, allowing it to seep slowly back into the ground. Where possible, the project proposes road diets

to reduce impervious cover, beautify the neighbourhood with landscaping and calm traffic, but also to build complete streets for safe walking and biking.

This project aims to create safe and functional streets by re-assessing the wide pavements and numerous traffic lanes. Road diets, pavement reductions, and correctly sized travel lanes will create traffic calming features and the opportunity to increase green space. The reclaimed roadway areas are being designed to include rain gardens and community parks.

Another focus for Living with Water is to integrate street designs. These streets will be adapted to increase walking, bicycling, and/or transit trips within the Gentilly Resilience District through creative wayfinding, multimodal facilities, and improved access to jobs, educational opportunities, commercial areas, and recreational destinations.

Creating a vision that frames blue and green corridors is one thing; implementing a transformational community-based project that can deliver, measure and celebrate broad benefits is another. Living with Water wants every resident to feel as though they have a park outside their own front door.

By creating an interconnected, linear district that offers local people every amenity within walking distance, residents will spend more time enjoying their community, building strong ties with their neighbours. Interactive activities will bring the neighbourhood together, using public art and education to reflect New Orleans' unique natural history and culture.

The people of the Gentilly and New Orleans have proved to be resilient. The Blue and Green Corridors project has designed a dynamic urban landscape that revitalises the neighbourhood and reduces flood risk by adapting to the changing environment through innovative techniques.

This project serves as a model for urban adaptation in New Orleans and for delta communities around the world. It's a vision for resilience, grounded in reality. ◉

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