

REGIONAL RESILIENCE

Building a More Resilient
Greater Houston



GREATER HOUSTON
PARTNERSHIP



Introduction

Greater Houston’s economic strength is inseparable from its infrastructure: the critical systems that power our businesses, connect our communities, move people and goods, protect homes and assets, deliver essential services and respond when disruption occurs.

Like major coastal metro regions, Houston must continually prepare for severe weather and other disruptions that can affect those systems. Strengthening resilience helps protect quality of life, support business continuity and reinforce Houston’s long-term competitiveness as a place to operate, invest and grow.

About the Partnership’s Regional Resilience Initiative

The Regional Resilience initiative is focused on turning insight into action by bringing together the organizations that own, operate and rely on Greater Houston’s critical systems. The work is designed to strengthen coordination, advance shared priorities and support continued progress across the region.

About this Publication

This report draws from a 2026 regional resilience case study developed by the Greater Houston Partnership in close collaboration with and support from Boston Consulting Group (BCG).

The research combined extensive research and analysis with input from Partnership members, public-sector partners, academic and community institutions, and the owners and operators of the critical systems that support life and commerce across greater Houston.

The result is a robust, but not comprehensive, baseline for understanding the region’s resilience journey and identifying opportunities for continued progress.

WHY RESILIENCE MATTERS

Resilience is an economic and quality-of-life imperative

Greater Houston’s geography is fundamental to its economic strength.

Access to the Gulf Coast and Port Houston supports industries central to the nation’s economy including energy, manufacturing, logistics, trade and other industrial activity. At the same time, being a major metro along any coastal region brings inherent exposure to hurricanes, flooding, extreme heat, winter weather and other disruptions.

Since 2000, greater Houston has experienced a series of major weather events with estimated damages exceeding \$250 billion. Tropical Storm Allison, Hurricane Ike, Hurricane Harvey, Winter Storm Uri and Hurricane Beryl each tested different parts of the region’s infrastructure and revealed where systems were strong, and importantly, where they needed to improve.

In Houston, we learn; we invest; and we improve. Across the region, significant investment has already strengthened the systems people and businesses rely on every day. This case study establishes an initial baseline across seven critical systems, examining historical vulnerabilities, major investments, measurable progress and opportunities for continued improvement.

The question for a coastal region like Houston is therefore not whether extreme weather will occur. The question is how effectively we prepare for disruption, protect people and assets, maintain critical services, recover, learn and ultimately become stronger as a result.

Houston is not starting from a deficit.

The research points to a strong foundation. Major investments in infrastructure, technology, policy and coordination have advanced resilience across the region.

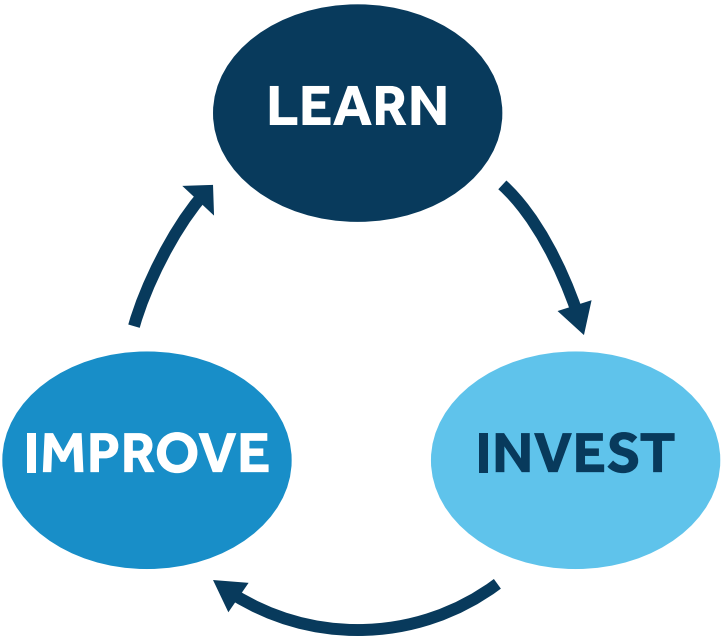
But resilience is not a finish line. Risks evolve. Our population and economy continue to grow. Technology changes. Infrastructure ages. And every major event creates new lessons.

Our opportunity is to continue turning those lessons into action.

HOUSTON LEARNS, INVESTS AND IMPROVES

Regional resilience is built over time.

Major events expose vulnerabilities. Businesses, system operators and public agencies learn from those experiences. Investments follow. Systems improve. The next event creates new information, and the process begins again.



LEARN

Disruption becomes a catalyst for change

Houston's resilience story is not one of simply rebuilding the same systems after every storm. Across the region, experience has driven changes in infrastructure, technology, standards and the ways organizations work together.



Tropical Storm Allison

Protect critical healthcare infrastructure

After Tropical Storm Allison exposed major vulnerabilities within the Texas Medical Center, significant structural hardening followed. Investments included an **8.5 million-gallon detention tank** and **170 submarine-style flood doors**. Those upgrades later demonstrated their value during Hurricane Harvey, when the Medical Center's hardened infrastructure was tested under another historic flood event.

Hurricane Harvey

Expand flood mitigation and visibility

Harvey reinforced the need for both major infrastructure investment and better real-time information. In 2018, Harris County voters approved a **\$2.5 billion flood-control bond** to support projects including **channel improvements, detention basins** and updated floodplain mapping. Within four years of Harvey, **102 new gauge stations** had also been added to improve rainfall and water-level information. Those investments helped strengthen the region's ability to manage subsequent storms. When Hurricane Beryl moved through the region in 2024, parts of Harris County received roughly 6–12 inches of rain within several hours. Despite the heavy rainfall, fewer than 10 reports of structural flooding had been recorded in the county in the immediate aftermath, an indication of how flood-mitigation investments have strengthened the region's ability to manage major rain events.

Winter Storm Uri

Strengthen standards and energy resilience

Uri exposed vulnerabilities across generation, fuel supply and weatherization. Texas subsequently implemented new weatherization requirements for power generation, transmission substations and switchyards, and natural-gas production and processing. By Winter Storm Fern in 2026, forced generation outages had **fallen from 33% during Uri to 7%**, evidence of how lessons from one event can inform stronger standards and improved system performance.

Hurricane Beryl

Accelerate grid hardening and preparedness

Beryl highlighted the vulnerability of above-ground infrastructure, vegetation near power lines and communications systems dependent on grid power. In the period following Beryl, large-scale vegetation management, weather monitoring and grid-hardening initiatives have expanded across greater Houston.

Since Beryl, CenterPoint has installed **26,000+ storm-resilient poles, undergrounded 400+ miles of power lines, cleared 6,000+ miles of higher-risk vegetation and added 100 weather stations** across Greater Houston. Entergy Texas, meanwhile, is advancing **more than \$300 million** in targeted resilience investments, including **hardening 400+ miles of transmission and distribution lines and upgrading 9,000+ utility structures**.

THE TAKEAWAY

Resilience is the ability to apply what we learn.

Houston's experience with extreme weather creates an obligation, and an opportunity, to make the next investment smarter than the last.

INVEST

Resilience is backed by action — not just planning

What does investing in resilience actually look like?

Resilience investment is much broader than a single flood project, backup generator or hardened power line. It includes physical infrastructure, technology, redundancy, operational capacity and increasingly, the ability of organizations and systems to see what is happening, share information and coordinate a response.

Across greater Houston, resilience investment takes many forms:



CATEGORIES OF INVESTMENT

Harden Infrastructure

Make physical assets better able to withstand disruption. Stronger power infrastructure, coastal and flood protection, hardened healthcare facilities.

Build Redundancy

Reduce reliance on a single point of failure. Backup generation, multiple communications pathways, diversified water sources.

Expand Capacity

Prepare systems to support regional growth and periods of extraordinary demand. Generation capacity, water treatment and transmission, transportation infrastructure, emergency-response assets.

Improve Visibility

Detect problems earlier and make better decisions faster. Weather-monitoring stations, flood gauges, sewer sensors, smart-grid technology and real-time roadway information.

Strengthen Coordination

Improve how organizations and systems operate together before, during and after disruption. Interoperable emergency communications, public-private coordination, emergency operations and information-sharing.

Maintain Access and Continuity

Keep people and businesses connected to the critical services they depend on. Expanded broadband access, healthcare continuity, emergency communications and business-continuity planning.

The case study documents substantial activity in each of these areas: across the public sector, private sector and institutions throughout the region.

Resiliency and preparedness go hand In hand

For employers, stronger regional systems can help reduce the frequency, severity and duration of disruption – and support faster recovery when disruption does occur. But resilience does not mean critical service will never be interrupted.

Businesses have a role to play, too. Planning for continuity, building appropriate redundancy and preparing employees and operations for periods of disruption complements the investments being made across greater Houston’s critical systems.

Together, stronger regional systems and better-prepared businesses strengthen Houston’s value proposition as a place to operate, grow and invest.

IMPROVE

Progress is measured by stronger capabilities, not investment alone

The amount invested in resilience matters. But the more important question is:

What can the region do better because of that investment?

Across greater Houston, investments are producing stronger physical infrastructure, greater redundancy, better information and new capabilities to maintain essential services and respond to disruptions.

Sustained investment can turn resilience into continuous improvement. The City of Houston's **Build Houston Forward program** provides a long-term roadmap to repairing, rehabilitating and rebuilding streets and drainage infrastructure. The case study identifies approximately **\$2.9 billion in funding for local streets, traffic control and storm drainage**, supported by a pay-as-you-go funding model designed to sustain infrastructure improvements over time.

Technology can shift systems from reactive toward proactive.

More than **3,000 real-time remote sensors** are being deployed across the sewer network. The case study reports that smart manhole monitors have helped prevent more than **600 overflows** by detecting leakage and triggering real-time alerts.

Coordination can become infrastructure of its own.

Houston, Harris County and Montgomery County have built interoperable emergency communications capabilities across jurisdictions. Emergency-response investments increasingly focus not only on physical assets, but also on shared information, situational awareness and the ability to coordinate across organizations.

These examples illustrate an important shift:

Resilience is not only about how quickly Houston reacts after something goes wrong. It is increasingly about reducing vulnerabilities before disruption occurs, seeing problems earlier and creating the capacity to respond more effectively when needed – then using what we learn to rebuild and reinvest to a higher standard, rather than simply restoring what was there before.

A strong foundation with more work ahead

The case study found meaningful progress across every critical system. It also identified substantial remaining opportunities, including infrastructure modernization, coastal protection, water-system improvements, communications redundancy, expanded data-sharing and stronger coordination across sectors.

Progress and remaining opportunity are not competing narratives.

They are both part of a credible resilience story.

SEVEN SYSTEMS

Seven critical systems. One regional economy.

Businesses and residents experience critical infrastructure as a connected system even when those systems are owned, operated, regulated and funded by different organizations.

The Greater Houston Partnership's resilience work focuses on seven systems essential to keeping everyday life and the regional economy functioning.



Power

Provides the electricity required to operate homes, businesses, public infrastructure and nearly every other critical system.



Communications

Keeps employees, customers, system operators and emergency responders connected through wireless, broadband, data and voice networks.



Water & Wastewater

Provides reliable water for residents, public health and industry while safely managing wastewater throughout the region.



Stormwater & Flood Management

Protects people, property, infrastructure and economic assets from rainfall, flooding and coastal storm surge.



Transportation

Moves employees, residents, critical supplies and goods through one of the country's most important logistics and trade hubs.



Healthcare

Maintains access to essential care and protects the health and wellbeing of the workforce and broader community during disruption.



Emergency Response

Coordinates people, resources, information and services before, during and after major events.

The case study examined the component parts, historical vulnerabilities and major investments within each of these systems. But one conclusion stands out:

The resilience of any one system increasingly depends on the resilience of the others.

EVIDENCE OF PROGRESS

Resilience in action across greater Houston

Houston’s resilience story is built from thousands of projects, policies, partnerships and operational improvements. The following examples provide a snapshot, not an exhaustive accounting, of the scale and breadth of work already underway.

Power



Grid modernization and backup capacity are strengthening reliability across greater Houston. **670+ intelligent switching devices** have been installed to improve grid flexibility; **CenterPoint reports 100M+ fewer customer outage minutes** and a **50% reduction in vegetation-related outage minutes** year to date as of the case study; and **Texas has launched a \$1.8B backup power program for critical facilities**.

Communications



Communications providers are making significant investments in network reach, capacity and resilience across greater Houston and Southeast Texas. **AT&T invested \$2.1 billion in greater Houston from 2019–2023**; **Comcast has invested \$265 million in fiber expansion** across Southeast Texas; and **Verizon has deployed more than 4,500 communications solutions** across greater Houston **over the past five years**.

Water & Wastewater



Greater Houston is reducing its reliance on groundwater to limit subsidence and strengthen long-term water supply. Regional groundwater-reduction requirements target **80% by 2035**, supported by major surface-water infrastructure including the **Luce Bayou Interbasin Transfer Project, which can move 500 million gallons per day**, and the **Northeast Water Purification Plant** expansion, with a total capacity of up to **up to 480 million gallons per day**.

Flood Management



A **\$2.5 billion Harris County bond program**, supplemented by partnership funding, is supporting channel improvements, detention, floodplain mapping and other mitigation projects. More than **\$600 million** in upgrades have also been made across greater Houston’s bayou system, and new tools such as MAAPNext are improving how the region understands and communicates changing flood risk.

Transportation & Logistics



The Houston Ship Channel expansion widened the channel from **530 feet to 700 feet**, enabling two-way vessel transit and strengthening the infrastructure supporting one of the region’s most important economic assets. Across the region’s transit network, a **\$17 million upgrade to the METRO Texas Medical Center Transit Center** and the installation of **1,400 new bus shelters** are also improving mobility, access and the resilience of everyday transportation infrastructure.

Healthcare



Following Hurricane Beryl, NRG Arena was converted into a **250-bed discharge holding facility** for patients who were medically ready to leave the hospital but could not safely return to homes without power, creating a safe transition point during recovery.

Emergency Response



The Harris County Citizen Corps has expanded the Community Emergency Response Team program to more than **67,000 trained members**, while the Houston Fire Department has established a dedicated **80-member Water Strike Team** equipped for flood response.

THE STORY BEHIND THE NUMBERS

No single project makes a region resilient.

Resilience comes from investments compounding over time — across systems, organizations and events.



THE NEXT OPPORTUNITY

The next resilience opportunity is between the systems

Houston has made significant investments *within* its critical systems.

The case study suggests our greatest opportunities ahead are *between* them.

A prolonged power disruption can affect communications infrastructure, water and wastewater operations and healthcare delivery. Communications disruptions can limit access to alerts and reduce the situational awareness organizations need to respond. Transportation disruptions can complicate the movement of workers, emergency assets and critical supplies.

The systems are different.
The consequences are connected —
that makes coordination itself a resilience
capability.

- **Stronger relationships before disruption**

During an emergency, knowing **who to call, what information to share and who has the authority to act** can be as consequential as physical infrastructure

- **Better shared information**

The emergency-response case study identified opportunities to create a stronger common operating picture across sectors and improve real-time visibility into constraints and impacts.

- **Sustained private-sector involvement**

Businesses own and operate substantial portions of the infrastructure and supply chains on which the region depends. The research identified the need for more consistent private-sector participation in preparedness, response and recovery planning.

- **Planning for interdependencies**

Understanding where systems rely on one another — power and communications, utilities and healthcare, transportation and supply chains — allows organizations to identify vulnerabilities before they become cascading failures.

- **The infrastructure matters. So do the connections.**

Houston’s next stage of resilience will require continued physical investment, but also stronger relationships, shared information and coordination across system owners, government, businesses and institutions. That is where the Partnership can play a distinctive role.

HOW THE PARTNERSHIP LEADS

Accelerating regional progress through convening, advocacy and communication

The Greater Houston Partnership does not own or operate the region’s critical systems.

Our role is to bring together the organizations that do — along with the companies and communities that depend on them — to help accelerate progress.

The Partnership advances its Regional Resilience strategic imperative through three core areas of work.

Convene for Impact Bring together critical-system owners, business leaders, government partners and institutions to identify shared challenges, better understand interdependencies and develop coordinated solutions. The Partnership’s resilience network already includes participants across the private sector, public sector, social sector and academia – creating opportunities for relationships built before an emergency to translate into faster, more informed coordination when disruption occurs.	Advocate for Solutions Advance policies, funding and regulatory solutions that improve the performance and reliability of critical systems. That includes identifying barriers to progress, advocating for investment in critical infrastructure and pursuing legislative and policy opportunities that can strengthen Houston’s resilience.	Communicate Regional Progress Build awareness of how Houston is strengthening its critical systems, both to help businesses and residents better understand the work underway and to reinforce confidence in greater Houston as a place to live, work and invest.
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Turning a baseline into continuous progress

The 2026 case study gives the region something equally important: a starting point.

The Partnership intends to use that baseline to track new investment and improvement over time:

• What was built, funded or launched?	• What capability became stronger?	• What difference could be observed when that capability was tested?
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Regularly refreshing that evidence can help greater Houston identify priorities, demonstrate progress and continue moving from a reactive posture toward a more proactive one.

LOOKING FORWARD

Resilience is a continuous journey

Houston's exposure to extreme weather will not disappear.

Neither will the need to modernize infrastructure, prepare for population and economic growth, adopt new technologies, strengthen coordination and learn from the next event.

But Houston is not starting from zero.

Across seven critical systems, decades of public and private investment have created a strong foundation. Infrastructure has been hardened. New capacity has been added. Technology is creating greater visibility. Policies and standards have changed. Relationships are stronger. And the region has more information than ever to guide what comes next.

The work ahead is to build on that foundation.

To keep learning. To keep investing. To keep improving.

And to ensure the region remains a place where businesses can grow, people can thrive and communities can face the future with confidence.

Building resilience is a regional effort. The Partnership will continue bringing together the organizations that own, operate and rely on the region's critical systems to identify shared challenges, advance solutions and communicate progress. If your company or institution is thinking deeply about resilience, whether through infrastructure, business continuity, emergency preparedness, technology or investment, we invite you to be part of the conversation.



Acknowledgments

The Greater Houston Partnership thanks the Boston Consulting Group (BCG) for its close collaboration in developing the 2026 regional resilience case study and the many Partnership members, public agencies, critical-system owners and operators, academic institutions, community organizations and regional leaders whose expertise informed this work.

The findings and examples in this publication reflect the collective work of organizations across the region and are intended to provide a snapshot of regional resilience progress rather than a comprehensive inventory.

Learn more and get involved:





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