



HOUSTON RESILIENCY INNOVATION WORKSHOP

SUMMARY REPORT





Let's be proactive, not reactive, and it all starts with a single small step that you can share in your community to inspire others to do the same.



This is an exciting and important time in Houston. As we approach the 2-year anniversary of Hurricane Harvey and reflect on the unprecedented damage caused by the storm, our city has awakened to the importance of resilient thinking, planning and actions.

By joining the 100 Resilient Cities program, Houston has been plugged in to a global network of cities facing similar challenges and provided access to tools and thinking that will better equip us to address the physical, social, and economic challenges that are ever increasing in our world. Initiatives, such as the Houston 2020 Visions, a collaboration between AIA Houston and Houston City Council Member David W. Robinson, FAIA, are putting out a national call for ideas for how Houston can move forward as a resilient and sustainable city. Houston 2020 Visions is challenging designers, planners,

engineers, and our local governments and community organizations, to think outside their professional silos and connect with each other in order to reimagine our built environment at all scales, depths, and facets; creating a new vision for our future as a resilient city.

Designing and strategizing for a resilient city must be comprehensive. Solutions must influence and change all facets of the city, from the homes of our citizens to major infrastructure - from regulatory requirements to policy change.

On May 15th and 16th, 2019, Stantec brought together a group of over 50 national and local experts, stakeholders and community members to discuss, strategize and brainstorm in the Houston Resiliency Innovation Workshop. With response to major natural disasters as a rallying point, the focus



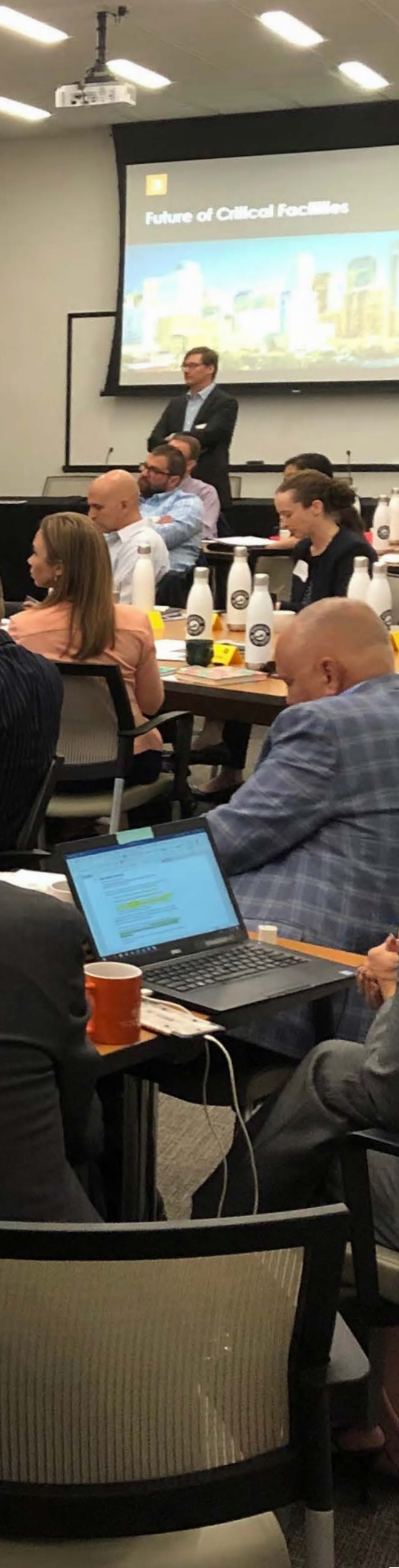
of this workshop was to highlight issues that our city has dealt with and currently faces, anticipate potential shocks and stresses of the future, and provide a platform for innovation around how to plan for a more resilient future Houston. It was both a platform for making connections across organizations and stakeholders, and for generating ideas for action plans that address partnerships, advocacy, funding, and implementation.

Participants convened over a day and a half, starting with panels geared toward information sharing and identifying key elements followed by the convening of working groups that represent broad constituency. Day 1 of the workshop focused on hearing from a variety of speakers and elevating the collective knowledge of the group around resilience: historical Houston facts and resiliency drivers for topics such as housing, education,

funding, critical facilities, infrastructures, and governance. Day 2 challenged participants to envision the future of Houston in 2050, and to articulate projects and action plans that facilitate the changes necessary to make that future possible.

The intent of this report is to share a summary of the discussions, findings, and outcomes of this event as a way of furthering the dialogue around resiliency in Houston. We hope that this report sparks even more ideas and creative thought that will feed into submissions to the Houston 2020 Visions program, and ultimately create action plans and initiatives for a truly resilient Houston.





HOUSTON RESILIENCY INNOVATION WORKSHOP PARTNERS

While the workshop provided the platform for idea generation, the content and ideas were the result of the diverse and dynamic group of participants. The group consisted of architects, urban planners, engineers, city and county officials, army corps of engineers, educators, research and advocacy organizations, private industry partners and more. Stantec would like to thank each of the participants (listed on the following page) for their time and contribution to the dialogue.

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Disaster Coordinator, NYCCT CUNY

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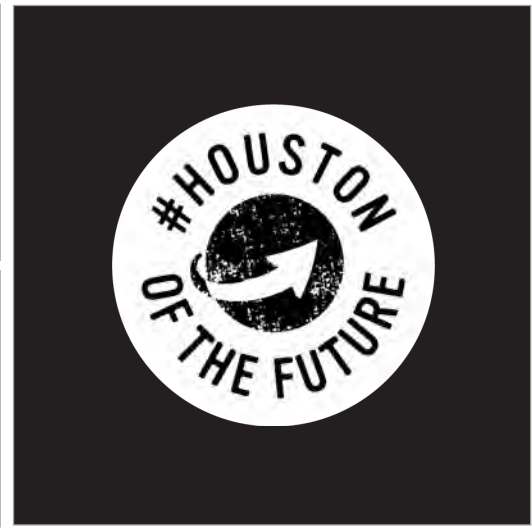
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- Galveston District

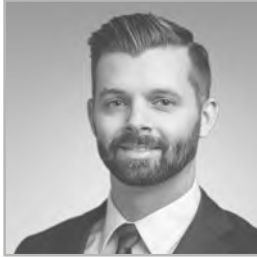


2
DAYS OF
FORWARD
THINKING

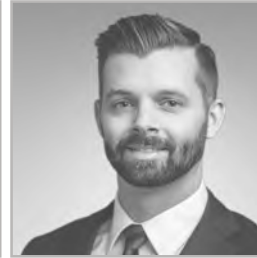
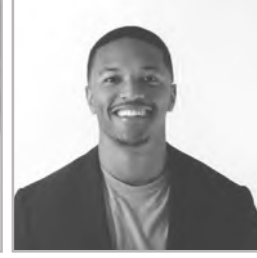




6
SECTOR PANEL
DISCUSSIONS



54
INFLUENTIAL
PARTICIPANTS



PRE- WORKSHOP SURVEY

Ahead of the Houston Resiliency Innovation Workshop, participants were polled to assess what they perceived as challenges to resilience in Houston, as well as potential opportunities. The following trends were identified:

TOPICS OF INTEREST

- How do we connect all the stakeholders and moving parts?
- How do we fund resilience?
- How do we effectively communicate plans and process?

IMPROVING REGIONAL RESILIENCE

- Coordination
- Addressing geography with water and infrastructure
- Provide Leadership

THE ROLE OF INDUSTRY

- Investment
- Innovate
- Provide Leadership
- Support development of stronger government codes

THE ROLE OF TECHNOLOGY

- Equity/Equalizer
- Key to comprehensive planning/policy
- Education and communication
- Information sharing

LONG TERM GOALS

- Comprehensive planning
- Regional planning
- Planning
- Better quality buildings

IMMEDIATE NEEDS AFTER HARVEY

- Long-term planning
- Better prepared for next storm
- Communication of risk
- Environmental alignment

HOUSTON'S GREATEST THREATS

- All Hazards (Natural & Manmade)
- Socioeconomic disparity

SUCCESS ELSEWHERE

- Cities
- Improved transportation systems
- Natural systems
- Green infrastructure

EMERGING ECONOMIES 2050

- Technology
- Small business
- Houston's attractiveness as place of investment





HOUSTON HISTORY AND CURRENT INITIATIVES

Speakers educated the group on everything from local history and factors that have shaped Houston into the place it is today, to the current challenges and initiatives facing the City of Houston. The presenters included:

Marissa Aho, ACIP,

City of Houston Chief Resilience Officer: *Resilient Houston*

Melissa Turnbaugh, AIA,

Stantec: *City of Houston Overview*

Kyle Shelton,

Kinder Institute for Urban Research: *Post-Harvey Resilience Policy and Research*

Lisa Gonzalez,

HARC: *Resiliency, Research and Strategies*

Stephen C. Costello, P.E.,

City of Houston Chief Recovery Officer: *Hurricane Harvey Recovery*

Learn more about the plans for reducing risk in Houston:

<http://houstontx.gov/oem/pages/plans/hmap/>

Learn more about the Kinder Institute's research on analyzing urban growth:

<https://kinder.rice.edu/research/mapping-houston-development>



A conference room with a large screen displaying a presentation titled "Governance". The screen shows a stylized image of a city skyline with a circular logo that says "VISION OF THE FUTURE". Five people are seated around a long table in front of the screen. In the foreground, several other people are seated at a table, some looking towards the screen. The room has a modern, professional feel with recessed ceiling lights and a whiteboard in the background.

Governance

**We need to empower people.
We need to build more trust.
We need to promote hope to
create a more resilient future.**



QUESTION
DO SCHOOLS NEED TO FUNCTION
BY PADS ?
(GUIDE TO HOUSTON
MANUAL)





IDENTIFYING HURDLES AND ESTABLISHING CONNECTIONS

Through our pre-workshop survey and prior conversations with key stakeholders, we identified six areas of focus that interact to impact a more resilient Houston. Participants were stretched out of their comfort zones and encouraged to think collaboratively across sectors through a series of panels with speakers on each topic, representing diverse areas of expertise and backgrounds. For each topic, panelists identified community and regulatory hurdles to action (and opportunities for connections to overcome those hurdles).



DID YOU KNOW?

The Greater Houston Metropolitan area is home to nearly 7 million people. Covering 10,062 square miles, it is larger than the entire state of New Jersey.

PANEL TOPICS

TRAJECTORY OF HOUSING

HD Chambers, Alief Independent School District

Aeron Hodges, Housing Architect, Stantec

Sarah Labowitz, City of Houston Housing and Community Development Department

Amanda Timm, Local Initiatives Support Corporation Houston

NEXT GENERATION EDUCATION

King R. Davis, Sheldon Independent School District

Jaime González, The Nature Conservancy

Laura F. Sachtleben, Education Architect, Stantec

RESILIENT INFRASTRUCTURES

Jesse Bounds, City of Houston Mayor's Office of Innovation

John Keane, Water Sector Leader, Stantec

Charles (Chip) H. Place, Houston Parks Board

Edmond J. Russo, Jr., Army Corps of Engineers - Galveston District

FUTURE OF CRITICAL FACILITIES

Dr. Kim Abrego, Disaster Recovery Services, LLC

Michael Conklin, CenterPoint Energy Electrified Transportation



Chris R Haigler, CP Chem

Andrew Irvine, Urban Planning & Community Development, Stantec

FUNDING THE FUTURE

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John Malueg, Resiliency Planning & Design, Stantec

Craig Maske, Harris County Flood Control

GOVERNANCE

Gabe Baker, Office of Harris County Judge Lina Hidalgo

Auggie Campbell, West Houston Association

Josh Human, Sr. Hazard Mitigation & Resilience Consultant, Stantec

Deborah January-Bevers, Houston Wilderness

Dr. Pam Wells, Region 4 Education Service Center





WORKING GROUPS

Following the panels, working groups convened to discuss the identified topics and hurdles. Each group included several workshop participants with diverse expertise and backgrounds, whom were charged with creating action plans that addressed scale, timeline, hard, soft, proactive, and reactive. The next page is a collection of discussion highlights, outcomes, and other thoughts from every group.

TRAJECTORY OF HOUSING

The Houston metropolitan area is home to just under 6.9 million residents, one quarter of which live in the floodplain. Nearly half of these residents rent their home. Resilient and equitable housing in Houston will help build strong communities to assist during disasters, creating the social resiliency complementary to climate resiliency.

RISK

We are risk-averse; we need to not be afraid of displaying risks and empowering people and communities with information. The fear of risk knowledge related to housing is the fear of disinvestment and devaluation of property, but effective communication and information increase the potential savings of lives.

COMMUNITY

People care about the communities in which they live. Housing that is affordable as well as socially and psychologically beneficial requires understanding the importance of feeling invested in our neighborhoods and the desire to protect our communities, not just our home and family.

AWARENESS

We need to educate people about their own vulnerabilities and potential risks to get them involved in solving problems. This means partnering with trusted and respected community leaders to disseminate information and provide transparent communication.

REGULATION

A housing code resiliency checklist that must be achieved to receive a building permit should be established, and it must be affordable. The potential challenge is that very restrictive codes and the drive for density in Houston may encourage residents and builders to move further out where the codes are less restrictive. With added regulation and changed expectation, the dynamic for the built environment will change. We also need city regulations on what you can grow on plots and permeability.

TECHNOLOGY

Look to business to find creative technology solutions and products that support and promote resiliency and provide access to self-developed, technology-driven housing to encourage equity building for residents.

EQUITY

Affordability builds equity. We need guidelines and practices to help overcome the stigma of affordable housing and the risk of economic disincentive to people moving to Houston. It's also important to remember not everyone living in affordable housing necessarily wants to live within the city.

ALTERNATIVE MODELS

Different models of housing, such as co-housing and multi-generational housing, can contribute to affordability and climate preparedness, while supporting a stronger community bond.

MONEY

Houston is receiving money from all over the United States. It needs to be invested properly, and we need to educate the rest of the nation on how it is being used. Additionally, it's a challenge for local government to distribute large amounts of disaster funds. A lot of money is taken from the local level and paid into a large national fund that local users don't necessarily end up seeing.

PLAN

We must design infrastructure, transportation and transit, and technology for the future to address the continuous rapid growth in population.

WATER

We need to learn how to live with and without water. Some ideas include creating regional natural systems/ drainage protections, giving strength to a regional flood authority, developing point source drainage requirements, communicating economic impact and opportunity cost of unregulated development, and incentivizing local water catchment.

NEXT GENERATION EDUCATION

Houston is home to over 48 public school districts and 37 open-enrollment charter schools, representing more than 1.2 million students, 97,000 educators, and 1,500 campuses. The Greater Houston area has 14 major institutions of higher learning and more than 60 degree-granting colleges, universities and technical schools. Schools are interwoven into the fabric of our community and can become hubs for resilience instruction and preparedness.

VALUE

Resiliency is a value – a shared sacrifice and acknowledgment that my personal need cannot always be prioritized.

EDUCATE

Schools have an opportunity to educate students and the community about resiliency through modeled change and behavior.

Topics ranging from the landscaping around the school to instruction about resiliency and climate change awareness are all important and needed as a part of a student's curriculum. Concepts that are ingrained in the students' minds and actions will inform/change the minds and actions of parents, friends, and relatives in their social circles.

LILY PAD

Schools should be the civic center of the community during response and recovery and be retrofitted to serve as a "lily pad." Schools are at the center of each neighborhood and serve as conduits for information and impromptu shelters, providing opportunity for districts to think more creatively about their property as a way to bring community resources into schools, provide housing for individuals, and create a network for information gathering and distribution.

LEARNING ENVIRONMENT

Technology is changing the learning environment –if schools must be closed, can students still learn from home?

SENSE OF PLACE

We are a more mobile society and have lost our "sense of place" – but students still need to learn about the history of their neighborhood, city, etc. Teach globally using local stories and provide exposure to nature to help build resilience.

LIFE-LONG LEARNING

Schools can educate far beyond the K-12 years; some already are. Public and private collaborations in education initiatives could further strengthen our schools' connections to their communities as well as generate climate change awareness and resiliency preparedness.

HOUSING CONNECTION

There is a strong relationship between housing and education. One connection is funding: taxable values dropped considerably after Harvey, thus reducing much needed funding for schools. Another is that when homes are rendered uninhabitable by an event, schools often become the temporary shelters.

FUNDING THE FUTURE (MARKET DRIVERS, FINANCE, FUNDING)

Houston is home to 23 Fortune 500 companies and the nation's largest port in international tonnage (the Port of Houston). In fact, if Houston was an independent nation, it would rank as the 30th largest economy in the world. The importance of Houston's economic well-being reaches far beyond its geographic boundaries.

PPP

While FEMA funding appears to be available, accessing it is a slow process. A network of public-private partnerships could serve as a temporary band-aid and short-term funding source until government funding was accessible. A goal for the future would be to establish public-private partnerships and a system of community-based metrics to determine where to allocate funds as well as develop a path for funding innovative resilient ideas.

LOCAL

Due to increased difficulty in attaining federal and state funding coupled with a decrease in availability, we must look to local and global funding support for capital improvement, resiliency preparedness, and equity distribution.

PRIVATE

We need a paradigm shift from the “self” to the “collective” in terms of financing; meanwhile, look for private funding and other methods for becoming more self-reliant.

MULTIPURPOSE

Think of multipurpose projects that can benefit multiple initiatives (think public spaces, resiliency, housing, and education).

EQUITY

Lower income residences are the most vulnerable, yet funding is tied to property values. Current policy supports inequality in spending capital, therefore we must change the policies and methods for how we determine project financing.

VALUE

We need to redefine a value proposition for proposed mitigation projects that recognizes long-term sustainability and resilience as beneficial for property value.

NATIONAL IMPACT

Issues in Houston can affect the entire country (e.g., gas prices). Policy research is needed to influence Washington DC through data that highlights the broader economic impact of Houston’s resilience on the entire nation.

SCORING

Develop a resilience score system (similar to LEED) that incentivizes resiliency by creating an investment infrastructure; as businesses see the value in resiliency, they are willing to protect their own investment and make resilient choices. The challenge is that several rating systems already exist. Can we combine and/or rally around one in order to make an impact?

FUTURE OF CRITICAL FACILITIES

At over 1,000 acres and home to 54 medicine-related institutions, Houston's Texas Medical Center, the largest medical center in the world, receives an average of 7.2 million visitors per year. Houston also houses the second largest petrochemical complex in the world, refines 35% of our nation's oil, and plays an essential role in the U.S. energy industry. How do we ensure these critical facilities are resilient?

PRIORITY

The biggest hurdles for critical facilities are facility prioritization and securing the funding to ensure they are prepared to withstand an event. Too often proper protection only comes after a disaster. These facilities must be hardened to avoid becoming obsolete.

PEOPLE

Review the idea of people as a critical facility that needs to be protected and encourage a paradigm shift about what is critical to protect. Lower income residences are the most vulnerable, yet funding is tied to property values. Proactive change to current policy is required to protect those who do not have the means to protect themselves.

FUTURE

Think future-proof: less brick and mortar, and more Amazon and Drones.

TECHNOLOGY

Monitor the performances of these facilities and share their availability through data-powered digital infrastructure, so that they are predictable and verifiable.

AWARENESS

There is a need to share vulnerabilities in order to create solutions. Individuals need a common understanding of what is acceptable for a response from their government.

STANDARDS

Minimum standards should be developed and enforced to ensure critical facilities can be delivered, including a diverse and adaptive supply chain to ensure proper operation of these infrastructures.

STAKEHOLDERS

Are we structuring partnerships to enable entities to get funding to create better facilities? We must support and encourage forums that convene industry stakeholders to share innovations, incentivize making better design decisions, and ultimately shift the mindset from “fix it when it’s broken” to “don’t let it break.”

RESILIENT INFRASTRUCTURES

Houston is home to second largest port in the country, three airports that serve over 58 million passengers a year and over 575 miles of highways. More than 600 trucking firms operate in the city and two major rail systems operate 14 mainline tracks radiating from Houston. So how do we create a roadmap for the future?

TECHNOLOGY

We have the opportunity to use technology and data to make things better – to pioneer smart city strategies and help combat the spread of misinformation. Technology can also create smart infrastructure, such as interconnected flood detention and control systems that can relay information about detention basins, weakening bridges, flood sensors on traffic lights, etc.

RESILIENT CHARACTERISTICS

Key features of resilient infrastructure are regional transportation, shaded hike-and-bike routes, safe lighting, and public transportation systems that connect all parts of the city. Infrastructures should be hardened, otherwise they will become obsolete. Infrastructure should be out of floodplain.

FUNDING

Distributed network. 80% of detention in Houston is privately owned, making regulations and code enforcement a critical factor for broad and impactful change. Incentivize volunteer efforts that align to Macro plans or master plans.

SUSTAINABLE

It is critical for government to integrate green infrastructure in planning and funding, and climate change initiatives must be at the forefront of discussions and decision-making. Houston has made great strides in this area with the work on the bayous, but more can be done. Green infrastructure can be used in multiple ways – including storm water control, education, social equity, and community improvement – and should be the connection to businesses, schools, and homes.

MACRO

Coordinate and implement macro interventions like the Coastal Spine initiative that provide solutions at a larger scale to help reduce risk and provide protection to multiple communities.

REGION

Form a regional solution rather than local evacuation plans. Pre-disaster communication, alignment, and relationships must be formed in order to be effective. An example is the USACE Galveston District, which covers 50,000 square miles, 48 counties, 2 parishes, and 1,000 miles of channels, and promotes region-wide flood control and advocacy.

GOVERNANCE

The Greater Houston metropolitan area has a higher population than the entire state of Maryland. It is a city without zoning; in fact, voters have repeatedly rejected zoning by voting it down. The city is divided into 88 Super Neighborhoods who work with their neighbors to identify, plan, and set priorities, and ultimately maintain a connection between City government and Houston communities. How does this impact our future resiliency?

ORGANIZATION

Help alleviate different jurisdictional requirements and create a unified flood permitting location, regional conservation plans, and accessible resources for information.

PROCUREMENT

We need to utilize our understanding of the FEMA and HUD funding structures to help create smarter procurement procedures. Incentivize volunteer efforts that align to Macro plans or master plans.

NETWORK

We need to develop a proactive and networked approach toward governance that leverages the coordinated efforts of government, residents, business and industry, and philanthropy. Each has their own unique strengths that they should capitalize on individually but cooperatively. This solution will require resisting the urge to identify with partisanship and instead focus on building a network of leaders that promotes transparency and draws from trusted sources.

PLANNING

Look to various disaster strategies that have been successfully implemented for policies and actions that are potentially repeatable throughout other industries and organizations. Consider what our first responders need to make our communities more resilient, and how to best make information publicly accessible via visual means.

MODELED

We should “lead” instead of “govern” by educating our communities about resiliency through modeled behavior that inspires widespread change.





REFLECTIONS

Day 2 of the workshop started with asking each participant to give a **"one sentence impression"** of the events and discussion of Day 1. A few of the impressions were:

- "Let's be proactive, not reactive, and it all starts with a single small step that you can share in your community to inspire others to do the same."
- "Action requires advocacy."
- "We need visible, tangible projects at every scale."
- "A vision for sustainable and resilient regionally integrated infrastructure in Texas on America's energy coast."
- "What I heard yesterday that was to me surprising was, 'Oh you're doing that?' So that's my sentence. 'You're doing that?' And then everybody getting excited."
- "Be the change."



Efficiency Innovation Workshop

What stood out to me is that it impacts every one of us at multiple levels, regardless of where we are from or where we are at, it affects all of us.

CASE STUDY #1
Lessons Learned From the Discussion

VISION STATEMENT
Address full community
Sustainability and resilience
through the engagement and
alignment of all stakeholders
in place

Educational
opportunities &
FULLY GREEN

CHARTER - a broad base of
public & private sectors for
promoting an alignment of mutually
beneficial objectives with a clear mission
planning and building a shared vision
for sustainable and resilient communities,
facilitating & accelerating through
formation of inter-organizational
relationships

Developed policies and services guiding
mutually beneficial
- Shared responsibility of public
institutions to deliver such things



CASE STUDY #3
Housing Case Study
Navy Green - Brooklyn, NY

2050 Vision (New Housing)
TRANSIT IMPROVEMENTS
COMBINE RAIL
IN SUBWAY
HIGH SPEED RAIL

COMPLETE STREETS
BICYCLE FACILITIES (LANES)
WALKWAYS
LANDING (SAFE)
SHADE/LANDSCAPING

USE TECHNOLOGY TO
TRANSFORMING



2050 Vision

AFFORDABLE HOUSING AVAILABLE

- WATERFRONT DEVELOPMENT
- DIVERSIFICATION OF HOUSING WITH BUYOUTS
- LID / GREEN INFRASTRUCTURE ON VERTICAL CONSTRUCTION
- UP TECH FOR COMMUNITIES
- PUBLIC EDUCATION & PROGRAMS / PLANS & VISIONS





VISION FOR THE FUTURE

The working groups were asked to create a *2050 Vision for Houston*. While Day 1 focused on identifying hurdles, Day 2 was about flipping the script. Looking at hurdles in a different way, so that they can be leveraged into something that propels us forward to something new and brilliant. As a city, where and who do we want to be in the long-term future?



DID YOU KNOW?

On August 29, 2018, the City of Houston joined the 100 Resilient Cities network to bring the collaborative spirit and empathetic leadership that characterized its Harvey response to other socioeconomic and environmental resilience challenges facing Houstonians.

2050 VISIONS AND KEY CONSIDERATIONS

LOCALLY FOCUSED RESILIENT COMMUNITY

- Resiliency Nodes – Neighborhoods, school districts, watershed districts
- Each community is linked to a larger region to establish networks and build relationships.
- Super Neighborhoods
 - Structure/model connectivity and network
 - Solicit key neighborhood stakeholders
 - Create communication tool/survey
 - Prioritize shocks and stresses – leverage school facilities/infrastructure
- Create champions/advocates within the community thus increasing participation, awareness and pride of place.
- Rings of resilience such as layers of redundancy

RESILIENCY EDUCATION AT THE NEIGHBORHOOD LEVEL

- Bring education to the neighborhood with mobile education vehicles
- Vehicle fleet is aqueous and educates residents about flood preparedness and becomes part of critical infrastructure during disaster

ALIGN HOUSTON

- Define common goals for all levels of government and stakeholders
- Think globally / act locally
- Communicate effectively and at all scales
- Virtual Digital Twin City: use technology and data to run scenarios and better understand how the impact of future shocks and stresses



ACHIEVE FULL COMMUNITY SUSTAINABILITY AND RESILIENCE

- Create a platform for Educational change, Infrastructure change and Policy change
- Engagement and alignment of all stakeholders
- Define “What it is to be a good neighbor”
- No more green lawns – let’s re-wild or re-Texas our lawns

BETTER QUALITY OF LIFE FOR ALL CITIZENS

- Neighborhoods must be safe, dry and connected
- Governance must be inclusive
- Must work across jurisdictions

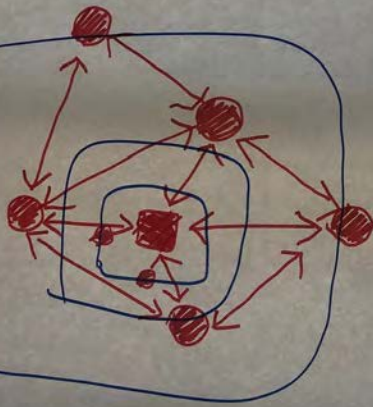
CARBON NEUTRAL

- Address urban growth
- Self-driving cars
- Different mode of work, e.g. telecommuting or co-working spaces
- Diversity + Global

DUAL-PURPOSE INFRASTRUCTURE

- Take every opportunity to find dual-purpose for critical infrastructure
- Tunneling system for both water conveyance and traffic

CONNECTING THE CENTERS



A CONSTELLATION OF SATELITES

- BUILDING ON NATURAL EXISTING CITY FRAMEWORK
- ATTRACTING THE NEXT GENERATION OF INNOVIATORS



MACRO URBAN PADS

- COOL URBAN CENTERS
- WALKABLE DENSITY
- NEW DIVERSITY

2050 VISION

- TRANSIT IMPROVEMENTS
 - COMPUTER RAIL OR SUBWAY
 - HIGH SPEED RAIL
- COMPLETE STREETS
 - BIKE FACILITIES (PROTECTED)
 - WALKWAYS
 - LIGHTING (SAFE)
 - SHADE / LANDSCAPING
- USE TECHNOLOGY FOR

FUNDING + CRITICAL FACILITIES

- A) INTER-REGIONS**
- PLANS - REGIONAL ATTENTION (LOCAL GOV) - REGIONAL GOV
 - CRITICAL FACILITIES (WATER SUPPLY) - REGIONAL GOV
 - CRITICAL FACILITIES (WATER SUPPLY) - REGIONAL GOV
 - CRITICAL FACILITIES (WATER SUPPLY) - REGIONAL GOV
- B) STATES**
- HOW TO STRENGTHEN REGIONAL ASSETS - REGIONAL GOV
 - HOW TO STRENGTHEN REGIONAL ASSETS - REGIONAL GOV
 - HOW TO STRENGTHEN REGIONAL ASSETS - REGIONAL GOV
- C) CITIES**
- SMART CITY - HOW TO STRENGTHEN REGIONAL ASSETS - REGIONAL GOV
 - SMART CITY - HOW TO STRENGTHEN REGIONAL ASSETS - REGIONAL GOV
 - SMART CITY - HOW TO STRENGTHEN REGIONAL ASSETS - REGIONAL GOV

- D) INFRASTRUCTURE**
- CRITICAL FACILITIES (WATER SUPPLY) - REGIONAL GOV
 - CRITICAL FACILITIES (WATER SUPPLY) - REGIONAL GOV
 - CRITICAL FACILITIES (WATER SUPPLY) - REGIONAL GOV

- 1) RISK EDUC. AS ASSET
- 2) LMI / RISK / EQUITY FINDING THE BALANCE
- 3) GETTING TO EMPOWERING COMMUNITIES
- 4) RINGS OF RESILIENCE
- 5) STRUCTURAL APPROACH TO HOLISTIC THINKING
- 6) SHARED SACRIFICE CITY/COUNTY URBAN / RURAL

- 1) FAILURE OF PUBLIC FUNDING VS NEED FOR P3
- 2) WHAT ARE MODES TO GET PUBLIC PRIVATE FUNDING ENGAGED
- 3) PRIVATE / PUBLIC UNTAPPED OPPORTUNITY
- 4) CARBON CAPTURE > GOOD EXAMPLE OF COMMUNITY AND GOOD BUSINESS
- 5) P3 DIALOGUE IS ONGOING NOW NEEDS TO ADVANCE TO IMPLEMENTATION

- 7) BALANCE COST W/ HIGHER REGULATIONS WITH AVAILABILITY / AFFORDABILITY
- 8) SHARED SACRIFICE W/ BLDG. OF SHARED VALUES
- 9) DETACHED LIFESTYLES BROUGHT TOGETHER BY DISASTERS
- 10) SCHOOL GR. INCLUDE ATTACH TO WHERE THEY LIVE
- 11)

- ### HURDLES TO FUNDING RESILIENCE
- o INEFFICIENCIES OF FED. PROGRAMS
 - o REACTIVE
- ### CRITICAL FACILITIES
- o How to prioritize /
 - o How to ^{with} consider probability of mother nature
 - o How to rank
- CONC. >
- o EST. P3

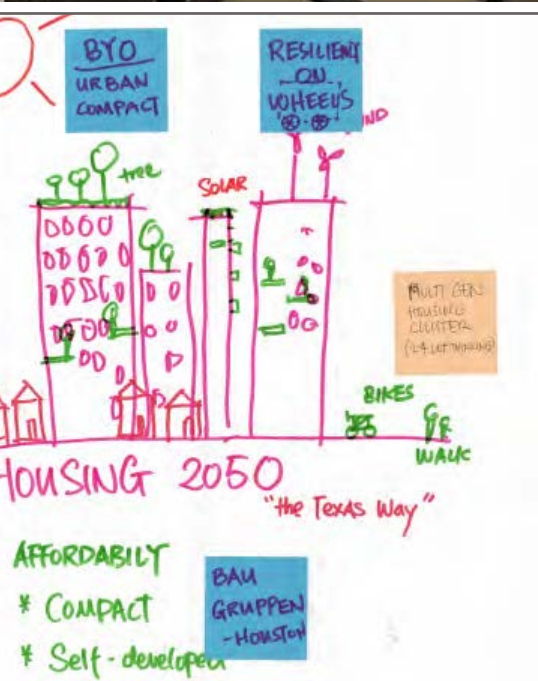
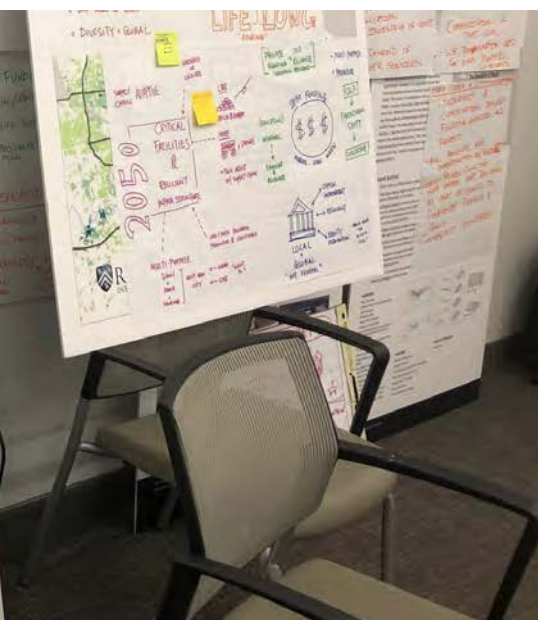
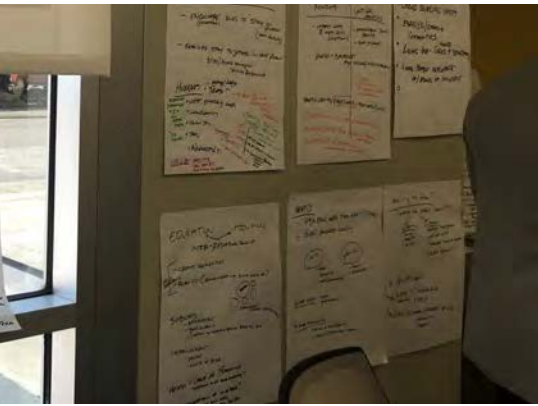
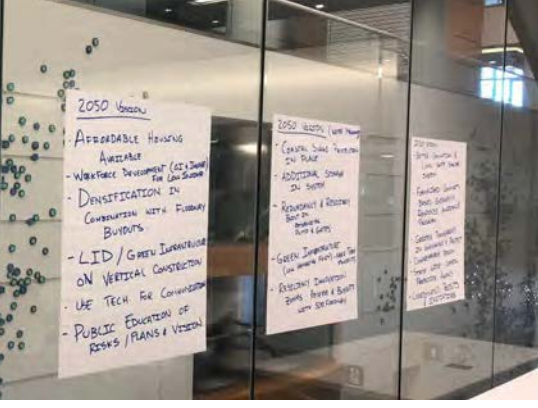
A complex diagram featuring several sticky notes and maps. Key elements include:

- 'PROACTIVE + NETWORKED' with a network diagram.
- 'HOUSING 2050' with a house icon and a map of the US.
- 'CROWD POWER REPRESENTATION' with stick figures.
- 'LEAD!' with a pink sticky note.
- 'NETWORK SUPPORT' with a pink sticky note.
- 'VISUAL & ACCESSIBLE POLICY' with a pink sticky note.
- Maps of the US and a city grid.
- Sticky notes with text like 'AGREEMENT', 'Compact', 'Self-development', 'Ownership / CO-HOUSING'.

A large diagram with 'VISION 2050' in a central box. To the right, it says 'CARBON NEUTRAL (ALT. ENERGY OF THE WORLD)'. Below this, it says 'FEDERAL DRIVEN GAS/ENERGY POLICY'. To the left, it lists:

- o URBAN GROWTH
- o SELF-DRIVING CARS
- o DIFF. MODE OF WORK
- o DIVERSITY + GLOBAL

- ### 2050
- SAFE / AFFORDABLE HOUSING
 - EST. SCHOOLS AT CIV. CENTERS
 - PROGRAM STUDENTS TO BE PROACTIVE
 - SCHOOLS CONNECTED TO COMMUNITIES AND SUSTAINABLE HOUSING STOCK



VISION INTO ACTION

Following the 2050 Visioning exercise, the dialogue shifted toward potential initiatives and projects to support those visions. Many exciting ideas were generated during the event, with five main projects emerging, primarily centered around infrastructure and education: a multi-functional tunnel system, a fleet of aqueous vehicles, a “lily pad” network, a regional recovery working group, and the creation of a City digital twin.

Marissa Aho, the City of Houston Chief Resilience Officer, shared the action plan template the city is using to gather recommendations for implementable ideas. Participants worked through the template with their ideas to vet out key partnerships, funding sources, and challenges around the implementation of the ideas.



NEXT STEPS:

One of the workshop goals was to connect practitioners and community stakeholders who might not otherwise have chances to interact. Each provided insight into their priorities and the challenges they face in creating a more resilient Houston. The dialogue and idea generation produced through the workshop was evidence of the success of these collaborations.

Participants were challenged to maintain these connections and continue the dialogue outside of the workshop. They were also encouraged to

engage in specific initiatives that will push forward a resilience strategy for Houston in a coordinated manner.

As we near the close of the Houston 2020 Visions initiative, a collaboration between AIA Houston and City Council Member David W. Robinson, FAIA, there are great opportunities to further engage in defining the future of Houston. Furthermore, Marissa Aho will continue leading the charge on behalf of the City of Houston to plan and define a resilience strategy.



**“Weave people,
ideas, and
action together.”**

SPECIAL THANKS:

Stantec would like to thank each of the participants for giving their time and sharing their perspectives in the Houston Resiliency Innovation Workshop. We would also like to recognize the effort and collaboration provided by Illya Azaroff around the organization of the event. A special thank you is due to City Council Member David W. Robinson for sharing thoughts and inspirations for the Houston 2020 Visions initiatives, and to Marissa Aho for contributing her insight into the strategy of the workshop.

MONA

James [unclear]

[Signature]



[Signature]

VISIT ONLINE TO LEARN MORE

To see more about the events of the **Houston Resiliency Innovation Workshop**, scan the QR code provided or visit the link below.

spotlight.stantec.com/houstonofthefuture



To find out more about the **Houston 2020 Visions initiative**, scan the QR code provided or visit the link below.

aiahouston.org/v/site-home/Houston-2020-Visions/42/



