



Continuum for Water- and Weather-Related Pre-Disaster Risk Mitigation “Greater Houston Global Water Resiliency Initiative”

Background on US Department of Commerce’s Economic Development Administration Grant Proposal

On May 2nd, a partnership among Houston-Galveston Area Council, AccelerateH2O, Houston Community College, University of Houston, The Cannon, and support from the Greater Houston Partnership, West Houston Association, City of Houston and Harris County submitted a Resiliency Grant Proposal to the US Department of Commerce’s Economic Development Administration. The following are highlights of the content, context, and coordinated approach.

Prior to and since Hurricane Harvey, several “After Action” Reports, Post-Disaster Exercises, and Lessons-Learned Briefings have been conducted throughout the Southwest US, Texas, and the Greater Houston region. Common themes have emerged on which our approach seeks to coordinate public sector elected-appointed officials, private sector executives, leading academic and workforce institutions, small businesses and Fortune 500 company representatives, chambers of commerce and civic organizations, and investment-procurement decision-makers towards converting previous findings and recommendations into actionable insights for implementation of mitigating long-term risk to business continuity, job creation, supply-chains, urban and rural economies.

Addressed herein, these themes are “**Reducing Gaps**” – more innovative technologies and best practices, training and skills, facilities and infrastructure, capital formation and “**Leveraging Opportunities**” – connecting disparate data and information into robust actionable insight across a broad spectrum of end-use, capacity building for small businesses-enterprise/non-urban communities, and unleashing entrepreneurial-inventor-innovator expertise with alternative resources for unique resilience-focused mitigation. Currently, the fragmented nature of a post-disaster eco-system requires highly-targeted projects resulting in immediate and sustainable confidence for employees, employers, industries, and economies.

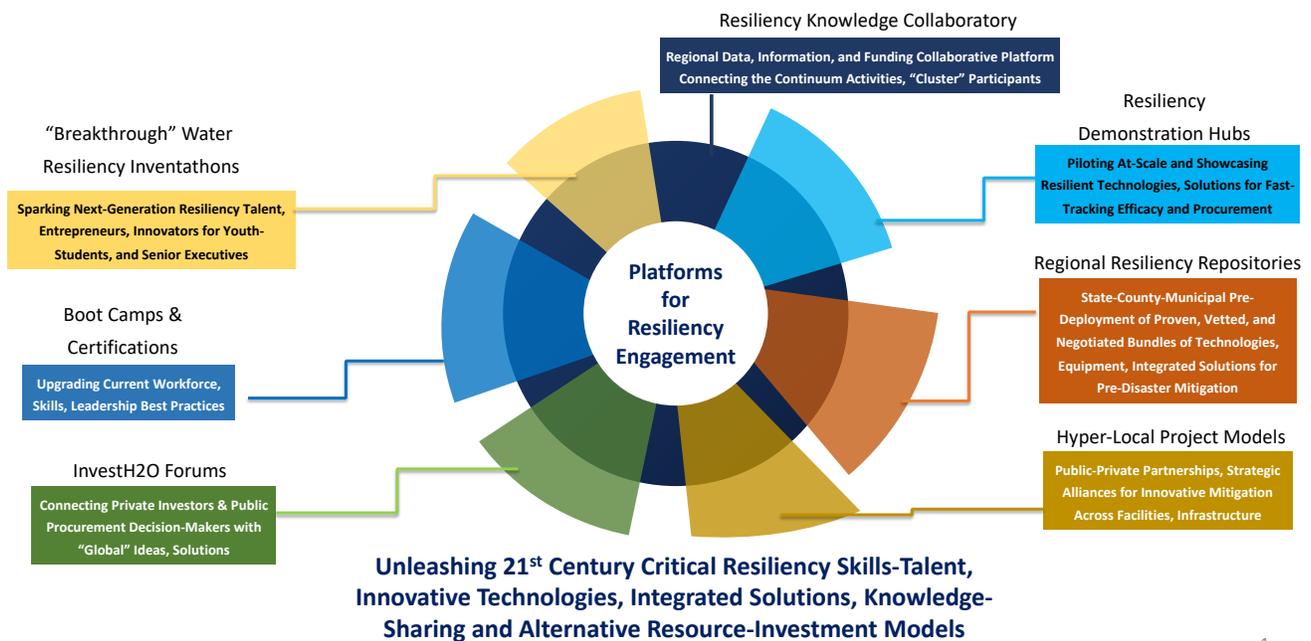
The cumulative losses of approximately \$500 billion to federal-state-local government AND private sector insurance-reinsurance companies requires a continuum of activities resulting in measurable performance through innovative technologies, integrated solutions, alternative investment resources, strengthened operational-facilities coordination, and certified skills and talent development.

The regional perspective of our strategy addresses that holistic approach to the realities of Hurricane Harvey and future water- and weather-related incidents (including recent spills, leaks, fires): preparedness and pre-disaster mitigation have shown a 1:4+ reduction in losses, versatility in employer-employee retention, and reduction in post-disaster rebuilding. Correspondingly, displaced employees, workforce, business owners, large-scale facilities and infrastructure operators has proven to cause negative economic consequences lasting well beyond the current approach to rebuilding. The strategy’s continuum-approach links sub-projects into a circular economic methodology, where each element is leveraged by the whole of the integrated programs, resulting in more efficient, effective and economic benefit.

Finally, the continuum approach specifically drives the linkages between pre-disaster risk mitigation and the immediate, near-, and long-term skills, workforce, job creation, and retention demands that resilient

communities and regions require to recover, rebuild. There are no resilient-worker – operators, managers, owners – certification programs that ensure the critical skills are aligned with minimizing losses to business continuity, valuation of key assets, and job stability. ***From first-responders to onsite preparedness managers, Texas could lead the Nation in THE most pre-disaster mitigated workforce, innovations, and facilities-infrastructure as suggested herein.***

Continuum of Regional Water-Related Resiliency & Mitigation Activities



Breakthrough Inventathons

AccelerateH2O, Houston Community College, University of Houston, and other local partners will conduct six two-day Inventathons with teams competing to develop breakthrough, innovative solutions to water and weather resiliency challenges. Three Inventathons will be organized for youth and student participants, and three for public and private professionals/decision-makers. AccelerateH2O will work with The Cannon (a regional incubator-accelerator program) to fast-track adoption by small businesses, corporate and public sector end-use. **Six hundred participants are targeted for invitation and team-building.**

Skills Development Boot Camps

H-GAC, Houston Community College, AccelerateH2O, and other local partners will conduct eight three-day immersion Resiliency Talent Development Boot Camps based on Texas Workforce Commission, Texas Commission on Environmental Quality, and Texas Water Development Board input for certification review. **Eight hundred participants are targeted – 50% new career populations, 50% existing career advancement** – leading to a job-creation ladder for public and private sector water resiliency careers and certification.

Resiliency Investor Forums

AccelerateH2O, in partnership with regional academic and non-academic commercialization programs as well as regional and national private investment interests, will conduct four (4) one-day technology, innovation, and growth-company Acceleration Workshops for urban and rural, multi-industry sector investment and procurement decision-makers. The workshops will provide the specific training, insights, and guidance for commercializing products, services, integrated packages of technical-engineered solutions into

immediate and near-term job-creation vehicles. The partners will also conduct four (4) two-day sub-regional InvestH2O Forums for project ideas to be presented to decision-makers and funders. **One thousand participants are targeted (400 for Acceleration Workshops, 800 for Forums)**

Resilient Demonstration Hubs

AccelerateH2O, local governments, chambers of commerce, and sub-regional economic development planning groups will conduct five '**Grand Challenge Call for Proposals**' for pilot projects throughout the region to demonstrate innovative technologies, integrated solutions, and best practices in water- and weather-related resiliency needs. A Regional Demonstration Hub Working Group of senior public and private representatives will develop economically-meaningful resiliency criteria for projects. Such Hubs provide at-scale, in-field, and on operational facilities-infrastructure opportunities to advance innovations into the supply chain. Further, the Hubs will attract international, global expansion and relocation by leveraging Greater Houston's extensive Consul General presence and foreign business offices.

Regional Resilience Repositories of Strategic Inventory

H-GAC, the Greater Houston Partnership, West Houston Association, City of Houston, Harris County, AccelerateH2O, and other local governments and regional industry sector organizations will leverage the current but disparate activities around supply-chain management into a **Regional Resiliency Repository Council to develop a regional-wide multi-use Pre-Disaster Supply Chain Road Map** and conduct initial assessments on highest, best use locations for creating sub-regional repositories through a new public-private partnership program. Focusing on the most water-, weather-related, and economically vulnerable locations, the Council will work with federal, state, local jurisdictions, and insurance and reinsurance companies to determine the most efficient, reimbursable cost-estimates and where applicable pre-negotiated emergency-purchase order process so as to align the repository program with rules, regulations, and practices.

Hyper-Local Projects

Houston Community College, University of Houston, AccelerateH2O in collaboration with Greater Houston Partnership, West Houston Association, other local governments and H-GAC will conduct program design for translational research commercialization, training, technology adoption, through an 'integrated systems' approach around two **Resiliency Centers of Excellence** on the east and west sides of the region. Through the **Resiliency Collaboratory Forums described below**, partners will define three to five projects, including defining the purpose, end-use impact, operational engagement, and economic-financial business plans. AccelerateH2O, with previously mentioned partners, will support the initial 3-5 initial project efforts through a series of workshops designed to spur connection with alternative investment strategies and new non-federal financial models, and coordinate with the outcomes of other elements of this project.

Regional Resilience Collaboration

H-GAC will conduct a series of strategic **Resiliency Collaboratory Forums** with governmental and business representatives in each of the region's major river basins to prioritize and fast track local resiliency projects throughout the region. These forums will provide a basis for matching the innovations and regional project initiatives with local needs and establish successful pilot projects across the region. H-GAC will provide technical assistance and track progress of these pilot initiatives, as well as other implementation efforts and will make this information available to a broad array of decision-makers through an easily accessible web portal.

Performance, Impact and Results: As a result of the sub-projects described herein, the following job creation and private-alternative investment resources have been aligned to immediate and near-term implementation and performance:

- **Breakthrough Inventathons:**
20 technologies commercialized into early-stage companies with a minimum of seven (7) initial-year employees: 140 direct jobs, 220 indirect jobs; initial investment from alternative resources including strategic partnerships: \$2.8 million
- **Boot-Camps:**
From 600 participants: New Hires – 120 with average salaries of \$42,000, resulting in \$5.04 Million in new annual payroll; Increase in Expertise/Increase in Salaries: 300 with additional average salary “bump” of \$20,000, resulting in \$6.0 million in additional annual payroll;
- **InvestH2O Workshops & Forums:**
50 technologies, integrated solutions (including both early and growth-stage companies) receiving average investment or strategic partnership resources of \$250,000 resulting in alternative capital of \$12.5 million; 50 companies with expanded job creation of 3 per average resulting in 150 new hires and additional annual payroll of \$2.0 million based
- **Regional Resiliency Repositories:**
5 sub-regional locations with non-project financing (including other public and private sector co-investment) per location of FY \$175,000 and required equipment-technology acquisition-lease of \$500,000 per location resulting in \$3.375 for all repositories; New Hires per location of 3 direct and 8 indirect, resulting in 55 new jobs created with an average salary of \$72,500 resulting in new annual payroll of \$3.98 million
- **Hyper-Regional Projects:**
3 new resiliency projects with average investment per project of \$450,000 resulting in \$1.35 million of alternative investment; direct job creation of 6 per project 54 and indirect of 11 per project resulting in 198 additional hires with an average payroll of \$72,500 or additional annual payroll of \$18 million
- **Estimated Total Impact:**
 - Direct and Indirect Job Creation: 883
 - Payrolls (Direct and Indirect including Increased Salaries for Existing Positions): \$37.82 million
 - Investment and Alternative Resources: \$17.225 million

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