

Smart Cities & Resilience

before the

National Association of State Energy Officials

Steve Crout

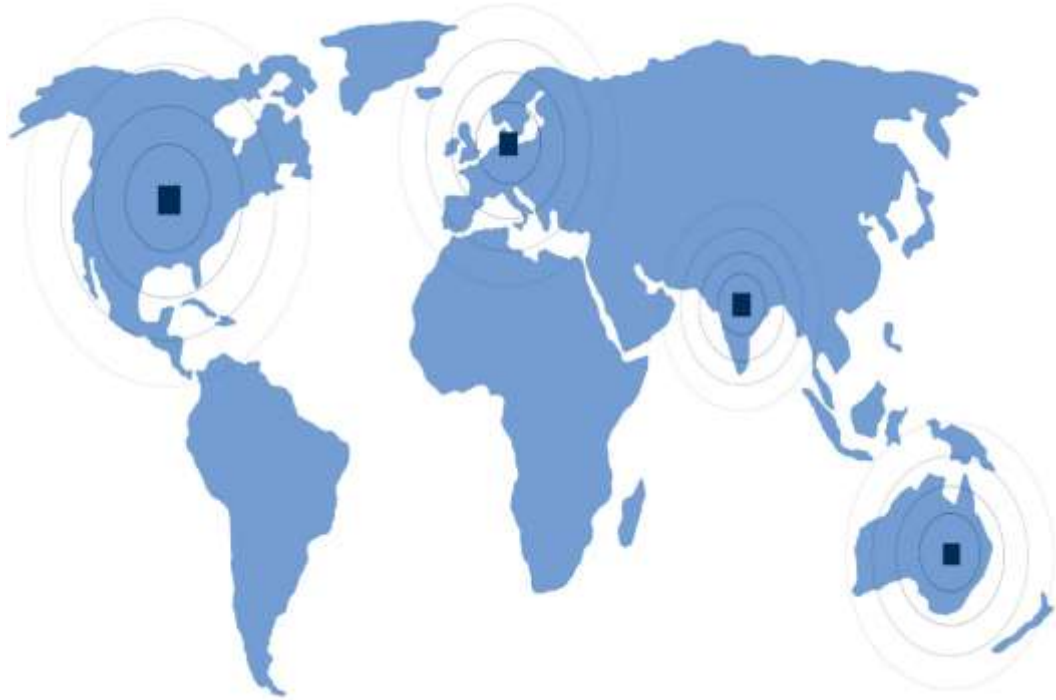
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Smart**Cities**Council

LIVABILITY | WORKABILITY | SUSTAINABILITY



Founded in 2012

Global Coalition

Joining forces to accelerate progress by advising and educating cities

120+ member and advisor organizations employing...

- **1.5 million+** people generating...
- **\$2.7 trillion+** in annual revenues that have worked on...
- **10,000+** smart city projects past and present

Cities represent...

1%



Surface

55% Now
68% 2050



Population

75%



Energy Use

80%



Greenhouse Gases

What is a “Smart City”

*A city that **uses** information and communications technology (ICT) to enhance its livability, workability and sustainability.”*

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Livability

Clean, healthy living conditions

No pollution and congestion

Digital infrastructure

Easy access to city services anytime, anywhere

Workability

Enabling digital infrastructure

Energy, Connectivity, Computing

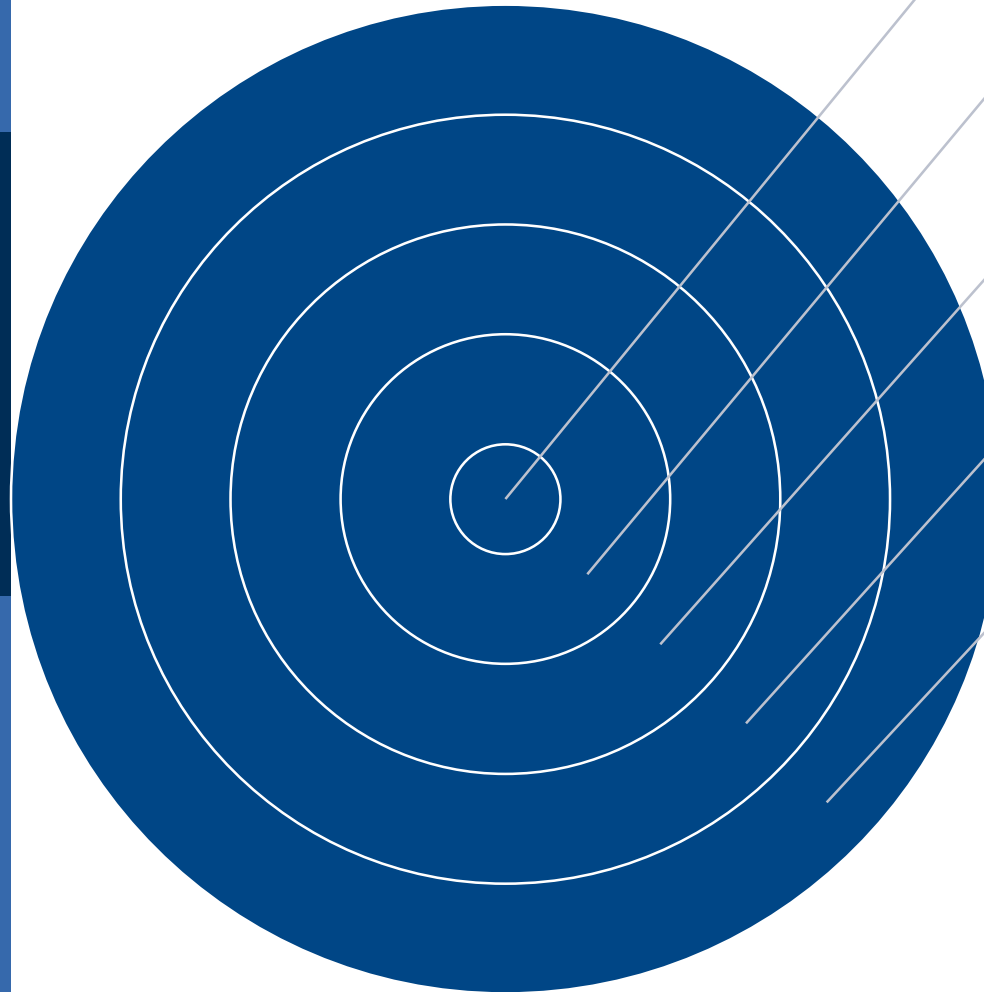
Easy access to essential city services

Sustainability

Cities that provide for the needs of future generations

What Cities Want

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**Livability,
Workability,
Sustainability**

Certainty

**Interoperability,
Open Standards,
Cybersecurity &
Privacy**

**Public, Private,
Partnerships**

**Trusted
Technology
Advisors**

Solution Providers “Challenges”

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Challenges

- Leadership – Decision Makers
- Limited Technical Resources
- Fragmented market – Jurisdictional Boundaries
- Highly regulated market – Local Ordinances
- Bureaucratic Silos
- Funding Limitations

5G Game Changer?

Applications:

Industrial IoT, Autonomous Vehicles, Health IT, Drones, Smart transportation, power, water systems, AR and VR

Multi-gigabit speeds

10x faster than LTE

Very low latency

Response time delay

More efficient M2M

10+ years of battery life

Reliable secure network

Mission critical services

Greater coverage shared spectrum

High Efficiency

Blockchain A Disruptor?

Time-stamped and encrypted
transactions

Blockchain For Smart Cities 12 Possible Use Cases



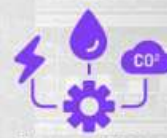
Universal
ID Cards



Prioritizing
Local
Commerce



Land, Property
& Housing
Management



Energy, Water
& Pollution
Management



Improving
Public
Transit



Interoperability
For Smart Devices



Security For
IoT Devices



Rewarding
Citizenship



Urban
Planning



Departmental
Transparency



Universal Data
Storage Platforms

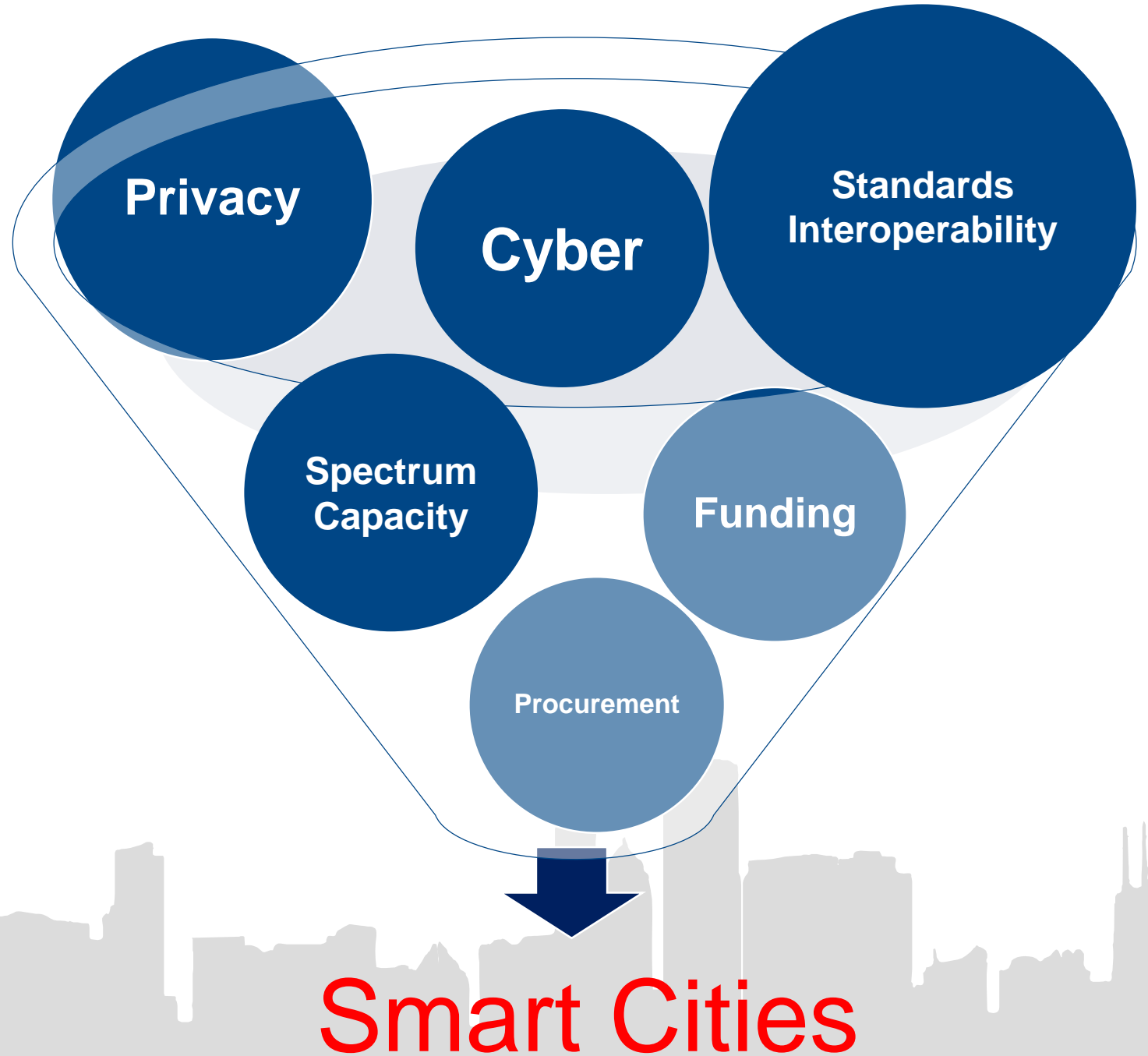


Keyless Signature
Interface

DISRUPTOR DAILY

Blockchain For Smart Cities

Policy Issues



Federal Legislation

**Senate IoT
Resolution**

**House IoT
Resolution**

The Digit Act

**LIFT America Act
Smart
Technologies
Infrastructure
Provisions**

**The Smart Cities and
Communities Act**

The Street Act

The Moving First Act

Federal Legislation

The Smart Cities and Communities Act

- Crosscutting Smart Cities Federal Program Guide
- Procurement Policy Survey
- Smart Cities Standards and Interoperability Review
- Smart Cities Regional Demonstration Grant Funding
- Workforce Training Program
- Review of Privacy and Cybersecurity

Smart Cities Projects

Advanced Metering Infrastructure

The Business Council
for Sustainable
Energy®

GRIDWISE ALLIANCE

READINESS FOR RESILIENCE:
Clean Energy Solution Case Studies

Advanced Metering Infrastructure Helps Hasten Power Recovery

Investments in grid modernization technologies such as advanced metering infrastructure helped utilities restore power in the aftermath of Hurricane Hurricanes Harvey and Irma in 2017.

Locations: Texas and Florida

- After Hurricane Harvey, CenterPoint Energy brought its customers online faster with advanced metering infrastructure technology, **saving an estimated 45 million outage minutes.**
- Within 48 hours of Hurricane Irma, Florida Power & Light had restored power **to 2.7 million customers**, and in just over a week, **all 4.4 million of its customers** were back online – the fastest large-scale restoration in history.

For more information: <https://gridwise.org>.



Smart Cities Projects

Greater Cincinnati Water &
Wastewater



Sensors

Connectivity

Analytics

- Edge Processing

Smart Cities Projects

Link NYC

LinkNYC

- Secure Gigabit Wi-Fi
- Advertising Revenue
- Charging Stations



Readiness for Resilience Program

Helping Communities Impacted by Natural Disaster Deploy Smart Technology to Enhance Resilience

Sponsored by: **Qualcomm**

READINESS FOR RESILIENCE

A Resilient Technology Roadmap for Puerto Rico

With Partners:   



Sponsored by: **Qualcomm**

READINESS FOR RESILIENCE

A Resilient Technology Roadmap for Rebuilding Texas

With Partners:   



“Readiness for Resilience”

A Technology Neutral
Trusted Advisor Forum for
Resilience Stakeholders

Qualcomm Sponsored Partnership:

- National Association of State Energy Officials
- Smart Cities Council
- Business Council for Sustainable Energy

With Local Partners:

- Government of Puerto Rico/Texas A&M AgriLife

Three Phased Program:

- 1) Discovery phase -- learn of local rebuilding needs
- 2) Resilience Roadmap -- pairing technology best practices/solutions & community needs
- 3) Pairing – Roadmap/P3s/Funding

****GOAL TO FUND PROJECTS****

Puerto Rico Discovery Workshop Action Areas

Stakeholders Discuss Priorities



Housing: Smart technologies and project design to make housing safer, more resilient and more affordable for residents.

Communications and IT: Affordable, high-speed internet, reliable and redundant communications infrastructure to support economic, social and public safety sectors.

Energy: Smart city technologies and processes to enable distributed and renewable energy projects to build greater infrastructure resilience and economic opportunities.

Transportation: Road/bridge repair and design standards to improve the mobility of people, goods and service providers.

Texas Discovery Workshop Action Areas

Stakeholders Discuss Priorities



Public Safety: Smart technologies to communicate with public, keep people safe, reduce emergency response times.

Energy: Improve energy resilience with smart city technologies and processes to build greater infrastructure resilience and co-benefits.

Telecom and IT: Smart technologies and design principles for more connected, citizen-centered, affordable and resilient services.

Transportation and Mobility: Mobility solutions, technologies and standards to create a more intelligent, resilient and sustainable transportation system.

Activity 1: Resilience Priority Identification

Identify 2- 3 projects that offer the biggest potential for increased resilience

FOCUS AREA:

Resilience Challenges Faced with Harvey	Biggest Community Needs for Recovery & Resilience	Potential Reconstruction Projects to Meet Needs (full list)	Prioritized Projects (why a priority: e.g. biggest impact, quick win)	Key Project Stakeholders
Flooding Winds Debris Evacuation	Preparedness Communication Energy	See Recommendations		Government Industry Non-profit Academia

Activity 2: Technology Solutions & Best Practices

Focus Area:

Priority Resilience Project(s)	“Smart” Technology/Best Practices (ways innovative tech can add value)	Potential Benefits Above and Beyond a Traditional Solution	Potential Collaboration Opportunities	Potential Process Innovations (new business models, legislation, etc.)	Critical Success Factors (to factor into guidelines)

Puerto Rico Telecom & IT

Projects and Technology Best Practices

Project C-1: Regional Telecom Hubs – National Guard

- A communications system with several layers — radio, wireless, fiber optic, satellite — that operate in parallel, which should be available to all agencies.
- Mobile units can be shared across regions and agencies and directed to where they are needed the most.
- Low bandwidth open source community messaging

Project C-2: Local Telecom Planning and Response Training

- Municipal involvement and education
- Annual drill awareness activities
- Municipal/State training on emerging comms
- Public awareness campaign

Project C-3: Resilient communications infrastructure

- Hardening/expanding infrastructure, creating more redundancy.
- Use diverse networks to create redundancy, including cellular, satellite, mesh and Wi-Fi.
- Consider buried fiber lines in areas more impacted by wind.

Public Safety

Projects and Technology Best Practices

Project PS-1: “Match.com”-style resilience tool:

- Integrated resilience tool for public to access people, processes, systems and data they need to assist with preparedness, response & recovery (*Houston-Galveston and Coastal Bend*)

Project PS-1B: Proactive debris removal planning:

- Resilience planning tool could help community members and emergency responders understand rights of way, identify all the options for where to put debris and get MoU’s in place in advance.
- Consider options for handling debris (what can be salvaged, mulched, used for waste-to-energy, etc.), and provide safety guidelines. (*Coastal Bend*)

Project PS-4: Volunteer Rescue Network:

- Extending public safety response through a system of volunteers using “ride-sharing” technology.
- This could include offering evacuation car-pooling, connecting volunteer expertise with special populations, matching people in need to volunteers offering food and shelter, matching pets and temporary foster homes, etc. (*Houston-Galveston and Southeast TX*)

Energy/Utilities

Projects and Technology Best Practices

Project EU-1: Localized infrastructure monitoring:

- Improve monitoring of underground/above ground utility infrastructure at the connection level to provide household service visibility to expedite recovery.
- Piggyback on IoT technologies, sensors, fiber optic infrastructure and sensing technology, pipeline sensors, individual household gas metering, CCTV.

Project EU-2: Municipal Microgrids:

- Examine feasibility of deploying microgrids that enable critical community assets to continue operating during power outages or disruptions; i.e. campuses, police headquarters, shelters, or communications centers, others.

Project EU-3: Smart Metering, Smart Grid, and Energy Efficiency:

- Better manage power outages, reduce financial losses, and shorten outage time by installing smart grid technologies and systems.
- Distribution automation devices (smart switches) sensors, advanced metering infrastructure, energy storage, drones.

Project + Puerto Rico Plan + Technology Enablers

“Smart for Resilience” Projects	An Economic and Disaster Recovery Plan for Puerto Rico Capital Investments – Strategic Initiatives															Technology Enablers			
	Energy	Communications & IT	Water	Transportation	Housing	Public Buildings	Education	Health & Well Being	Natural Environment	Ocean Economy	Visitor Economy	Emergency Services	Agricultural Transformation	Digital Transformation	21 st Century Workforce	Entrepreneurship	Advanced Manufacturing	Computing <ul style="list-style-type: none"> Analytics AI/AR Blockchain Cloud Dashboards Data Platform Digital Services Location/GIS Networking Privacy/Security Interoperability 	Connectivity <ul style="list-style-type: none"> Cellular WiFi RF Mesh LPWAN/LoRa WAN Other
Project C-1: Regional Telecom Hubs	●	●	●	●			●				●		●	●			<ul style="list-style-type: none"> Analytics AI/AR Blockchain Cloud Dashboards Data Platform Digital Services Location/GIS Networking Privacy/Security Interoperability 	<ul style="list-style-type: none"> Cellular WiFi RF Mesh LPWAN/LoRa WAN Satellite Other 	<ul style="list-style-type: none"> Controls Sensors
Project C-2: Local Telecom Planning and Response Training	●	●		●			●	●			●		●	●			<ul style="list-style-type: none"> Analytics Dashboards Data Platform Mobile App 	<ul style="list-style-type: none"> Cellular WiFi RF Mesh LPWAN/LoRa WAN Satellite 	<ul style="list-style-type: none"> Controls Sensors

Project + County + Resilience + Texas Report

Smart Resilience Project	County			Resilience Focus			Relevant Governor's Commission Report Recommendations (Chapter #, Recommendation #)
	Harris	Orange	Aransas	Prepare	Respond	Recover/Revitalize	
PS-1: Match.com-style resilience tool	●		●	●	●	●	6-9: Create recovery task force to provide specialized assistance to communities and individuals to speed local level recovery. 8-16: Examine ways to better inform public about how to prepare for and survive a disaster.
PS-1A: Localized damage prediction			●	●			8-4: Strengthen quality and sharing of data used in emergency management operations.
PS-1B: Proactive debris removal planning			●	●	●	●	6-1: Catastrophic debris management plan and model guide 6-2: Improve contracting for debris removal 6-3: Study issues surrounding removal of "wet" debris
PS-1C: Evacuation scenario planning		●		●	●		6-18: Grant TxDOT authority to pre-purchase and stockpile food and water for each hurricane season
PS-2: Smart, resilient buildings	●		●	●		●	6-7: Improve oversight, accountability and availability of individuals in building trades offering services to disaster survivors.
PS-3: Affordable housing	●				●	●	6-19: Study and recommend ways to resolve restrictions impeding debris removal or trailer placement for short-term disaster housing.
PS-4: Volunteer rescue network activation	●	●		●	●		8-2: Review current training courses to strengthen training for recovery operations for state and local emergency management personnel.

Activity 1: Public Private Partnership Principles

For each project identified, fill in the 3P Principles outlined below.

FOCUS AREA:

Project	Create a Shared Vision	Identify Key Stakeholders and Partners	Outline Risks and Rewards for all Partners	Determine Institutional Roles, Responsibilities	Identify Investment, Funding Options	Prioritize Investment Based on Value	Ensure Political, Regulatory Support	Communicate Public Benefit

Activity 2: Match Projects/Funding Streams/Assistance

Focus Area:

Project	Identify Federal Funding Streams	Identify Additional Federal Assistance Programs	Identify State and Local Funding Streams	Identify Additional State and Local Assistance	Match Projects with Federal, State and Local Funding Streams	Match Projects with Federal, State and Local Assistance	Match Potential PPP Contribution to Each Project	Compile Project Federal State & Local Funding & Assistance



Online Collaboration Tool

Activator Discover

- Powerful input tools to capture the needed data
- Instant access to best practices

Activator Plan

- Collaborative tools for multi-stakeholder planning
- Templates from leading experts

Activator Exchange








- Trade lessons learned with peer cities

Activator Finance (coming soon)

- Rocket Mortgage for cities – fill in one form, get introductions to multiple lenders

Find Resiliency Projects in Smart Cities Activator



<p>▼ SMART SIGNAGE</p> <p>In addition to strategically placing signage and incorporating real-time data to improve signage along evacuation routes, a smart system would use real-time triggers, such as roadway water-level sensors, to adjust signage, suggest reroutes and automate road closure gates (Houston-Galveston and Southeast TX)</p>	<p> TEXAS</p>	<p> UNITED STATES - (TEXAS) </p>
<p>▼ MUNICIPAL MICRO-GRID</p> <p>Establish public-private partnerships to examine the feasibility of municipal microgrids that enable critical community assets to continue operating event during power outages or disruptions. • Each community may wish to target specific campuses or infrastructure (such as police headquarters, shelters, or communications centers, among many others) depending on their individual assessments of disaster vulnerabilities and highimpact response strategies. • Examine funding solutions, such as direct grants and utility rate-basing and coinvestment, or innovative financing structures such as Microgrid-as-a-Service agreements (as used in Montgomery County, Maryland).</p>	<p> TEXAS</p>	<p> UNITED STATES - (TEXAS) </p>
<p>▼ LOCALIZED DAMAGE PREDICTION</p> <p>Integrate past and live storm data (sea level rise, storm surge, pressure, wind etc.) with local infrastructure data (building age/ location etc.) and GIS and aerial/drone imagery. Use algorithms to predict damage at a highly localized level to better inform risk, evacuation needs, building codes and upgrades (Coastal Bend).</p>	<p> TEXAS</p>	<p> UNITED STATES - (TEXAS) </p>
<p>▼ SMART RESILIENT BUILDINGS</p> <p>Improving the resilience of homes and other buildings to natural disasters (Houston-Galveston and Coastal Bend): • Combining general building/ disaster risk assessment data with real-time sensor data to understand structural and performance risk – using moisture, vibration, environmental and other sensors. • Improving access to resilient, sustainable material and repair guidelines through a web portal / mobile app from FEMA/HUD – including guidelines for repairs, permits, reputable contractors, and funding sources. • Providing recognition, such as Smart Home America “Fortified Wise”, and incentives, such as insurance company and low-income household incentives, to get people to participate. • Streamlining procedural and funding issues – it’s currently a long process to get approval to take down dilapidated buildings and there’s a lack of funding.</p>	<p> TEXAS</p>	<p> UNITED STATES - (TEXAS) </p>
<p>▼ CORAL GABLES - RESILIENCE - RESILIENT ENERGY SYSTEM (RES) WITH SMART MICROGRID AND SOLAR/WIND ENERGY SOURCES</p>	<p> CITY OF CORAL GABLES</p>	<p> UNITED STATES - (FLORIDA) </p> <p> Select Language ▼</p>

Next Steps

Readiness for Resilience
Program

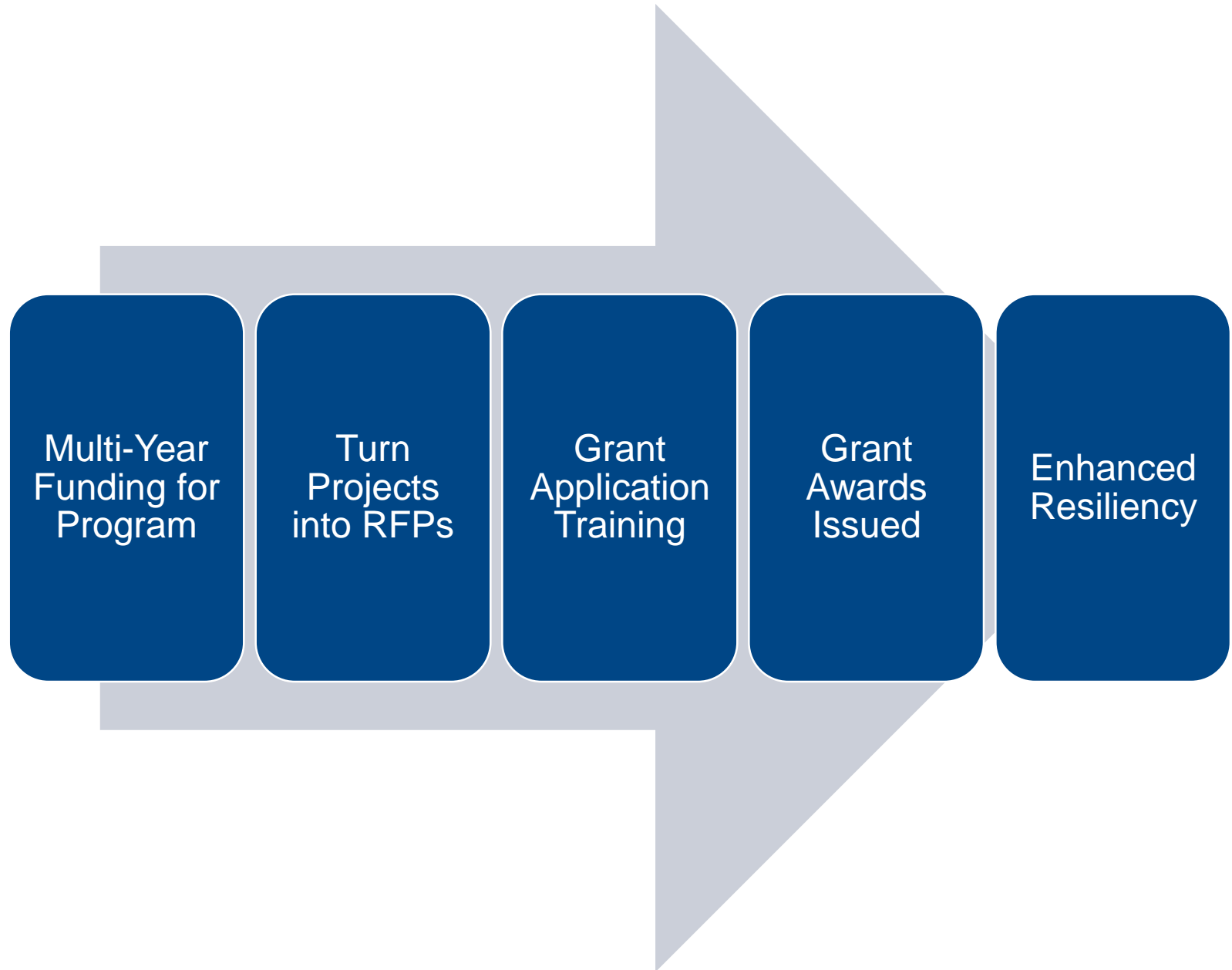
Multi-Year
Funding for
Program

Turn
Projects
into RFPs

Grant
Application
Training

Grant
Awards
Issued

Enhanced
Resiliency



Call to Action

Champion Sponsors
Needed!



READINESS FOR RESILIENCE CHAMPION

Steve Crout

**Director, Policy and Resilience
Program,**

Smart Cities Council

Thank You!

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