

# Considerations for Public Safety in Smart & Connected Communities

Michael Dunaway, PhD

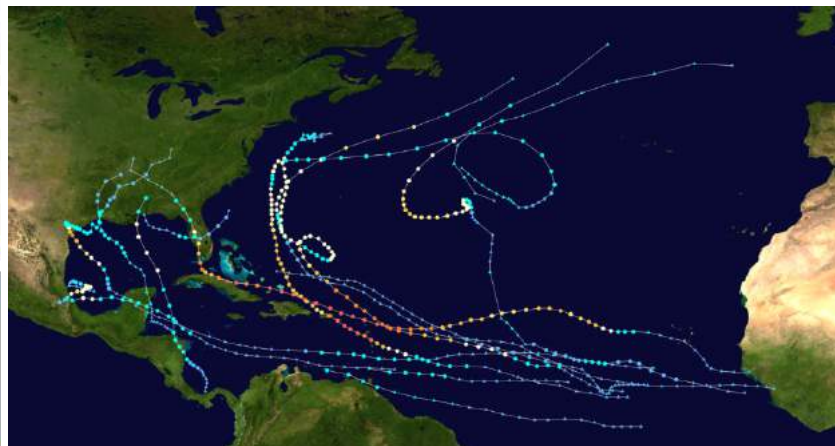
Informatics Research Institute  
University of Louisiana at Lafayette



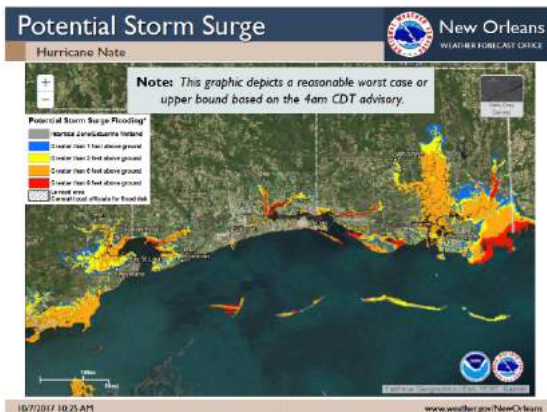
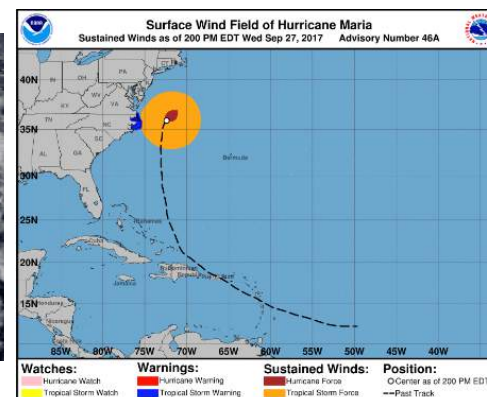
# 2017 Hurricane Season



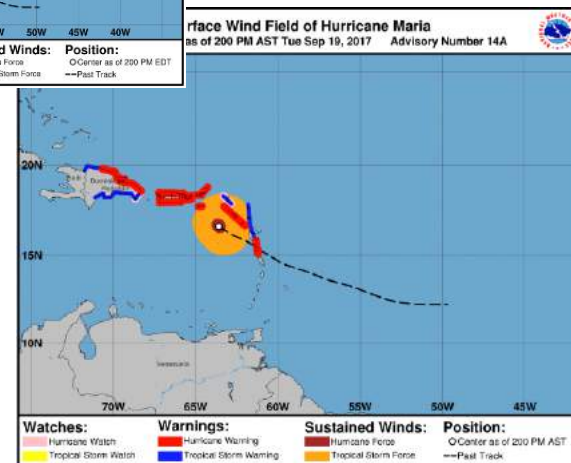
**Hurricane Harvey**  
24-28 August



**Hurricane Irma**  
5-10 September  
(+ Jose + Katia)



**Hurricane Nate** 4-8 October



**Hurricane Maria** 18-24 September





<http://www.cnn.com/2017/10/05/us/las-vegas-shooting-investigation/index.html>



<http://www.mercurynews.com/2017/10/09/maps-napa-wildfire-santa-rosa-evacuation-area/>



## A Chinese space station is falling to Earth next year — but it's the last thing to worry about

The odds are in your favor  
By Lauren Graham | Bloomberg | Dec 31, 2017, 1:00pm EST

Facebook Twitter LinkedIn



<https://www.theverge.com/2017/12/31/16830890/chinese-space-station-tiangong-1-debris-falling-to-earth>



[https://media4.s-nbcnews.com/i/newscoms/2018\\_02/2290396/180111](https://media4.s-nbcnews.com/i/newscoms/2018_02/2290396/180111)



Stranded travelers rested at baggage check-in. More than 1,350 departing or arriving flights were canceled. Photo courtesy of The New York Times



Photos: Amtrak train derailed over interstate

<http://www.cnn.com/2017/12/20/us/amtrak-derailment-washington/index.html>

**News Release**  
Follow us on Twitter, @georgiapower



## Power restored for all essential activities at Hartsfield-Jackson International Airport

ATLANTA – Dec. 17, 2017 – Georgia Power and Hartsfield-Jackson International Airport personnel have worked throughout the day today to restore power at the Airport as quickly and safely as possible. As of 11:45 p.m., power had been restored for all essential airport activities including all concourses and flight operations.

# How to think about our current challenges



## Natural Environment

Geography / Terrain

Climate / Weather

Biosphere

# How to think about our current challenges



## Built Environment

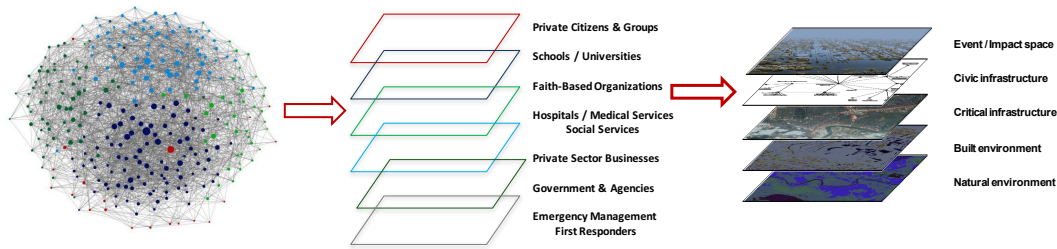
Cities / Infrastructure  
Engineered Systems  
Transportation



## Natural Environment

Geography / Terrain  
Climate / Weather  
Biosphere

# How to think about our current challenges



**Social Environment**  
Communities / Organizations  
Social & Economic Activities  
Communication



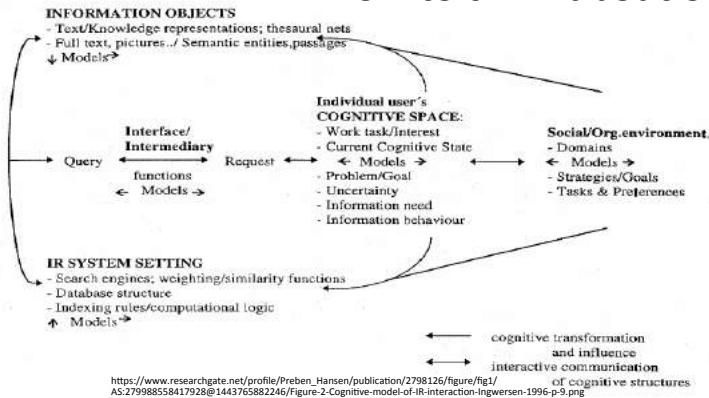
**Built Environment**  
Cities / Infrastructure  
Engineered Systems  
Transportation



**Natural Environment**  
Geography / Terrain  
Climate / Weather  
Biosphere



# How to think about our current challenges

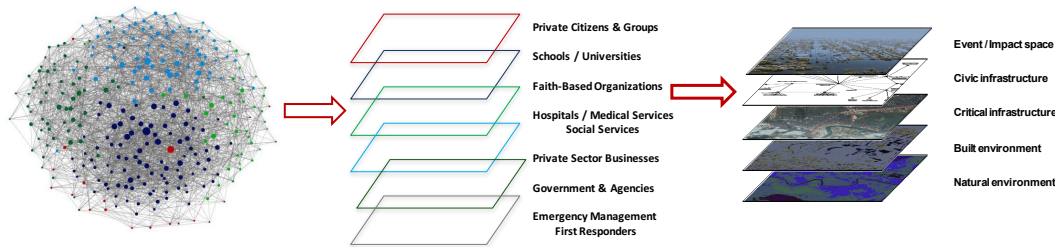


## Cognitive / Information Ecosystem

Model / Understand Environments

Interact with Features

Manage Relationships



## Social Environment

Communities / Organizations

Social & Economic Activities

Communication



## Built Environment

Cities / Infrastructure

Engineered Systems

Transportation



## Natural Environment

Geography / Terrain

Climate / Weather

Biosphere

# Simulation of the August 2016 Historic Flood Event: Sample Results

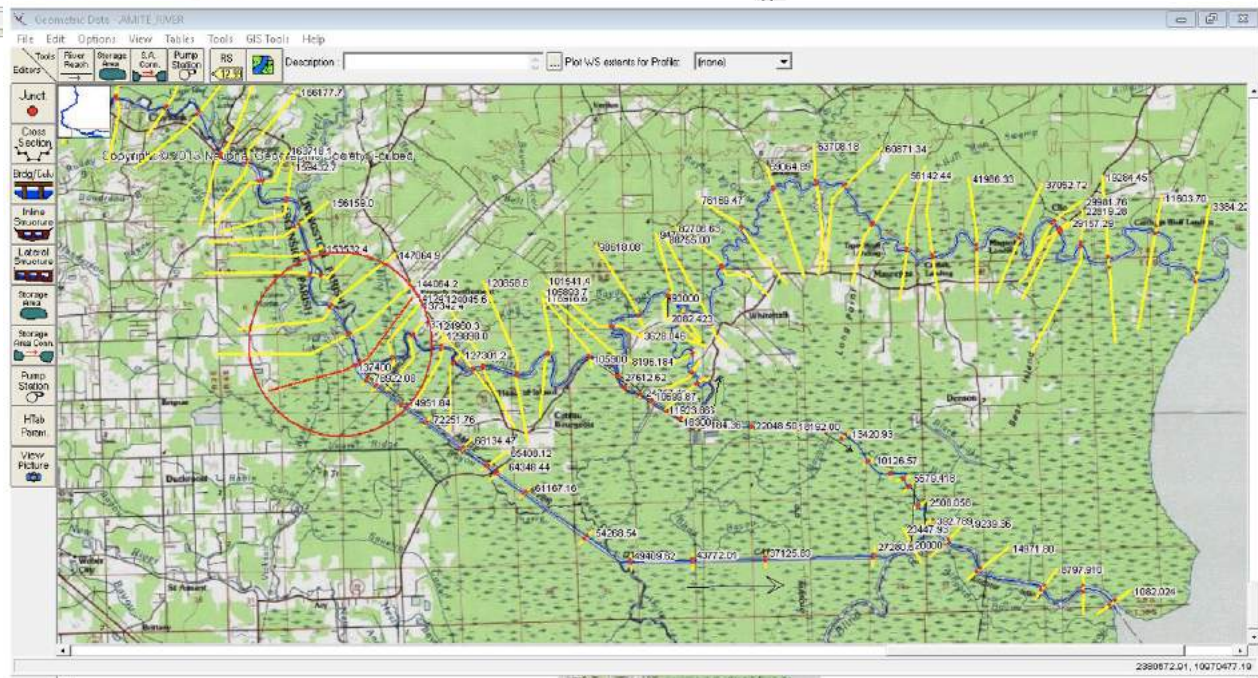
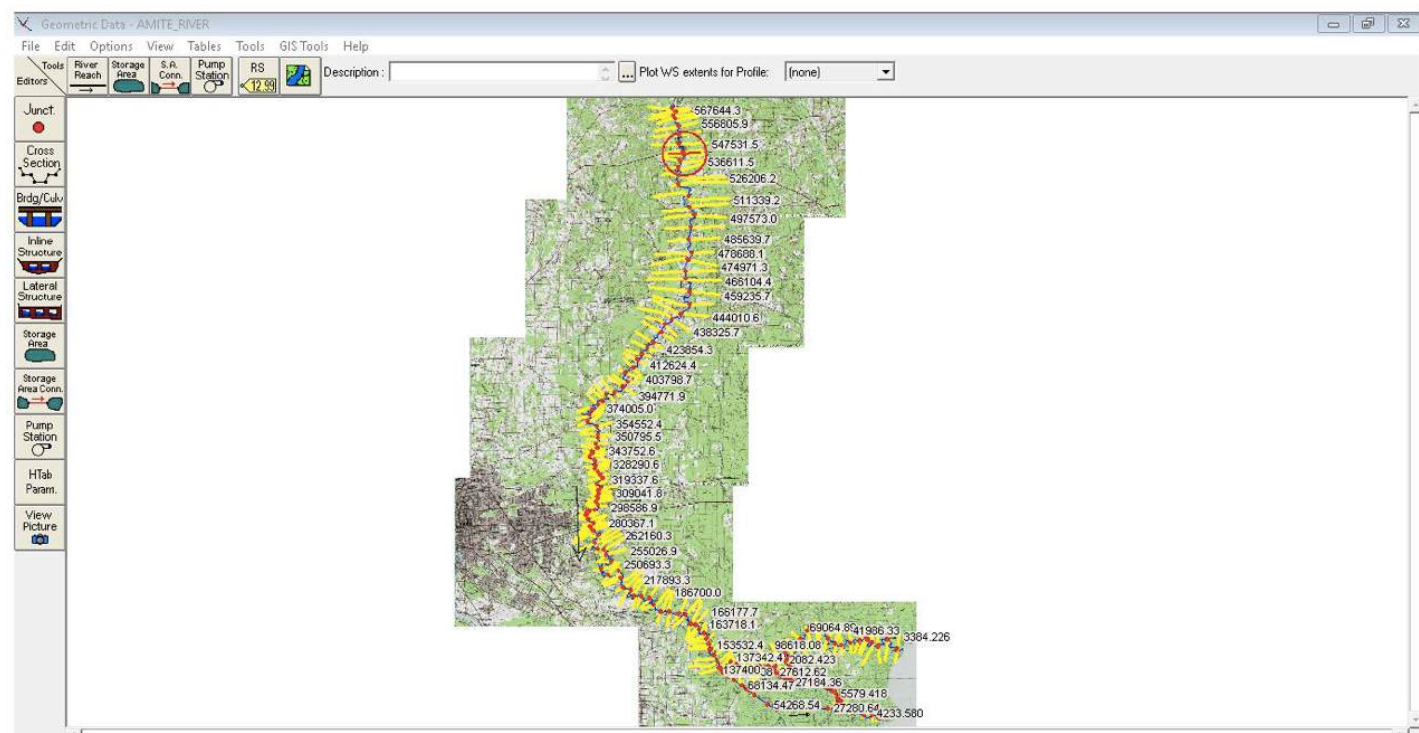
1-D Model along the Amite River & 2-D Model for the  
lower region of the system

Emad Habib, PhD, PE  
Professor and Endowed Chair, Department of Civil Engineering  
Associate Director, Institute for Coastal and Water Research  
*University of Louisiana at Lafayette*

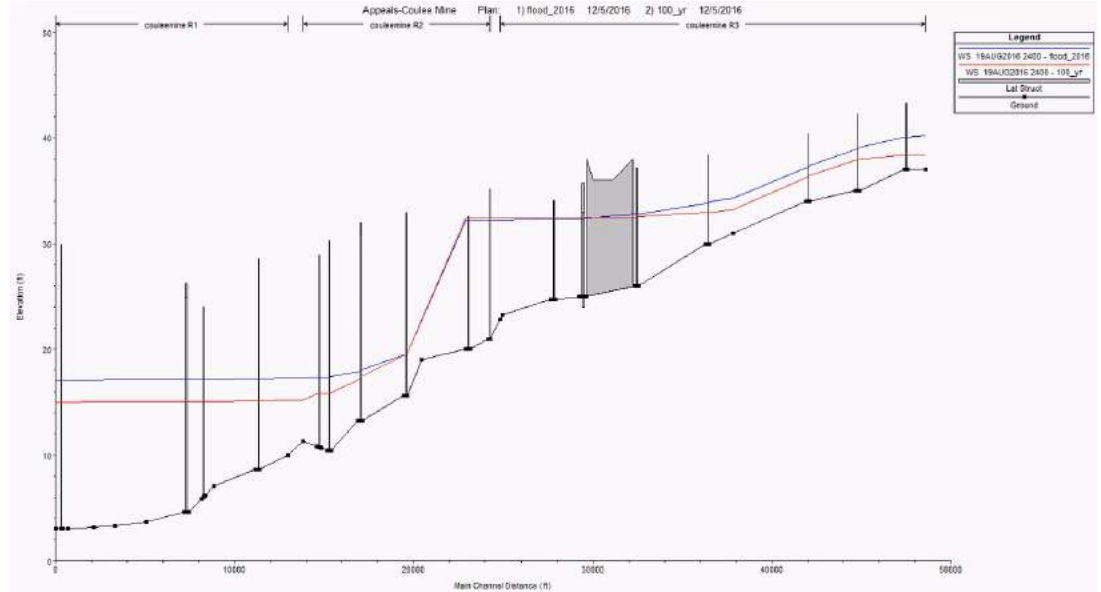
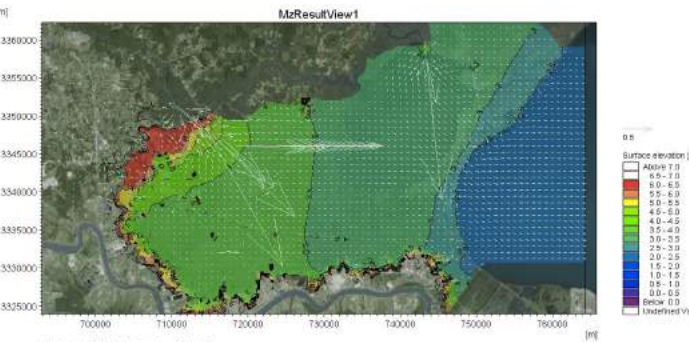
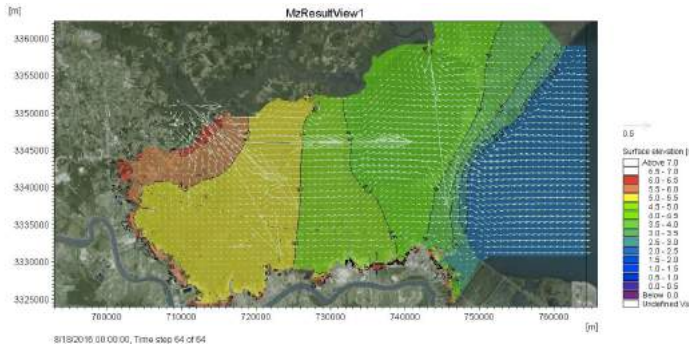
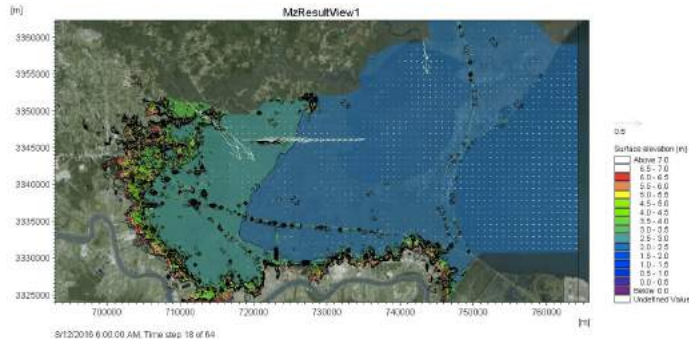
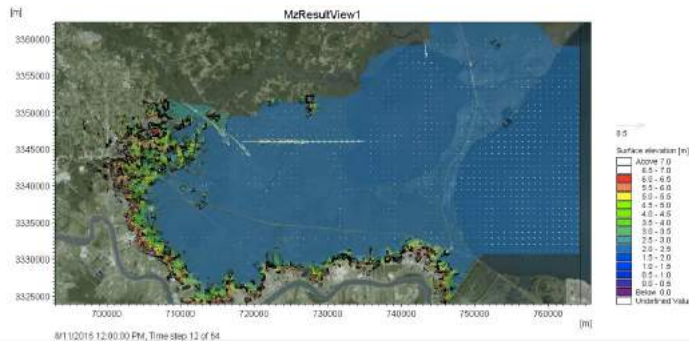


*"Research for a Reason"*

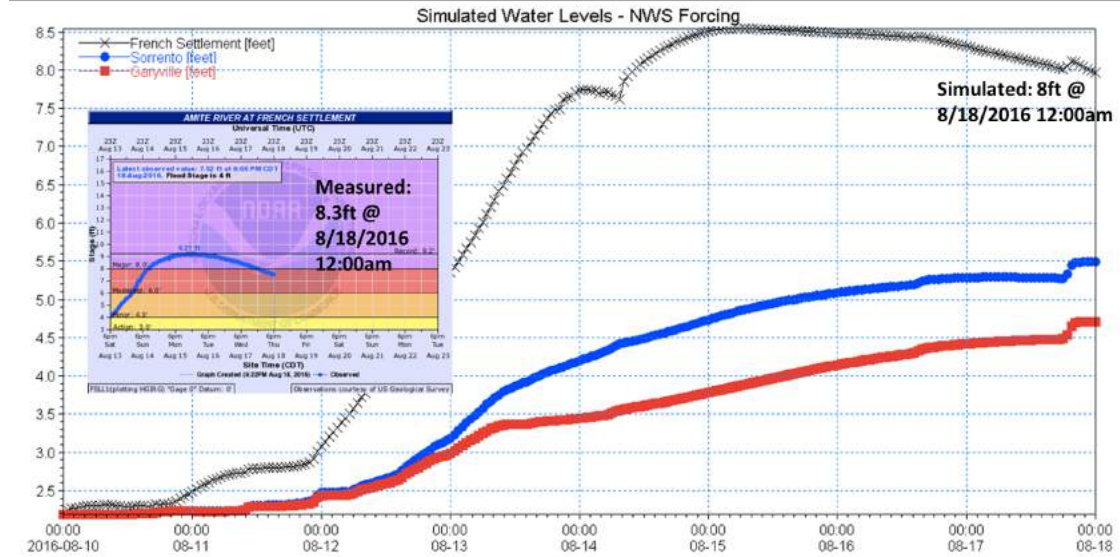




# Water Surface Elevation along the Main Channel



## Preliminary validation for the 2-D model





# Cybersecurity Risks of Electric Vehicle Charging

Raju Gottumukkala, Ph.D

Director of Research, Informatics Research Institute

Site Director, NSF Center for Visual and Decision Informatics

Assistant Professor, College of Engineering

[2017 Internet2 Global Summit \(04/25/2017\)](#)



UNIVERSITY OF  
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Informatics  
Research Institute



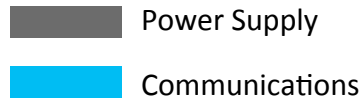
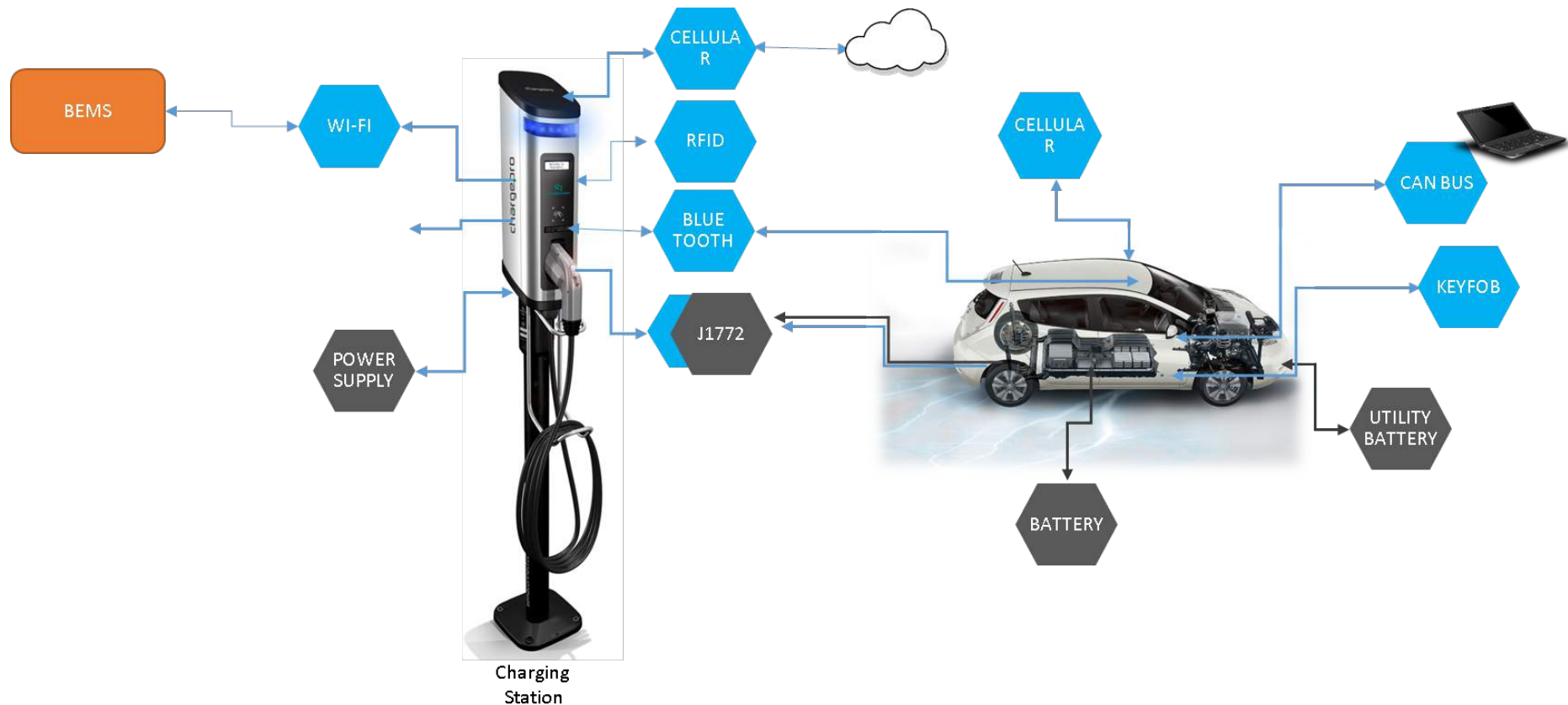
U.S. DEPARTMENT OF  
**ENERGY**



Idaho National Laboratory

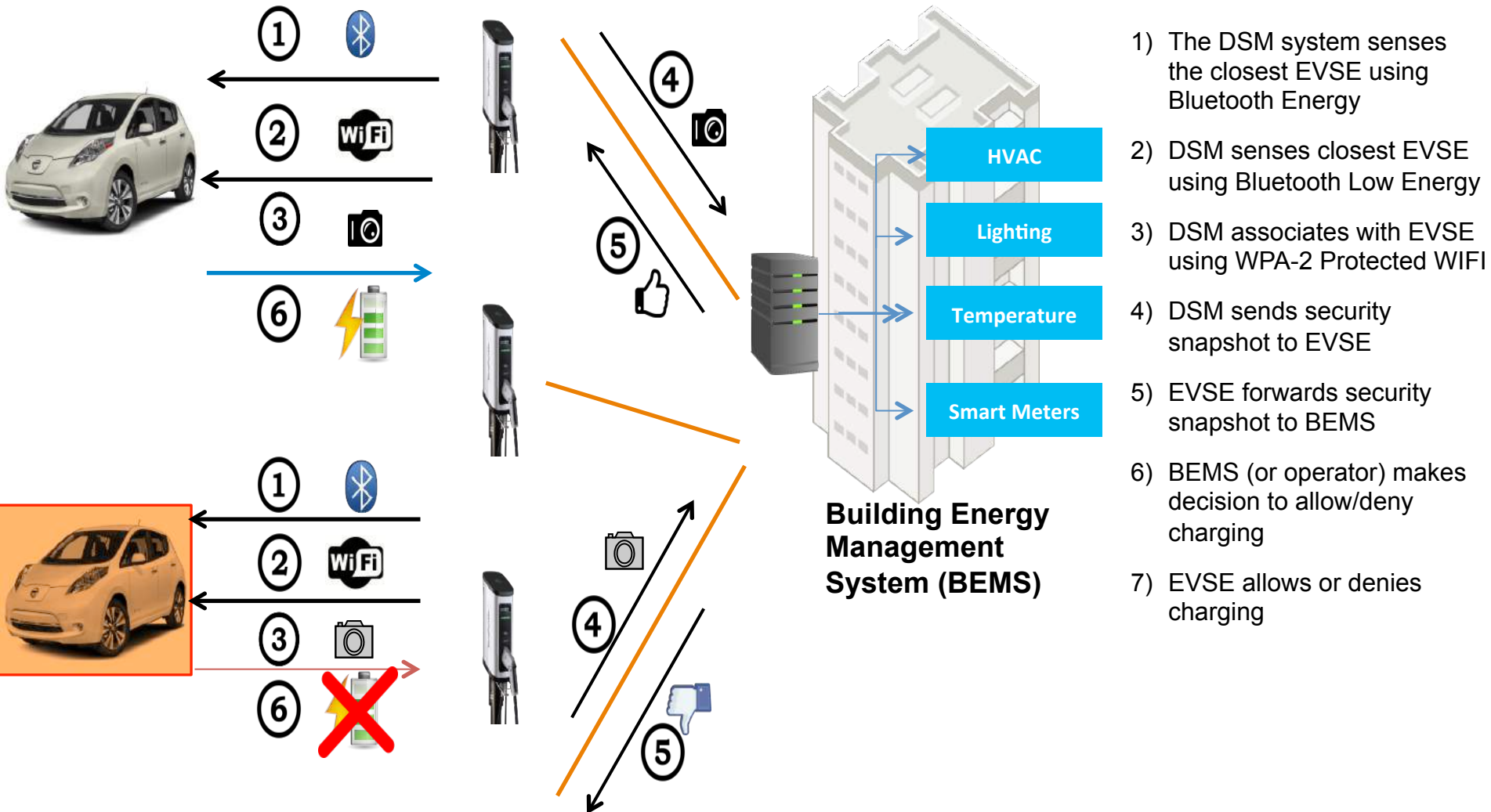


# EVSE to EV Communications





# Fingerprinting Algorithms to uniquely identify devices and vehicles



# Mass-Casualty Shooting Incident in a Public Theater

Lafayette, Louisiana July 23<sup>rd</sup> 2015



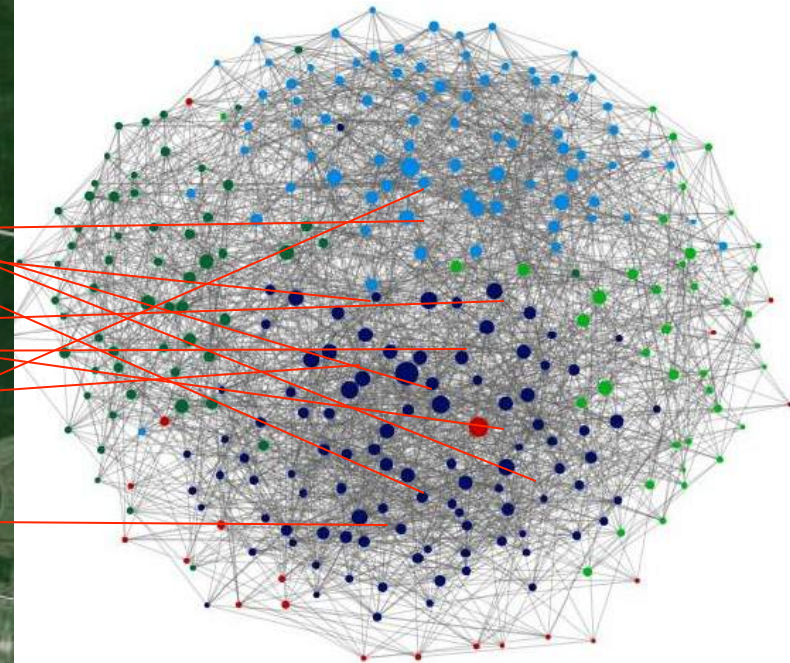
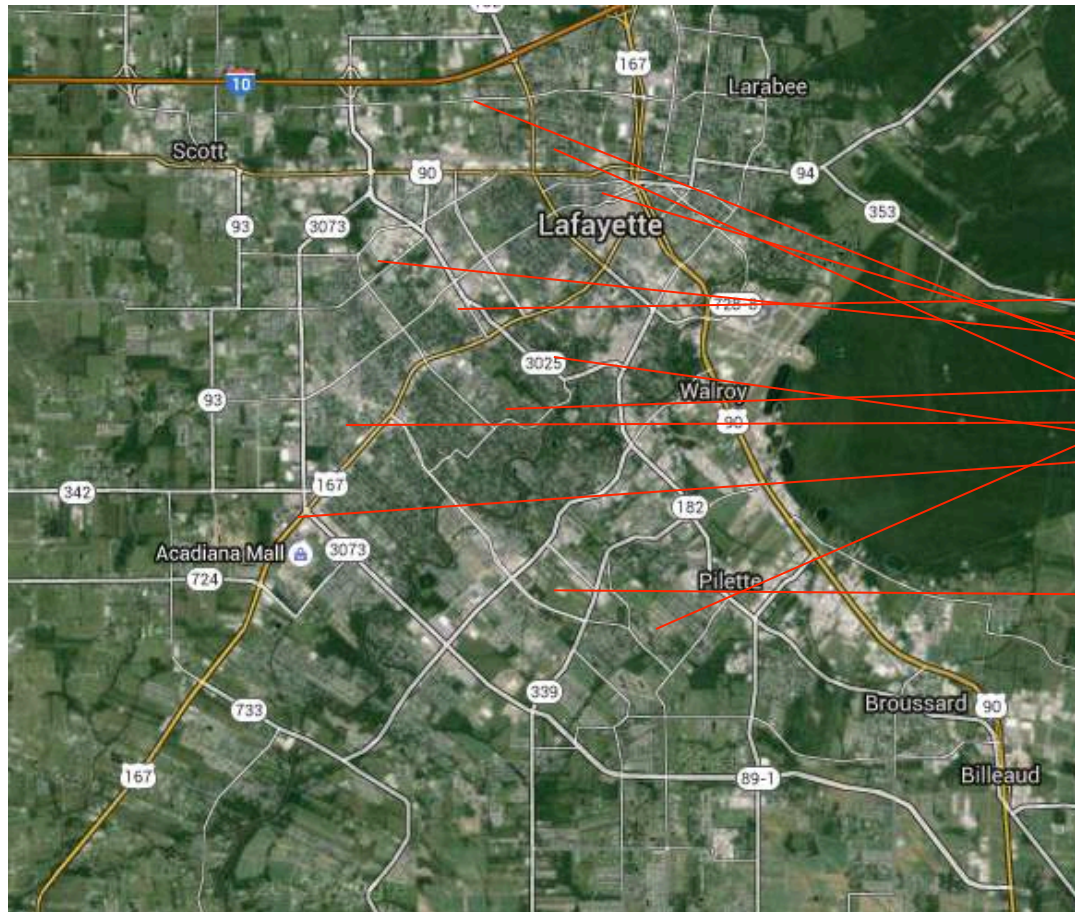


# Who are the key actors in a community's recovery from a crisis?



## Assessing Community Resilience through Modeling Human Geography

Objective: Develop a GIS-based analysis tool for mapping social networks, communications channels, socio-economic relationships, and community leadership.

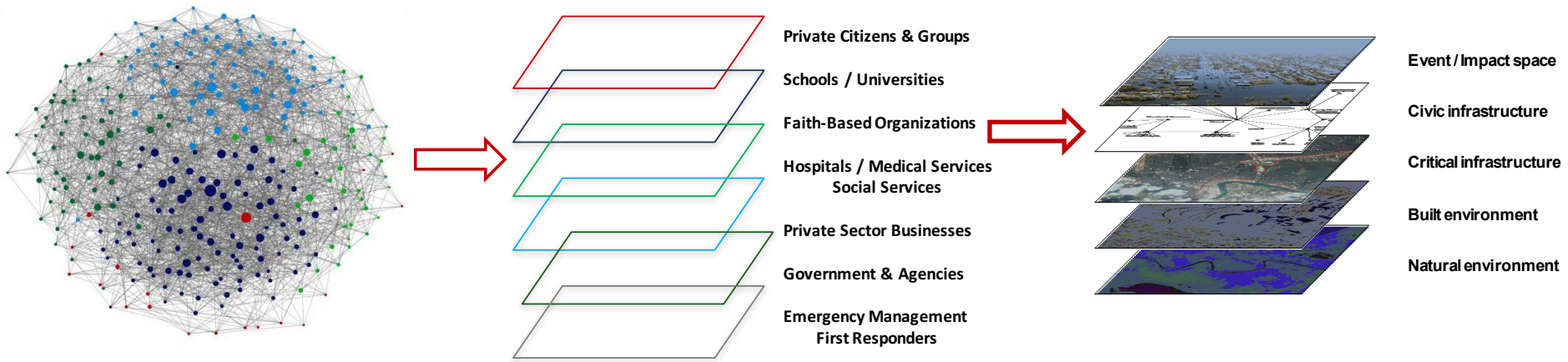


# Understanding “whole community” critical infrastructure

Community social networks

Civic infrastructure

Critical infrastructure



**Applications of Social Network Analysis for Building Community Resilience, (2009) National Research Council, National Academy of Sciences**  
<https://www.nap.edu/catalog/12706/applications-of-social-network-analysis-for-building-community-disaster-resilience>

**Building Community Resilience Through Public Private Collaboration (2011) National Research Council Board on Earth Sciences and Resources**  
<https://www.nap.edu/catalog/13028/building-community-disaster-resilience-through-private-public-collaboration>

**Disaster Resilience: A National Imperative (2012) National Academies Committee on Science, Engineering and Public Policy**  
<https://www.nap.edu/catalog/13457/disaster-resilience-a-national-imperative>

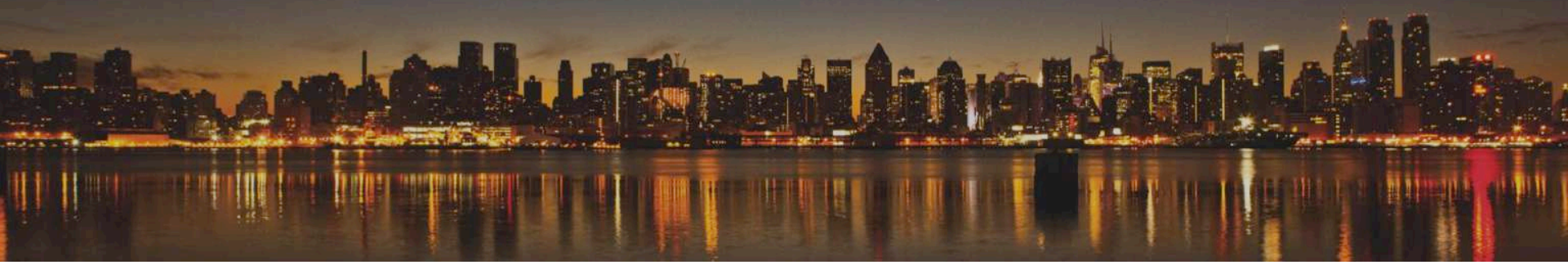


# GLOBAL CITY TEAMS CHALLENGE

**2017 Smart & Connected Cities and Communities**

**2018 Smart & Secure Cities and Communities**

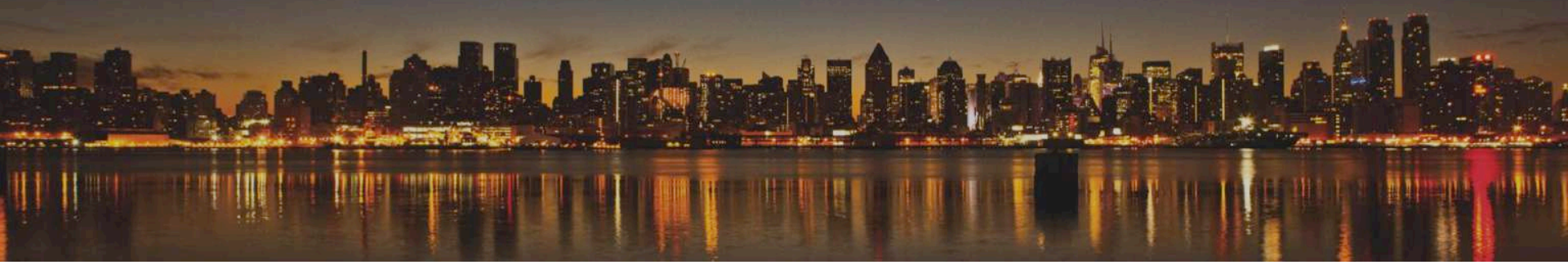
<https://pages.nist.gov/GCTC/>



## *Research & Development in “Smart Public Safety”*

Alameda / San Francisco, CA  
Conover, NC  
Denton, TX / UNT / PSU  
Fairfax County, VA / GMU  
Lafayette, LA / UL Lafayette  
Las Vegas, NV  
Montgomery County, MD  
Nashville, TN  
Newport News / VA Beach, VA  
North Central Texas COG  
Orlando, FL  
Ronart / Santa Rosa, CA  
San Francisco, CA  
Washington, DC  
Genoa / Milan / Torino, Italy  
Taichung City, Taiwan  
Wakayama / Nagano / Miyagi  
Prefectures, Japan

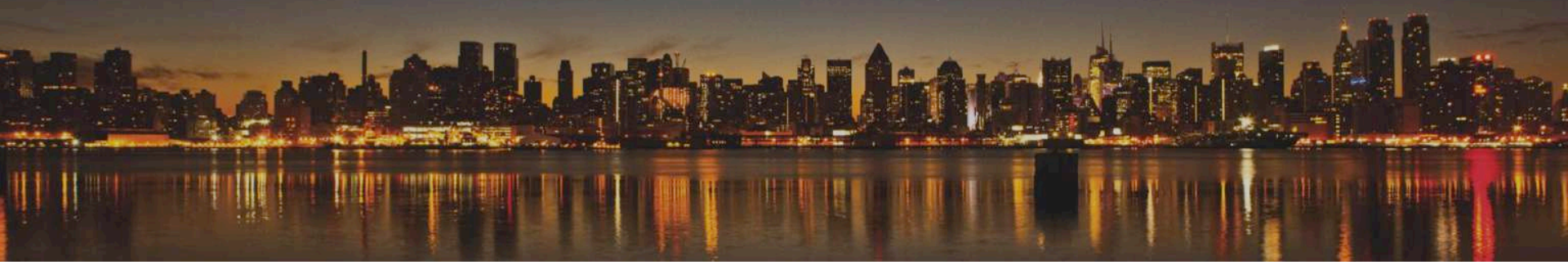
AI-based Emergency Preparedness  
GEO Fencing Predictive Policing Solutions  
Deployable Communications & Incident Command  
Multi-Team Coordination & Analysis  
Louisiana Business Emergency Operations Center  
IoT for Preparing Underserved Communities  
Safe Community Awareness and Alerting Network  
Integrated Analytics & Scheduling of First Responders  
Storm Sense Inundation and Flood Prediction Modeling  
Smart Emergency Response System  
Video Analytics for Public Safety during Special Events  
Advanced Flood Warning & Environmental Awareness  
Mobile Micro-Grids for Disaster Resilience  
Cyber City Education & Awareness Platform  
Open Platform for Smart City Disaster Prevention  
Community Traffic Control for Disaster Response  
NerveNet Regional Resilience IoT Platform



## ***GCTC 2018 Focal Point: Cybersecurity and Privacy in Smart & Secure Cities***

### ***Foundation for Public Safety: Trustworthiness***

- Security
- Privacy
- Safety
- Resilience
- Reliability



## ***Challenges in Cybersecurity and Privacy affecting Public Safety***

- **Identity management and credentialing of personnel + “credentialing of things”**
- **Public interacting with government “online” rather than “in line”**
- **Data security and assurance for technologies affecting children, families, schools, etc.**  
Particularly virtual/augmented reality systems
- **Data security and assurance for collaboration between U.S.-Canada (and other jurisdictions)**  
Policy problem solved by a technology application
- **Public education and awareness and definitions of “truth” in public safety context**  
Decision not to evacuate New Orleans during Hurricane Nate  
Decision to alert the public about a possible nuclear attack
- **Activating mobile devices remotely during disasters for situational awareness**

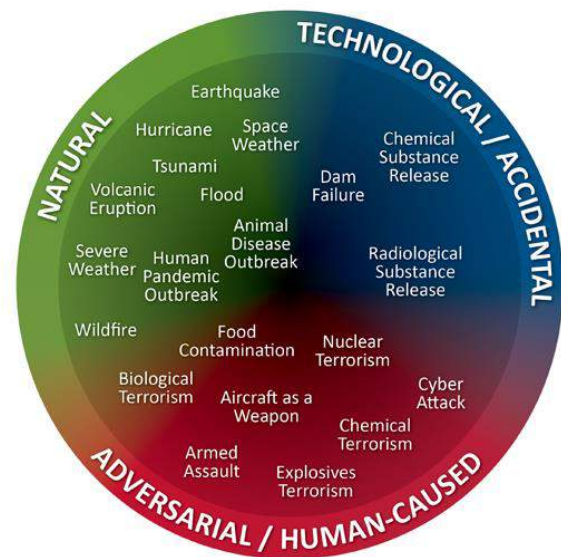




## Blueprint for Smart Public Safety in Connected Communities

An Initiative of the Global City Teams Challenge

August 28, 2017



<https://pages.nist.gov/GCTC/super-clusters/>



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