## *Resilient and Reliable Infrastructure*

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In recent years, Hurricanes Harvey (2017), Katrina (2005), and Sandy (2012) have widely been considered the top three costliest hurricanes in United States history. The 2017 Atlantic hurricane season was particularly destructive with Hurricanes Irma and Maria joining Harvey as contributing to the costliest hurricane season on record. As recovery from these disasters continues – and as the possibility of severe weather increases with climate change – research, planning and design must look to the future to provide resilient and reliable infrastructure. Resilient infrastructure is not completely shielded from climate change but is rather adapted to mitigate against flood impacts and rising temperatures so as to rapidly recover after a disaster occurs. Quicker recovery is the key to reliability and the end goal of resilient infrastructure.

In this session we will explore the interconnectivity of varying types of infrastructure including water, transportation and energy, and telecommunications, and explore how to predict future impacts of disaster events along with potential solutions that may be incorporated to upgrade these systems to be resilient and reliable. It is imperative that researchers and designers work together with manufacturers and public agencies to develop innovative solutions for implementation in areas susceptible to damage or failure. Incorporating resiliency into innovative repairs and rehabilitation of aging infrastructure is a trend we will continue to see across the United States.

The first speaker, Josh Vertalka (Resilient Solutions 21), will introduce the idea of infrastructure resiliency and discuss how to effectively communicate data science evidence to untrained audiences. He will explain how infrastructure resiliency challenges can be made digestible by using advanced web applications with graphic interfaces to make the data both highly accessible and interactive. Robert Hanson (DHS) will then speak in more detail on challenges associated with critical infrastructure resilience, discussing the importance of understanding interdependencies to strengthen infrastructure resilience and adding the critical cyber security element. With increasing connectivity of systems, cyber vulnerabilities are a growing threat to resilient and reliable infrastructure. He will also discuss national protection programs and the interface between research and governmental agencies to achieve infrastructure resilience. Finally, Firas Saleh (Jupiter) will discuss climate change and the importance of increasing adaptive capacities of infrastructure in a changing climate. He will demonstrate how implementing state-of-the-art modeling techniques helps further understand the impacts of natural and anthropogenic hazards and gradual stressors (e.g., sea-level rise) on critical infrastructure.