SMART CITIES

AMERICAN METEOROLOGICAL SOCIETY
WASHINGTON FORUM

DOMINIE GARCIA

BOOZ ALLEN HAMILTON

MAY 2, 2017

THE PHRASE 'SMART CITIES' HAS EMERGED AS A MEGATREND FOR HOW MULTIPLE INFRASTRUCTURE SYSTEMS AND FOUNDATIONS BECOME CONNECTED AND INCLUDE DATA-DRIVEN OPERATIONS

A Smart City allows various, previously disconnected domains or industries to **share information and analytic findings** to deliver more **real-time, predictive, and targeted information** to users and consumers. Connectivity and sharing of information within and among domains is key to uncovering **new efficiencies and opportunities.**

THE REALIZATION OF VALUE FROM SMART CITY TECHNOLOGIES IS IN ITS INFANCY, BUT HOLDS TREMENDOUS PROMISE IN KEY MODERNIZATION OBJECTIVES OVER TIME

	Today	3-5 years	10 years
Infrastructure, Automation & Connectivity	• R&D focused on sensor connectivity and processing • Transportation and utilities as leading industries	• Additional industries (health, public safety, education, etc.) modernizing and connecting • Data-driven decisions and services	• Ubiquitous connectivity and autonomy of regional and industrial systems • Deeper analytics and predictions
Access to and Value from Data	• Limited to industry players and often proprietary to organizations • Initial stages of open source data and software systems	• More access to data and findings to individual users • Beginning development of cross-industry data sharing and analysis	• Public and private collaboration and sharing of insights • User-centric data analysis • Improvement of systems based on data analysis
Citizen Experience	• Specific to area and socio-economic class • Congestion, electricity risks and costs high, limited access	• Increased access and services for traditionally underserved populations • Awareness and usage of new services and technologies	• Reduced poverty and safety issues across regions • Easy access to transportation and other facilities
Economic Development	• Fragmented access to resources and opportunities for individuals and business • Lack of public private partnerships	• Growth in industry modernization and cross-regional collaboration • Increased inter-industry operations • Improved efficiency of public operations	• More widespread access to resources across societal and geographic stratifications • Strong public private partnerships across many industries

GLOBAL TRENDS DRIVE MUCH OF SMART CITY TECHNOLOGY DEVELOPMENT AND ADOPTION, THOUGH THE U.S. GOVERNANCE ENVIRONMENT PRESENTS UNIQUE CHALLENGES IN DEPLOYMENT

Several macro-economic and social trends are driving the move towards more integrated, modern, and connected systems across domestic and global regions. The advent and growth of smart cities are in large part a reaction to these trends, coupled with opportunities presented by new technologies and processes.

- Significant trend towards urbanization and a non-regulated expansion of cities
- Widespread adoption of Green Technology and increasing focus on environmentally friendly products, services, and organizations
- Stress on cost efficiency in electricity production and distribution to serve increasing demands for energy stemming from technology
- Aging transportation infrastructure, implying worsening safety and congestion conductions
- Difficulties in adding infrastructure capacity across multiple industries

International locations differ in many aspects from domestic ones, often facilitating or providing an environment that allows for more efficient development and deployment of new technologies across multiple industries.

- The US governance model of distributed control and authority to states and municipal governments presents additional challenges in passing regulations, guiding policies, and public private partnerships
- Legacy technologies and systems are often more embedded and far reaching in the US or European countries, which presents a challenge for implementing new networks, systems, and technologies.
- Different competitive schemes or state-run programs in the international arena often provide traditional US competitors the opportunities to collaborate and develop technologies together in a pre-competitive situation.

FEDERAL AND LOCAL GOVERNMENTS AND PRIVATE INDUSTRY ORGANIZATIONS ALL PLAY DIFFERENT AND CRITICAL ROLES IN THE DEVELOPMENT AND OPERATIONS OF SMART CITIES

Federal Government

- Facilitating and working with other organizations to advance adoption of Smart City technologies and initiatives.
- Incentivize innovation and R&D for technology companies, academia, and industry consortia
- Promote standards to ensure interoperability, reduce uncertainty, and promote collaboration
- Feed adoption of technologies with pilot programs and other controlled deployments
- Ensure a transparent and enabling regulatory environment for industry to thrive
- Provide direct R&D and dissemination or access to research findings of advanced technologies needed to enable IoT that may not be adequately provided elsewhere

Municipal Agencies

- Actively introduce technology and solution implementation initiatives to drive economic development and increased levels of service to citizens.
- Lead the development and communication of the Smart City vision, strategy, and project timelines
- Develop local policy, guidance, and governance mechanisms to guide the development and implementation of new technologies and to ensure that multiple systems can be integrated
- Update local policies rendered obsolete by new technology
- Develop sustainable funding mechanisms and attract investment through P3s, commercial investment, revenue generation, entrepreneurship opportunities

Private Industry

- Developing IoT and Smart City solutions that improve efficiency and effectiveness across all facets of municipal public and private operations.
- Assist in Smart City strategy and vision development
- Develop Smart City and IoT technologies and solutions
- Engage in partnerships with local governments to test, pilot, adjust, and implement new solutions
- Invest in Smart City implementations and marketing activities to drive new sources of revenue
- Provide systems engineering, integration, and implementation services to local governments
- Provide ongoing Smart City and IoT services, such as data analytics, and monitoring to local governments.

Public Private Partnerships

New revenues models can be facilitated by increased investment from all players in a region and across industries. Ideal models for advancing these types of investments include various ways of combining public and private resources into Public Private Partnerships (P3s). It is incumbent on the city and its partners to develop models that will attract private investment and still attend to public needs and goals. Several types of P3s exist and can be developed in line with a municipality's needs, environment, and goals in ways that will also be beneficial to private or commercial companies and investors. These arrangements are long term in nature, grounding the partners from all sectors of the economy in building sustainable models for implementing new technologies over time.

WEATHER INFORMATION AND SYSTEMS CAN PLAY A PIVOTAL ROLE IN SMART CITIES ENVIRONMENTS

TRANSPORTATION:

- Integration of real time weather information for routing, transit, and user knowledge
- Planning and prediction based on impact of weather events
- Integration of operations and weather management systems across the entire transportation ecosystem/environment

UTILITIES AND ENERGY

- Analysis of the impact of adverse weather events on the energy grid and hardware (transformers, transmission lines, etc.)
- More fine grained planning for demand and pricing based on weather events and weather cycles
- Real time monitoring of weather as it impacts the grid and energy production
- More weather-dependent energy production facilities and applications

PUBLIC HEALTH:

- Ability to analyze more detailed data about impact of weather events or extremes on vulnerable populations
- Predictability of weather impacts on health and the health care system

FACILITIES

- Predictive maintenance, energy load balancing and usage management available with more data integrated across industries
- Ability for more rapid response to weather events and damage to buildings or other infrastructure components