GLOBAL CITY TEAMS CHALLENGE 2016

Sokwoo Rhee

Associate Director of Cyber-Physical Systems Program

National Institute of Standards and Technology (NIST)

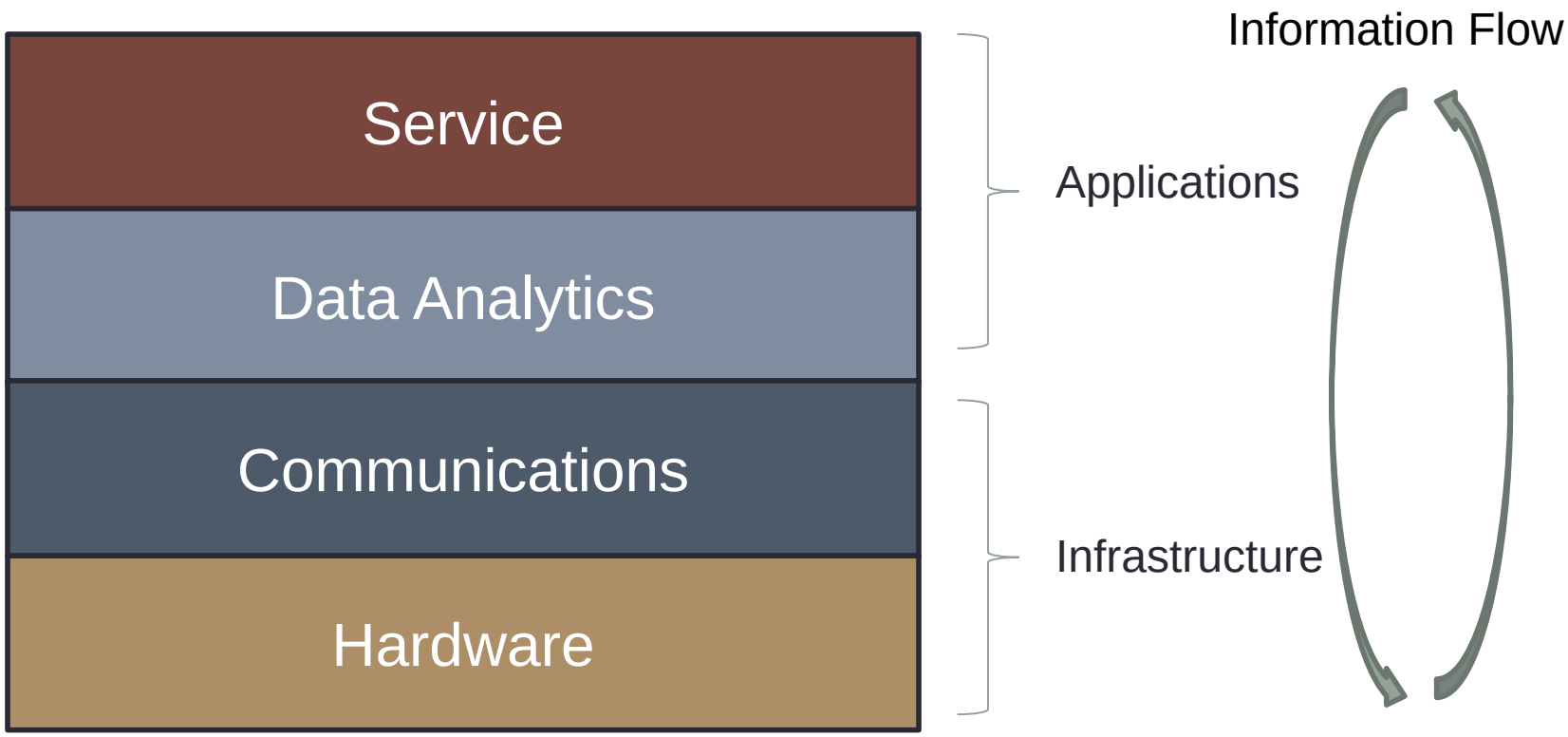
US Department of Commerce

NIST: Basic Stats and Facts

- Bureau within the US Department of Commerce
- Major assets
  - ~ 3,000 employees
  - ~ 2,800 associates and facilities users
- Two main locations: Gaithersburg, Md., and Boulder, Colo.
- Nobel Prize Winners: 1997, 2001, 2005, 2007, 2013

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

Internet of Things (IoT) and Smart Cities



Public Sector IoT: Smart Cities and Communities

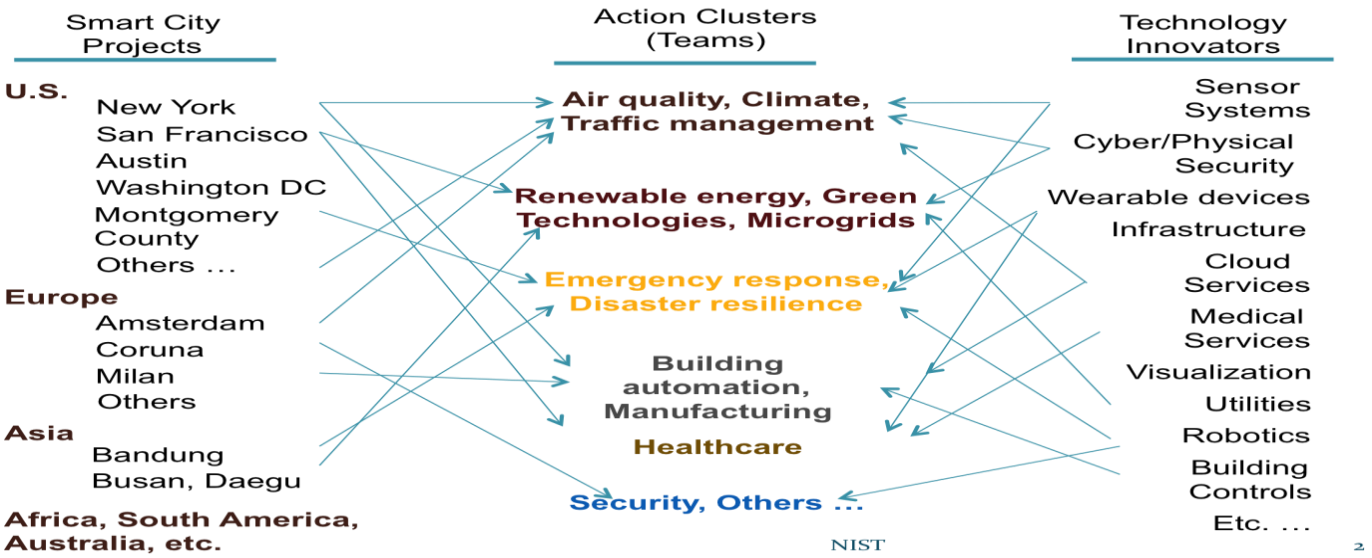
Smart City: Use smart technologies such as IoT and CPS to improve the quality of life in cities and communities

- Many smart community efforts are one-off projects with heavy emphasis on customization and inadequate consideration for future upgradability and extensibility
- Lack of clear measurability of success impedes broader adoption of the solutions
- As a result, many Smart Cities/Communities deployments are isolated and do not enjoy the economy of scale.

Global City Teams Challenge (GCTC)

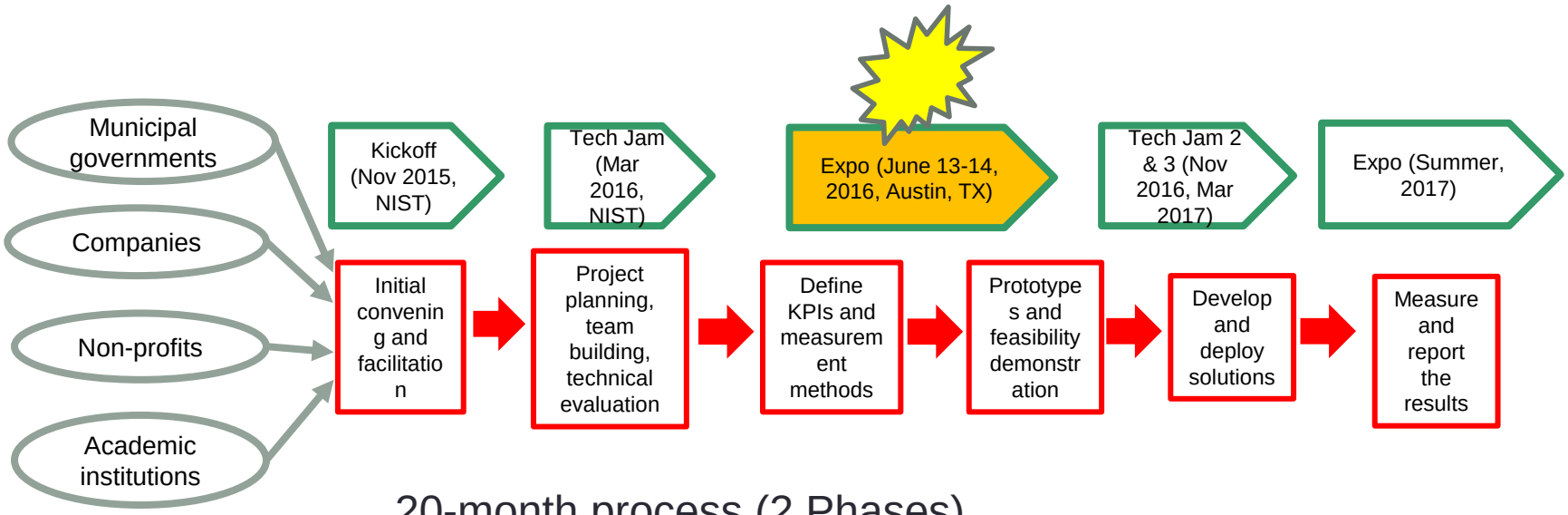
GLOBAL CITY TEAMS CHALLENGE

- Establish and demonstrate replicable, scalable and sustainable models for incubation and deployment of interoperable, standard-based IoT solutions and demonstrate their *measurable* benefits in Smart Communities/Cities



GCTC 2016 Process

- Develop replicable and measurable smart city deployment examples through voluntary participation of stakeholders. Action Clusters are conceived and incubated through convening, facilitating, coaching, and technical support by NIST, US-Ignite and GCTC Partners



20-month process (2 Phases)

1st Phase by June 2016 – Team building phase

2nd Phase by June 2017 – Implementation phase

Over 160 Cities in GCTC 2015 & 2016 (Partial list shown):

- Portland, OR
- Newport News, VA
- Greenville, SC
- Raleigh, NC
- Montgomery County, MD
- Winooski, VT
- Santa Rosa, CA
- New York, NY
- Washington, DC
- Columbus, OH
- Kansas City, MO
- Nashville, TN
- Austin, TX
- Amsterdam (Netherlands)
- Genova, Perugia (Italy)
- Coruna, Valencia (Spain)
- Saint-Quentin (France)
- Abuja City, Obia-Akpor City (Nigeria)
- Busan, Seoul, Daegu (Korea)
- Chikuma (Japan)

GCTC 2016 Partners

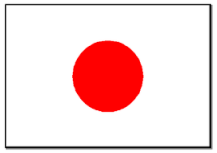
NATIONAL SCIENCE FOUNDATION

INTERNATIONAL TRADE ADMINISTRATION

U.S. DEPARTMENT OF TRANSPORTATION

U.S. DEPARTMENT OF STATE

NAT. TELECOMMUNICATIONS & INFORMATION ADMIN.

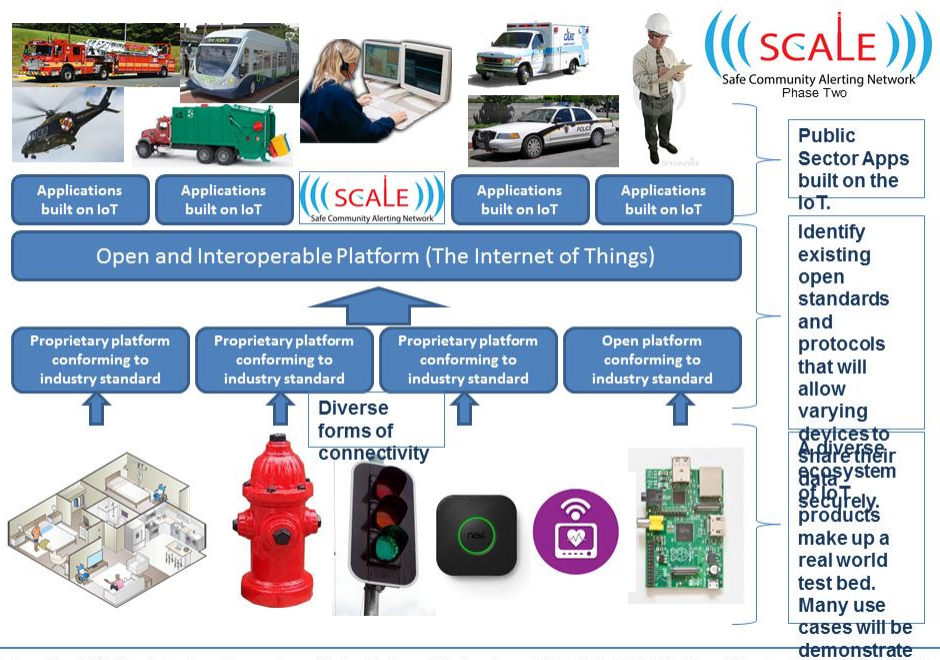


StormSense Project

Forecasting Flooding from Storm Surge, Rain, and Tide

Partners (as of April 2016):

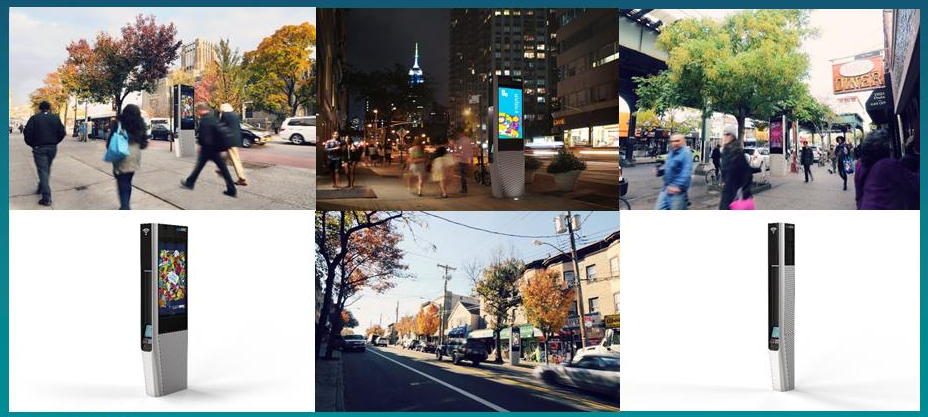
Newport News · VIMS William & Mary Virginia Institute of Marine Science · Hampton VA · Portsmouth · Norfolk · Virginia Beach · Chesapeake Virginia · York County Virginia · Williamsburg · Christopher Newport University · Wetlands Watch · VDH Virginia Department of Health



University of California-Irvine, Massachusetts Institutes of Technology, IBM, Intel, AT&T, SigFox, Brivo Labs, Senseware, N5 Sensors, the Telemedicine and Advanced Technology Research Center (TATRC), Responder, Del Ray Analytics, biobright, EIC Data, IoT DC, Captiva, Earth Networks, Victory Housing and more to come

LinkNYC by City Bridge

First-of-its-kind communications network that will bring the fastest available municipal Wi-Fi to millions of New Yorkers and visitors



Source: www.link.nyc

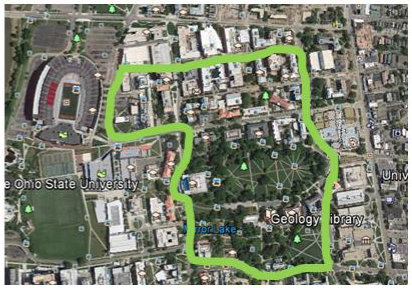
New York City, Qualcomm Incorporated, Titan360, Control Group, COMARK Corporation, Antenna Design

SMART MOBILE OPERATION: OSU TRANSPORTATION HUB (SMOOTH)

The Ohio State University
Center for Automotive Research

First Mile/Last Mile Solutions

- On demand automated vehicles will move passengers the first mile to the bus stop and the last mile from the bus stop (bottom picture).
- Scheduled or on demand vehicles will move passengers through a closed loop within OSU campus (through roads and pedestrian areas, top picture).
- The vehicles will:
  - use automated driving technology;
  - use V2V communication for convoy driving;
  - be equipped with vulnerable road user protection technology enabling them to function in pedestrian zones.
- SMOOTH will keep track of vehicles and guide them.
- Smartphone applications will be developed to schedule and track the on-demand automated vehicles.



PARTNERS

Ohio State University - Center for Automotive Research
City of Columbus
Mid-Ohio Regional Planning Commission (MORPC)
Team ARIBO

Location: Columbus, Ohio

Automating the First and Last Miles

GCTC 2016 Expo

- June 13-14, 2016 at the Austin Convention Center
  - **90+** Teams
  - **120+** Cities/Local Governments
  - **300+** Companies, Universities, Non-profits
  - **14** Countries
  - **2000** attendees

- Federal Keynote Panel
  - Reginald Brothers, Undersecretary of S&T, DHS
  - Mark Dowd, Deputy Assistant Descretary, DOT
  - Martin O'Malley, 61st Governor of Maryland, Senior Fellow, Metrolab Network
  - Moderated by Dan Correa, White House OSTP
- Mayoral Keynote Panel
  - Steve Adler, Mayor, City of Austin, TX
  - Ivy R. Tayor, Mayor, City of San Antonio, TX
  - Gary McCarthy, Mayor, City of Schenectady, NY
  - Jack Mikkers, Mayor, Veldhoven, The Netherlands
  - Mary Salas, Mayor, City of Chula Vista, CA

GCTC 2015 Expo

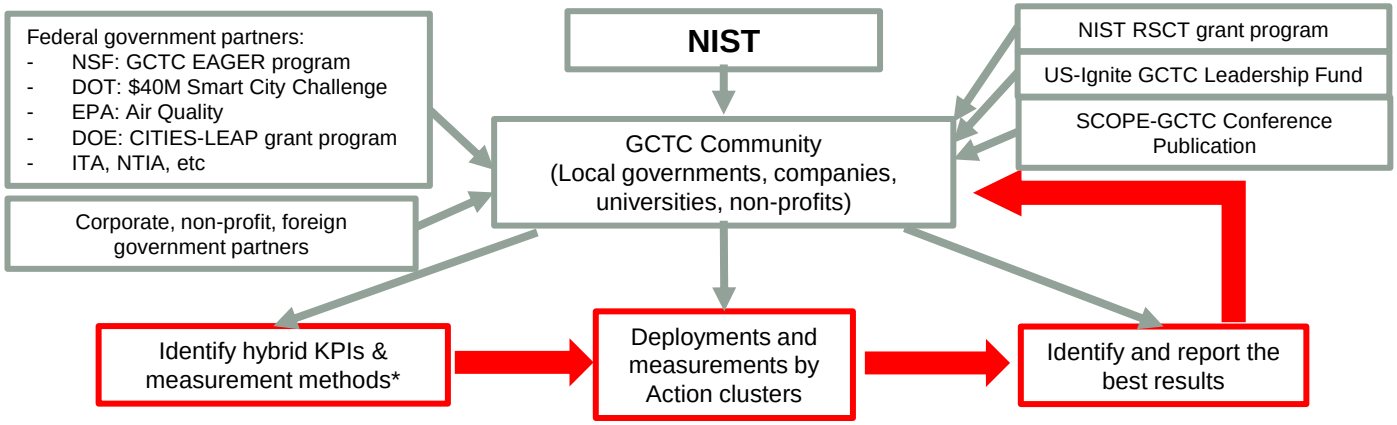
Photo Credits: NIST / US-Ignite

GCTC 2016 Phase 2 Goals

- Deploy and replicate the solutions in multiple cities.
- Each team creates at least one Key Performance Indicator (KPI) of the *tangible and direct* impacts to the local governments and the residents. Teams will report the feasibility and prototypes by June 2016 and the final results by June 2017.
- Suggested KPIs include:
  - Productivity/planning efficiency (e.g. frequency)
  - Environmental impacts (e.g. CO2 level)
  - Energy usage (e.g. kWh)
  - Traffic congestion (e.g. time to commute, number of cars)
  - Crime (e.g. reported number of incidents)

Community-based Smart City Measurement Science

Hybrid KPIs and measurement methods will be identified and applied to the participating action clusters. The results and methodologies will be made available to the community for further adoption.



Expected Outcomes/Products

- Hybrid KPI model development and analysis of the GCTC action clusters
- IES-City framework output based on GCTC super clusters
- Reports and analysis from the RSCT projects

*Prior works such as ISO/TS 37151:2015 and CITYKeys by EU can be reviewed and used as basic building blocks.

For More Information

- Contact
  - Sokwoo Rhee (sokwoo.rhee@nist.gov)
- Challenge web site: Meet the action clusters
  - www.globalcityteams.org
- GCTC 2016 Expo (Austin, TX, USA, June 13-14, 2016)
  - http://www.gctcexpo.org/
- Social Media
  - Twitter #globalcityteams
  - Twitter #gctcexpo2016
  - Linkedin Group https://www.linkedin.com/groups/8285610