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MAKING SMART CITIES:

THE DESIGN, DEVELOPMENT, AND DEPLOYMENT OF CROSS-PLATFORM, SERVICE-INTEGRATED, TECHNOLOGY "PRODUCTS" INTO CITIES

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Overview: Opportunity and Challenge

Design, development, and deployment of an emerging class of cross-platform, service-integrated, technology products to enhance performance and/or create a platform for economic development and expanded access in CITIES and COMMUNITIES

Cities Domain (Smart and Connected)

Problem #1:

Smart Cities: Upgrading Urban Systems

- Backwards and Forwards Interoperability --- of urban systems and urban data
- Identifying opportunities for multiple, simultaneous systems upgrading
- Shifting to a strategic (rather than opportunistic) approach to technology diffusion in cities
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Cities Domain (Smart and Connected)

Problem #2:

Connecting Communities: Equitable Implementation

- Managing incrementalism and equity simultaneously
- Avoiding islands of extremes (or building in baselines)
- Budgeting for backfilling
- Balancing economic and human development

What's Actually Happening

- Trade Offs Between Making Smart Cities and Connecting Communities
- "Urban Development Districts" (UDDs) PCAST report
  - Test beds as a scoping exercise become uneven development practices
  - Historically dis-embedded (enterprise zones, empowerment zones, main street initiatives, promise zones, innovation districts)
- No (or minimal) evaluation and "passive metrics" (borrowed rather than deliberated)
- Focus on scalability and replicability rather than "tailoring" (see OECD)
- "Muddling through" creates path dependencies

Deployment Strategies : Competing Paths

Bottom UP: Social and Civic Entrepreneurship

- Civic Innovation: Hack-a-thons, crowd sourcing
- Civic IoT sets use cases: localized partnerships
- Prioritizes user connectivity, mobility, accessibility
- Prioritizes open platforms and interoperability for persistent innovation
- Grafts onto urban form/existing infrastructure

Top DOWN: Industry-led and Market-driven

- Large scale implementation and proprietary systems
  - Prioritizes systems optimization: power, ICT, urban infrastructure
- Redeploys urban form/new infrastructure

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Research Grand Challenges

A Systems Approach to Objects, Projects, and Programs

Rethinking vertical and horizontal DOMAIN Boundaries

- Intervening in the built environment (hardware and infrastructure)
- Designing software platforms integrating newly deployed and older systems
- Developing data management architecture to manage multiple
- Designing user interfaces --- virtual and face to face

Transportation (modes) through the lens of mobility and accessibility

Rethinking bike sharing as a mobility systems not a transportation object

Seeing linear parks as mobility land use systems

Recasting VALUEs as Systems not Programs

Sustainability, Equity, Resilience

Grand Challenge: Uneven Development

Confronting the patterns and implications of uneven investments in urban innovation

- Uneven capacities across cities to **design** and **absorb** new technologies relevant to both performance management and optimization and
- Uneven distribution of technologically-advanced infrastructure and its impact on the **economic competitiveness of cities inside/outside the core**
- Peripheral cities are adopting designs and models developed and tailored for core cities --- causing a **convergence towards core cities needs/priorities/circumstances** embedded in the design of "smart city solutions"

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Implementation Challenges

Navigating and Managing…

- Multi-scalar and varied governance regimes
- Distributed decision-making
- Regional variation and locally tailored solutions (technology and process)
- Complex funding mechanisms
- Contested priorities
- Dynamic implementation
- Lack of generalizable models