Smart Cities – Real Opportunity or Marketing Hype?

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Agenda Today

- Driving Forces
- The Smart City Concept
- Components of a Smart City
- Smart City Infrastructure
- The Current Market
- Hot Markets and Regions
- Tips for Getting in the Game


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The “Smart” Trend

Cities Are Facing Real Challenges

Population

- 746 million in 1950
- 9.7 billion people by 2050

Urbanization

- 54% of Population
- 66%, or 2.5b, by 2050

Limited Resources

- Limited energy
- Limited water
- Limited mobility around cities


7.5B


≥50%
URBAN

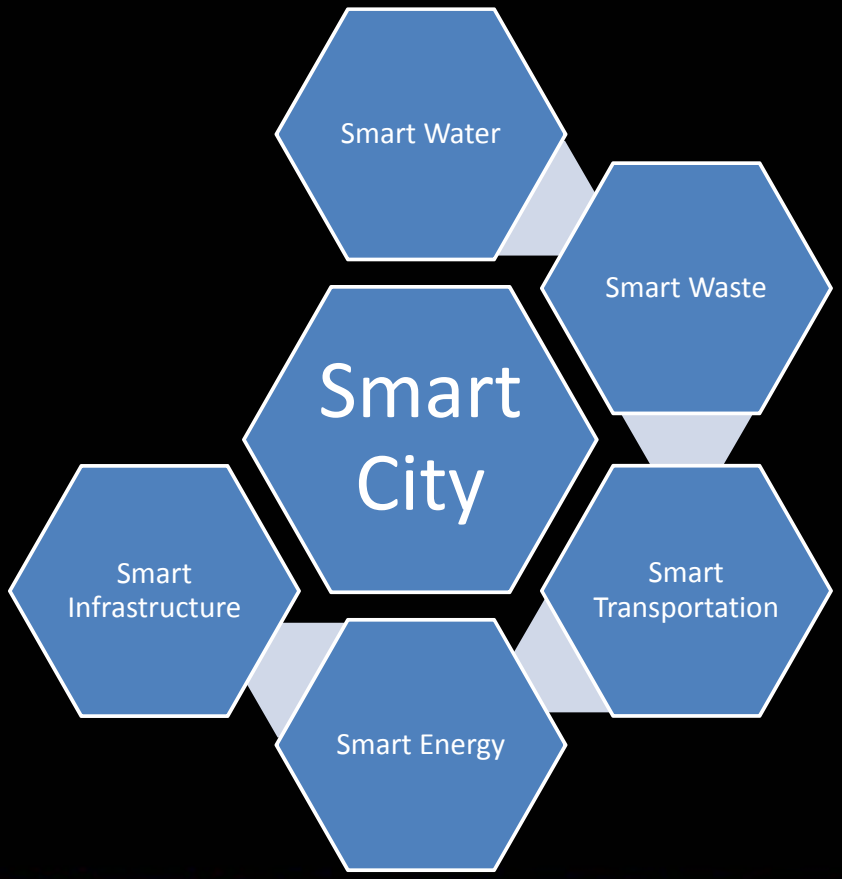
What is a “Smart City”?

“A **smart city** is an urban development vision to integrate information and communication technology (ICT) and Internet of things (IoT) technology in a secure fashion to manage a city's assets.”

Source: Wikipedia

Half devices and telecom infrastructure

Half “Big Data” and data analytics



Components of a Smart City

Smart Water

- Demand Management
- Smart Leakage Detection
  - Presence if leak, low pressure
- Smart Metering
- Flood prediction / Risk mitigation
  - River and lake level monitoring
  - Telemetry for automatic control

Smart Waste

- Smart garbage cans
  - 900MHz Mesh
- Vehicle logistic optimization
  - GPS positioning
- Automatic Waste Collection Systems (AWCS)

Smart Transportation

- Traffic Optimization
  - Using cameras to determine traffic data
  - Using public transit and traffic data to optimize transit routes
- Smart Parking Systems
  - Retrofits can easily use video cameras
  - If the street is being repaved, magnetic sensors are a better choice

Smart Energy

- Smart Metering
  - 900mhz RF mesh
- Smart Grid
- Local or Distributed Generation
- Intelligent Networked Buildings
  - Energy Management
- Networked Street Lighting
  - 802.11 based or Cellular based

Smart Infrastructure

- The infrastructure is less a component and more of the fabric that holds the other components together
- This is also the largest point of entry for BICSI professionals
  - Public offered wireless internet
  - Additional fiber infrastructure
  - Wireless connectivity for IoT solutions

Wireless Connectivity Options

- Some options for unlicensed RF are 433MHz, 868MHz, 900MHz, and 2.4GHz
- 2.4GHz is shared with 802.11 protocols
- 900MHz appears to be a good choice for IoT solutions
  - smart meters and light pole mounted sensors
  - good choice for low bandwidth options

Radio Types

- Z-Wave (RF 900MHz)
  - 100kbps through put
  - 30m range
- ZigBee (2.4Ghz and 900Mhz)
  - 250Kbps
  - 7-12Km range
- 802.11 Wi-Fi, 3G, 4G, Bluetooth

Common Protocols

- LonWorks or Bacnet
  - Usually used for monitoring purposes.
  - Works well for smart lighting, HVAC and energy monitoring.
- ModBus
  - A serial communication.
  - Used a lot for SCADA and remote controlling smart devices.

Do Smart Meters Kill People?

- Smart Meters are bad for your health due to EMF
- Smart Meters are bad for your health due to “dirty” power
- Smart Meters are bad for your electronics
- Smart Meters are actually spying on you

Smart Meters and EMF Safety

Device	RF (mW/cm^2)	
Smart Meter	0.000015	
Natural RF from Earth	0.00013	8.7 times greater
TV Radio and Cell Towers	0.00015	10 times greater
Natural RF from the Human Body	0.0003	20 times greater
WiFi Signal	0.0010	67 times greater
Microwave Oven	0.0047	313 times greater
Cordless Phone	0.1200	8000 times greater
Cellphone	0.1900	12,667 times greater
FCC Limit for Safety	1.0000	66,000 times greater

Values based on 30 minutes of exposure under normal operation per 47CFR1.1310 guidelines


Current Market Size
$622 Bn


Projected Market Size by 2026
$3.48 Tn

Target Geographic Regions

1. Asia Pacific excluding Japan (APeJ), primarily China
2. Western European Market, primarily the U.K.
3. Japan
4. Latin America, primarily Mexico
5. Middle East
6. North American, primarily the U.S.

Be Willing To:

- Be willing to assume some risk
  - Shedding risk is very attractive to cities
- Consider leasing equipment instead of building it and handing it over
  - this provides the city with lower up front capital for installations
- Be willing to sign a long term contract and lock in pricing
- Be willing to be a partner. Make sure they understand that you are also invested in the success of this program
- Help them get the word out and promote engagement

Basics of the PPP

- (PPP) Private-Public-Partnerships
- Traditional PPP are medium to long range in duration and usually large scale infrastructure
- SMART PPP are different because they can often time be a smaller component of the larger PPP's or even be added onto an existing PPP
- City and County Bids
- Private Companies

Operating Models

- Build Own Operate (BOO) – Everything done by the city
- Build Operate Transfer (BOT)
  - The contractor builds and operates the system for a period of time
  - After a set period of time, the system is transferred to the city for ownership and operation
- Build Own Manage (BOM) *
  - The contractor builds and operates the system for a set period of time
  - There is no plan for the city to take ownership
  - Either the contract is renewed with the same vendor, or someone else can take the contract for ownership and maintenance

Ways To Play

- Product Vendors
  - Smart Meters
  - Pole-Top Devices
  - Physical Security and Surveillance Devices
- Managed Service Provide
  - Monitoring
  - Consulting
- Integrators
  - End to end integration
- Network Service Providers
  - Physical (Fiber)
  - Wireless

5 Concluding Takeaways

The use of technology in the planning, monitoring and optimizing of cities is **NECESSARY** to meet future demands

Consider **NON-TRADITIONAL METHODS** of contracting to meet the needs of the client

SOLVE PROBLEMS

don’t let the technology drive the solution

City officials are looking for CHAMPIONS AND PARTNERS, not just vendors

The ICT industry and BICSI must emerge as the

LEADERS in this market