



منتدى دبي  
للمدن الذكية | DUBAI SMART  
CITIES FORUM

# Smart Cities and The Internet of Things

**Howard Charney,**  
**Senior Vice President**  
Office of the Chairman and CEO  
November 23, 2014



# The Big Picture

# A Changing World – Transformation



# Megatrends for the Urban Century



## Technology

- Internet of Things
- Convergence of networks
- Big Data, Cloud, Mobile

## Socio Economic

- Population growth
- Global urbanization
- Widening income gaps

## Policy

- Energy independence
- Digital access
- Utilities ownership

# Megatrends for the Urban Century



## Technology

- Internet of Things

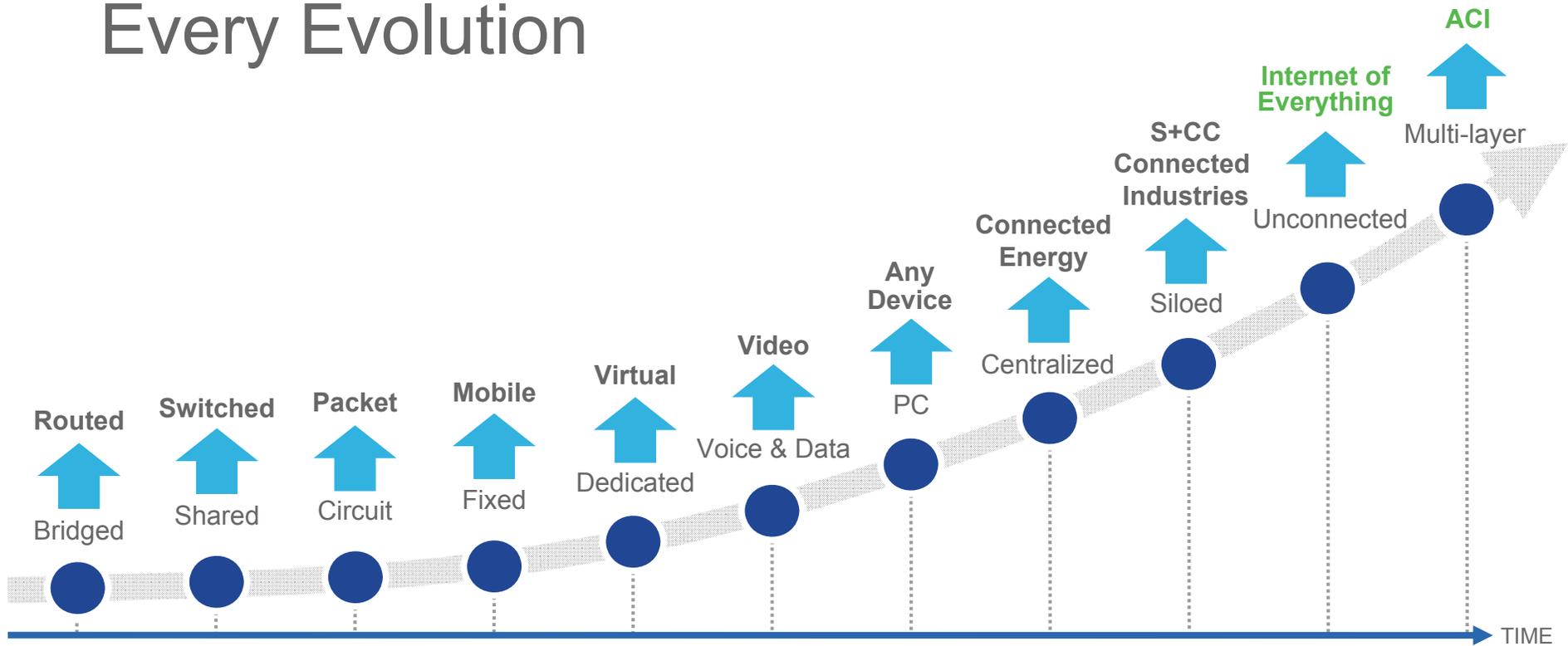
## Socio Economic

- Global urbanization

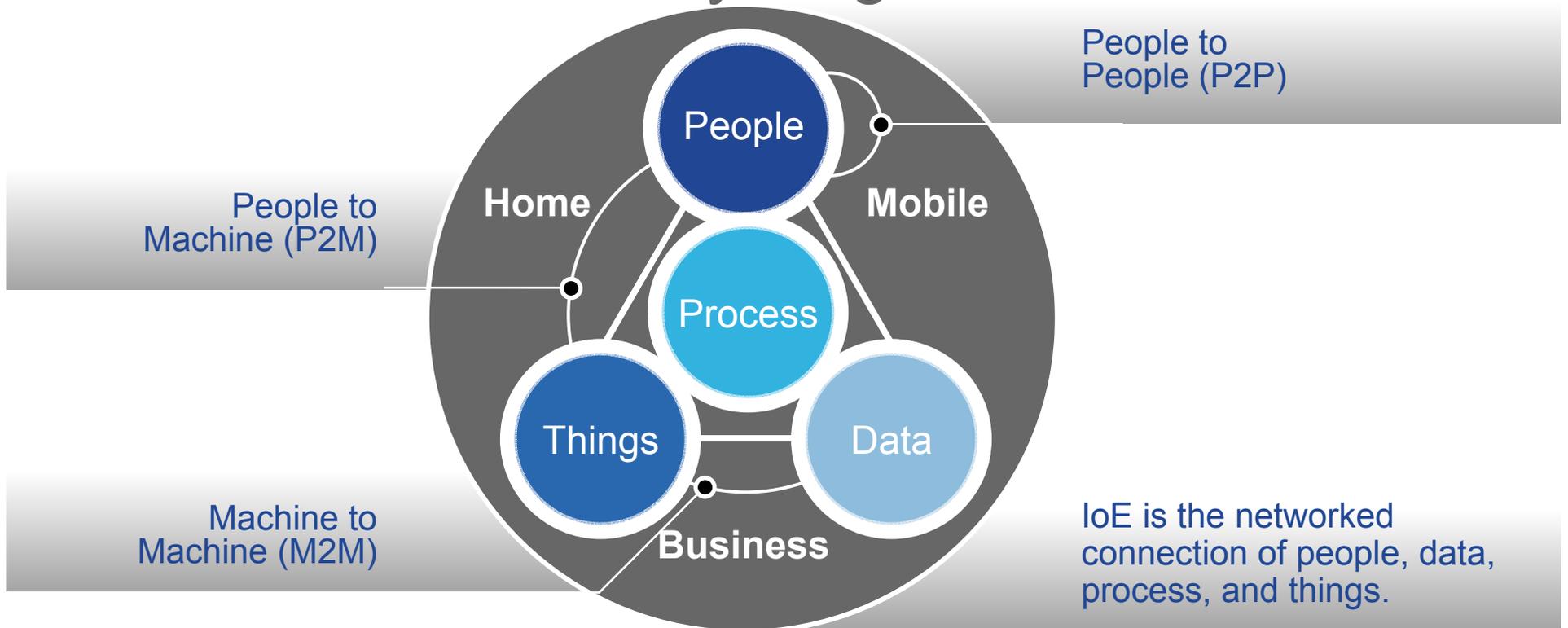
## Policy

- Digital access

# The Network Is at the Center of Every Evolution



# The Internet of Everything



# Value of Smart Cities

# Sizing the Opportunity

\$ **19.0\*** Trillion

## VALUE AT STAKE

### 14.4 Trillion PRIVATE SECTOR

Includes Both Industry-specific and Horizontal Use Cases:

- Customer experience
- Innovation
- Employee productivity
- Supply chain
- Asset utilization

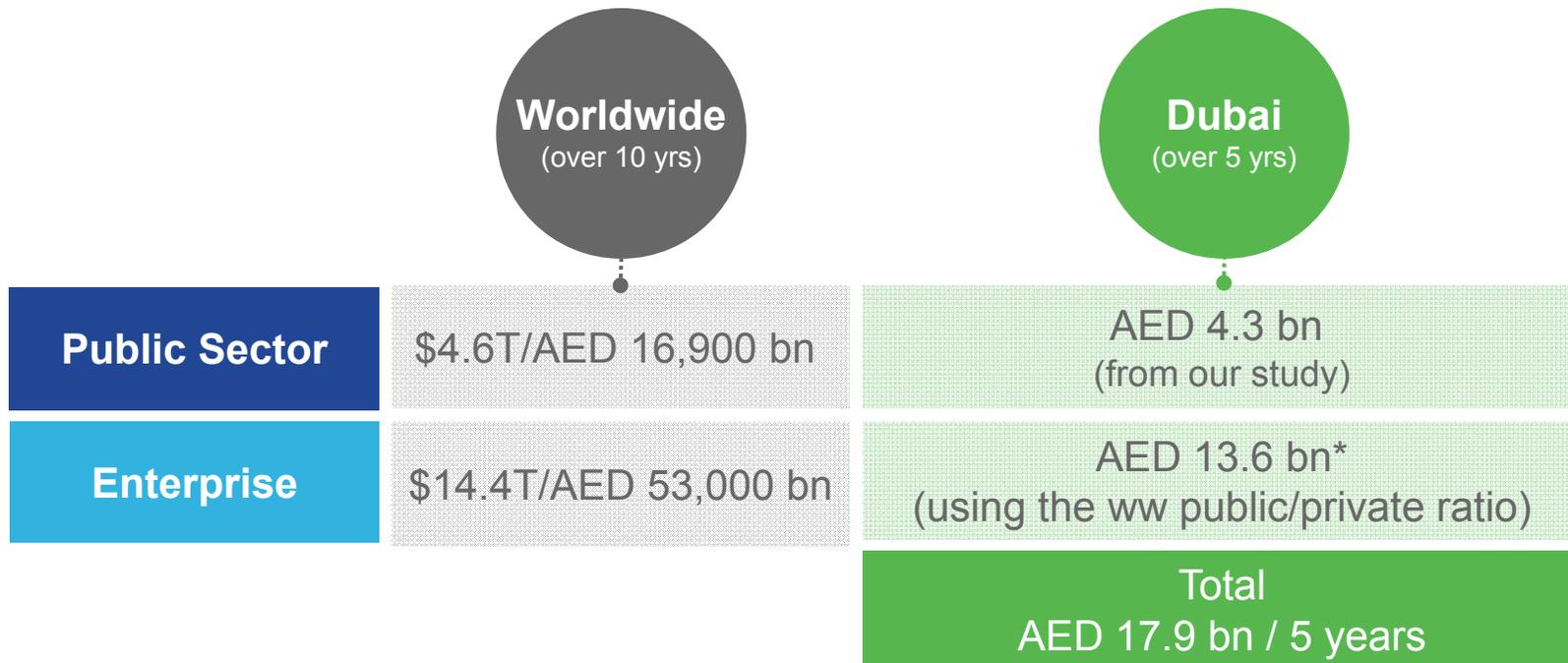
### 4.6 Trillion PUBLIC SECTOR

Includes Cities, Agencies, and Verticals Such as Healthcare, Education, Defense:

- Increased revenue
- Reduced cost
- Employee productivity
- Connected militarized defense
- Citizen experience

\* Estimate Is Based on Bottom-up Analysis of **61 Use Cases**, Including 21 for Private Sector and 40 in Public Sector (\*2013-2022)

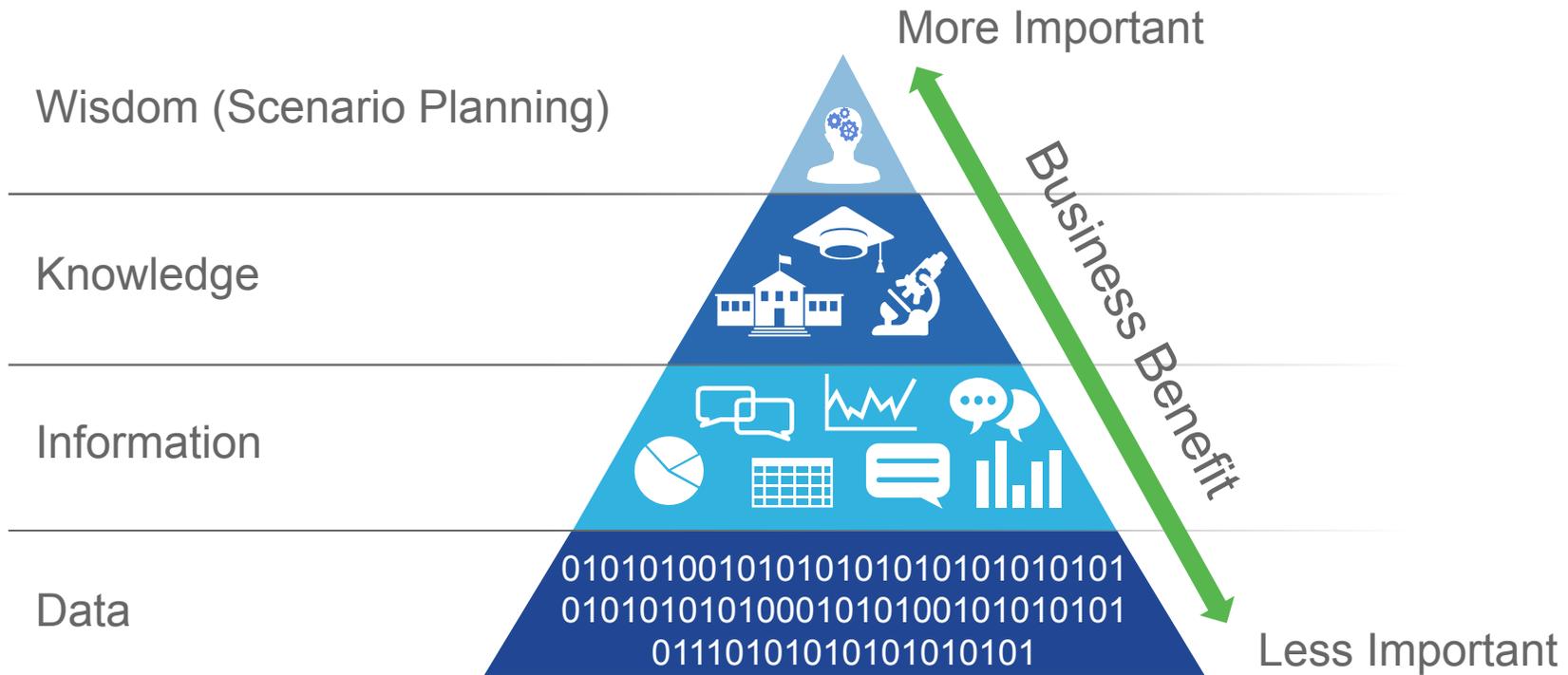
# AED 4.3B Value at Stake for Dubai Public Sector.. With higher potential for private sector



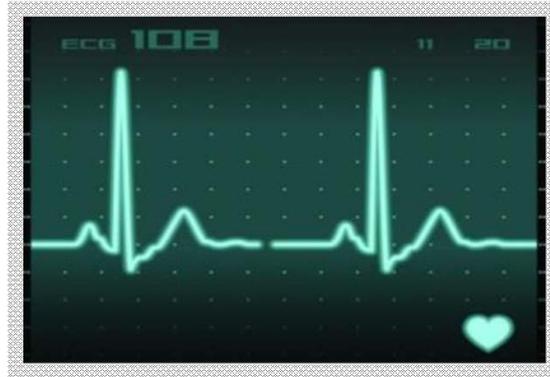
\* Assumes Dubai has same enterprise mix

# New Insights from New Data

# IoT Transforms Data into Wisdom



# Health Informatics



# IT and Analytics Are Boosting Enrollment Rates

ASU online enrollment grew 35.6% between 2012 and 2013



**Students Know How They Stand**

ASU uses “dashboards” to understand everything from student study patterns to faculty research projects

**Tracking Student Progress**

From ASU's eAdvisor Dashboard

**Monitoring Class Enrollment**

From ASU's Course Enrollment Management Dashboard

**Early Warning/Retention Tool**

From ASU's Retention Dashboard

**Learning Mgmt. System Analytics**

From ASU's Learning Management System Analytics Dashboard

Predictive analytics improved freshman retention rates by 6.8% over six years

**Research Dashboard**

From ASU's Research Dashboard

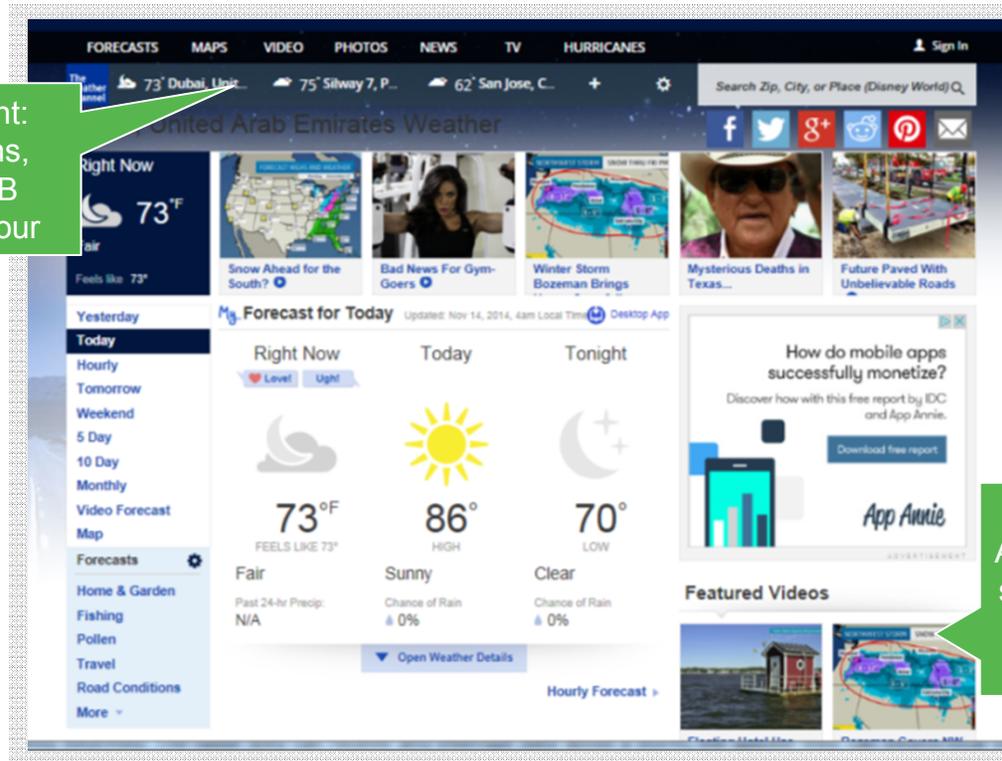
**Faculty Instruction/Research**

From ASU's Faculty Dashboard



# Big Data Reshapes Weather Channel Predictions

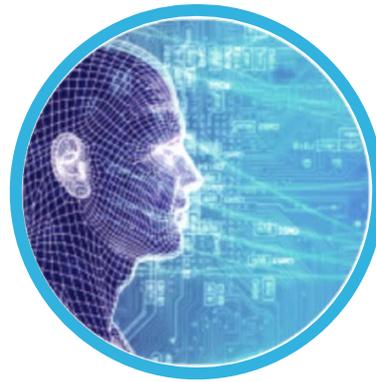
Forecasting improvement:  
From 2.2 million locations,  
4 times per hour, to 2.8B  
locations, 15 times per hour



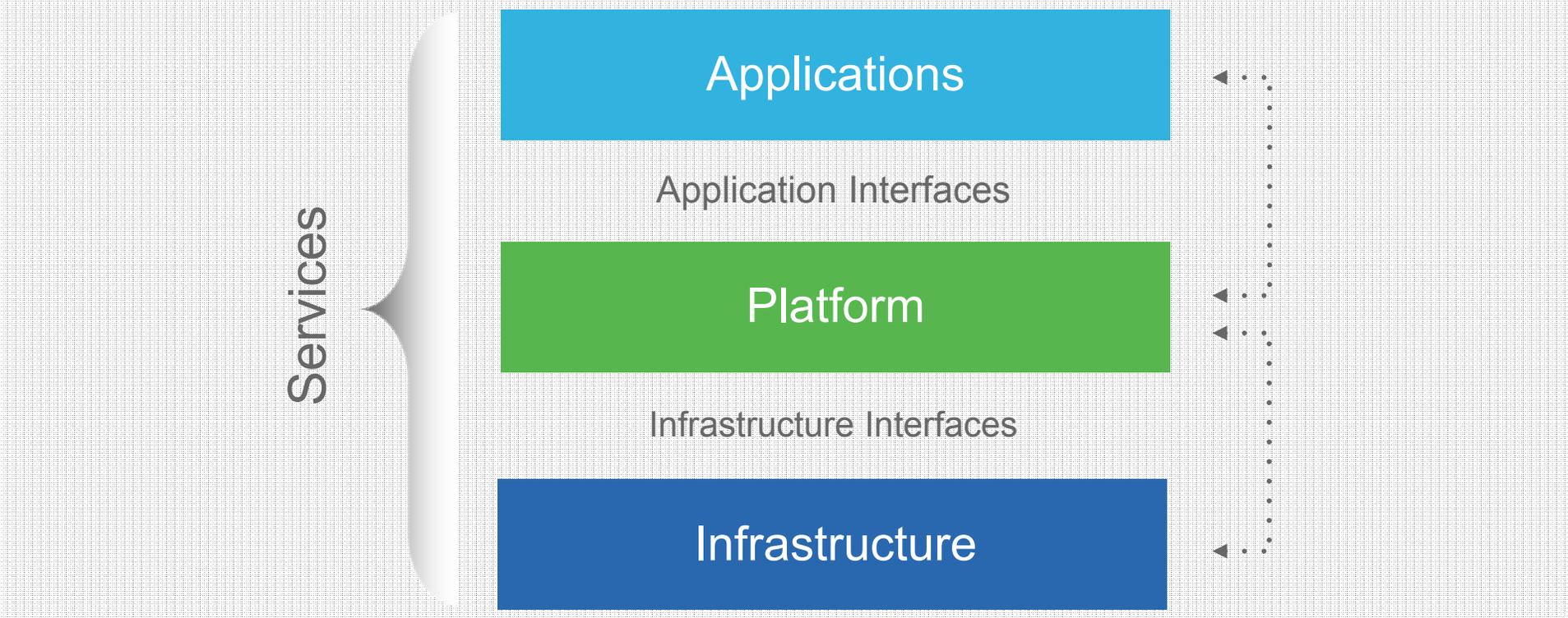
Ability to pinpoint weather for  
specific cities, street corners  
or single home addresses

# What Will It Take To Be Successful?

# Technology Challenges



# Fast IT



# A New Model for Cities of the Future



●  
Visionary  
Leadership



●  
Global Open  
Standards



●  
Smart  
Regulation

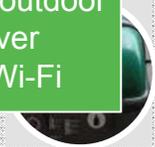
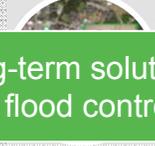


●  
Public Private  
Partnerships



●  
New  
Ecosystem

# Greater Copenhagen Deployment

	<p><b>DOLL – Outdoor Light</b> 37 outdoor light solutions converged on City Wi-Fi Denmark Outdoor Light Lab</p>		<p><b>Remote Government Expert</b> Secure remote access to Government records</p>
	<p><b>City Wi-Fi</b> • Two inner city zones • Albertslund Municipality • Horizon 2020</p>		<p><b>Smart Waste</b> IoE innovation area for greater Copenhagen</p>
	<p><b>Smart Mobility</b> • Mobility monitoring inner city • Smart parking</p>		<p><b>IoE for Health</b> • Video for care homes • Location-based services</p>
	<p><b>IoE-enabled tourism with Wi-Fi and location services</b></p>		<p><b>Smart Municipal Buildings</b> • Connected Real Estate • Energy management</p>
	<p><b>IoE for Tourism</b> • Wi-Fi access • Location-based services</p>		<p><b>Cloud Burst Program</b> • Comprehensive water defenses • Forecasting, sensing, alerting, controls</p>

Wide-ranging outdoor lighting over municipal Wi-Fi

IoE-enabled tourism with Wi-Fi and location services

Long-term solution for flood control

## Current and Potential Partners

- 24x7
- Accenture
- AGT
- CH2MHILL
- Citelum
- Conscia
- Elevate Digital
- Global Connect
- IBM
- Sensity
- TDC



## Danish Academic Partners

- Aalborg University
- DTU

## PMO for IoE Program

- CLEAN
- Gate21

## Incubator Partners

- Accelerace
- SCION - DTU
- Startup Bootcamp



منتدى دبي  
للمدن الذكية

DUBAI SMART  
CITIES FORUM

Thank you.



“One generation plants  
the trees, and another  
gets the shade.”

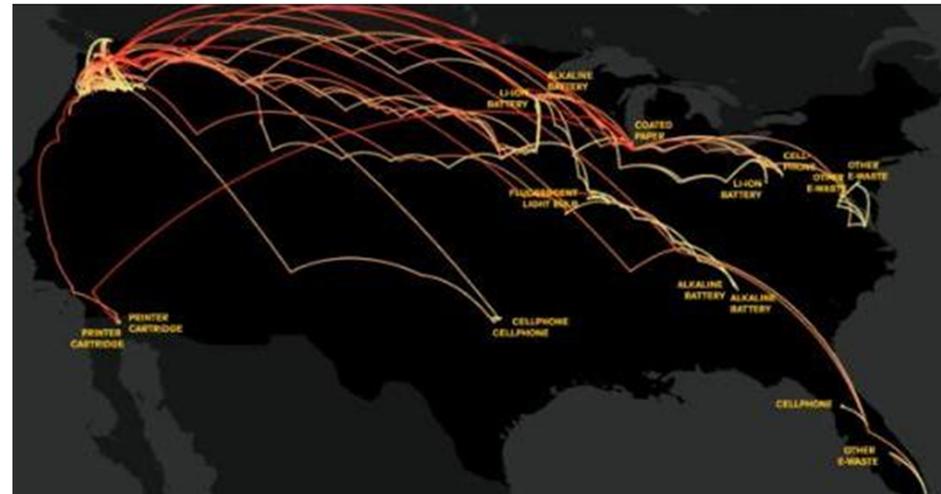
— Chinese proverb



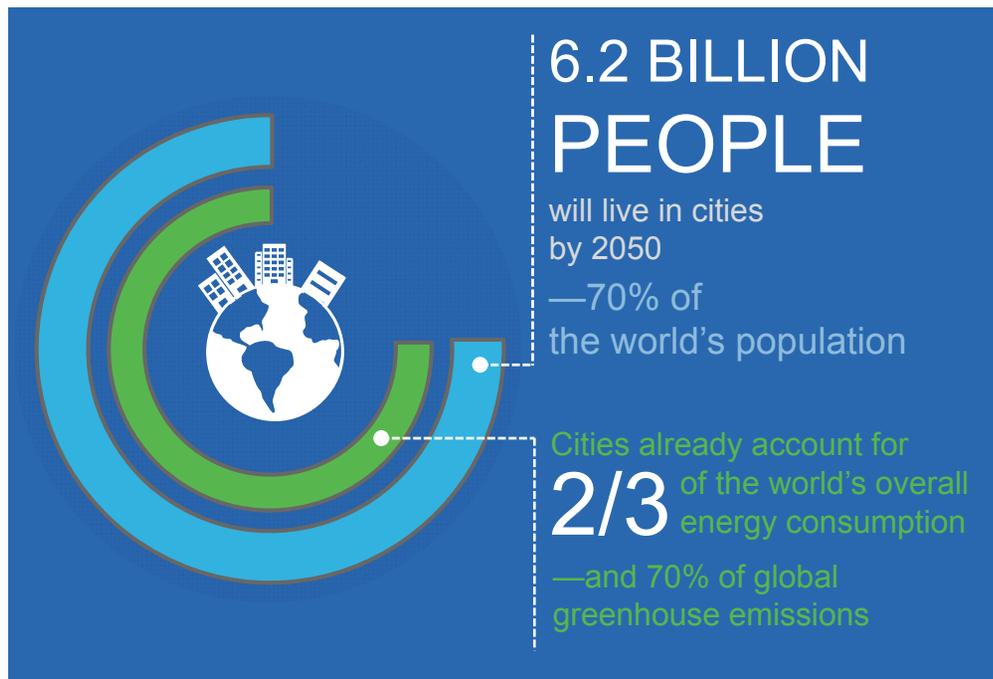
# Sensors and Mobile Technologies for Resource Management



Professor Carlo Ratti  
Massachusetts Institute  
of Technology



# Challenge



With sea level and land subsidence, flood damage in large coastal cities could reach **\$1 TRILLION A YEAR** by 2050



The number of people exposed to storms and earthquakes in large cities will more than double to **1.5 BILLION PEOPLE** by 2050

منتدى دبي  
للمدن الذكية

DUBAI SMART  
CITIES FORUM

# إنترنت الأشياء THE INTERNET OF THINGS



دبي الذكية  
SMART DUBAI

HAPPY LIVING لحياة أسعد



كلية محمد بن راشد  
للإدارة الحكومية  
MOHAMMED BIN RASHID  
SCHOOL OF GOVERNMENT

Dubai Smart City:  
IoE Value at Stake in the Public Sector

Shukri Eid

Director, Cisco Consulting Services  
Lead for Middle East Africa Russia CIS

#DSCF #SmartDubai #MBRSG

# AED 4.3b Value at Stake for Dubai Public Sector

With a higher potential for the private sector

	Worldwide (over 10 yrs)	Dubai (over 5 yrs)
Public Sector	\$4.6T	AED 4.3 bn (from our study)
Enterprise	\$14.4T	AED 13.6 bn* (using the ww public/private ratio)
<b>Total of around AED 17.9bn / 5 yrs</b>		

\* This assumes Dubai has the same enterprise mix

4.3bn AED of net value from 17 use cases only \*\*

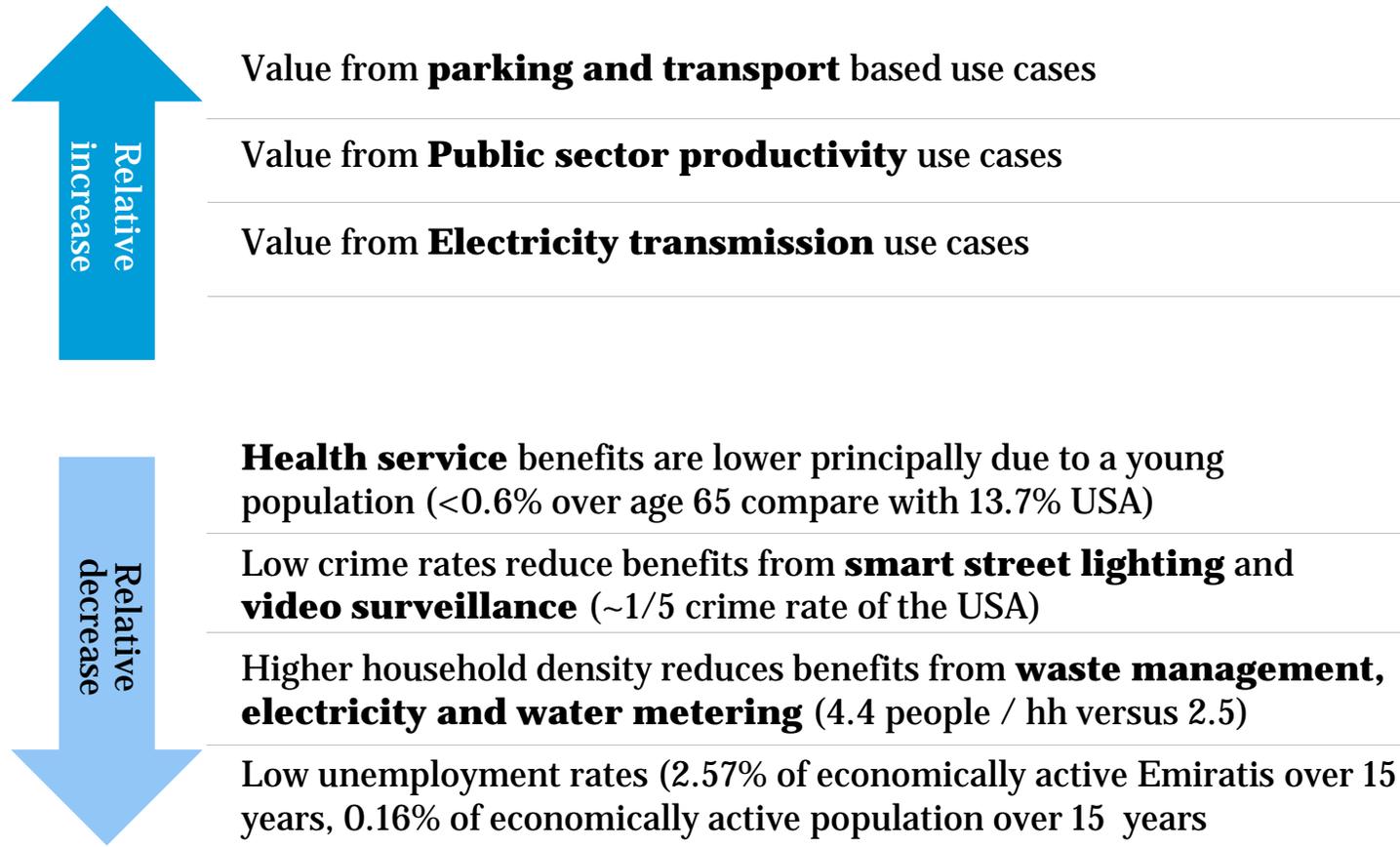
Theme	5 year value at stake (AED m)
1. Public sector productivity Telework, Collab, BYOD, S. Bldg	1,892
2. Transport Buses, Parking, Street Light, Travel Avoid	1,094
3. City Management Video Surv, Water, Electricity, Waste	378
4. Other use cases Health, Learning, Smart Pay, Trans. Grid	949

\*\* Assuming only 60% adoption rate for most services



# The Unique City of Dubai:

Dubai has unique characteristics that re-order the relative value of the use cases compared to the global analysis. For example:



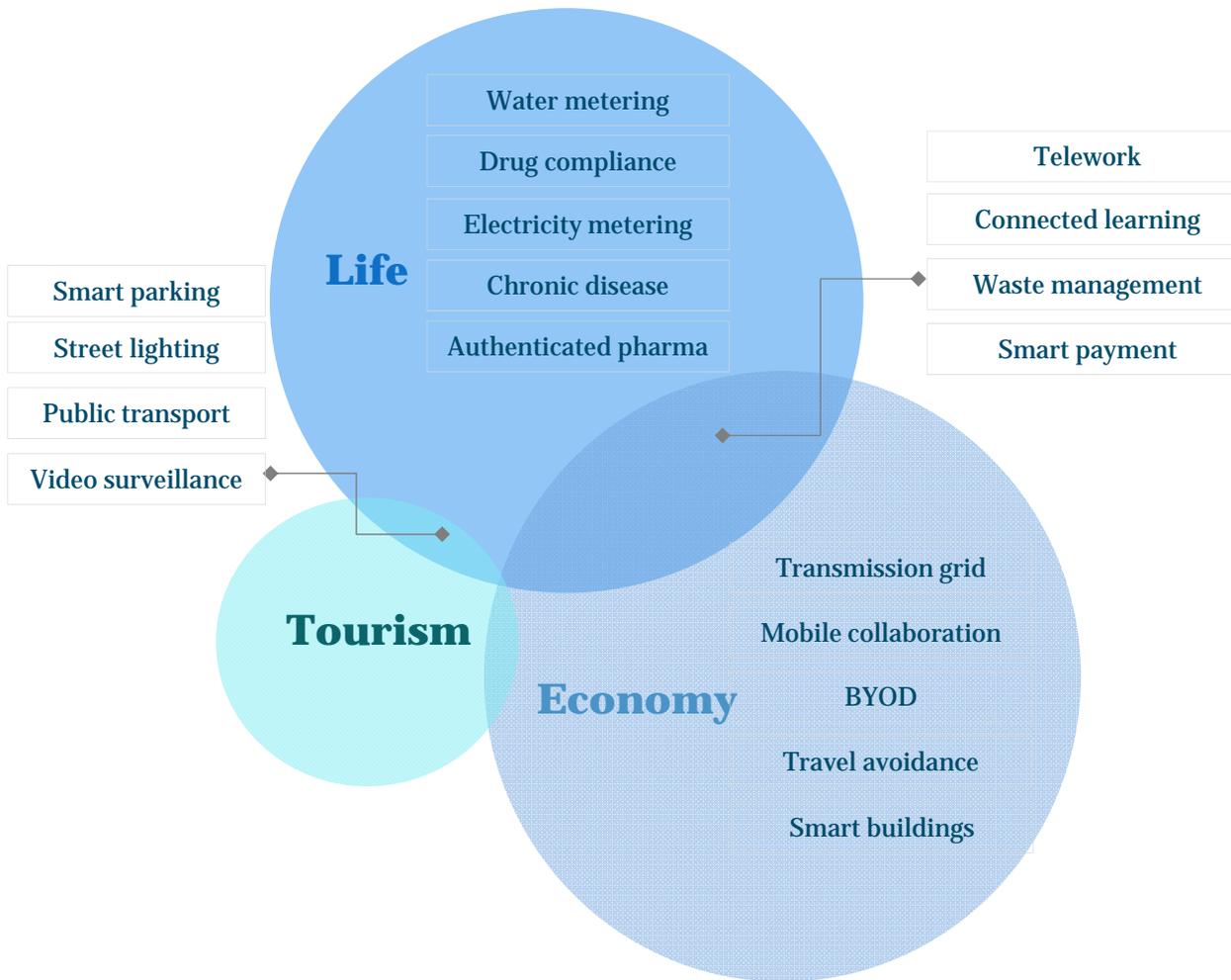
# Selected use cases overlap with “Life, Economy, Tourism”



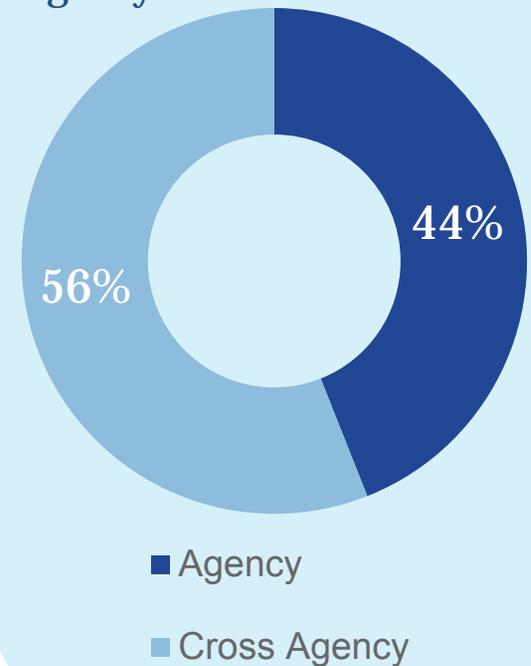
دبي الذكية  
SMART DUBAI  
لحياة أفضل  
HAPPY LIVING



كلية محمد بن راشد  
للإدارة الحكومية  
MOHAMMED BIN RASHID  
SCHOOL OF GOVERNMENT



Benefits are split evenly between agency and cross agency



# Factors critical to capturing Dubai Smart City value



دبي الذكية  
SMART DUBAI  
لحياة أفضل  
HAPPY LIVING



كلية محمد بن راشد  
للإدارة الحكومية  
MOHAMMED BIN RASHID  
SCHOOL OF GOVERNMENT

## Leadership

- Own version of IoE Value at Stake to drive Dubai's smart initiative;
  - *PS work excellence/productivity,*
  - *Superior city/tourism experience, and*
  - *City & Transport Management.*
- Touching Life, Economy, Tourism.

## Governance

- Areas of funding might not map directly to where value is recognized and measured.
- A city vision and experience requires an executive driver above agency level.
- Budget centralization on related initiatives is a strong tool.

## Competence

- Success to be measured at a level different to current departmental KPIs. City dashboard?
- Thinking in terms of value flow, data usage, decision making and ecosystems is critical. Processes to be transformed with new-gen capabilities.

## Technology

- Shared infrastructure among PS agencies (sanitation with utilities, roads with municipality and police ..etc)
- Shared access to systems, data, collaboration call for 'fog' computing.
- Re-thinking the role of existing partners.



# Dubai Strategic Plan

Focus on sustainability as a responsible city

Economic

Social

Environmental

Economic  
Development

Social  
Development

Security, Justice  
and Safety

Infrastructure, Land  
& Environment

Public Sector  
Excellence



## Internet of Things/ Everything



منتدى دبي  
للمدن الذكية

DUBAI SMART  
CITIES FORUM

Thank you

