Consultation on Developing ICT Infrastructure for Smart Cities in Peru

15 July 2014

KISDI KOREA INFORMATION SOCIETY DEVELOPMENT INSTITUTE

Peru-Korea Workshop on Smart City

In the point of view of ICT, with cases in Korea

Introduction on Smart City

15 July 2014

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1 Why Smart City?

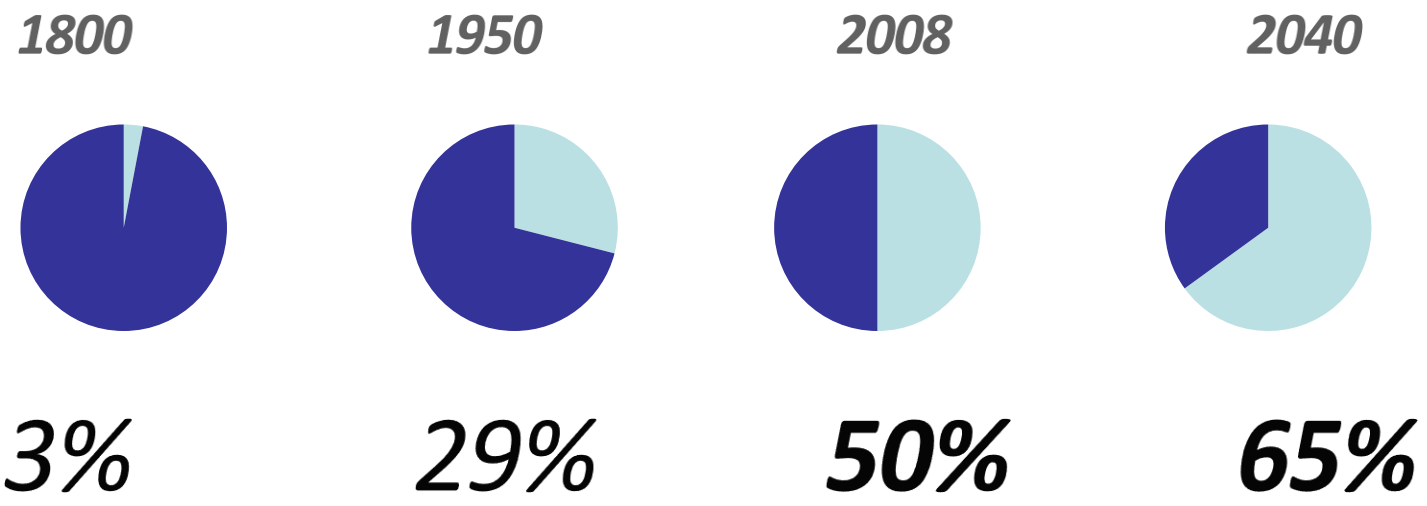
2 What is Smart City?

3 How to implement Smart City

4 What we could get from Smart City

Why Smart City? > Urbanization

1.3 million people are currently moving into cities **each week**



http://postscapes.com/anatomy-of-a-smart-city-full

Why Smart City? > Impact of Urbanization

The top 600 urban centers generate

60% *of global GDP*

In the developing world,

as much as ***80%*** *of future economic growth will occur in cities*

http://postscapes.com/anatomy-of-a-smart-city-full

Why Smart City? > Impact of Urbanization

Cities use ***60% - 80%***
of the world's annual energy needs

Lighting alone represents
19% *of the world's total electricity consumption*

http://postscapes.com/anatomy-of-a-smart-city-full

Why Smart City? > Problems by Rapid Urbanization

Why Smart City? > How to Solve

We have an experience in

Work efficiency

by ICT technology

Why Smart City? > How to Solve

Then, how about applying ***ICT technology*** *to solving urbanization problems?*

Start of the ***U-City in Korea***

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What is Smart City? > U-City in Korea

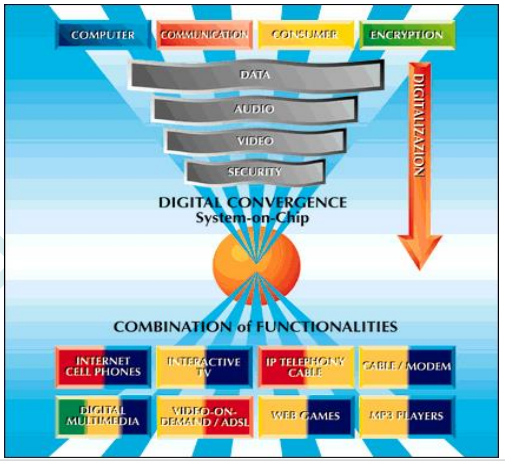
Manufacturing-oriented: 1980s

- ***Export-oriented*** *economy owing to insufficient natural resources*
- *Rapid economic growth thanks to* ***concentration in heavy industries***
- *Emerged as a new growing economy*

Re-boom of Construction/IT: 1990s

- ***Decline of manufacturing*** *while emergence of knowledge-based industries*
- *Continued investment in IT industry has made* ***IT as the driver*** *of economic prosperity*
- *Re-boom of construction industry thanks to* ***new city construction***

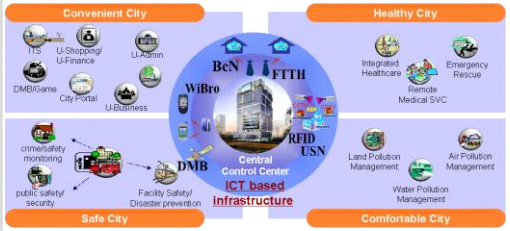
New Growth Engine: 2000s ~ Present



- ***Saturation of construction/IT market***
- *Advance of new technologies through convergence between industries*
- *Design of much better solutions via* ***convergence of construction and IT***

What is Smart City? > U-City in Korea

Start to build "U-City" Concept(2004)



- *Model of integrated city administration*
- ***Test-bed for IT-construction convergence***

MOCT-MIC collaboration to U-City development(2006)

- ***MOCT*, MIC** and KLC***** *signed a MOU on U-City implementation*
- ***KT*** *agreed with MIC to develop U-City technologies*

Applying U-City Concept in Dongtan Project(2007)

New City Project

- ***KT:*** *U-City planning, implementation and operation*
- ***KLC:*** *Construction Works*
- ***Local Government:*** *Operation and maintenance*

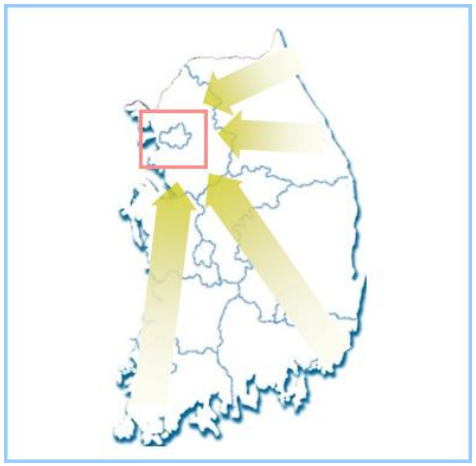
** MOCT: Ministry of Construction and Transportation*

*** MIC: Ministry of Information and Communications*

**** KLC: Korea Land Corporation, a subsidiary of MOCT*

What is Smart City? > U-City in Korea

Population Concentration

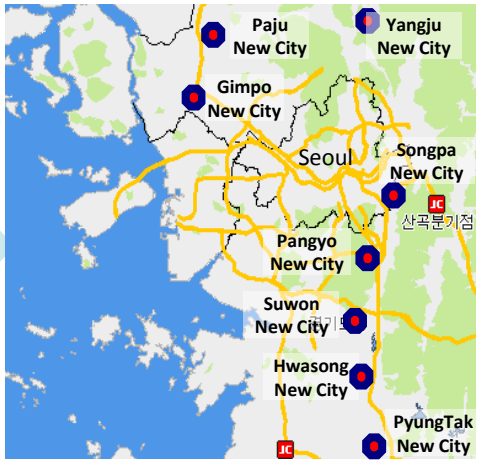


- *Concentration of population and industries in Seoul*

Phase 1: 1990s

- *5 new cities developed around Seoul metropolitan*
- *Emphasis on population dispersion produced a number of bed towns*

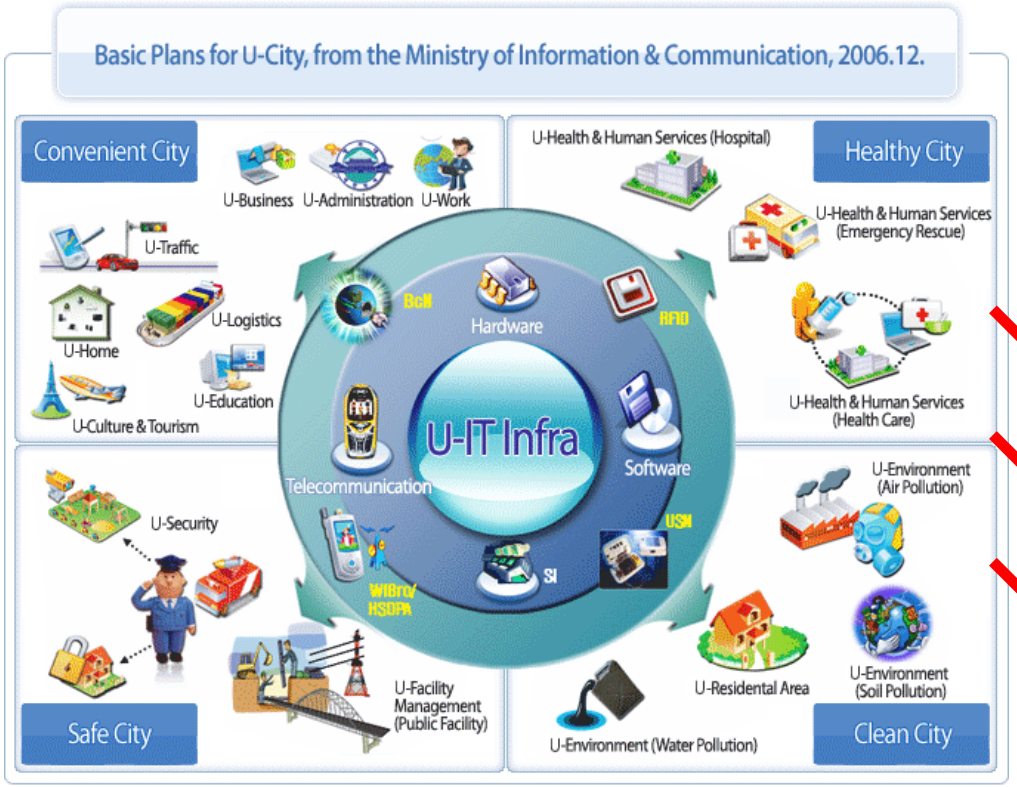
Phase 2: Up to Present



- *Paju-Unjeong City (2009-2013)*
- *Hwaseong-Dongtan City (-2007)*

What is Smart City? > U-City in Korea

"A future high-tech city where IT infrastructure, technology and service are integrated into housing, economy, traffic and other facilities"



- ***Public Sector Driven***
- ***ICT Technology Driven***
- ***Public Service Focused***

Basic Plans for U-City, from the Ministry of Information & Communications, 2006. 12.

What is Smart City? > U-City in Korea

*The term "**Ubiquitous City**" means a city that provides ubiquitous urban services **at any time in any place** through the ubiquitous city infrastructure constructed by utilizing ubiquitous city technologies to enhance the competitiveness of the city and the quality of life therein*

- Act on construction, etc. of ubiquitous cities

"ICT Technology & Infrastructure"

02

What is Smart City?

KNOWLEDGE CITY

Common service delivery platform for economies of scale across multiple infrastructure layers

SUSTAINABLE CITY

Goes beyond economic targets, to deliver quality of life improvements for its citizens, industry and local environment

INNOVATIVE CITY

Innovates to provide access to enhanced information flow for citizens and services providers

Smart City?

Sensor networks

SMART GRIDS

Intelligent Transport Systems

E-GOVERNMENT

Intelligent CITY

Combines disparate data sets to offer productivity insights and enhancement to its citizens and service providers

Mobile Opportunities in Smart Cities Connected Living Programme, GSMA, 2012

02

What is Smart City?

IBM

1. Cities are getting bigger
2. Increased consumption
3. Limited budget and resources
4. Need to become smarter

Smarter City

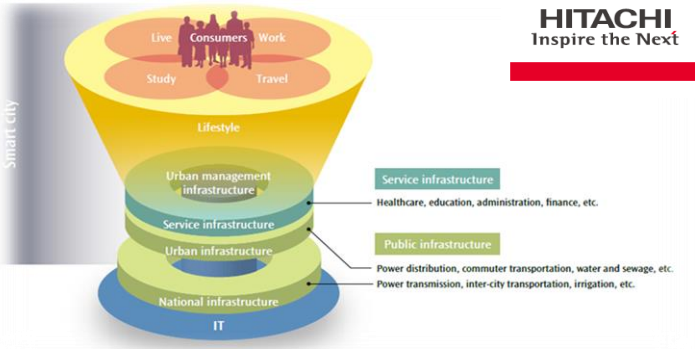
Smart City?

SIEMENS

Sustainable Cities Initiative by Siemens

Smart City Ranking

HITACHI
Inspire the Next



Low-carbon cities capable of sustained growth

02

What is Smart City?

*A City can be defined as "**smart**" when investment in **human and social capital** and traditional (transport) and modern (ICT) **communication infrastructure** fuel **sustainable economic development** and **a high quality of life**, with a wise management of natural resources, through participatory action and engagement*

1. *Smart economy*
2. *Smart mobility*
3. *Smart environment*
4. *Smart people*
5. *Smart living*
6. *Smart governance*

http://en.wikipedia.org/wiki/Smart_city#Definition

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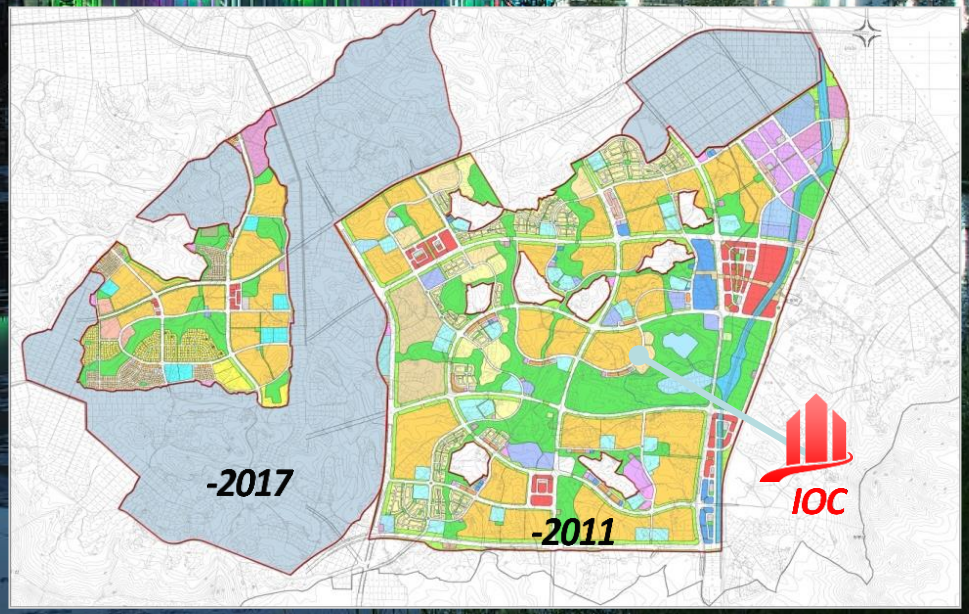
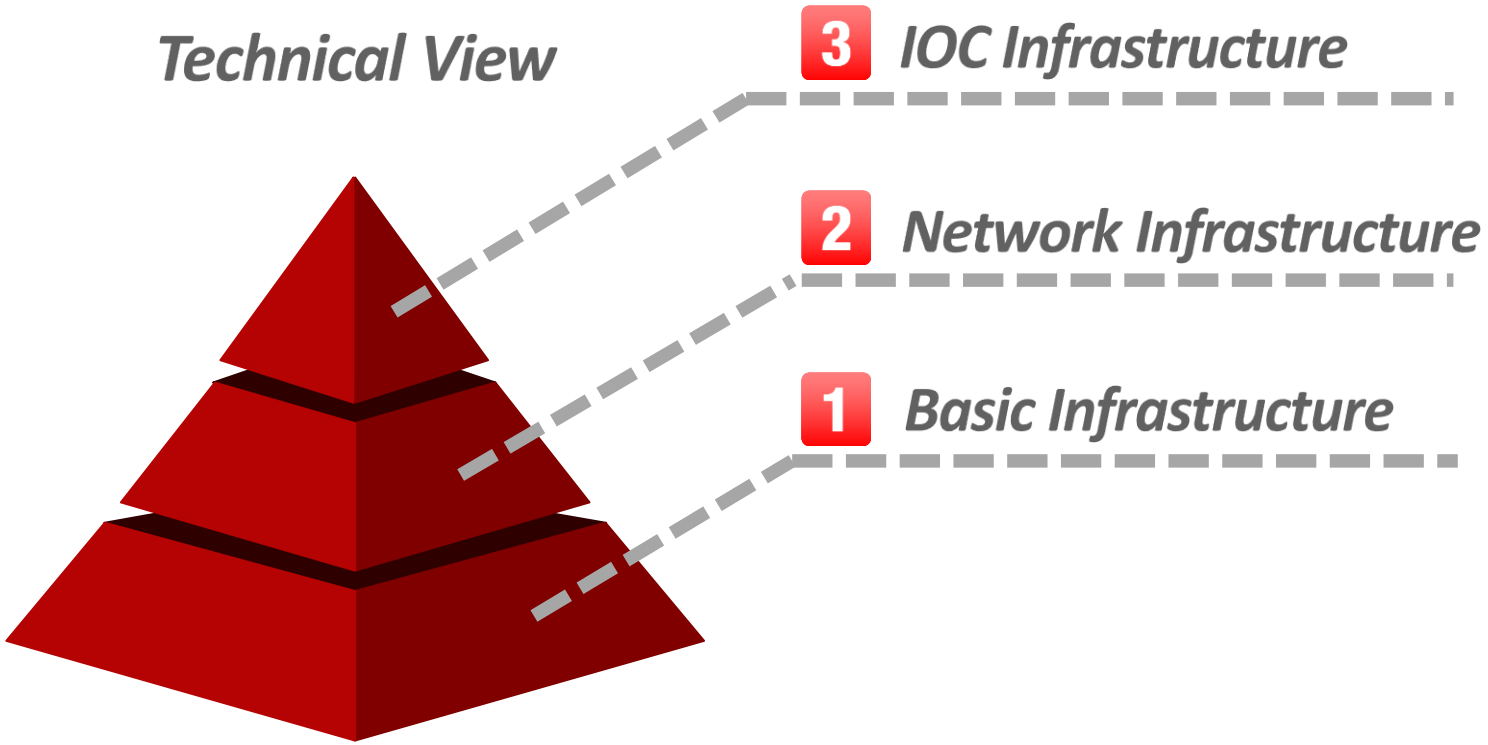
03

How to implement Smart City > Smart City Architecture

> Site Name: Paju Eunjeong City
> Location: 40km west from Seoul
> Size: 16,477km²
> Population: 205,000
> Period: 2008 - 2017



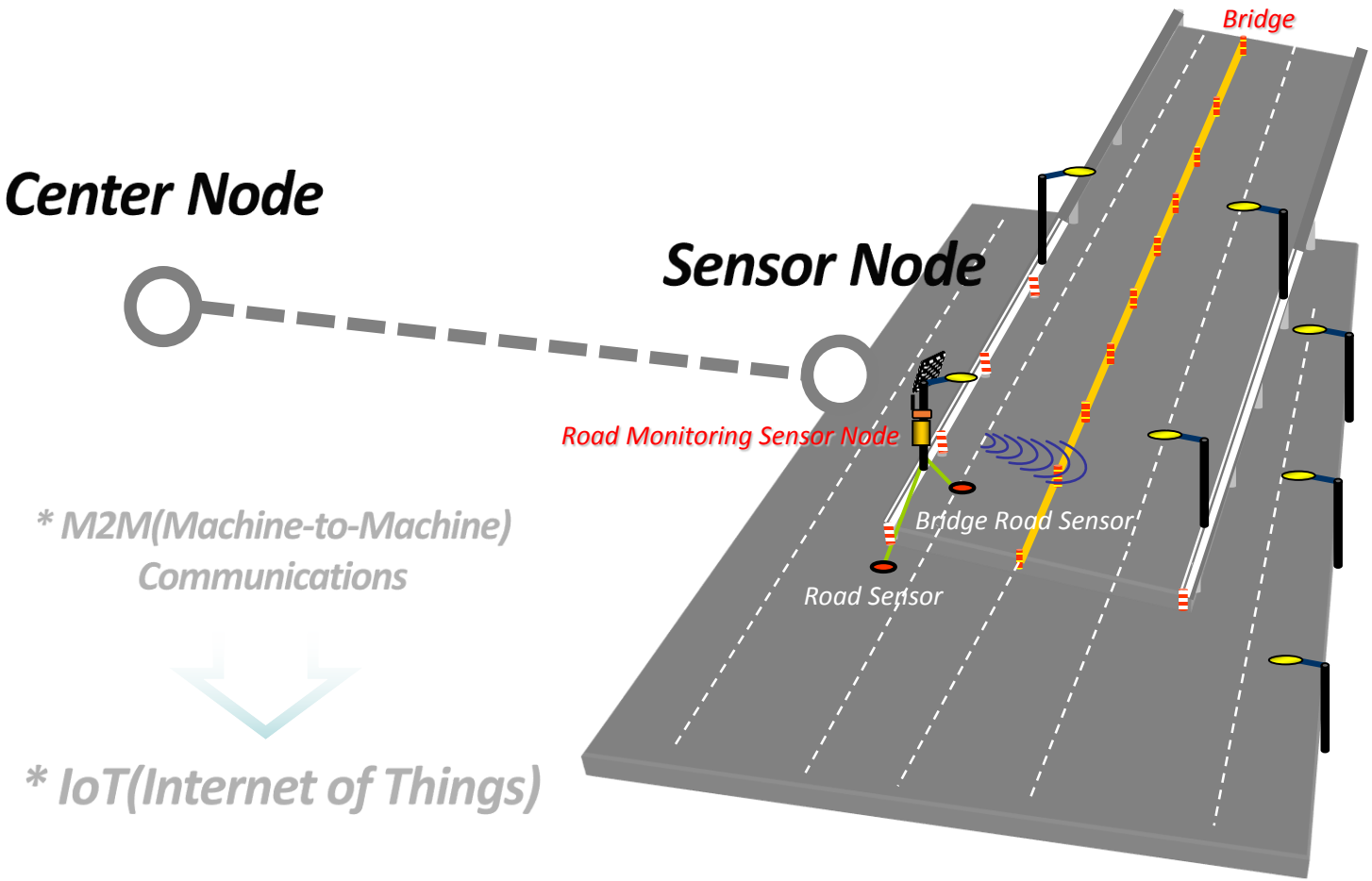
How to implement Smart City > Smart City Architecture



National Information Society Agency, u-City IT Infrastructure Implementation Guideline

How to implement Smart City > Smart City Architecture

How to implement Smart City > Smart City Architecture



How to implement Smart City > Smart City Architecture

Wired Network

Telephone Network(PSTN)
Data Network(Broadband, Frame-relay and so on)

Wireless Network

Telephone Network(UMTS, 3G, 4G)
Data Network(3G(HSPA+), 4G(LTE), WiMAX, Wi-Fi)
Wireless Personal Area Network(ZigBee, RFID, NFC, Wi-Fi, Bluetooth and so on)

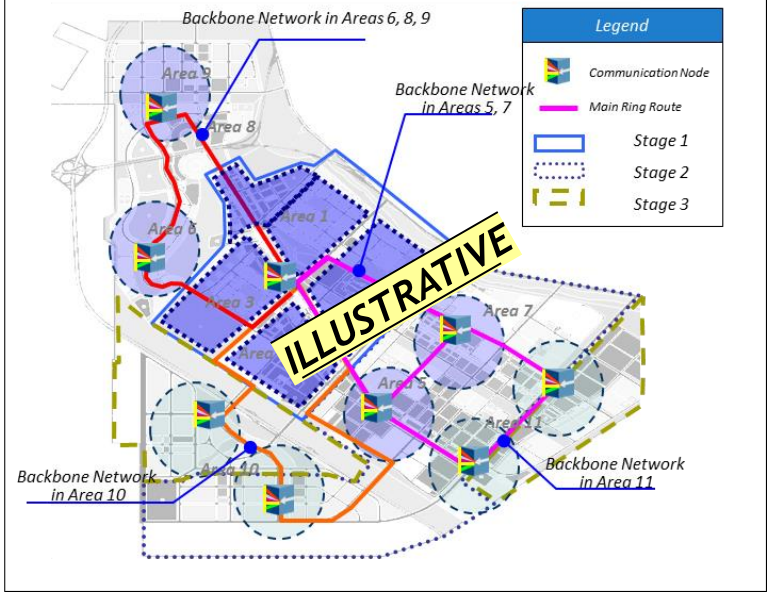
How to implement Smart City > Smart City Architecture

- Communication Network Bandwidth by Services

Smart Services	Bandwidth/Device	Communication Type
Environment Monitoring (Pollution, Disaster)	~ 64 Kbps	Serial TCP/IP
Underground Facility Monitoring (Sewer Pipe, etc...)	~ 64 Kbps	Serial TCP/IP
Safe & Security Monitoring (Image Surveillance – CCTV)	***1 ~ 10 Mbps***	**Serial TCP/IP**
Transportation Information	VMS: [illegible]bps Ki[illegible]4 Kbps	Serial TCP/IP
Traffic Signal Control	~ 10 Mbps ~ 64 Kbps	Serial TCP/IP
Parking Management	5 ~ 40 Mbps	TCP/IP
Urban Facility Control (Streetlight, etc...)	~ 64 Kbps	Serial TCP/IP
Remote Education	100 Mbps/School	TCP/IP
Digital Signage / Media Board	10 Mbps	TCP/IP

ILLUSTRATIVE

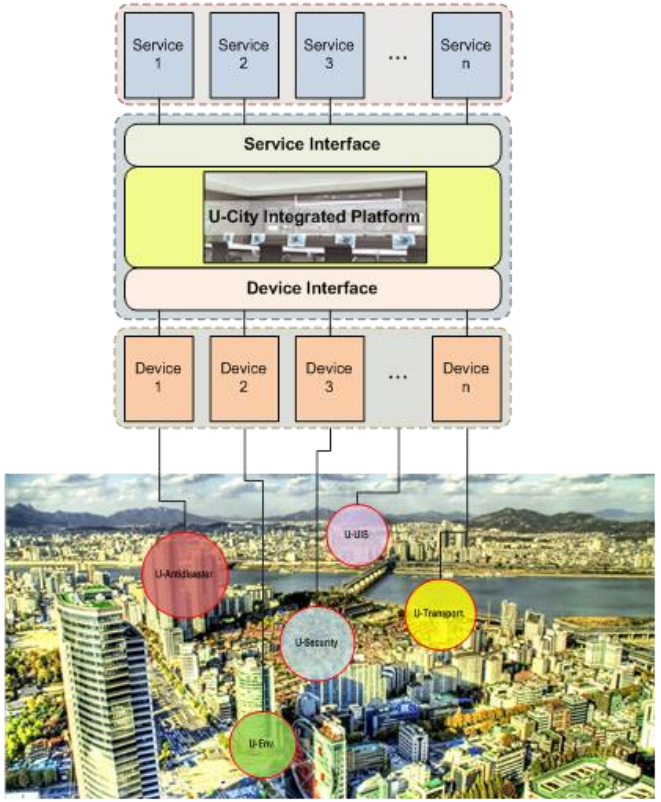
Physical Routes of Backbone Network



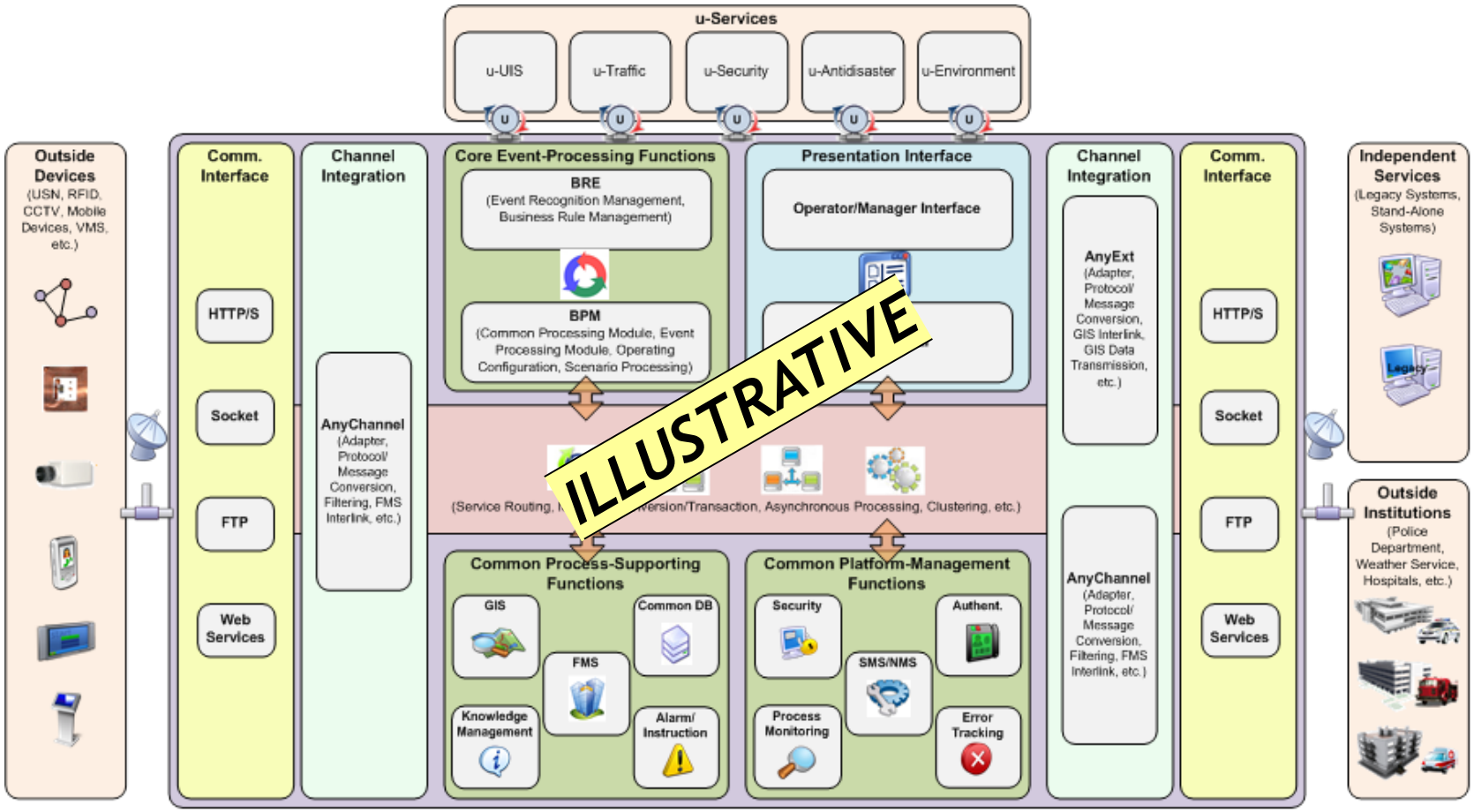
How to implement Smart City > Smart City Architecture

Anti disaster, UIS, Transportation, Security, Environment
**UIS: Urban Information System*

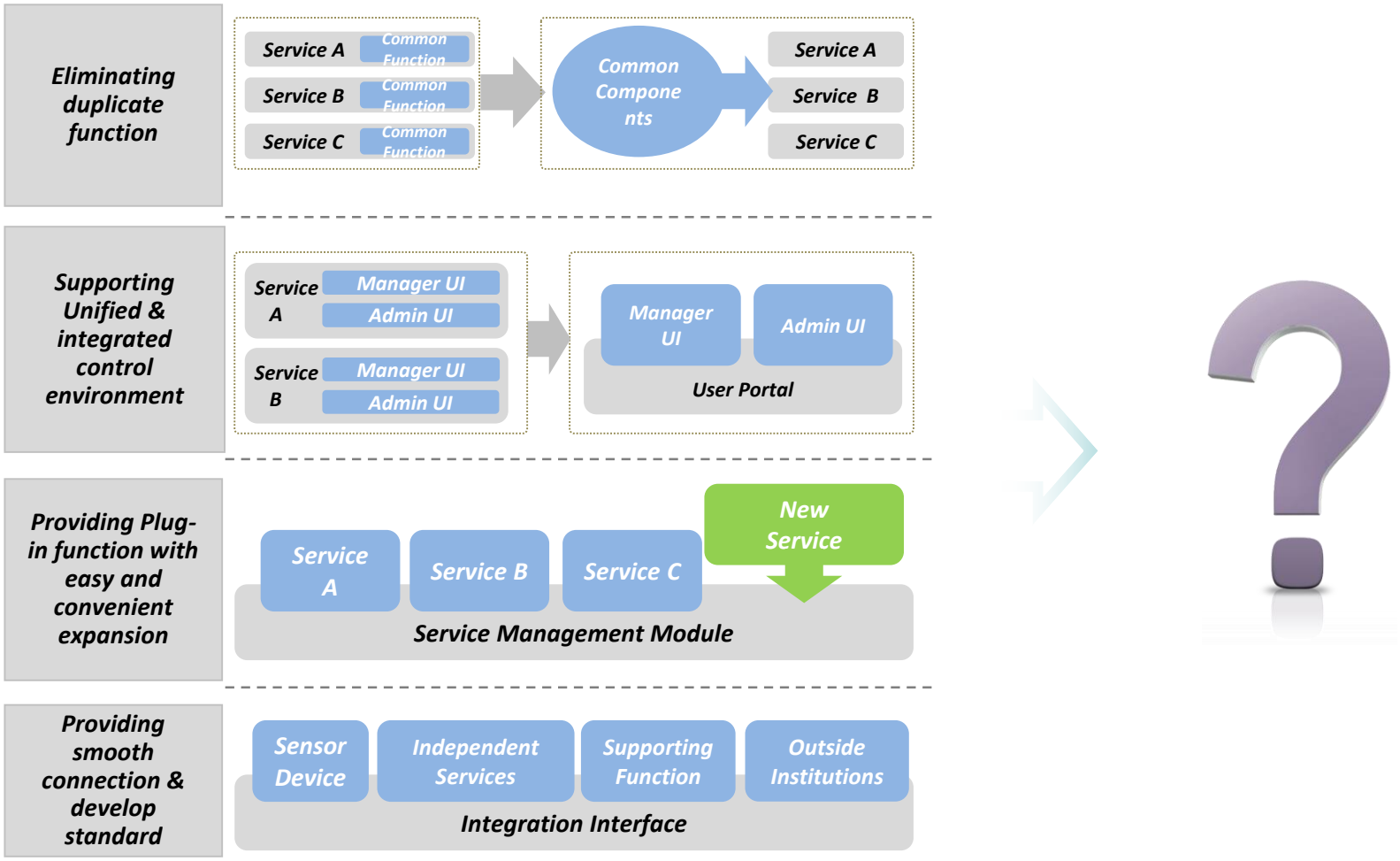
Vs.



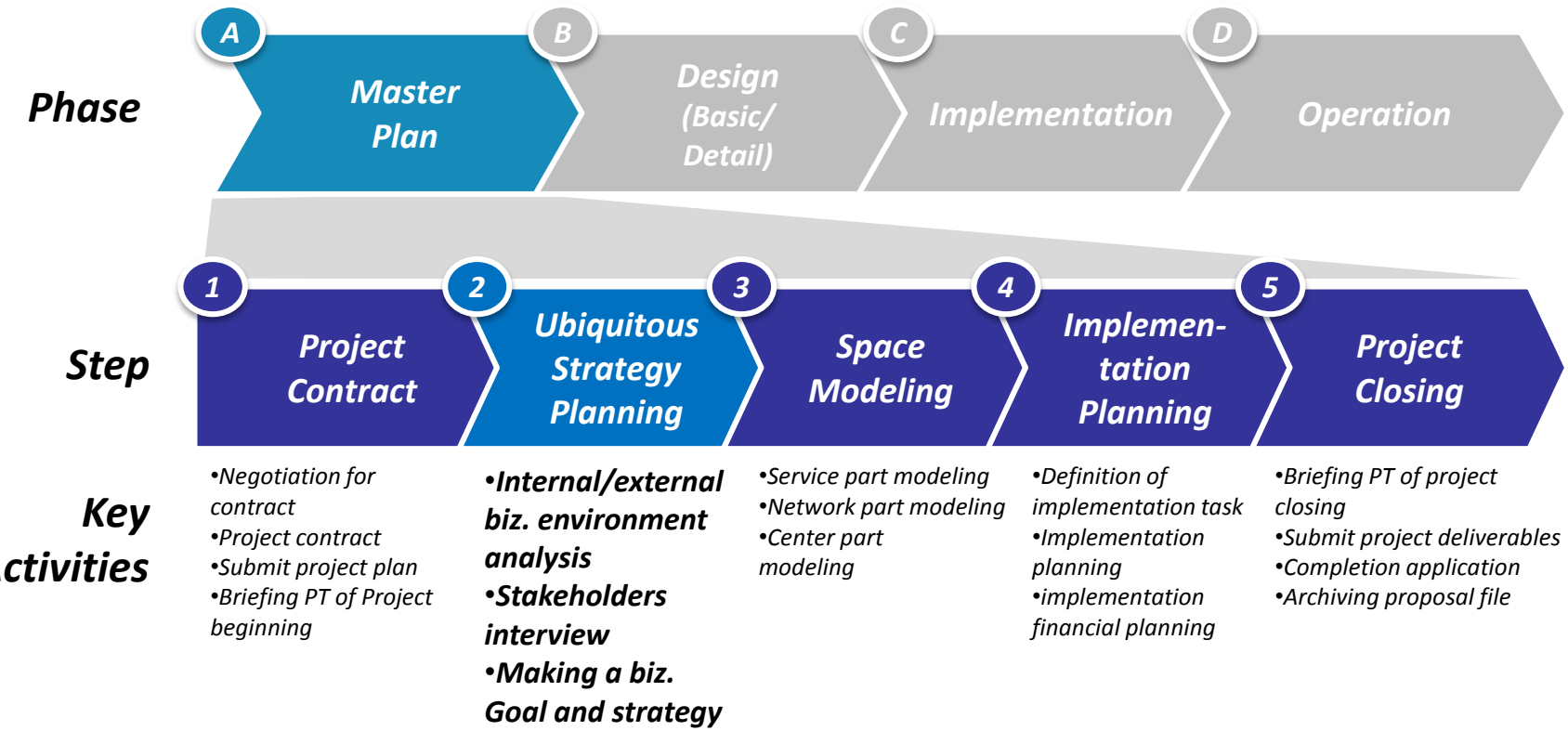
How to implement Smart City > Smart City Architecture



How to implement Smart City > Smart City Architecture



How to implement Smart City > Process



How to implement Smart City > Service Selection

- *Web Based PMIS*
- *RFID labor and material management*
- *Web-camera site monitoring*

U-Construction

U-Biz

- *U-Conference Service*
- *IBS Service*
- *U-Card*

U-Home

- *Home Automation*
- *Home Security*
- *Image Surveillance in Housing Complex*
- *Shared Facilities Management Service in Housing Complex*

U-Education

- *Learning Aide Service*
- *Intelligent Classroom*
- *Educational Content Delivery*

U-Traffic

- *Real-Time Signal Control*
- *Automated Traffic Control*
- *Public Transportation Information*

U-Health/Welfare

- *Home Care*
- *Emergency Patient Recognition*
- *Emergency Rescue for the Single Elderly*

U-Environment

- *Weather Observation & Forecast*
- *Air Quality management*
- *Water Quality management*

U-Culture/Tour

- *Tourist Information*
- *City Tour Service*

U-Urban Facility

- *Water Pipe Leak Management*
- *Underground Facility Location Detection*
- *Remote Streetlight Control Service*

U-Administration

- *Administration Portal*
- *Comprehensive Ombudsman Service*

U-Security/ Prevention

- *Protection Service for the Weak*
- *Emergency Call*
- *Fire Management*

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What we could get from Smart City > New Town

04

Hawseong-Dontgan City Case

Public benefit through smart city services

- *Total public benefit of U-City implementation and operation will be about 104M USD*

  *(Benefit/cost ratio = **1.57***)*

Improved Safety

- ***49.3%** decrease in crime rate*
- *U-Safety service performance in 2011*

  *- **44** wanted criminal arrested*

  *- **553** wanted vehicles and 1,176 criminals recognized by CCTV*

Increased asset value & marketing effect

- *Residential asset premium*
  = About 600 USD per square meter
- ***10%** increase compared to the competing cities around Dongtan City**

Effective Urban Infrastructure

- *Parking lot capacity increased by **40%** with intelligent parking service*
- *Water pipe leakage decreased by **4%** with water monitoring service*

** U-City Feasibility Study(Ministry of Land, Infrastructure and Transport, 2010)*

What we could get from Smart City > New Town

04

IFEZ(Incheon Free Economic Zone) Case

Songdo Area	▪ *Area: 53.4 km²* ▪ *Working expenses: 10,425 M USD* ▪ *Period: 2003-2020* ▪ *Estimated Population: 252,000 people*	▪ *ICT infrastructure CAPEX 164M USD(1.57%)* ▪ *Pilot project: 12M USD*
Yeongjong Area	▪ *Area: 98.3 km²* ▪ *Working expenses: 4,671 M USD* ▪ *Period: 2003-2020* ▪ *Estimated Population: 294,000 people*	▪ *ICT infrastructure CAPEX 115M USD(2.46%)* ▪ *Pilot project: 20M USD*
Cheongna Area	▪ *Area: 98.3 km²* ▪ *Working expenses: 6,352 M USD* ▪ *Period: 2003-2012* ▪ *Estimated Population: 90,000 people*	▪ *ICT infrastructure CAPEX 52M USD(0.81%)*

THANK YOU

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