SMARTCITY
EXPO WORLD CONGRESS

Smart City beyond the City: Regional and National Strategies

Korean Smart City
- Status of Korean City Development -

2019 Smart Cities Index Report:
Analysis of 20 Cities

19th November 2019

Information Systems Intelligence

DFK

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SMARTCITY
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01

2019 Smart Cities Index Report

Smart City Index

Performance Measurement Dimensions

Smart City Index Report Published Biannually,
8 Measurement Dimensions as : Service Innovation, Urban Innovativeness, Collaborative Partnership and etc.

Smart Cities Performance Measurement Dimensions

Analysis of Global Smart Cities

2019 Smart Cities Index Report : Analysis of 20 Cities

386 Smart City Projects, 993 App-Web Services,
249 Infra based Services, 169 Smart City Living Lab

*Source: 2019 Smart City Index Report, ISi Lab, Yonsei University

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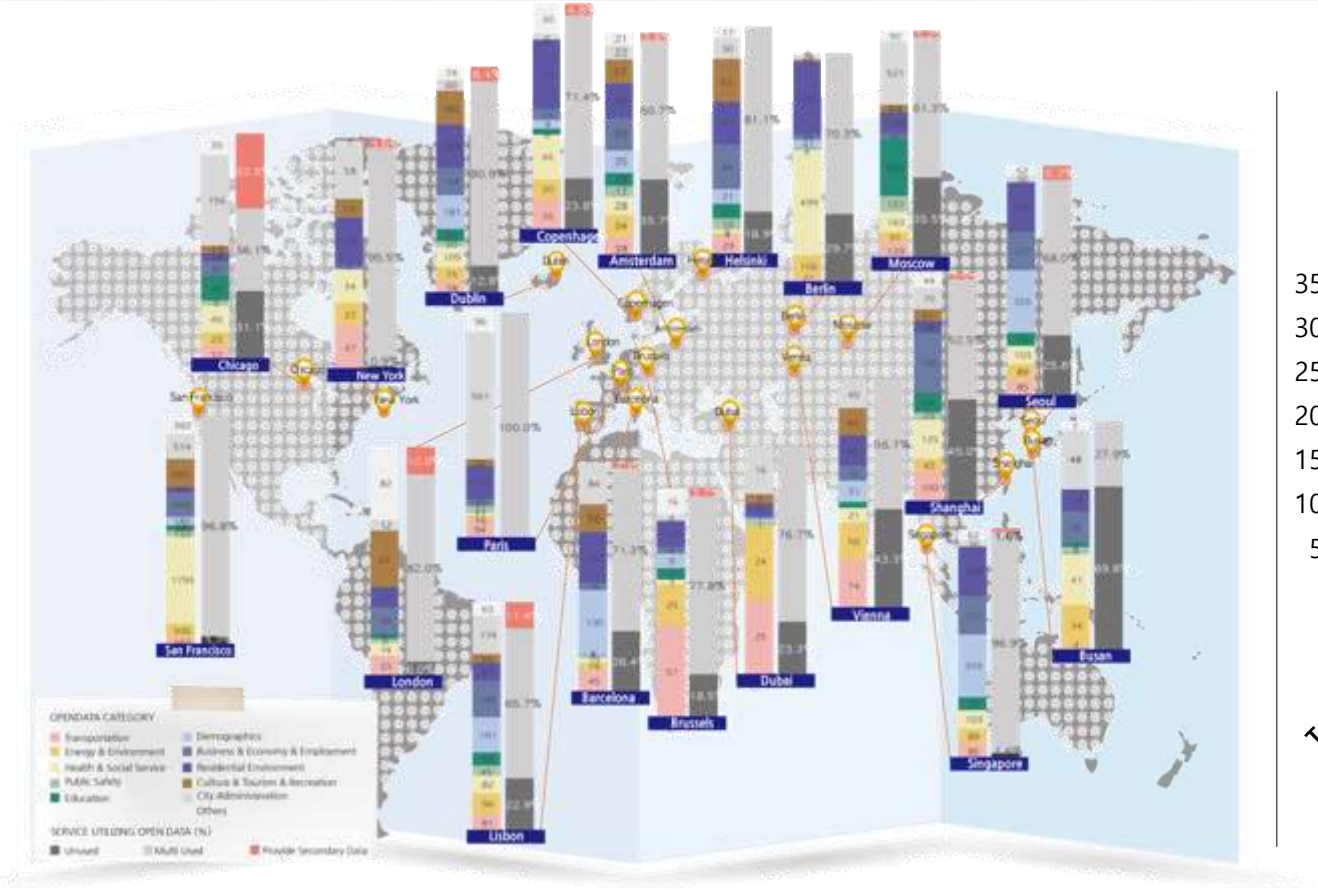
URBAN OPENNESS

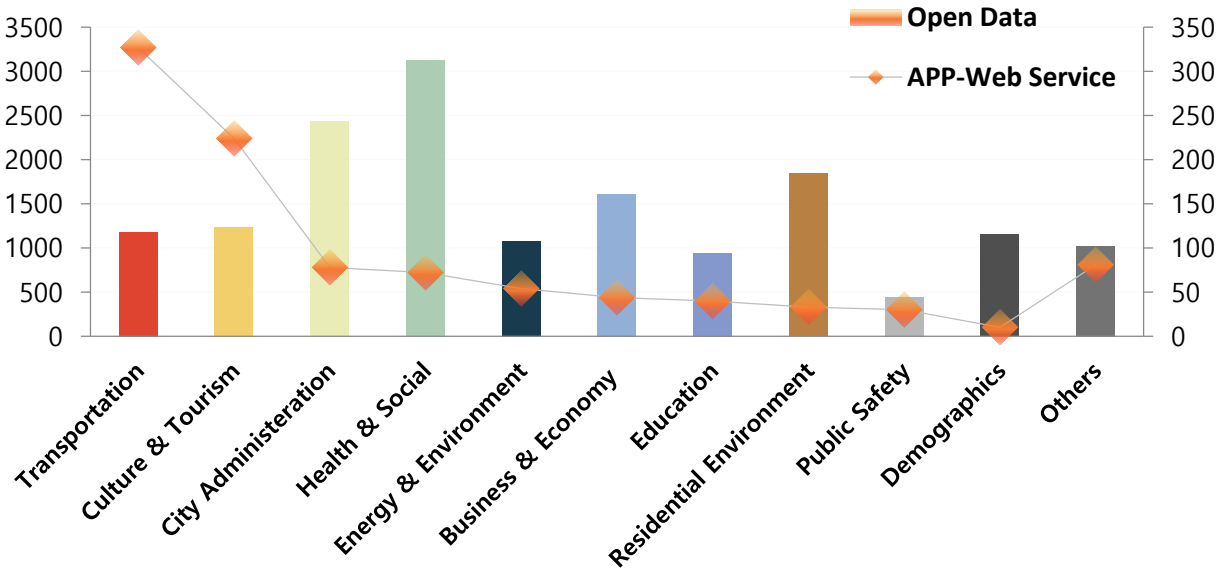
(1) Open Data : Utilization is the key

Urban openness can be defined as
: Creating Open Innovation Environment by empowering citizen with Open data / ICT Technologies



Open Data Categories & Service Categories

Need to monitor the quality of open data,
to foster future development of smart city services



*Source: 2019 Smart City Index Report, ISi Lab, Yonsei University

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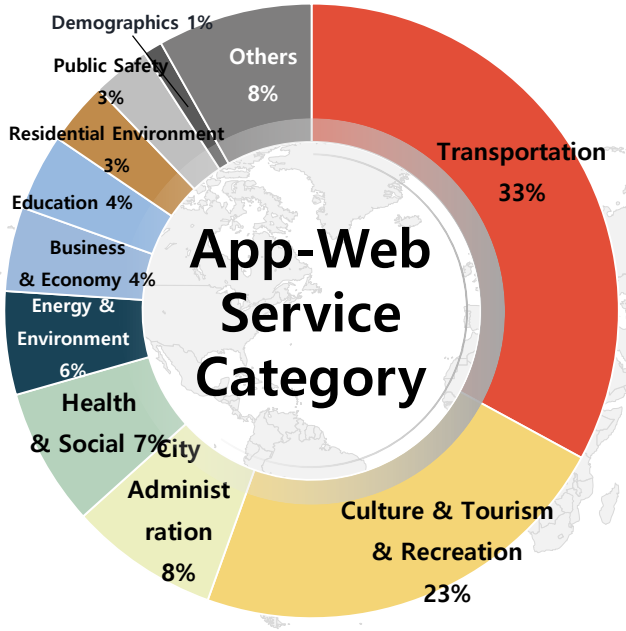
SERVICE INNOVATION

Analysis of 993 App-Web Services

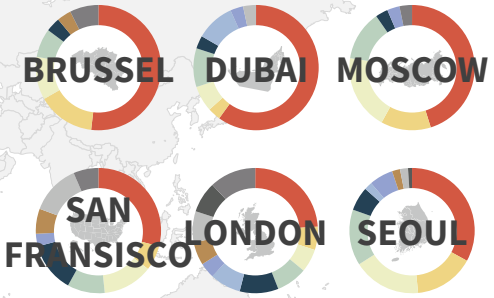
Based on analysis of 20 cities, most cities providing smart city services in Transportation (33%) followed by Culture and Tourism (23%) , City Administration (8%)

10 Smart City Service Categories



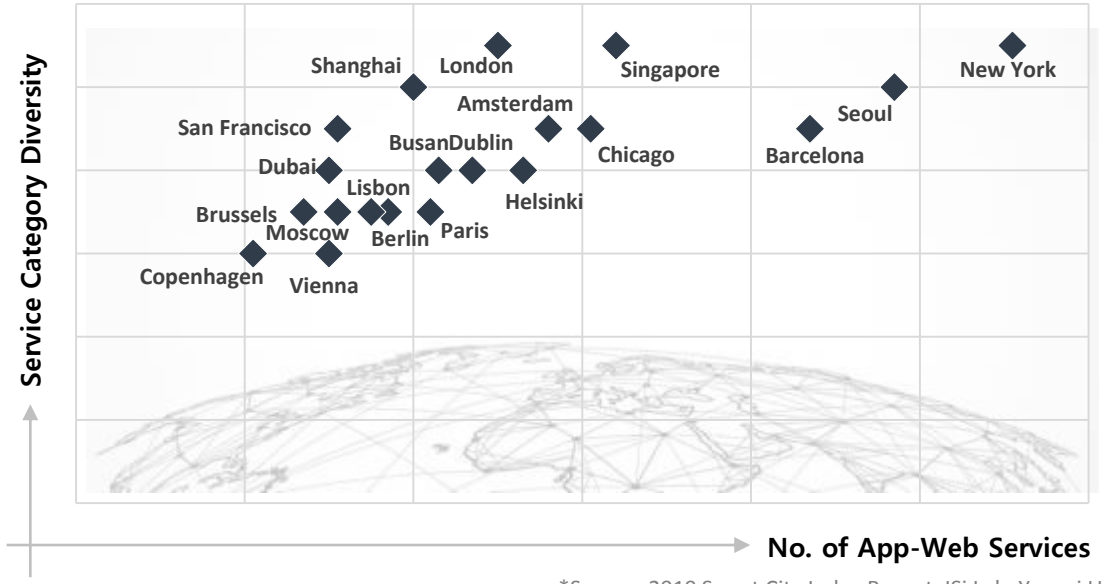
Transportation 33%

Cities with Service Demographic Focused on Transportation (over 40%) : Moscow, Dubai, Dublin, Brussels, Paris



Smart City Service Demographic

Comparing the number of Smart City Services and Service Category Coverage, New York, Seoul, Singapore, London were Leading Smart Cities in terms of Service Innovation.



*Source: 2019 Smart City Index Report, ISi Lab, Yonsei University

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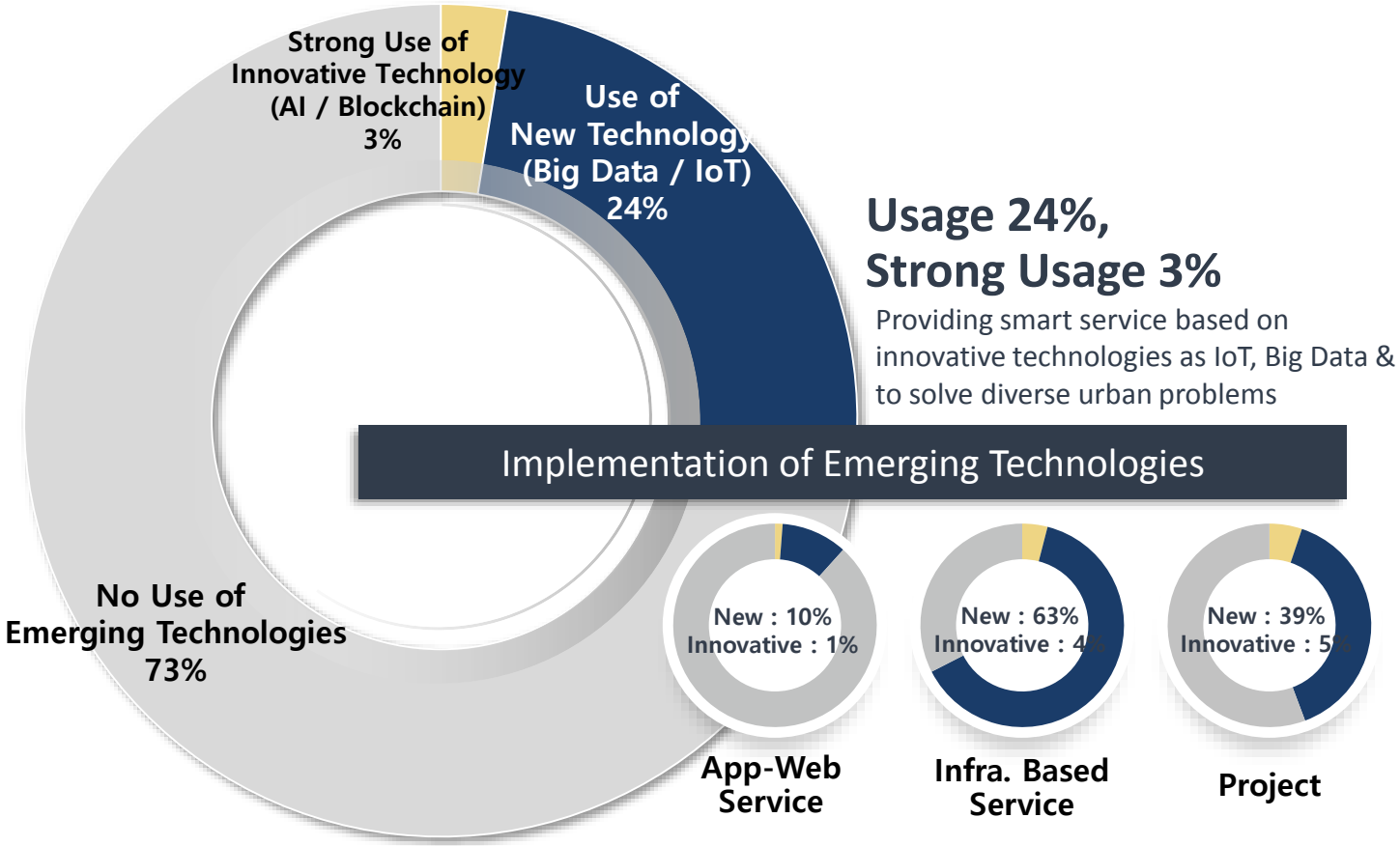
URBAN INTELLIGENCE

Analysis of 993 App-Web Services, 386 Smart City Projects, 249 Infra Based Services

Average Level of Urban Intelligence 28%,
Energy & Environment(35%), Transportation(26%) adopt intelligent technologies

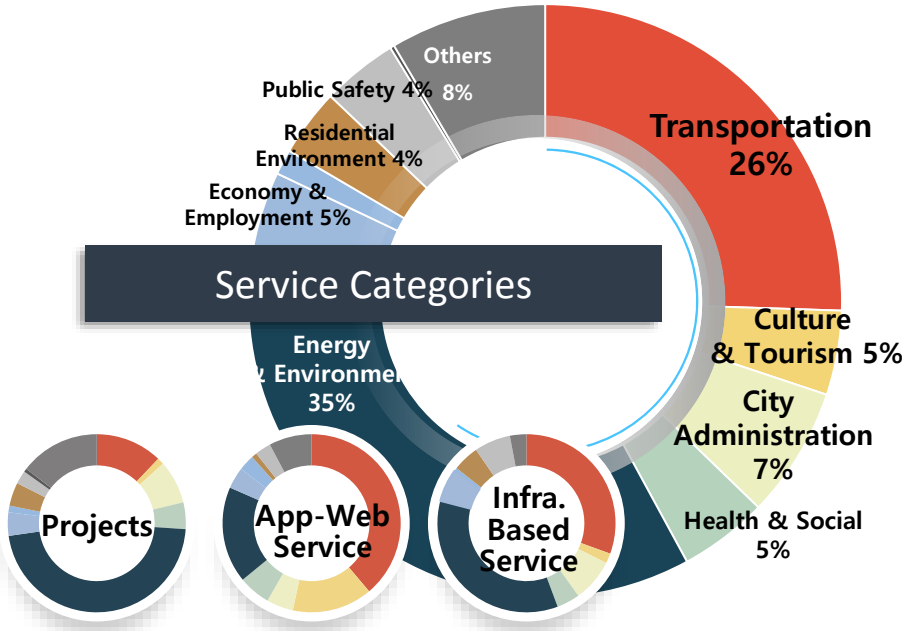


Usage 24%, Strong Usage 3%

Providing smart service based on innovative technologies as IoT, Big Data & AI to solve diverse urban problems

Average Level of Urban Intelligence 28%

- Leading Cities : New York, Seoul, Berlin, Amsterdam
- Categories : Energy & Environment (35%), Transportation(26%)



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SMARTCITY
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02

National & Regional Smart City Strategies

SMART CITY GOVERNANCE

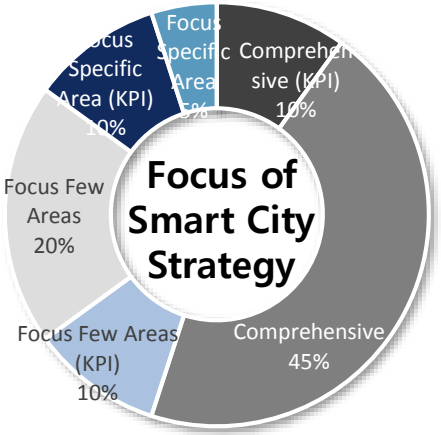
Korean Smart City Initiatives

Smart Governance can be defined as
: Establishing effective governance system to foster smart city innovation

Smart City Governance

Need to share holistic view of Smart City

45% smart city strategy comprehensive, 35% driven by IS department.
Based on their Smart City Strategies, cities need to set KPIs to develop / monitor their initiatives with feasible roadmap actions.
To encourage cooperation between different government agencies / private sectors, some cities operate SPCs.



Smart City Governance of Korea

Smart City Master Plan

- 1st Master Plan ('09-'13)
- 2nd Master Plan ('14--'18)
- ✓ 3rd Master Plan ('19--'23)

Data Hub Model

3rd Smart City Master Plan ('19-'23)

"SMART CITY: A Platform for Daily Innovation"

5 Year Roadmap for Smart City Initiatives, with 4 Strategies

Strategy. 1
Customizing Smart City Approach : Development Stage

Strategy. 2
Infrastructure Building

Strategy. 3
Enhancing Eco-systems for Innovation

Strategy. 4
Strengthening Global Network

*Image Source: Ministry of Land, Infrastructure and Transport of Korea

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00 Smart City Seoul – Data Driven Smart City

Digital Seoul 2020

A city that works with citizens and corporations to

solve urban problems & change the lives of citizens

based on data

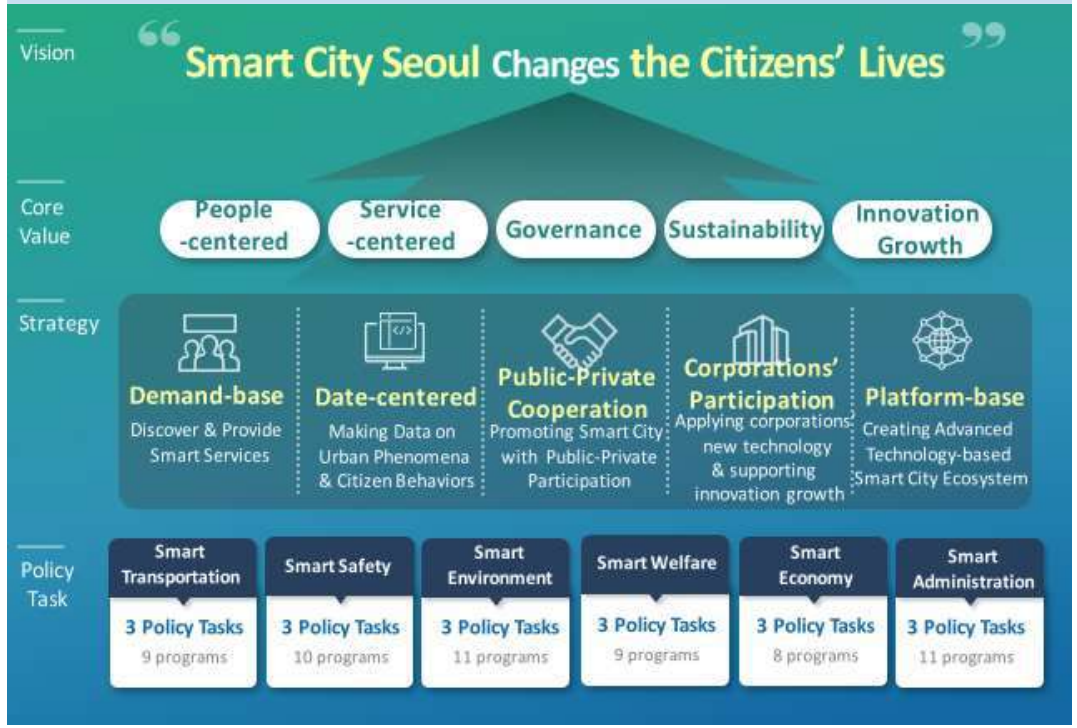

*Image Source: Digital Seoul/Smart City Seoul (2019)

Seoul Big Data Campus

*Image Source: Seoul Metropolitan Government Big Data Campus

Seoul Smart City Center

Prototype Factory

Expert Education

*Image Source: Seoul Smart City Center

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Seoul Metropolitan Government

Smart City Seoul – Big Data+AI Use Case

Case of Seoul Late Night "OWL BUS"

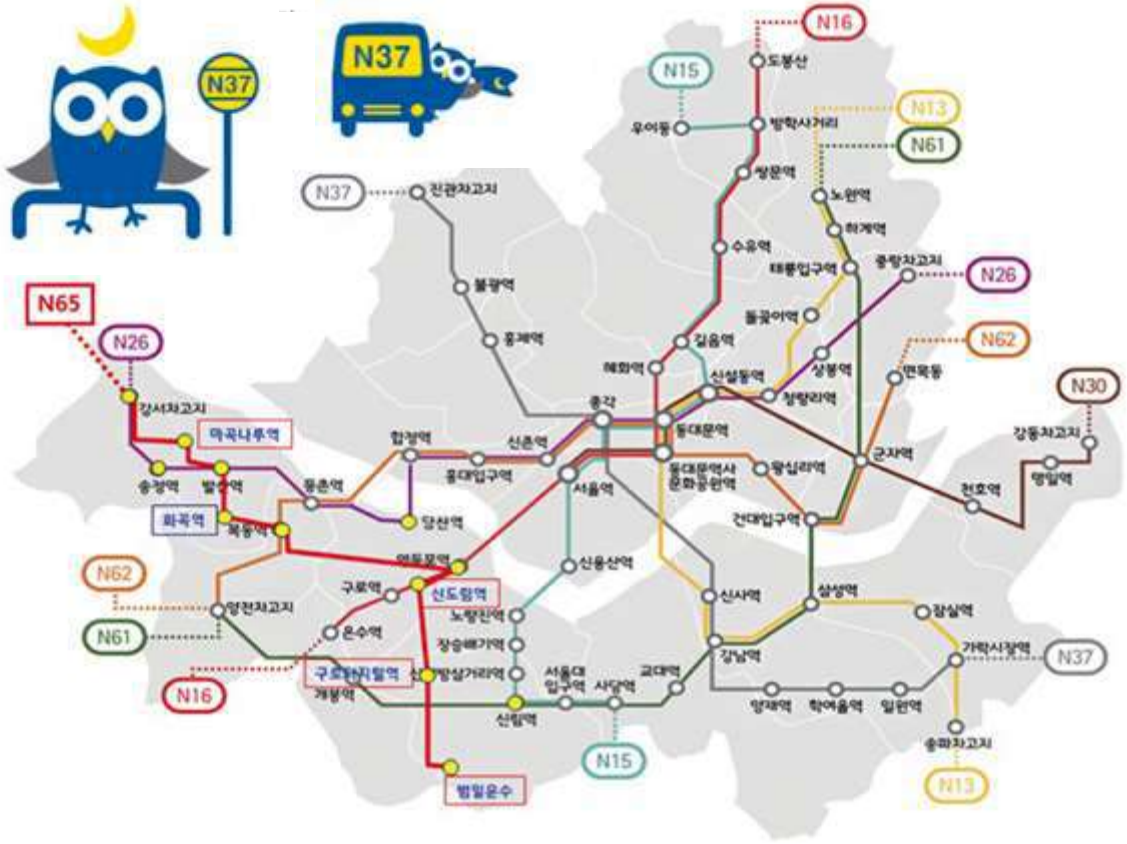


*Image Source: Seoul Metropolitan City

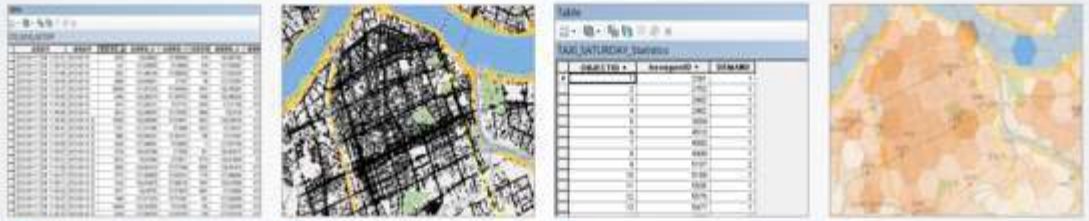
Utilized Data

*ODdivision (O:Starting point, D:destination)

*ODdivision (O:Starting point, D:destination)

Predictive Analytics

▪First prediction of demand based on location of getting-on/off taxi



1 Getting-on/off table by day

2 Established layer based on getting-on/off location

3 Statistics of summarized getting-on/off cases

4 Hexagon Mapping
➡ Used as expected demand

▪Adjustment of route and interval with pattern analysis of floating population

Analysis of floating population density

Optimization of route based on floating population

Floating population-based interval adjustment

*Image Source: Seoul Metropolitan City, Big Data Initiatives of Seoul (2018)

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Seoul Metropolitan Government

Smart City Seoul – Big Data+AI Initiative

Introduction of AI Taxi via Big Data Analysis

Case of Mobility: "AI Taxi"

- **Route selection made based on experiences of the taxi driver** causes inefficiency.

With **AI-based big data analysis** of past driving data from the Seoul Taxi Information System (STIS), **predicted information on real-time taxi demand** to be provided.

Data Collection
- Floating populations, etc.
- Getting On/Off Information(KSCC)

Data Processing
- Creation of data by region

AI Prediction
- Deep-learning method

Information Provided

Pilot Application to Corporate taxis | **5 taxi companies, 380 taxis(2019)**

*Image Source: Seoul Metropolitan City

GPS-based App Taxi Meter's Pilot Operation (2019)

Dec. 2018
Completed the development of Seoul-type App meter for AI Taxi

Jan 2019
Pilot operation of call taxi for the disabled

March 2019
Apply for Regulation Sandbox

July 2019
Pilot operation of App meter

Rigid service structure of taxis, such as mechanical meters, roving businesses, etc.

ICT-based Customized Services to be provided
(Real-time information on taxi operation, elastic charge system, etc.)

*Image Source: Seoul Metropolitan City, Big Data Initiatives of Seoul (2018)

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Seoul Metropolitan Government

Smart City Seoul – AI Initiatives in Public Service

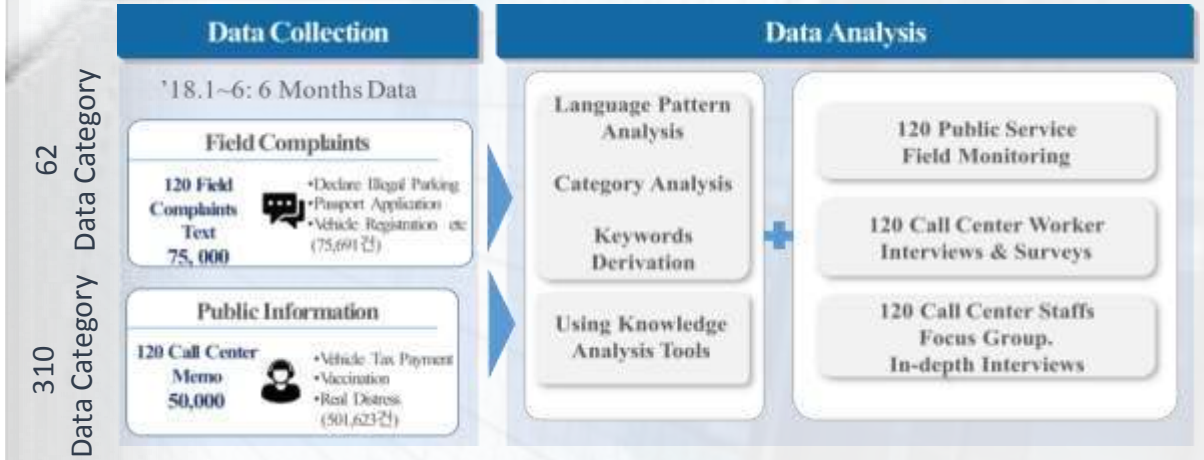
Public Service: “120 ChatBot Service”

*Image Source: Seoul Metropolitan City

Problem

- Annual Public Complaints: 2.75M Phone+Text messages [Avg.16,000 per day; Simple Phone Directory: 1,200]

Data Analysis



Outcomes

Simple-Repetitive Task Automated Processing >>>>>>> Citizen Public Assistant Service

Scope	▪ 120 Pilot Operations	▪ Expand Chabot Service App.	▪ Service Intelligence
Method	▪ Text Message	▪ Voice+Text	▪ Video+Voice+Text
Device	▪ Smart Phone PC	▪ AI Speaker, Smart Phone	▪ Robot, AI Speaker, Smart P

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SMART CITY GOVERNANCE

Korean Smart City Initiatives

Smart Governance can be defined as
: Establishing effective governance system to foster smart city innovation

National Smart City Initiative : 5 major Projects

Stage 1 : New City	Stage 2 : Operating City	Step. 3 : Deterioration of City
Testbed of Innovative Technologies	HIgh Demand, Excellent Citizen Participation	Limited Investment
National Pilot Smart City	***Smart City Challenge***	***Smart Urban Regeneration*** *(New Deal Project)*
(1) Sejong 5–1 Sector, (2) Busan Eco Delta City	***National Strategic Smart City R&D***	
	Theme-based Smart City	
Development of Innovative Technologies	**Commercialization of Technologies**	**Cost-Efficient, Appropriate Technology**

*Image Source: Ministry of Land, Infrastructure and Transport of Korea

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01 'National Smart City Project'

Smart City Challenge : 6 Cities

Smart City Challenge (2019)

Of 6 Candidate Cities in Phase 1 (2019), 2 Cities will be selected for Phase 2 (2020)

Phase 1 — 6 Candidate Cities, KRW 1.5 Billion

Phase 2 — 2 Cities will be finalized, KRW 20 Billion

Bucheon

Incheon ✓

Daejeon

Changwon

Gwangju

Suwon

*Image Source: Respective City Government

Co-Creation of Smart City Service : Living Lab

I-MoD Service

* MoD(Mobility on Demand)

Civic Engagement

Living Lab Operated for I-MoD

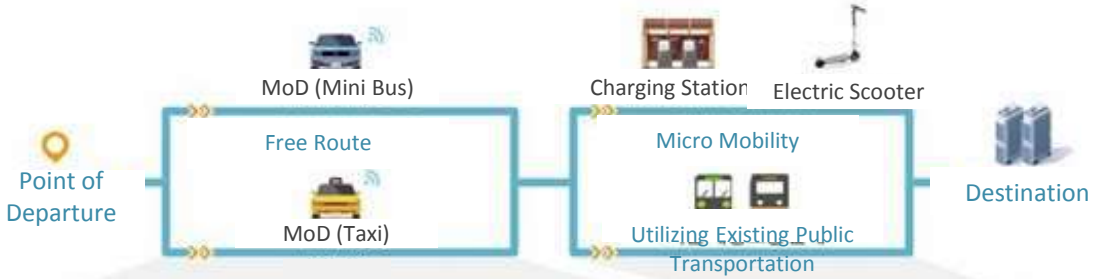
- Participate in service design process, Provide feedback for service expansion (Phase 2)

*Image Source: Respective City Government

Phase 1 (2019)	(Pilot) Demand-Responsive Mobility Service Implemented in Younjong-do Area
Phase 2 (2020)	Expand service area in Incheon, Establish model for sustainable development

SOLATI (Bus)

MICRO MOBILITY



In-Car Service

- Location-based services
- customized advertisement, information guidance, etc.

New Biz. Model

MoD Service

- MoD (Mini Bus)
  - Route Allocation based on real time demand
  - Stop Locations remain the same
- MoD (Taxi)

- Providing platform to promote Ride sharing service

Last Mile

Micro Mobility

- Expand to MaaS
- Utilize bus / subway / electric scooter

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01 'National Smart City Project'

Smart City Challenge : 6 Cities

I-MoD Service

* MoD(Mobility on Demand)

Concept of I-MoD Service

Fares / Bus-Stop Remain the Same,
While Routes / Payment / etc. may vary

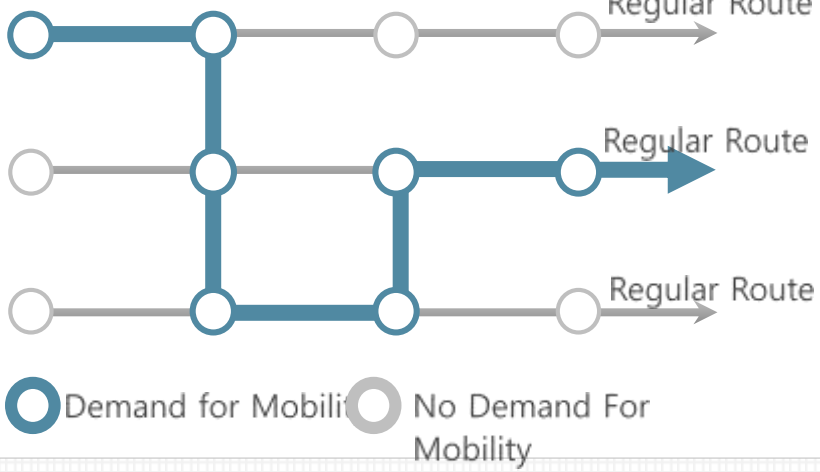
SOLATI
(Bus, Capacity 16)

I-Zet (Incheon-Zero Emission Transport, Electric Scooter)

Living Lab ("YoungS")

For User Research & User Test, Managing Service Performance

Modified Route



I-MoD Service Application

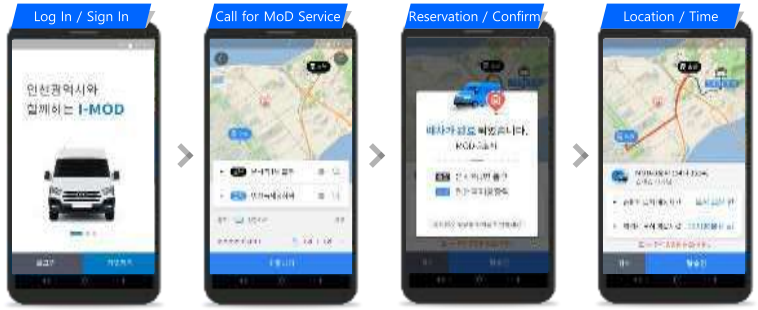


*Image Source: Incheon City Government

Pilot Service Area (2019)

A Youngjong-Do
- I-MOD* (8 Bus)
- Taxi MOD (Carpooling App. Service)

B Unseo-Dong Area Demand
- I-ZET (Incheon-Zero Emission Trans.)

Activities for Sustainability

*Image Source: Incheon City Government

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National Strategic Smart City R&D

National Strategic Smart City R&D Program Consists of 3 Parts

1) Smart City Model Development Project
2) Demonstrative Project (Use-Case Model, Daegu)
3) Living Lab Model (Living Lab Model, Siheung)

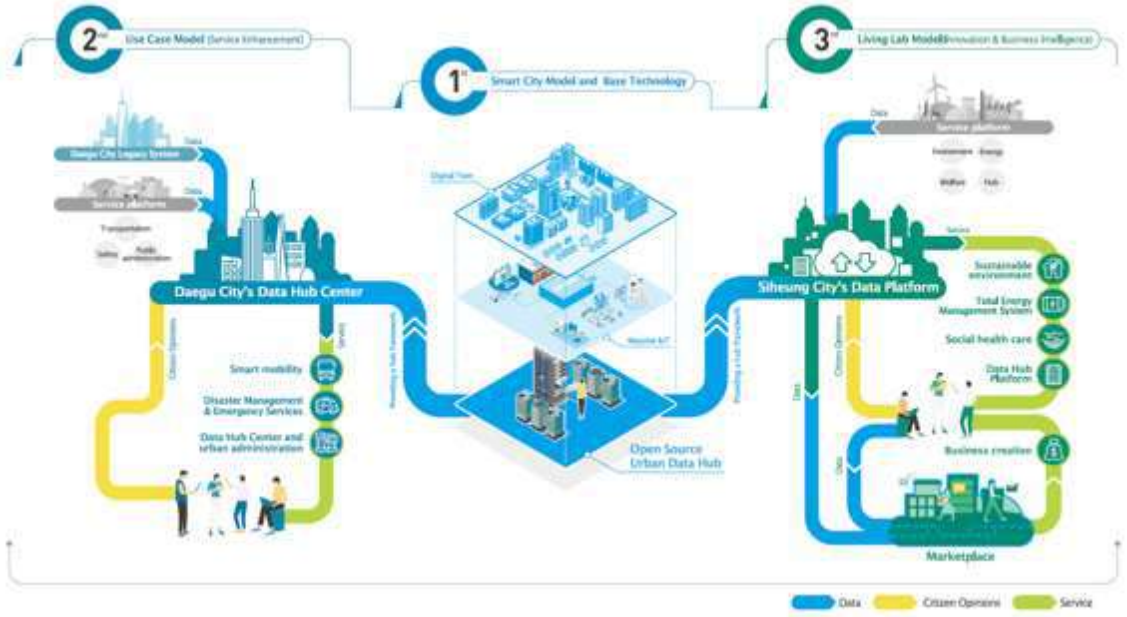
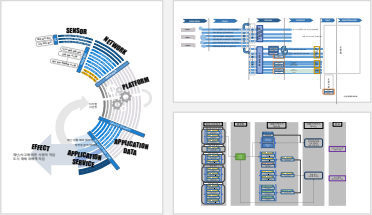
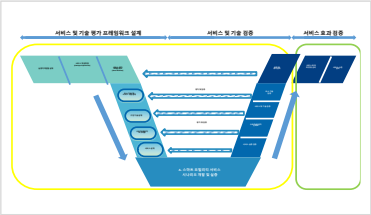


*Image Source: : National Strategic Smart City Program, KAIA (2019.05)

1st : Smart City SOS(System of Systems) Management Tools Developed

Project – Program - Portfolio	Data Reference Model	Stage-Gate / V-model
		
Concept of 3P are introduced to differentiate layers of performance	Data flow diagram is drawn to analyze the lifecycle and its core value	Stakeholders are recognized, Project development process evaluated

*Source: Concept Paper(v.1), ISi Lab, Yonsei University (2019.06)

2nd & 3rd : Demonstrative Project (Daegu, Siheung)

Daegu, Use Case Model

Smart Mobility, City Administeration, Safety, Data Hub Center

Budget (KRW)
- **Government : 33.4 Billion**
- **Total : 56.3 Billion**

Siheung, Living Lab Model

Environment, Energy, Welfare, Innovation Center

Budget (KRW)
- **Government : 24.4 Billion**
- **Total : 40.6 Billion**

*Image Source: : National Strategic Smart City Program, KAIA (2019.05)

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03 'National Smart City Project'

Theme-based Smart City

Project Administration, Budget

MOLIT
Ministry of Land, Infrastructure and Transport

Master. Plan, Project Management

LH 한국토지주택공사

City Government

대전광역시 DAEJEON METROPOLITAN CITY
Fantasia 판타지아 부천
부산광역시 BUSAN METROPOLITAN CITY
서울특별시 SEOUL METROPOLITAN GOVERNMENT
김해

"4 Cities are Selected Annually (2018-2020)"

Theme-based Smart City (2018)

Daejeon : Re-New Science Town

Gimhae : Emphasizing History / Culture

Bucheon : Fine Dust Monitoring System

Chungbuk : Developing Energy industry

*Image Source: Ministry of Land, Infrastructure and Transport of Korea

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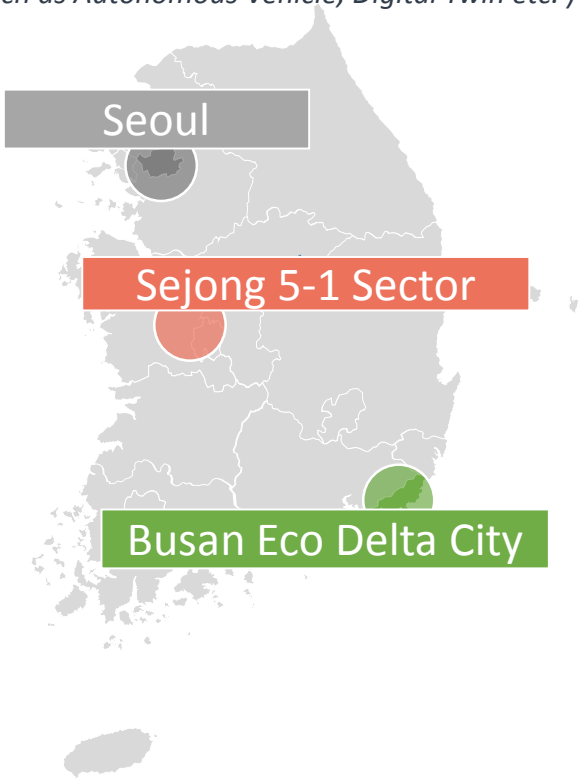
04 'National Smart City Project'

National Pilot Smart Cities

"*Providing Test-bed for Innovative Technology Development,*"
(Such as Autonomous Vehicle, Digital Twin etc.)



Two Pilot Cities : Testbed for innovative city services

Sejong 5-1 Sector

- Area : 2,741,000m^2
- Project Expense : $616 Million
- Developer : LH
- Planned Population : 29,300
- Project Period : '18~'21.12

*Image Source: The Presidential Committee on the 4th industrial revolution

Busan Eco Delta City

- Area : 2,194,000m^2
- Project Expense : $880 Million
- Developer : K-Water, BMC, Busan City
- Planned Population : 8,500
- Project Period : '18~'21.7

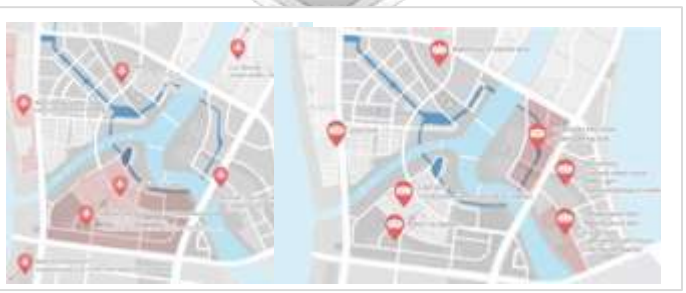


*Image Source: Ministry of Land, Infrastructure and Transport of Korea

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05 'National Smart City Project'

Smart Urban Regeneration (New Deal)

> ***Old cities are selected each year to receive government support for urban regeneration***

- Smart urban Regeneration
- : Applying appropriate technology (low-cost, high efficiency smart solutions) to old city center, to promote citizen's quality of life
- By 2022, 25 cities will conduct New deal smart unban regeneration project – receive guideline on implementation of smart city solutions, etc.

*Image Source: Ministry of Land, Infrastructure and Transport of Korea

Concept : Eco-friendly / Energy-independent town

Case : Busan Saha District

* Image Source : The Presidential Committee on the 4th industrial revolution (2019)

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THANK YOU

2019 Smart Cities Index Report [Hard Copy Version]

Will be Available at Seoul Pavilion Side Event

On 20th November 15:00~17:00

Location: “Hall P2, Level 0, Street C, Stand 385”

Contact: linkedin.com/in/lee-jung-hoon-b486a4109

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