

Urban Connected Automated Shuttle System Development

GCC Workshop

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Global Issues in Transportation

Sustainable Transport

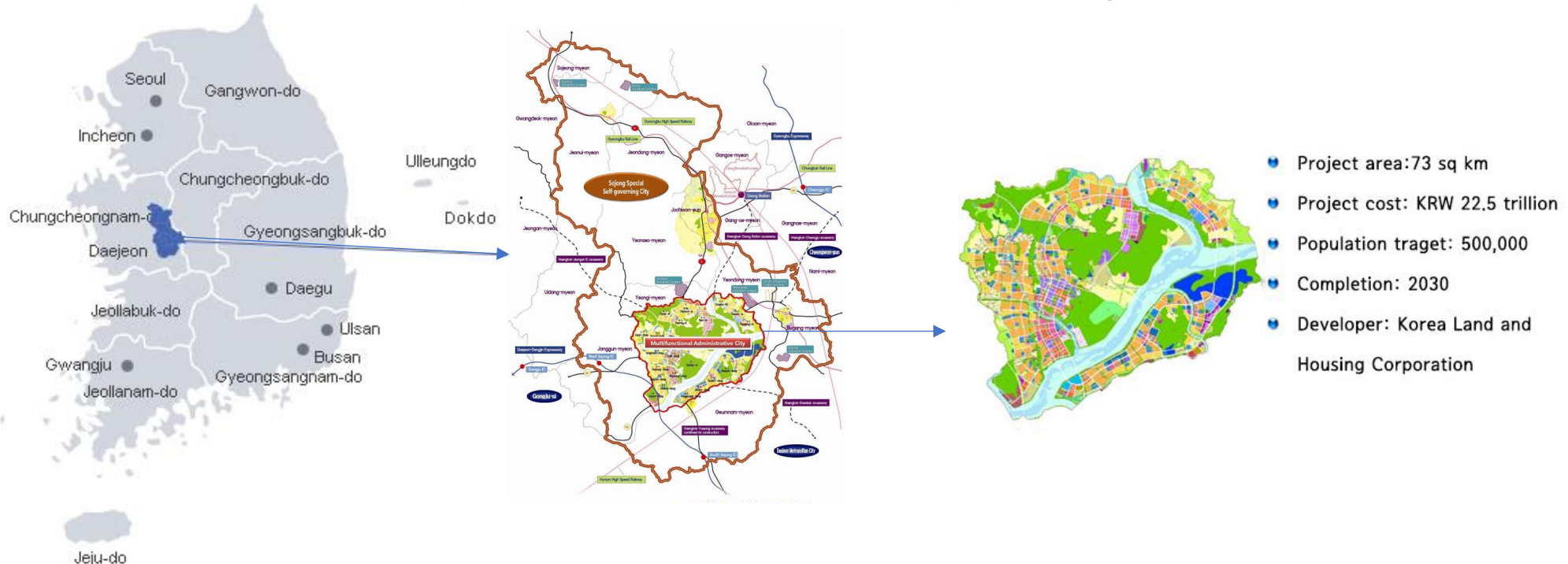
- To be Safe, Accessible, Affordable, & Environment Friendly

- Paradigm Shifts for Reducing
 - ✓ Congestion, Road Accidents, Emissions & Air Pollutions, Health Problems
 - ✓ by
 - Avoiding the Needs to Travel by Driving
 - Shifting to Sustainable Transport Modes
 - Improving Efficiency of All Transport Modes

Sejong : Government Complex City

➤ Political & Artificial

- ✓ The Government of the Republic of Korea enacted a Special Act on the Administrative City Construction on March 18, 2005 to develop this city.
- ✓ The new city plan aims at 1) eliminating urban sprawl of the capital region, 2) strengthening the national competitiveness and 3) balancing national development.
- ✓ The Administrative City has been constructed in the City of Sejong since 2006.



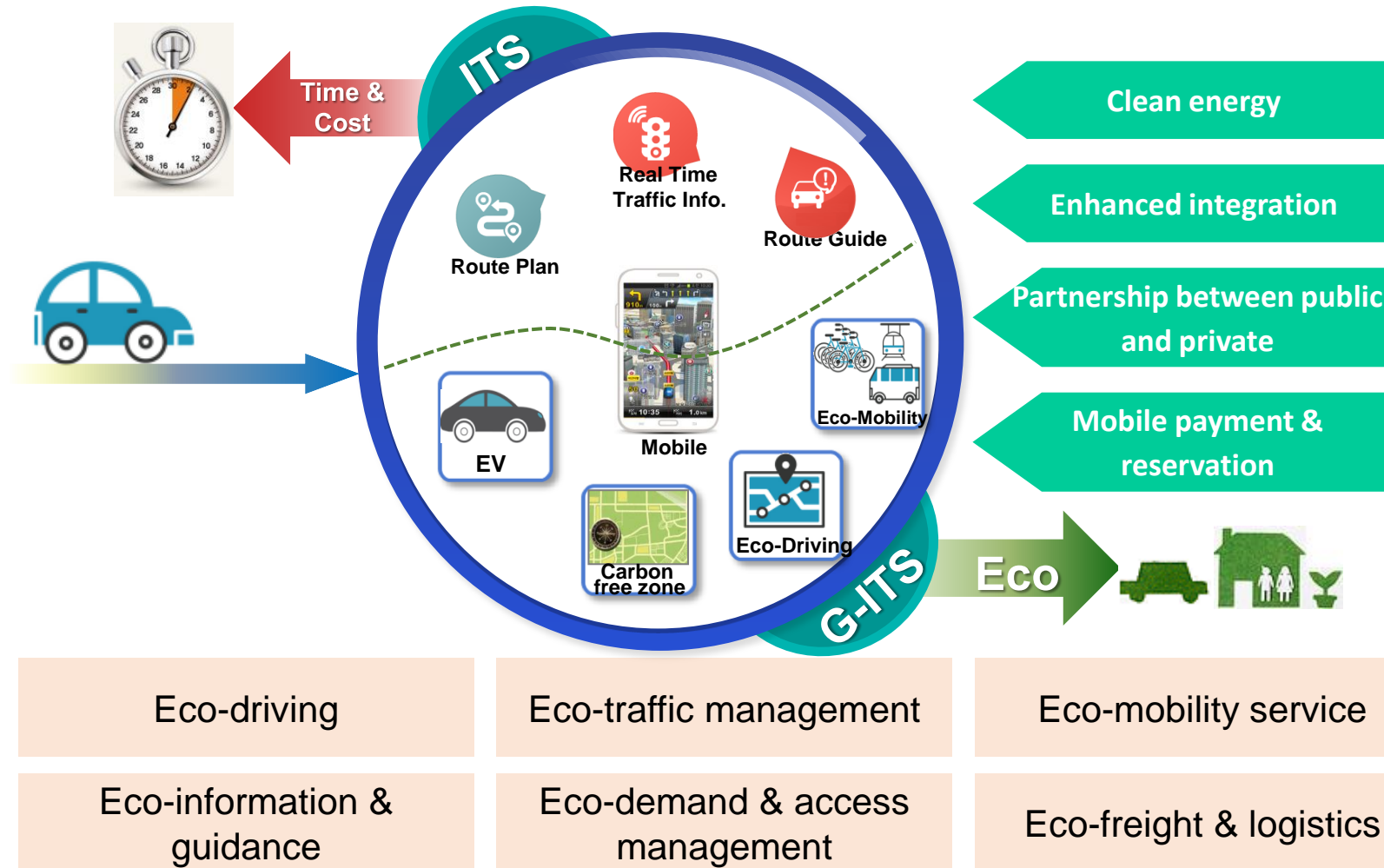
Sejong : Government Complex City

➤ “Being Green”

- ✓ Sejong wants to be a fore-runner in the worldwide conversation about going green.
- ✓ Aiming at reducing 70% CO2 emission by 2030, Sejong plans to replace 15% of total energy usage with renewable energy.
- ✓ More than half the size of the whole city will be green.



Urban Intelligent Mobility Services with G-ITS



Digitalization in Transport Systems

Challenges of a resilient investment environment for transport systems

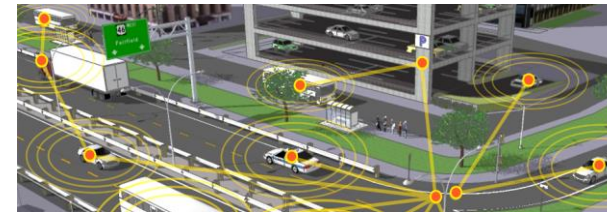
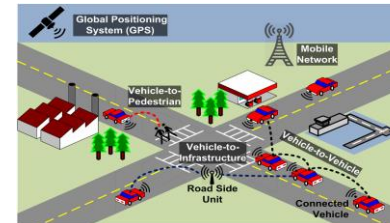
Intelligent Transport Systems (ITS) (1990s-2010s)

- Information Collection & Provision**
- Vehicle Detection System (VDS)
 - Road Surveillance & Monitoring
 - Variable Message Signs (VMS)



Cooperative ITS (C-ITS) (2020s-2040s)

- Information Collection & Provision**
- Digital Infrastructure by ICT (V2X)
 - Mobile & Nomadic Devices
 - Big Data & AI for Connected & Automated Driving



Connected Automated Driving Systems (CADS)

- Connected Automated Driving and Infrastructure
 - Level 2
 - Intelligent Transport Systems (ITS) by Physical & Digital Infrastructure
 - Level 3 & 4
 - Level 3: Cooperative ITS (C-ITS) by Digital Infrastructure
 - Level 4: Automated ITS (A-ITS) by Logical Infrastructure

	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
SAE	No Automation	Driver Assistance	Partial Automation	Conditional Automation	High Automation	Full Automation
NHTSA	No Automation	Function Specific Automation	Combined Function Automation	Limited Self-Driving Automation	Full Self-Driving Automation	
KOTI	Vehicle	Vehicle	Vehicle & Road Assisted (ITS)	Vehicle & Road Cooperated (C-ITS)	Vehicle & Road Automated (A-ITS)	

Connected Automated Driving Systems (CADS)

A-ITS with Logical Infrastructure based on Big Data & AI



Sources : AUVSI 2014, San Francisco

Development of Urban Connected Automated Shuttle in Sejong (UCASS)

Physical Infrastructure

- Vertical & Horizontal Alignment, Lanes, Pavements, etc.

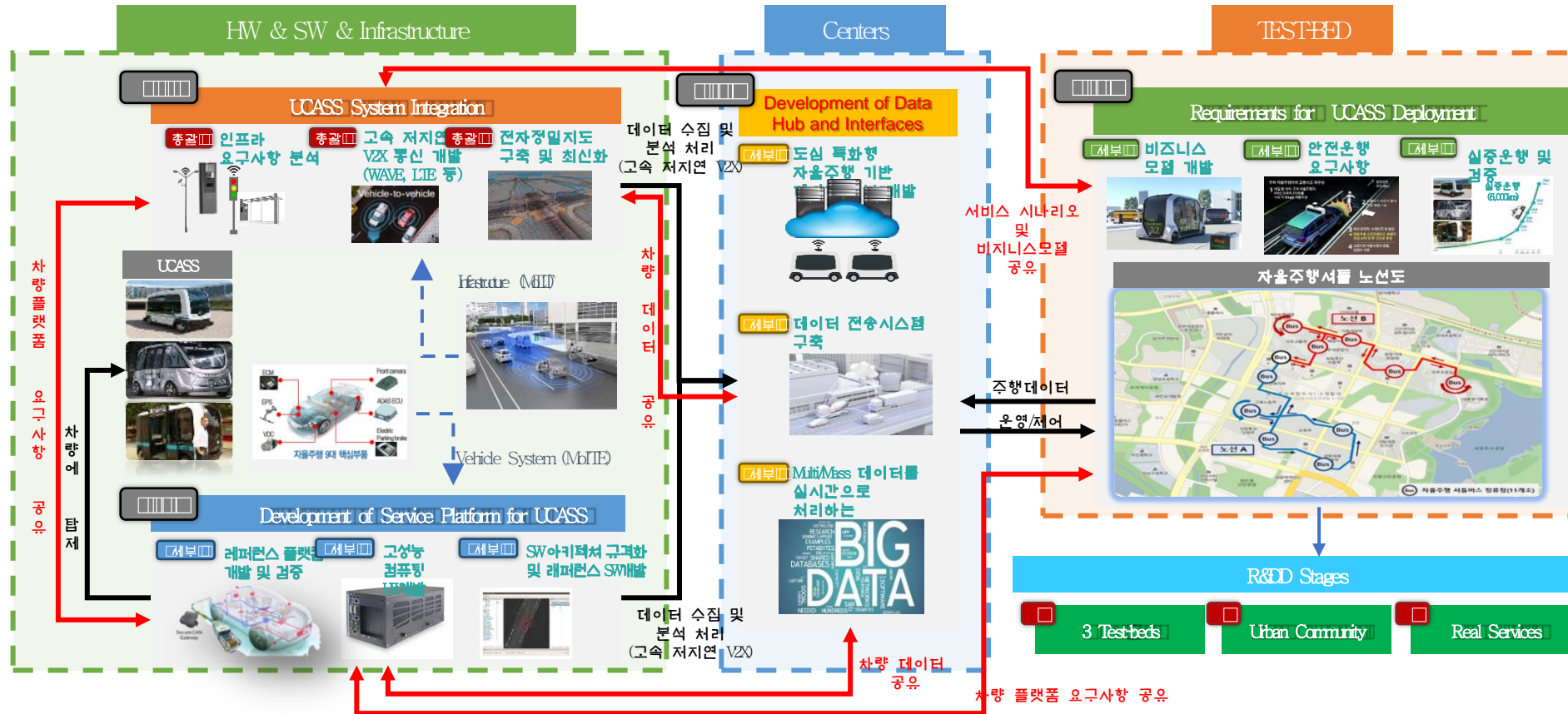
Digital Infrastructure

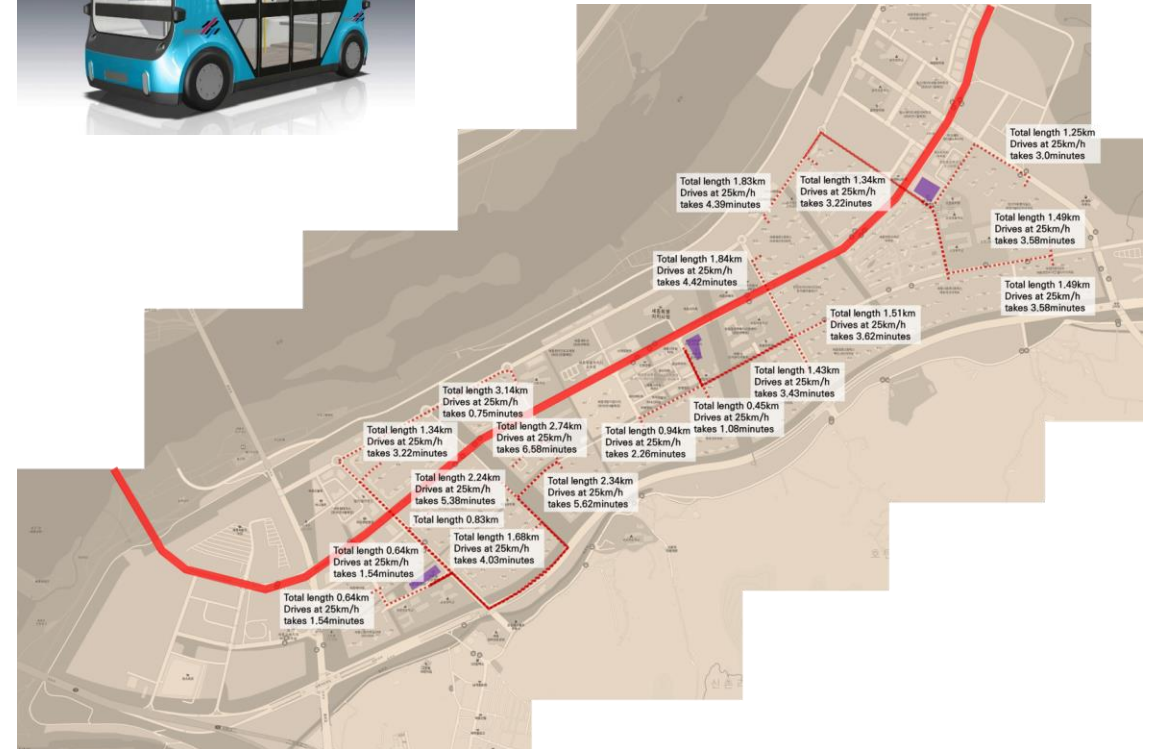
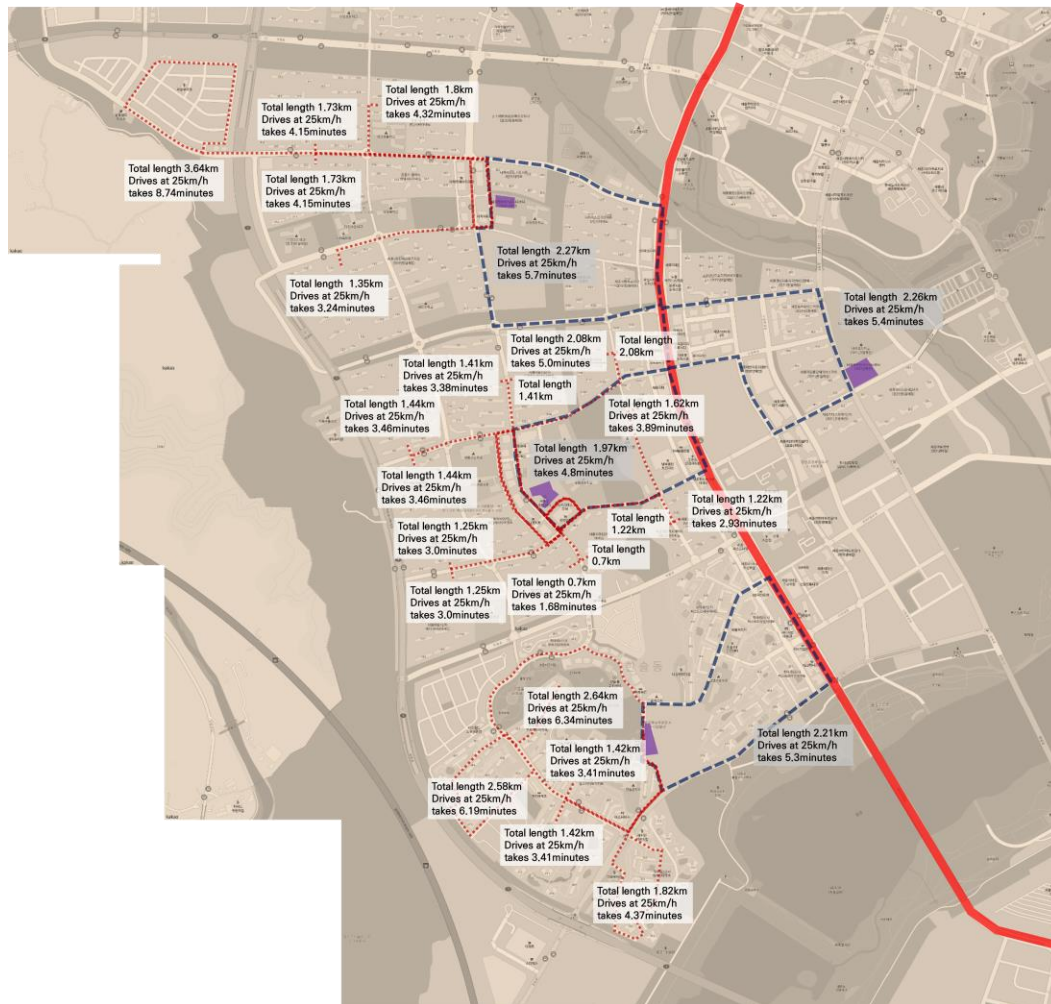
- Digital Signages, Traffic Information, etc.
- V2X Communication Systems, IoT, etc.
- HD Local Dynamic Map & Positioning, etc.

Logical Infrastructure

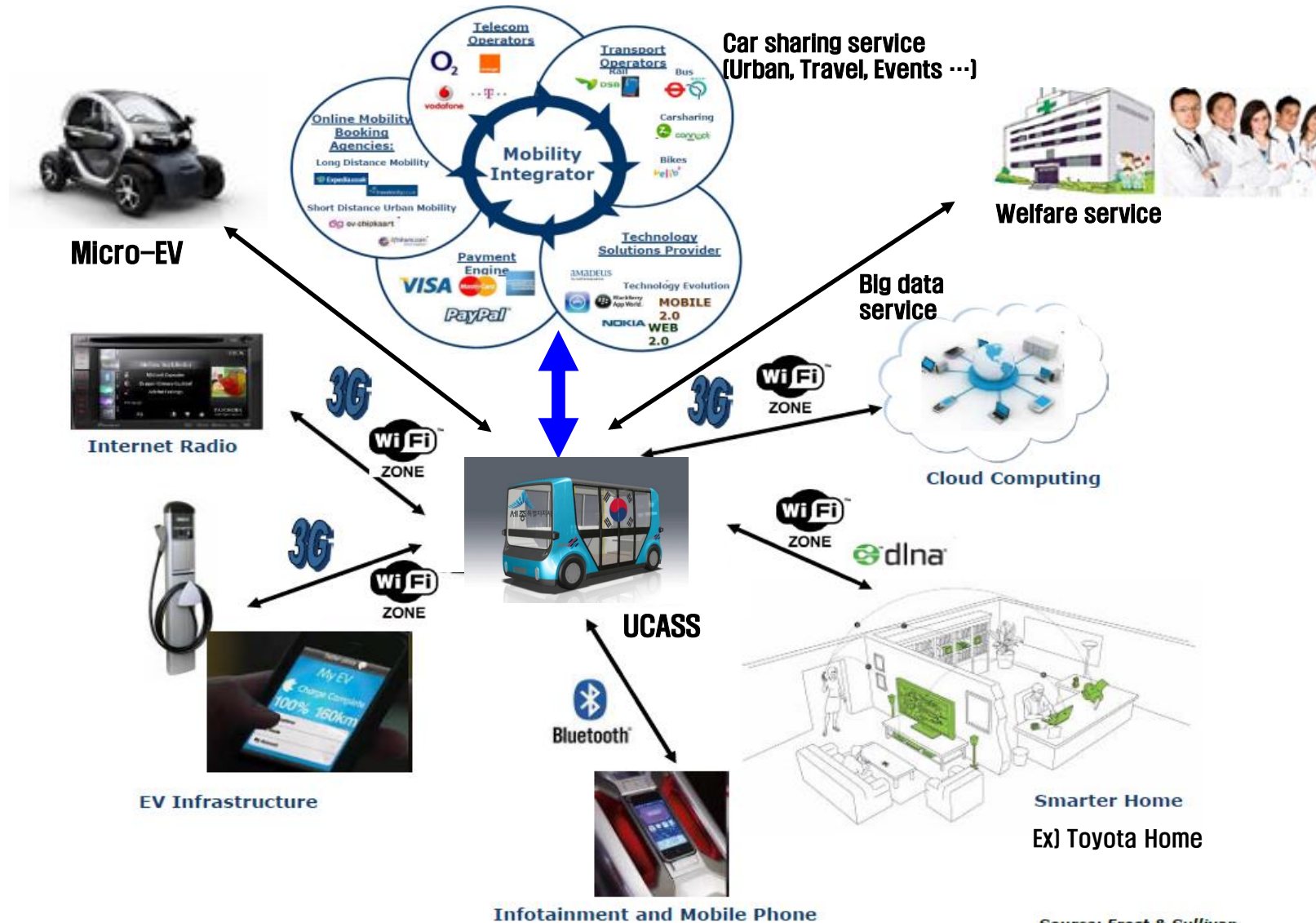
- Urban Mobility Management & Control Systems based on Big Data & AI
- Vehicle Computing, Edge Computing, Local & Cloud Center

Development of Urban Connected Automated Shuttle in Sejong (UCASS)





Urban Intelligent Green Mobility by Traffic Demand Control with 200+ UCASS Shuttles



Source: Frost & Sullivan

Driving Innovation to ITS Future

➤ Issues to be addressed

- ✓ Global Climate Change & CO2 Emissions
- ✓ Rapid Urbanization and Aging Society
- ✓ Sharing Economy
- ✓ Connected Automated Vehicles (CAV)

➤ Areas to be developed & deployed

- ✓ Connected Automated Driving Systems (CADS)
- ✓ Green & Urban Mobility
- ✓ C-ITS & A-ITS with Big Data & Artificial Intelligence (AI)
 - Physical, Digital & Logical Infrastructure

Thank you very much!

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