

# Activities to COVID-19 & Korean New Deal Policies

Ministry of Land, Infrastructure and Transport

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MOLIT

Activities to COVID-19 & Korean New Deal Policies

# Contents

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- 1. Activities to COVID-19**
- 2. Korean New Deal Policy**

Activities to COVID-19 & Korean New Deal Policies

# Chapter 1

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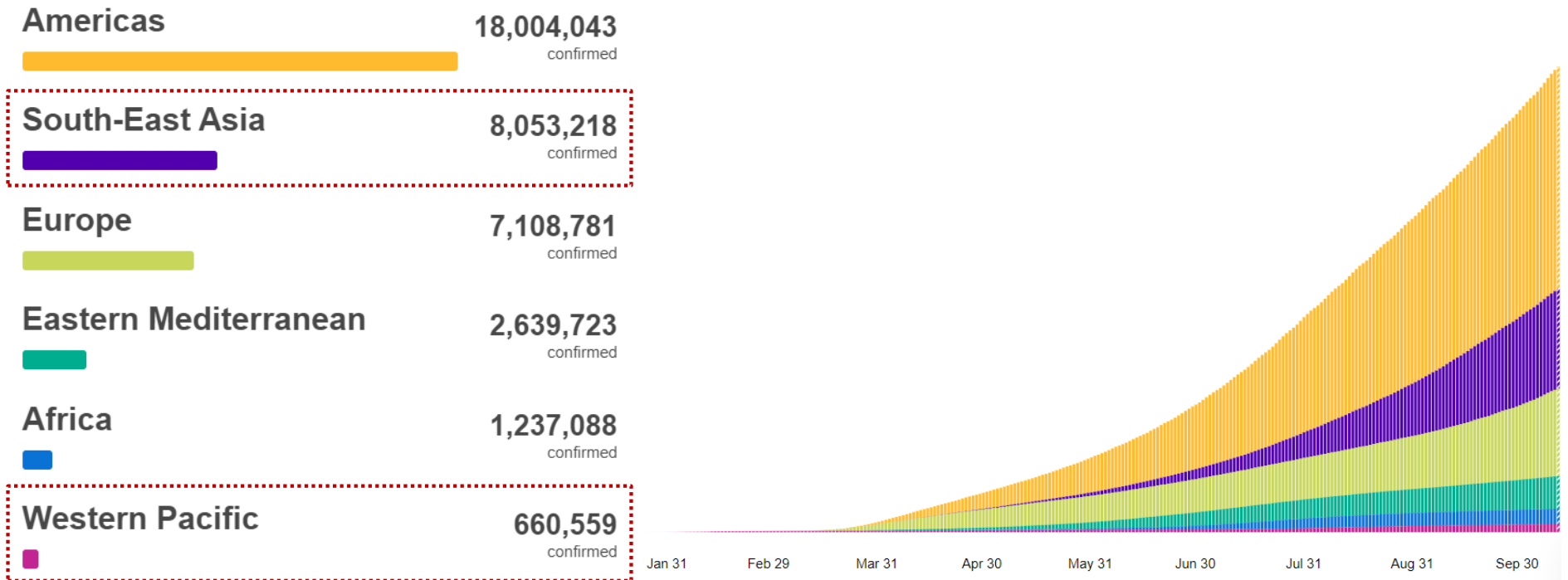
## Activities to COVID-19

1. COVID-19
2. Impact of COVID-19
3. Activities to COVID-19

# ➤ 1. COVID-19

## COVID-19 Cases Situation by WHO Region

- Globally, as of 5:06pm CEST, 13 October 2020, there have been **37,704,153 confirmed cases of COVID-19**, including **1,079,029 deaths**, reported to WHO



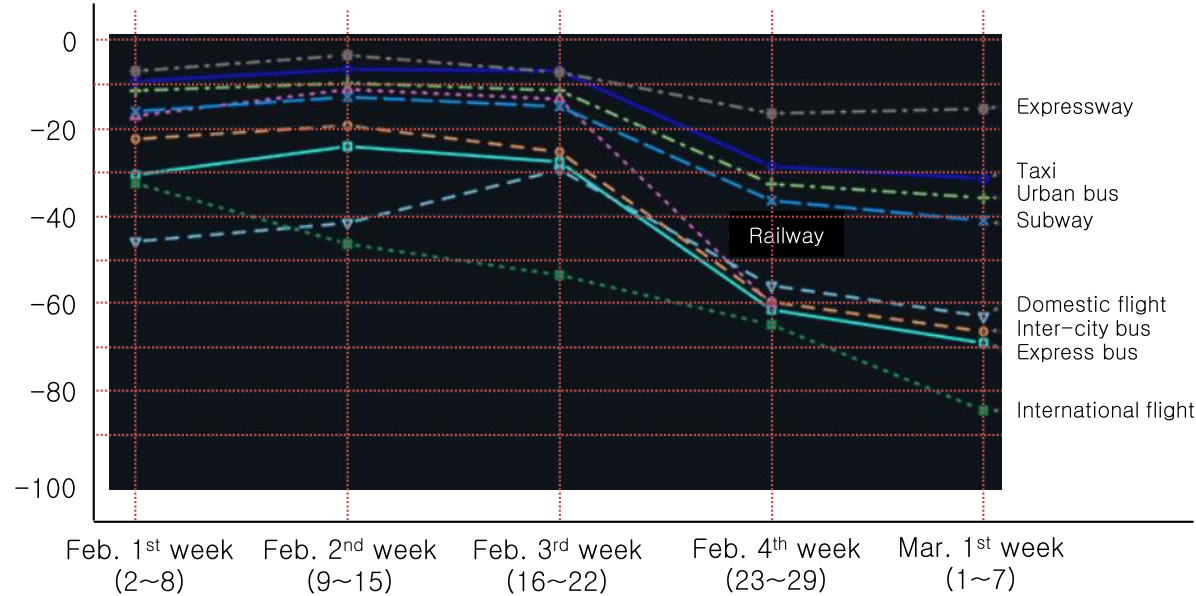
- **South-East Asia** : Indonesia, Thailand
- **Western Pacific** : Australia, China, Japan, Malaysia, New Zealand, Singapore, South Korea, Taiwan

\* Source: World Health Organization, 2020/10/13, 5:06pm

## ➤ 2. Impact of COVID-19

### Changes on Transportation

Fluctuation rate(%) comparison to 3<sup>rd</sup> week of January



<Passenger car : ▼7.2%>



<Car sharing : ▲21.0%>



<Public transport : ▼34.5%>

### < Changes in daily mean travel(%) >

- Travel volume on expressway showed the least decrease among major means of transport
- Inter-city travel decreased more than intra-city travel
- Sharp decline occurred in both domestic and international flight travel

\* Source: The Korea Transport Institute & <http://mediahub.seoul.go.kr/archives/1273765> & <https://news.joins.com/article/23738968>

## ➤ 3. Activities to COVID-19

### Preventive Measures against Epidemics in Seoul (1)



#### Subway

- Mandatory to wear masks when using public transportation
- 'Application report' system for non-mask wearers
- Increase disinfection in metro station
  - Inside station : Once a week → Twice a week
  - Restrooms : Once a day → Twice a day
  - Single-use transportation cards : Once in 5 days → Once a day
- Increase disinfection inside vehicle
  - Hand straps : When arrives in garage → Every turning spot
  - Safety bars : Twice a week → Every turning spot
  - Inside vehicle : Twice a week → Every turning spot
- Supplement of manpower and equipment for disinfection
- Concentrated disinfection on routes, vehicles, and stations that a confirmed case of COVID-19 had used
- Improvement of disinfection manual for operator
- Education on disinfection for officials and operators
- Promotion on individual sanitary control for passengers

\* Source: SeoulMetro, Seoul Metropolitan Government

## ➤ 3. Activities to COVID-19

### Preventive Measures against Epidemics in Seoul (2)



#### Bus

- Disinfection for entire(4,081) bus stations once a week
  - Chairs, digital devices, etc.
- Disinfection for buses 4~6 times in a day
  - Hand straps, chairs, safety bars, etc.
- Avoid commute time for disinfection(Implement disinfection after 10 a.m. & 8 p.m.)



#### Taxi

- Distribute posters for epidemics prevention behavior to taxi companies
- Distribute masks for taxi drivers
- Distribute individual disinfection equipment for each taxi



#### Public Bike

- Periodical disinfection for entire(1,540) public bike stations
- Furnish every bike station with hand sanitizer
- Disinfection for every bike(especially for handle and LCD display)

\* Source: Seoul Metropolitan Government

## ➤ 3. Activities to COVID-19

### Preventive Measures against Epidemics in Seoul (3)

#### Smart Bus Shelter

- Smart Bus Shelter that refuses entry to anyone with a fever
  - Determined to curb the spread of Covid-19, authorities in Seoul have installed a series of glass-paneled bus shelters that scan the temperature of commuters and refuse entry to anyone detected to have a fever.
  - “Smart Shelter” has several features to stop people infected with the Corona virus from spreading it to others, including external thermal cameras and internal UV sterilizers.
  - It also has air conditioning, free WiFi, charging stations and plays therapeutic music.



\* Source: Seoul Metropolitan Government, CNN



Activities to COVID-19 & Korean New Deal Policies

# Chapter 2

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## Korean New Deal Policy

1. Korean New Deal
2. Digital SOC\_C-ITS
3. ITS Investment Outlook in Korea

# ➤ 1. Korean New Deal

## Overview of Korean New Deal Program

“Paradigm shift to leap forward into a pace-setting economic model”

From a chasing economy to a leading low-carbon economy with an inclusive society



- Strengthen D.N.A ecosystem
- Digitalization of education infra
- Promotion of un-tact industry
- **SOC Digitalization**

- Invest 13.1B USD / Create 193K jobs until 2025

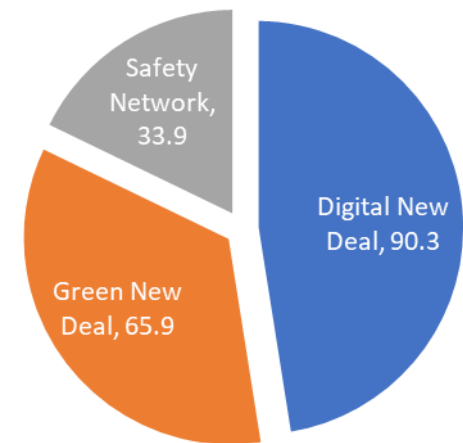
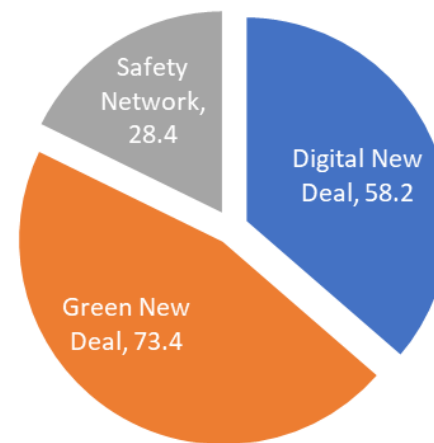
- Invest 3.4B USD for ITS & C-ITS



- Green convergence of urban & space & living infra
- Expansion of Low-carbon & dispersion energy
- Green industry innovation

### Invest 160 trillion KRW\* until 2025

\* About 133 billion USD



<Investment by program> (Trillion KRW)

<Job creation by program> (10,000 Jobs)

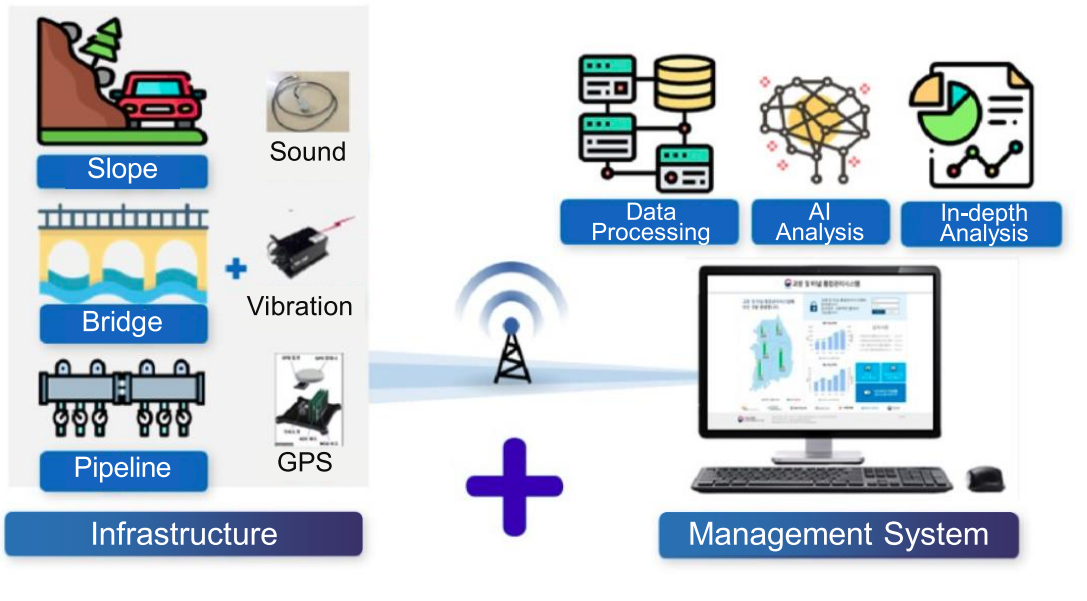
# ➤ 1. Korean New Deal

## SOC Digitalization

• **SOC(Social Overhead Capital) + Advanced Technology = Improvement of public safety and convenience**

### 1. Real-time Monitoring

• **IoT** : Internet of Things



- IoT constant measurement system for bridges and slopes
- Installation of CCTV for river management
- Detection faults in advance with IoT remote sensors of railroad

The images show practical applications: IoT sensors on a slope, CCTV for river management, and a smart monitoring system for railroads.

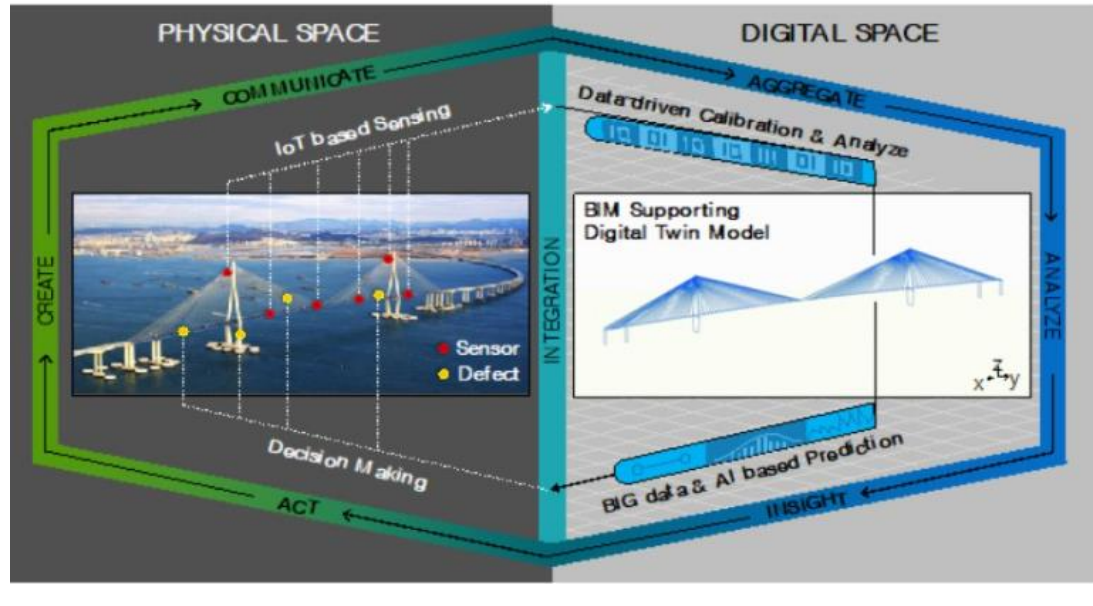
• Monitoring in real-time, collecting and utilizing big data by combining **IoT Sensor , AI and High-speed communication networks.**

# ➤ 1. Korean New Deal



## SOC Digitalization

### 2. Digital Twin


- **Digital Twin** : Realization of machines, equipment, and objects in the real world as a virtual world in a computer. It can be verified through simulation in virtual space.



- Tunnel remote control system
 



- Smart flood management system automatically controlled according to river water level
 

**종합상황실**




CCTV 실시간 모니터링

관련 부서간 공동 대응


[민방] [국방] [장비]

- 실시간 지령 전달  
- 기초자료 대안


계측장비 #1




1 수위계(수위계측) 2 관망기(전동식)




3 원격반(원격제어용) 4 CCTV(모니터링)



계측장비 #2



계측장비 #3



- Real SOC is fully controlled by implementing it in the **virtual world**.

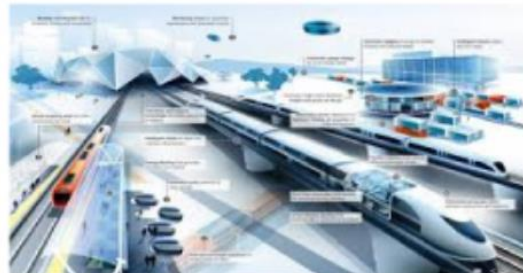
# ➤ 1. Korean New Deal

## SOC Digitalization

### 3. Smart Operation Technique



**[Smart Airport]**  
- Untact Biometric System



**[Smart Railway]**  
- Unmanned detection train



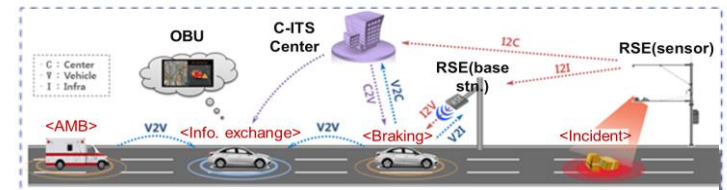
**[Smart Tolling System]**  
- Highway automatic toll payment



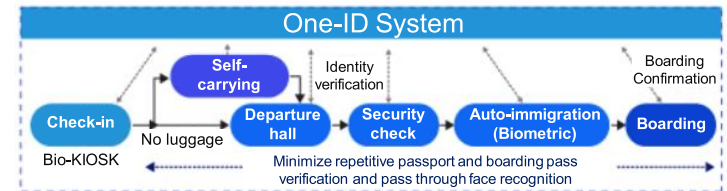
**[Advanced testbed for automated vehicles(K-city)]**

- Support for automated vehicles through C-ITS

**C-ITS**



- Simplified Check-in procedures through Untact biometric system



- Introduction and support of shared logistics center and smart logistics center



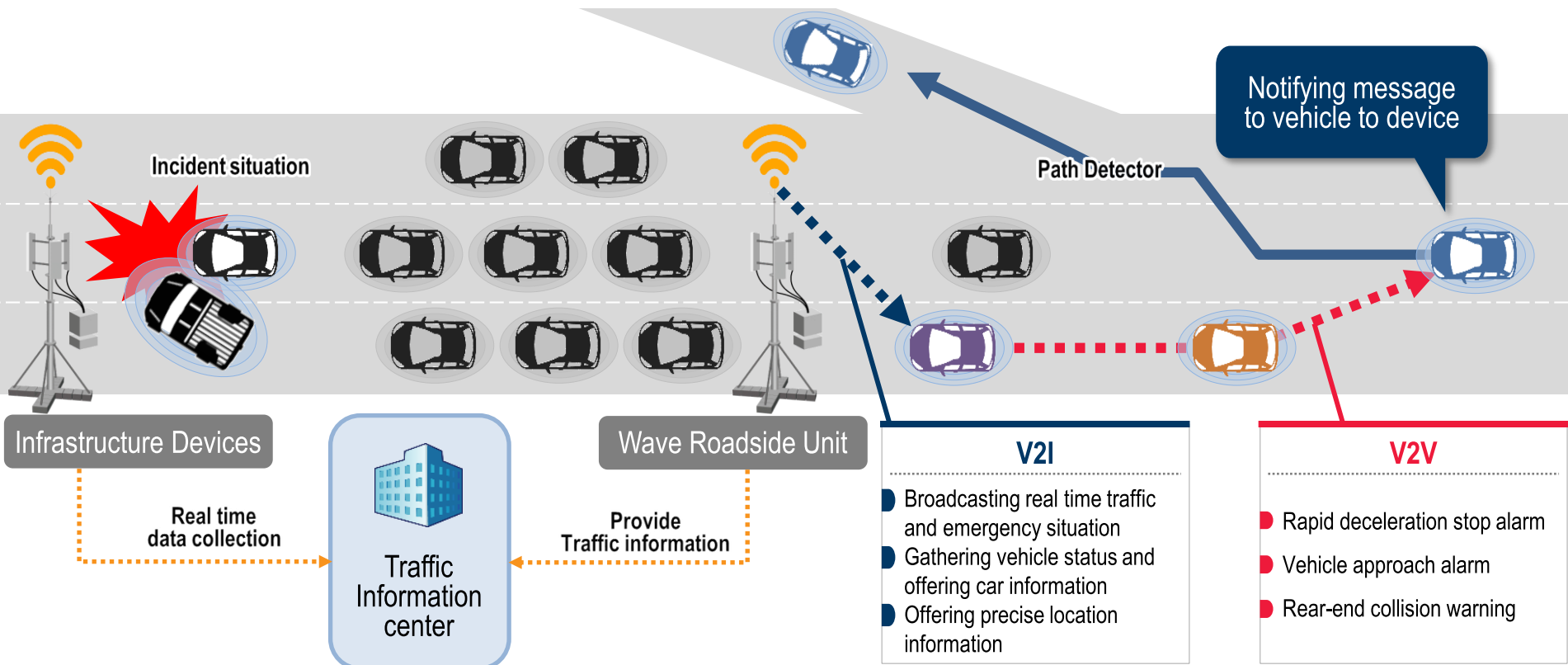
[Auto-Packing] [Auto-Classification] [Auto-Transfer]

- Building a more secure transportation network by introducing **advanced and smart digital operation systems** at airports, railways and roads.

## ➤ 2. Digital SOC\_C-ITS Cooperative-Intelligent Transportation Systems

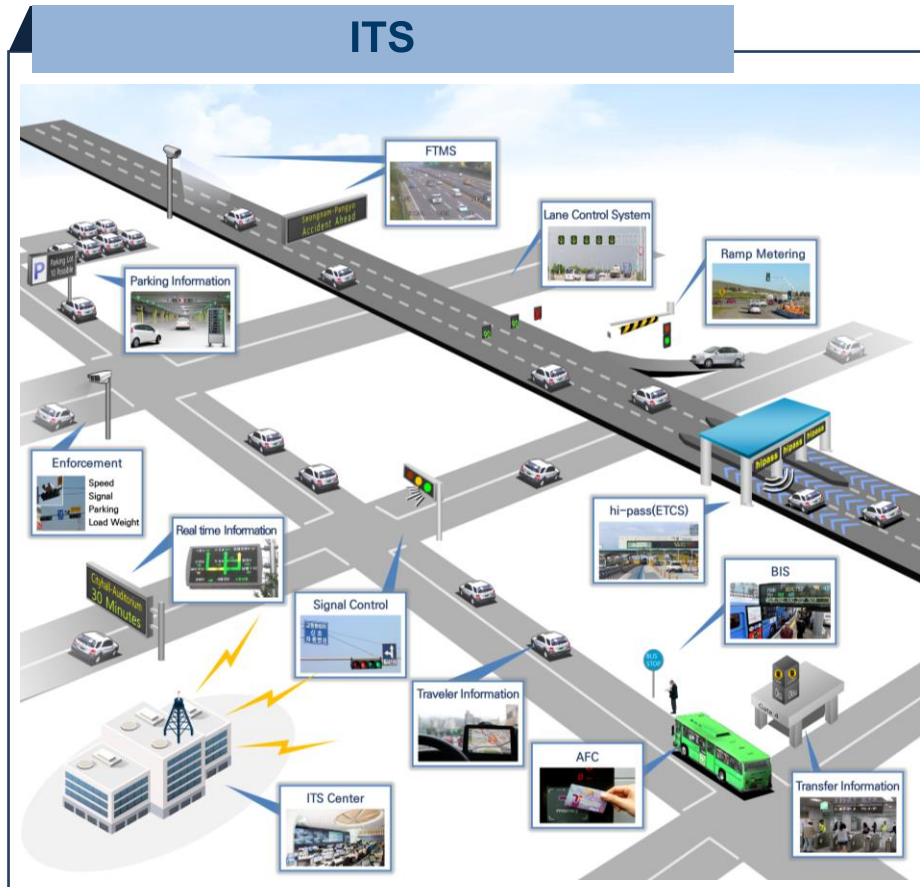
### Concept of C-ITS

- New Paradigm for ITS service on the open platform focusing on safety by V2V, V2I and V2P communication
- A system that provides accident-related information such as traffic conditions, sudden stop, and fallen objects to the driver in real time

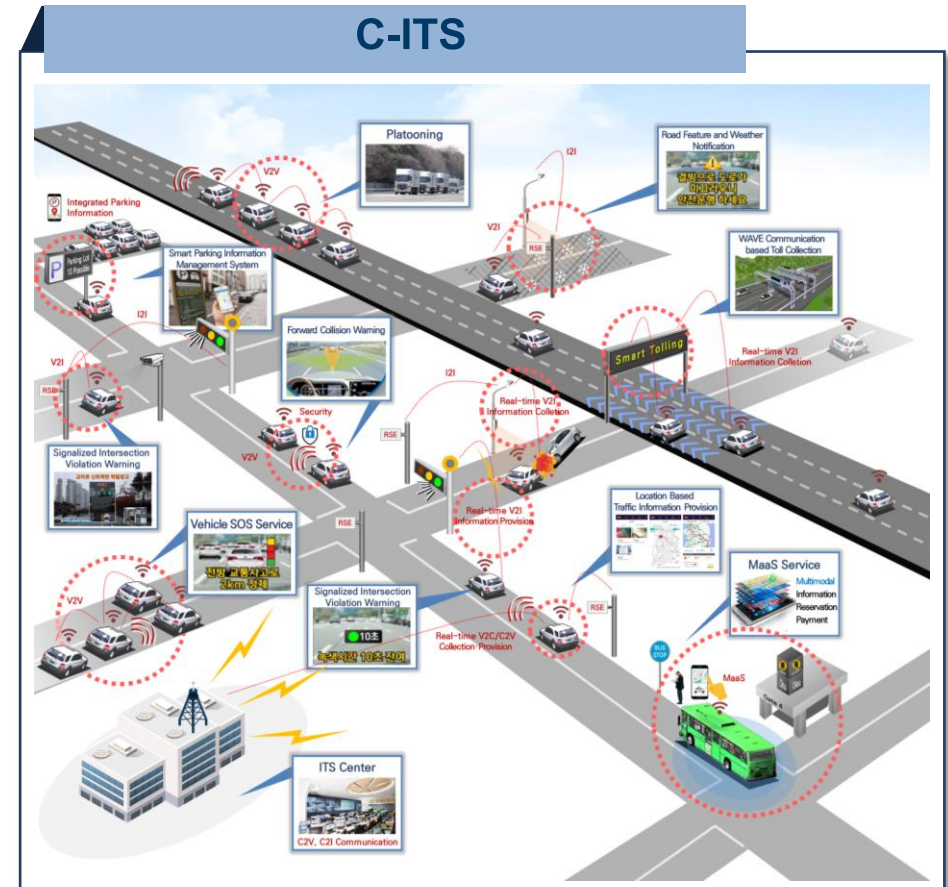


## ➤ 2. Digital SOC\_C-ITS Cooperative-Intelligent Transportation Systems

### Differences between ITS and C-ITS



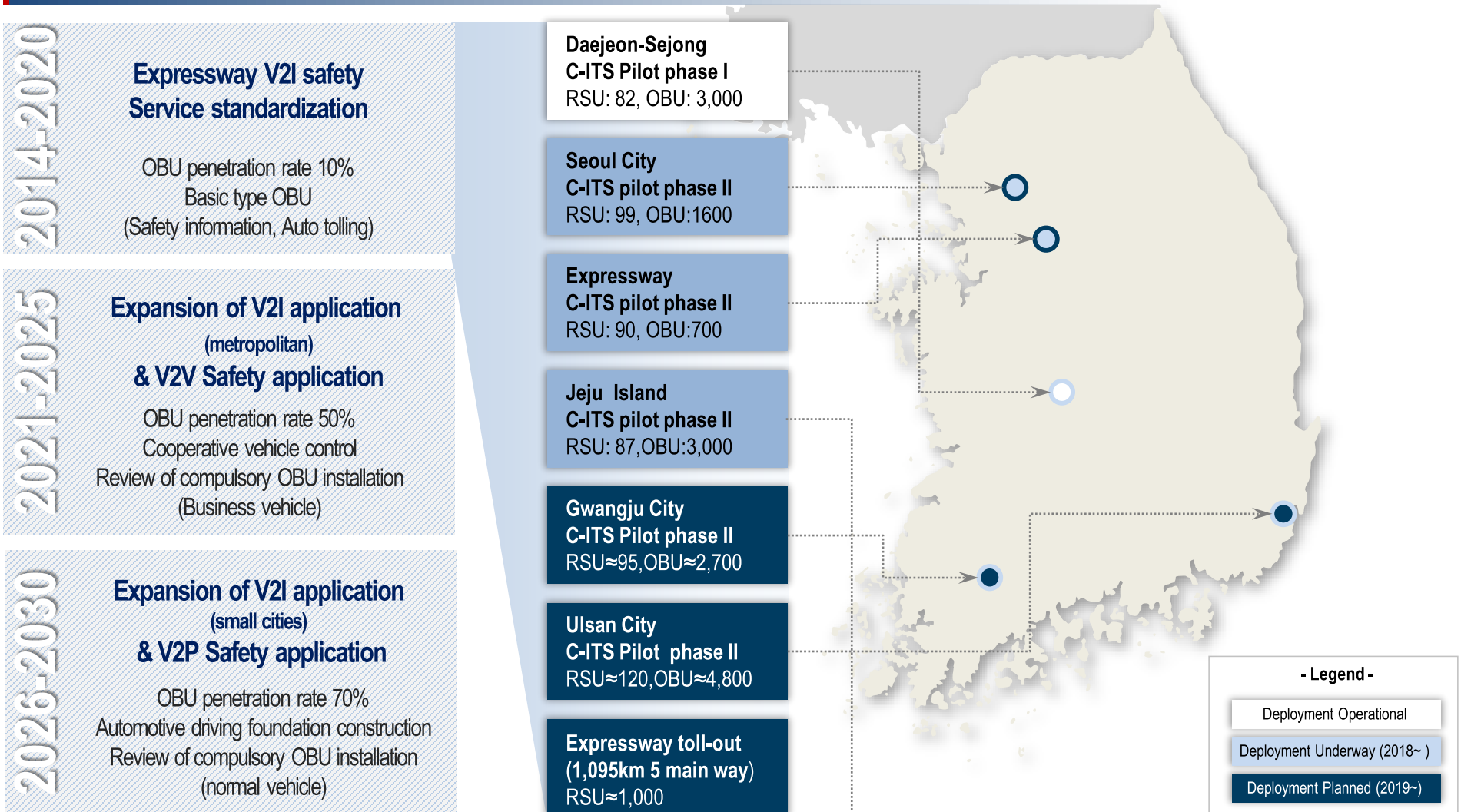
- Collecting and providing **One-way** traffic information at a specific point **takes a long time** between the occurrence of events and the provision of information



- When the vehicle is driven, it communicates **Two-way** communication with road facilities and other vehicles to spread and share **real-time** risk information

## ➤ 2. Digital SOC\_C-ITS Cooperative-Intelligent Transportation Systems

### C-ITS Deployment plans and project status



\* As of Jan. 2019

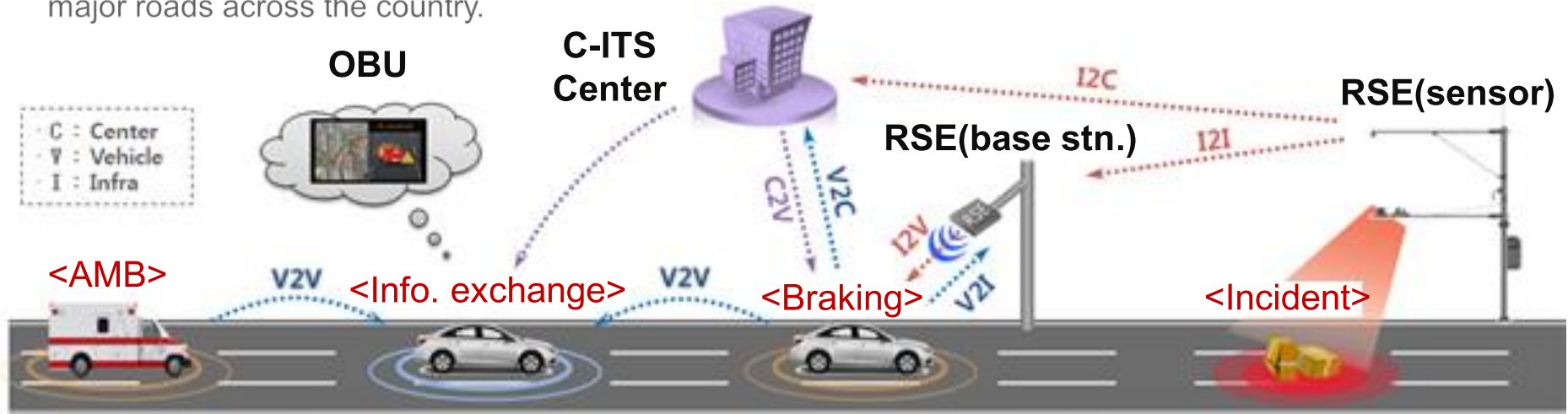
\*\* R&D Projects' RSUs(≈70) and OEM's OBU equipped car excluded



## ➤ 2. Digital SOC\_C-ITS Cooperative-Intelligent Transportation Systems

### Overview of the project

- Expand and build a digital road network (C-ITS) with the aim of commercialization full autonomous driving on major roads across the country.



#### < As-is >

##### ITS deployment

- National Highway – 3,413km
- Local Government – 8,334km

##### C-ITS deployment

- Expressway – 85 km
- National Highway – 3km
- Local Government – 210km

#### < 2022 >

##### ITS deployment

- National Highway – 9,361km
- Local Government – 12,995km

##### C-ITS deployment

- Expressway – 2,085km
- National Highway – 3,347km
- Local Government – 2,153km

#### < 2025 >

##### ITS deployment

- National Highway – complete('24)
- Local Gov't – complete(17,483km)

##### C-ITS deployment

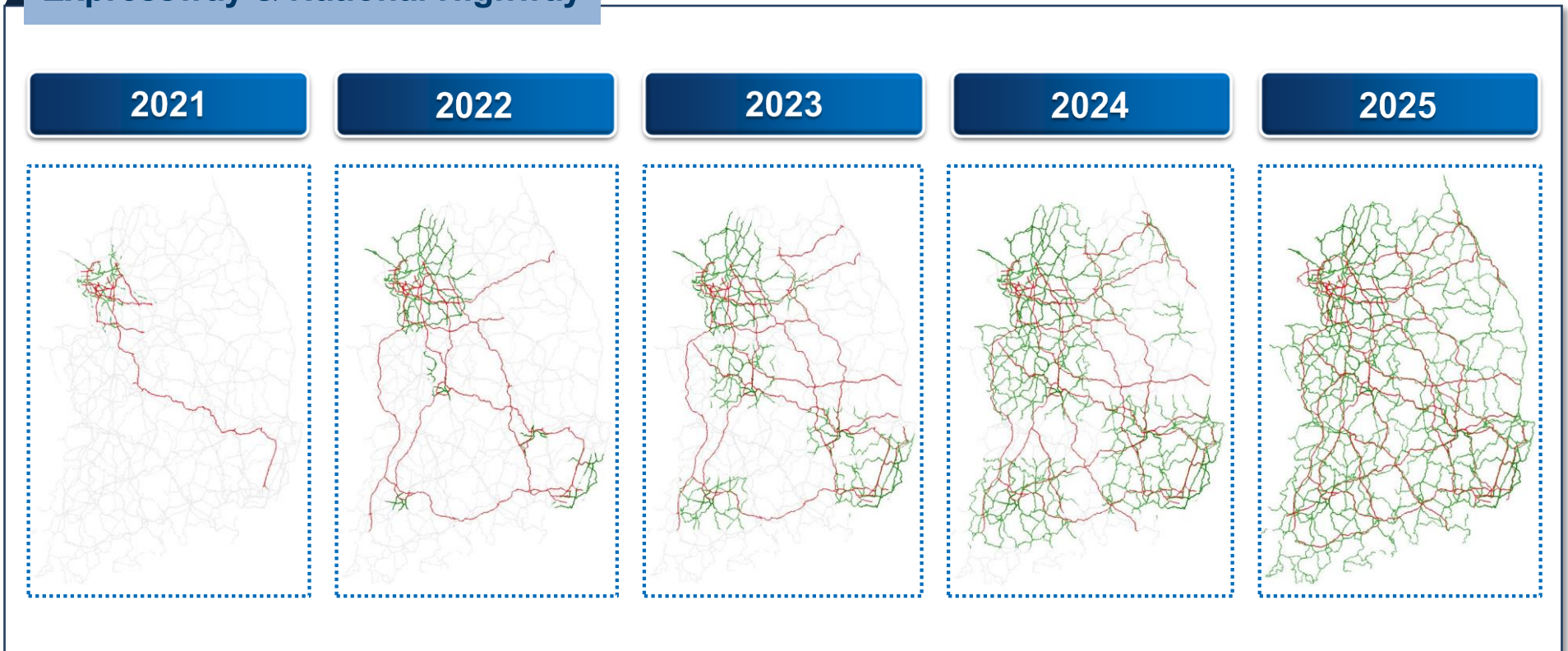
- Expressway – Completed
- National Highway – (4,075km, completed)
- 4-lane above local roads - complete(12,995km)

## ➤ 2. Digital SOC\_C-ITS Cooperative-Intelligent Transportation Systems

### C-ITS Implementation Plan by Road Type

- C-ITS will be established by region and annual basis.
- It will be gradually expanded after establishing the priority of metropolitan area.

#### Expressway & National Highway



## ➤ 2. Digital SOC\_K-City Advanced testbed for automated vehicles

### Overview of the project

#### Purpose & Core Services

##### Purpose

- Development of Evaluation Environment for Confirmation and Verification of Pre-stability of Automated vehicle
- Establishment of real road-based test bed K-City that can support automated driving technology development and commercialization

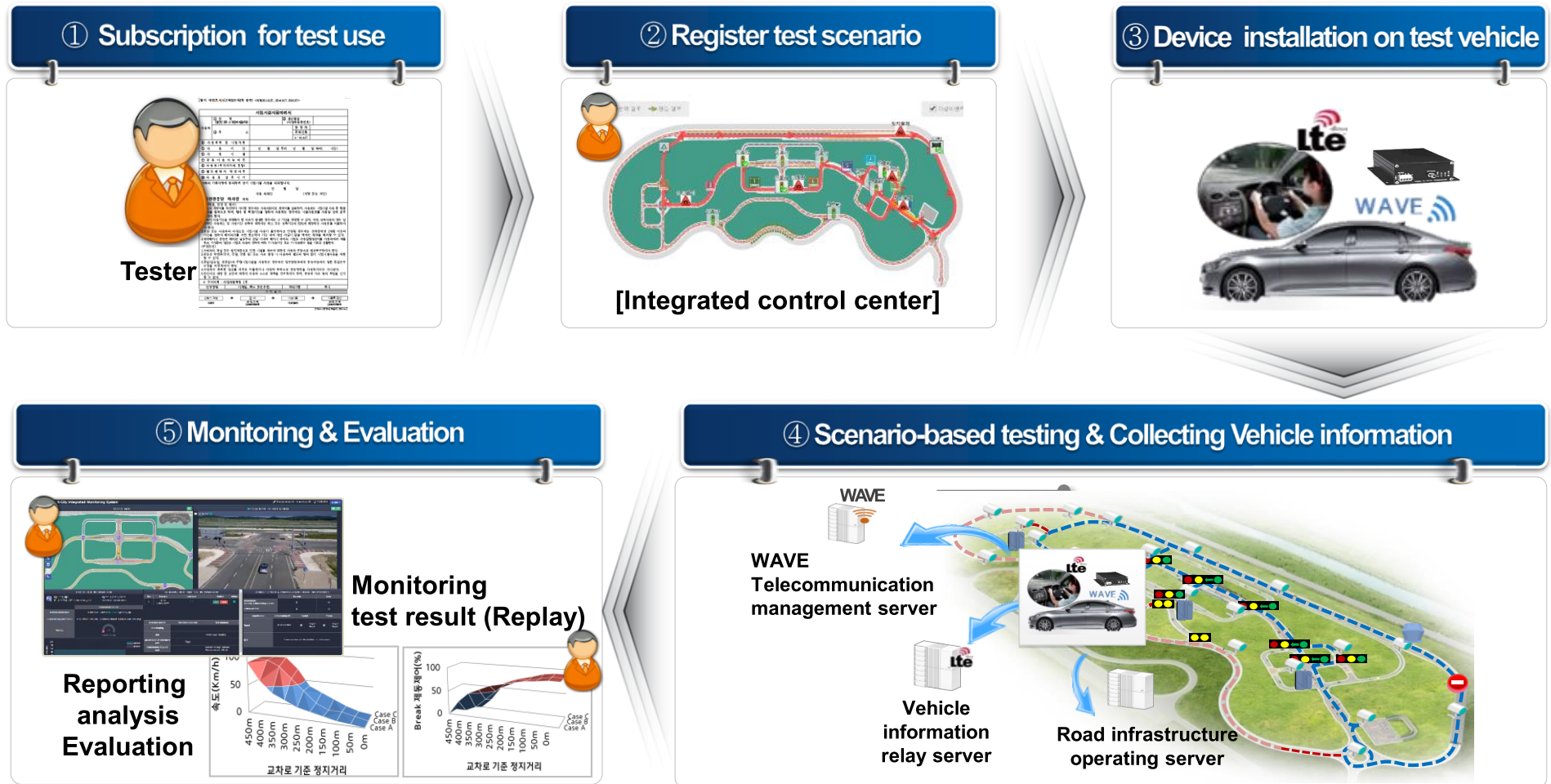
##### Core Services

- C-ITS Service for Automated cooperation driving (ex. Signal, Incident Information, ...)
- Information collection service of Automated vehicle in wireless communication (ex. WAVE, LTE, 5G)
- Precision control service of Infrastructure and evaluation system for scenario-based repetition test
- Real-time monitoring and integrated information analysis service (ex. Monitoring, replay, ...)

*K-city is striving to commercialize automated driving early and secure stability by supporting a variety of evaluation environments for automated vehicles.*

## ➤ 2. Digital SOC\_K-City Advanced testbed for automated vehicles

### Scenario based automated vehicle test process



## 2. Digital SOC\_K-City Advanced testbed for automated vehicles

### Test Result\_Sample

**1** It replay information

Kcity테스트업체0903      서울대\_테스트경로\_0910      LTE단말ID\_04      00:05:13

사용자 : 홍길동 / 접속번호 : 20180910-002\_0910      시나리오ID : S00000000001      단말ID : LTE0000000004 / Type : LTE단말      시작 : 2018-09-11 11:37:45 ~ 종료 : 2018-09-11 11:42:59

digital map

CCTV near the test vehicle

Event history info

11:38:49	시행주행이벤트	ScenarioLinkChanged
11:38:40	시행주행이벤트	ScenarioLinkChanged
11:38:31	시행주행이벤트	ScenarioLinkChanged
11:38:12	시행주행이벤트	ScenarioLinkChanged
11:38:12	시행주행이벤트	ScenarioDriveStarted
11:37:45	시행주행이벤트	ScenarioTestStarted

**2** Data/estimation data

type	marker / On board Unit ID	latitude	longitude	speed	acceleration	steering wheel angle	gap	Toll Gate	Time To Collision
autonomous vehicl	3 / LTE0000000005	37.2397393	126.7734763	7.4096437	-0.09	-1.1	0	0	0
opposite driving ve	10 / LTE0000000004	37.2403323	126.7732461	21					

recognition information(lane)		recognition information(obstacle)		control information		Test result	
delta X	2.5401761	delta X	0	latitude	37.2397393	Lane maintenance	Pass
delta Y	0	delta Y	0	longitude	126.7734763	gap	-
lane distance	-0.7584377	type of obstacle	0	speed	7.4096437	maintenance of scheduled path	Fail
type of lane	5.2087107	speed	0.0000000	acceleration	-0.09	maintenance of speed limit	Fail

### ① MAP & CCTV

- Display more accurate image using collected data from automated vehicle
- Provide event information
- Replay

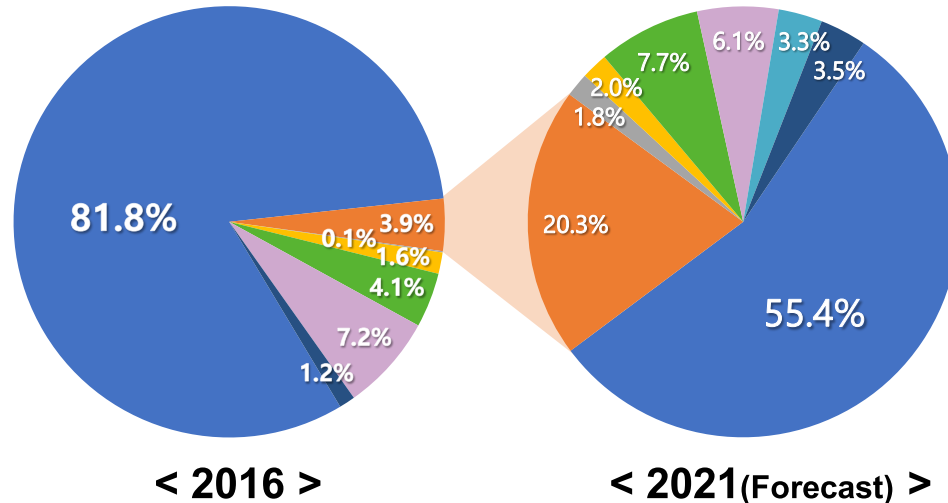
### ② Vehicle information

- Collected data of automated vehicle and opposite vehicle
- Recognition/control information of automated vehicle(recognition of obstacle/lane, motion plan, steering angle, speed)

### ➤ 3. ITS Investment Outlook in Korea

#### ITS in the Automotive and Road Sector(2021)

##### Investment Outlook by Project



##### Insights

- Traffic Management segment held the leading share and its amount of investment is anticipated to increase by 30.2% to 576.4 billion won.
- C-ITS segment is anticipated to record high growth during the forecast period with Korean New Deal project.
- C-ITS(3.9%→20.3%), Automated Vehicle(0%→3.3%), Improvement of ETCS(4.1%→7.7%), Green Transportation(1.2%→3.5%)

Project	2016	2017	2018	2019	2020	2021 F
Expansion of Traffic Management using IOT	432,964	417,741	428,539	242,674	442,757	576,427
Expansion of C-ITS	20,786	28,520	34,455	70,252	73,115	210,733
Expansion of the Provision of Safety Information	468	160	450	673	738	18,348
Establishment of Traffic Communication Information System	8,720	12,961	9,191	15,457	17,182	20,621
Improvement of ETCS	21,449	45,437	12,806	59,728	42,208	79,788
Providing Public Transportation Information	38,331	42,001	32,847	55,590	54,887	63,848
Expansion of Automated Vehicle	0	0	0	22,213	26,778	33,823
Support of Low Carbon, Green Transportation	6,610	24,467	26,404	32,477	34,506	36,361
<b>Total (Million KRW)</b>	<b>529,328</b>	<b>571,287</b>	<b>544,692</b>	<b>499,064</b>	<b>692,171</b>	<b>1,039,949</b>

\* Source : 2021 ITS Investment Outlook(2020.07), ITSK



**Thank you**

