

Best Partner for Achieving Your Better Transport

# Intelligent Transport Systems in Korea

Best Partner for  
Your Better Transport

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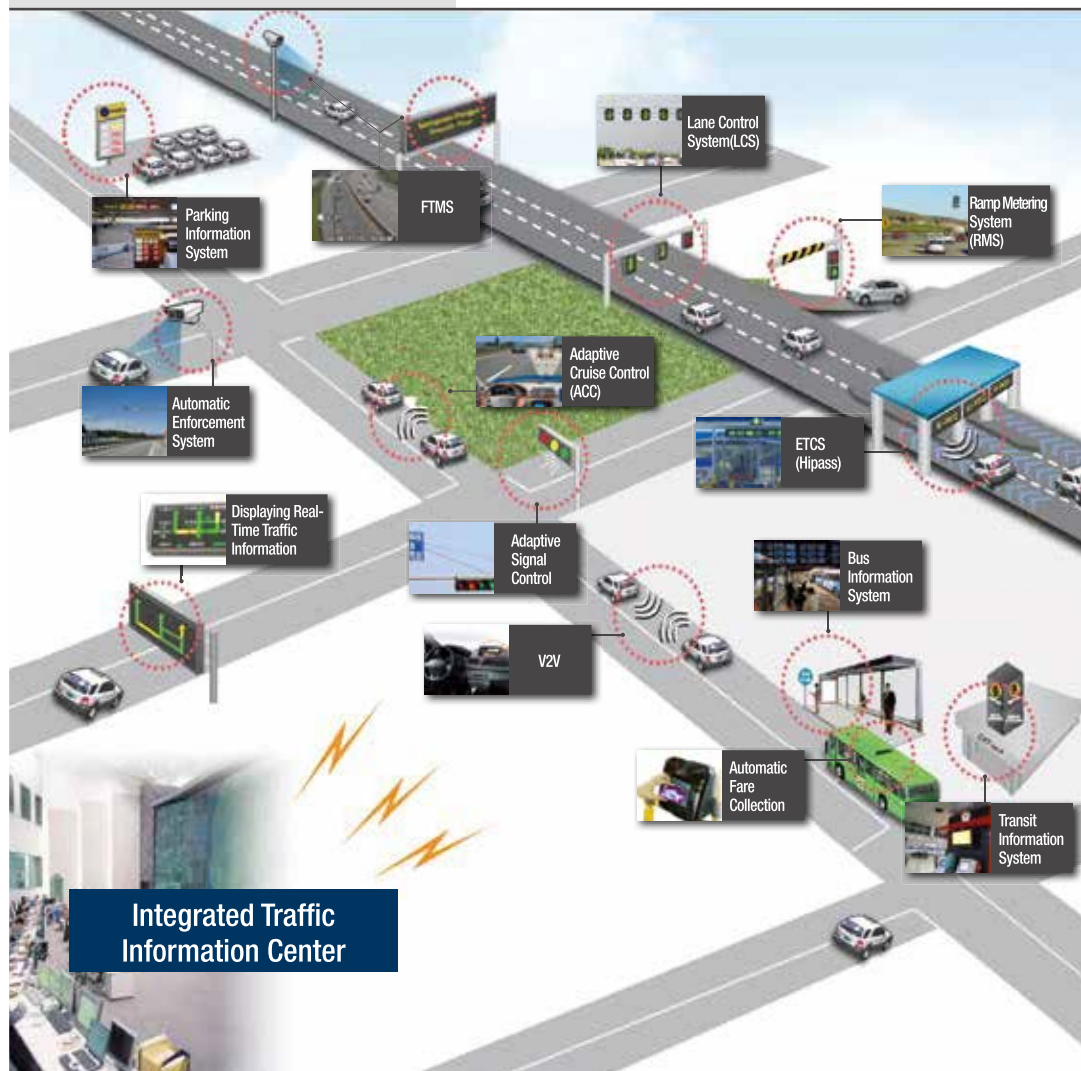
# Overview of ITS in Korea

## ITS Definition

### What are Intelligent Transport Systems (ITS)?

#### National Transport System Efficiency Act ( Article 2. Definition of ITS )

Advanced transport systems which collect, process and provide real-time traffic information to maximize the efficiency of utilization, improve convenient and safe transport and reduce energy by applying advanced electronics, information and telecommunications technologies into various transportation modes and facilities including roads and vehicles



# ITS History and Current Status

## ITS(Intelligent Transport Systems)

To Maximize the Efficiency of Existing Traffic Infrastructure



## Milestones of ITS in Korea



1993~1998

### Stage 1 (Introduction of ITS)

- \*1993 Review of ITS by the Presidential SOC Investment Plan Group
- \*1994 FTMS Pilot Project (Gyeongbu Expressway)
- \*1997 Establish 1st National ITS Master Plan
- \*1998 ITS Pilot Project(Gwacheon)
- \*1998 Hold the 5th ITS World Congress in Seoul



1999~2004

### Stage 2 (Laying Legal Foundation & System)

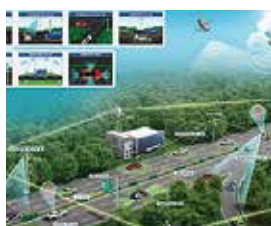
- \*1999 Enactment of the Transport System Efficiency Act
- \*1999 Development ITS Architecture
- \*2001 Establish 2nd National ITS Master Plan
- \*2001 Hi-pass(ETCS) Pilot Project
- \*2002 National ITS Standardization Plan Established
- \*2003 Project on Establishing ITS Model City(Jeonju, Daejeon, Jeju)
- \*2004 ITS Implementation on Seoul Urban Expressway



2005~2010

### Stage 3 (Growth & Expansion)

- \*2005 Bus Information System(BIS) Pilot Project(Suwon-Sadang)
- \*2006 Five ITS Centers of Regional Administration Established
- \*2007 Nationwide Expansion of Hi-pass(ETC)
- \*2009 Revision of National Transport System Efficiency Act
- \*2009 Deployment of ATMS by Local Governments
- \*2010 Host 17th ITS World Congress in Busan



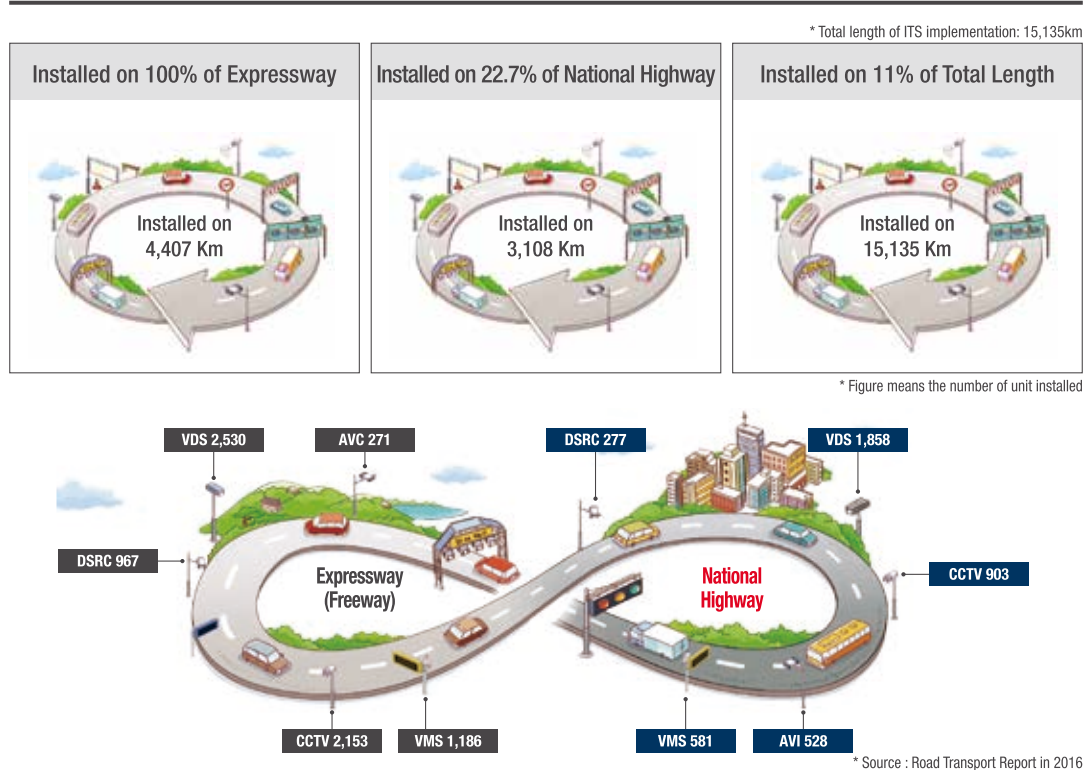
2011~Present

### Stage 4 (Next Generation of ITS)

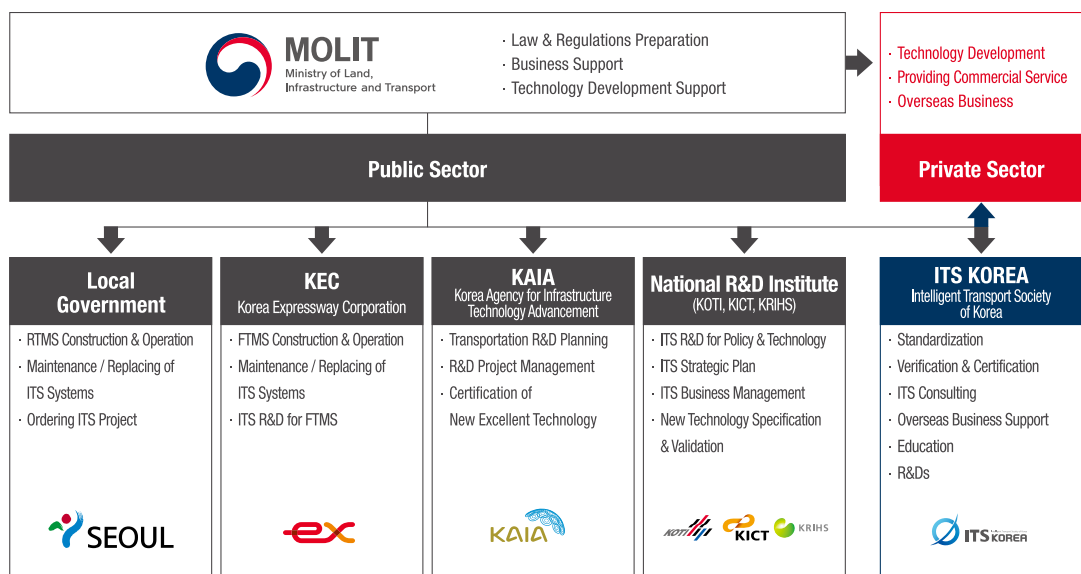
- \*2012 54 Traffic Information Centers (including BIS centers) in Operation
- \*2012 Establishment of ITS Master Plan for Vehicles and Roads 2020
- \*2013 Research on Introduction Plan for C-ITS
- \*2014 SMART Highway Project
- \*2014 Private-Public Cooperation in Traffic Information(MOU)
- \*2016 C-ITS Pre-Deployment Project
- \*2016 R&D on Cooperative Automated Driving Roadway System (C-AHS)



## ITS Operation Status in Korea



## ITS Organizations in Korea



# ITS Architecture

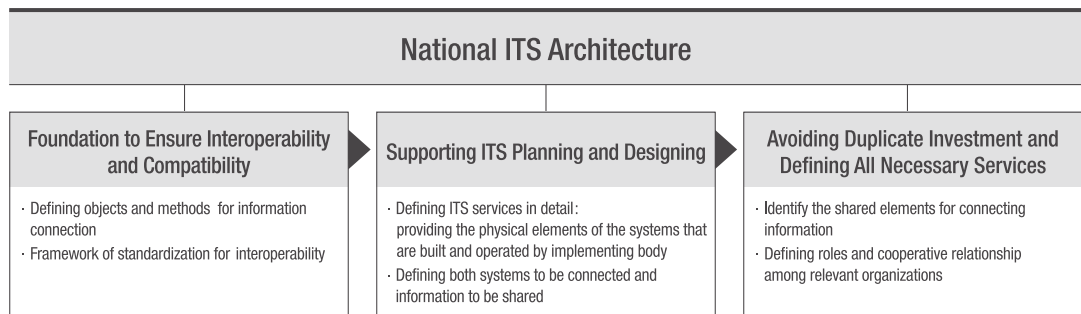
## Definition

National ITS architecture is the blueprint providing the overall frame at the national level, by defining the functionality of the system and the flow of information, along with configuring the main body to ensure interoperability and compatibility

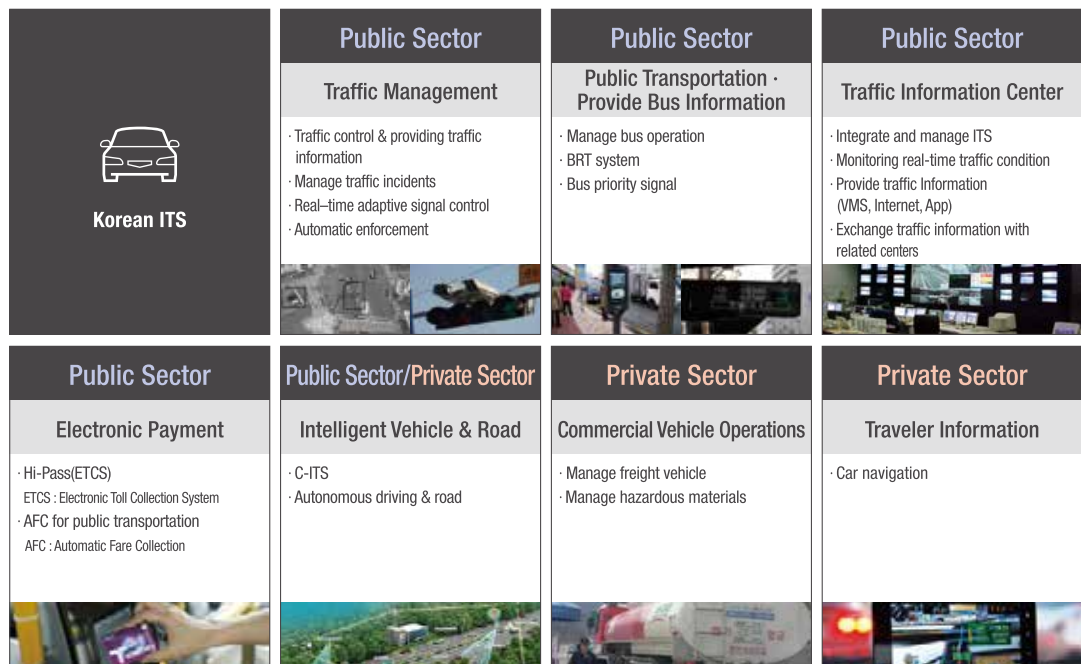
## Necessity of ITS Architecture

In cases where stakeholders are deploying ITS systems without connection, overall ITS installations and operations at a national level are inefficient and lacking in operability. Therefore, national ITS Architecture should be established to provide the whole framework for consistent and organized ITS implementation

## Roles of National ITS Architecture

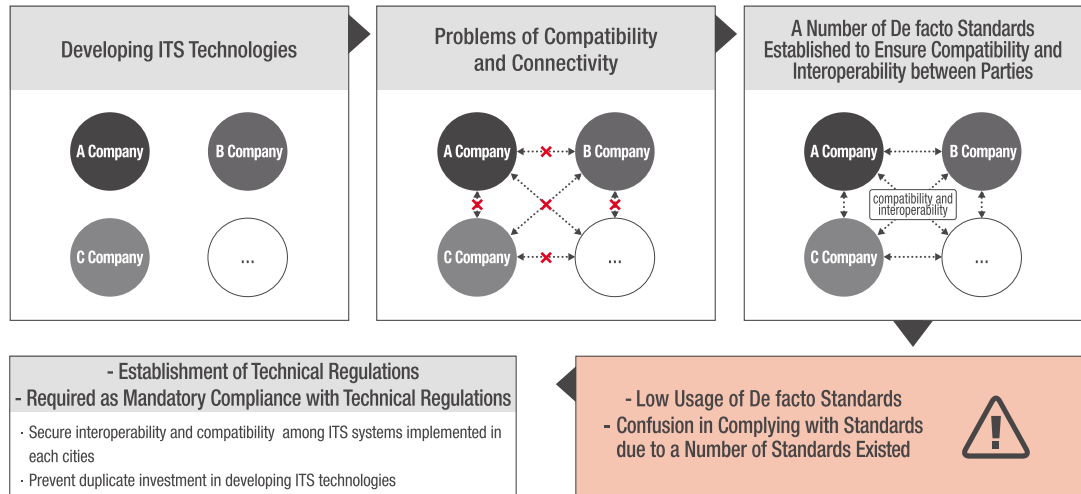


## Korean ITS Architecture Categorizes ITS Services into 7 Main Services

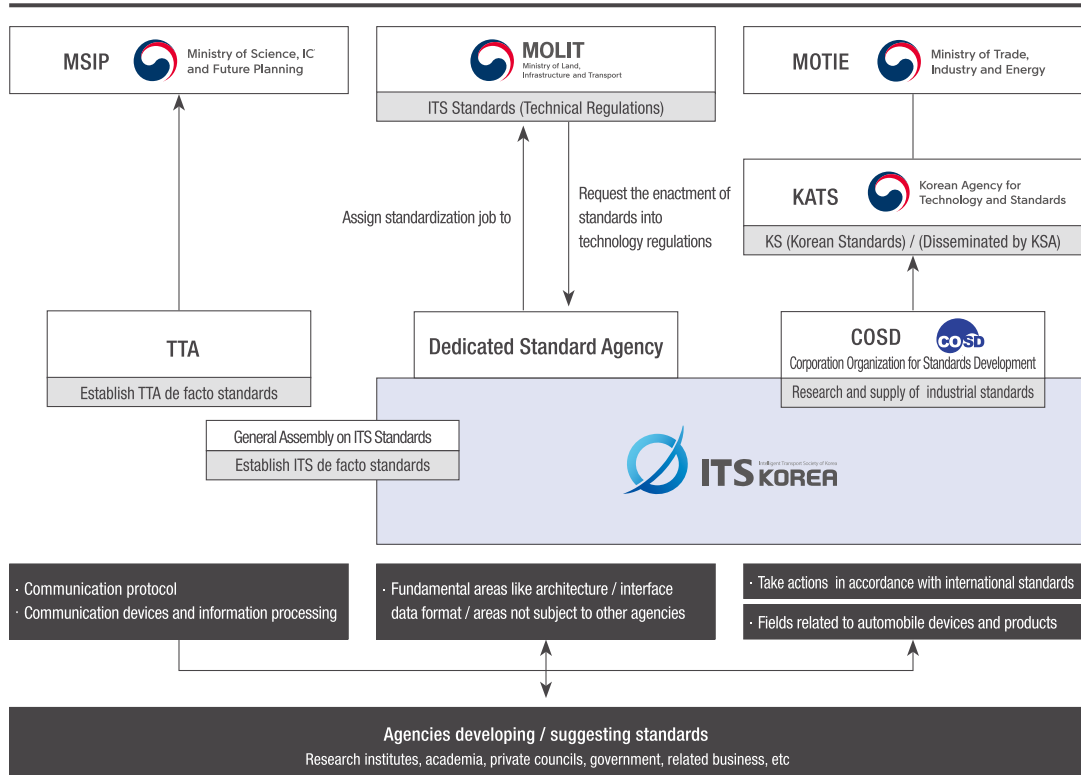


# ITS Standards

## Background and Objectives of Establishing Standards (Technical Regulations)



## Organizations Related to ITS Standardization



## National Transport Efficiency Act | Stating Mandatory Compliance with Standards (Technical Regulations)

Category	Existing Contents	Revised Contents			
Mandatory Compliance with Standards	The act states the technical regulations should be observed	<ul style="list-style-type: none"><li>Revised as stating not only mandatory compliance but also requiring the submission of the certificate of standard observance to complete the ITS project</li></ul>			
Verification on Compliance with Standards	Stated the conformance test should be executed according to “ITS Work Manual”	<ul style="list-style-type: none"><li>While performing the project, it is required to check if the standards are complied with. Confirmation of their compliance may be requested by the Ministry of Land, Infrastructure and Transport</li></ul>			
Dedicated Agency for Standardization	The agency shall survey trends for standards and develop / disseminate standards	<ul style="list-style-type: none"><li>Different standardization agencies may be designated for land / sea / air transportation for ITS development in respective fields</li><li>The agencies shall perform additional functions; confirmation / verification of compliance with standards, distribution, support for the use of standards</li></ul>			
Certification System	Category	Common Features	Difference		
			Time	Execution Body	Scope
	Verification of compliance with standards	Confirmation of all matters subject to ITS standards	Before inspection of completion (mandatory)	Project executor	All verification
	Certification of standards		Before purchase / delivery of products / equipment	Project executor or others	Sampling

## ITS Standards

ITS Technical Regulation	No of Publication	Title
	2016 - 206	The Basic Traffic Information Exchange I
	2016 - 186	The Public Transport(BUS) Information Exchange
	2016 - 207	The Basic Traffic Information Exchange II
	2013 - 251	ETCS Information Exchange by DSRC [RSE-OBUE]
	2016 - 208	The Basic Traffic Information Exchange IV

ITS Administrative Rules	No of Publication	Title
	2015 - 755	ITS Standard Node&Link Management Guideline
	2015 - 756	ITS Standard Node&Link Development Criteria
	2013 - 252	BIS / BMS Data Management Guideline
	2013 - 256	OBU Certification System Guideline for ETCS



# Achievement of ITS

## Strengthening Traffic Competitiveness and Reducing Social Costs

**\$11.8 billion worth of social benefits per year**  
(congestion · accident · logistical cost)



Increase travel  
speed by 15~20%



### Effect on Hipass

Tollgate passing time : 14 sec. -> 2 sec. reduced(Improvement of 85.7%)

Social benefit : USD 9.6 M/year

### High benefit-cost ratio



Use only 1% of road  
construction costs  
to reduce 20% of traffic jams  
B/C for ITS deployment by  
each city: 2.2~6.2

Seoul 2.27, Daejeon 5.2, Ulsan 4.64,  
Suwon 2.39, Jeonju 2.9, Jeju 6.2

### Growth of private traffic information

Provide national ITS data to private sector for free, so help  
ITS services of private sector to enhanced and expand



**NAVER**

**THINKWARE**

### Reducing greenhouse gas & oil consumption

Reducing greenhouse gas & oil consumption  
based on decrement of traffic congestion and idling

Per 1,000km of road covered with ITS

▶ annually 19,000 tons reduced

Through Hi-Pass(ETCS) service

▶ annually 2.3 tons reduced

**CO2**  
DOWN

# Major ITS Services in Korea

## AFC - Automatic Fare Collection



### Transportation Card

Integrated Transportation Card available for paying taxi, bus, subway, train and expressway fares



Subway



Bus



Taxi

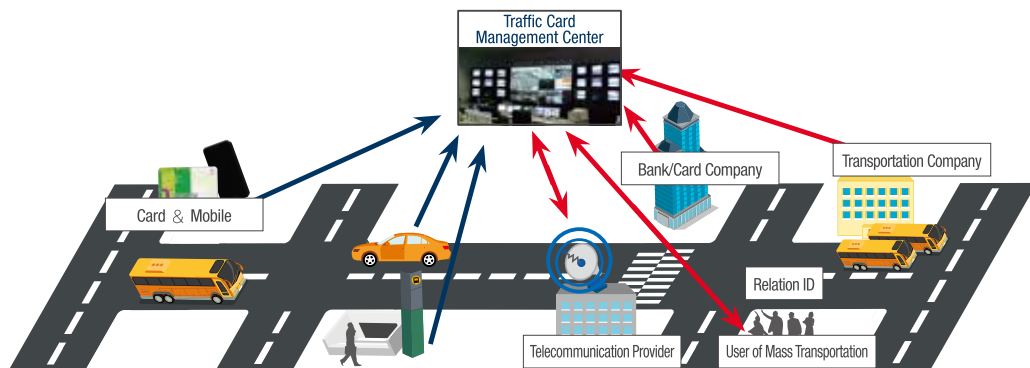


Parking Lot



Shopping Center  
Convenient Store  
Internet Shopping Mall  
Vending Machine etc.

## Improve Convenience of Public Transport by Using an Electronic Transport Card to Pay Fares



Inconvenient Payment



Before

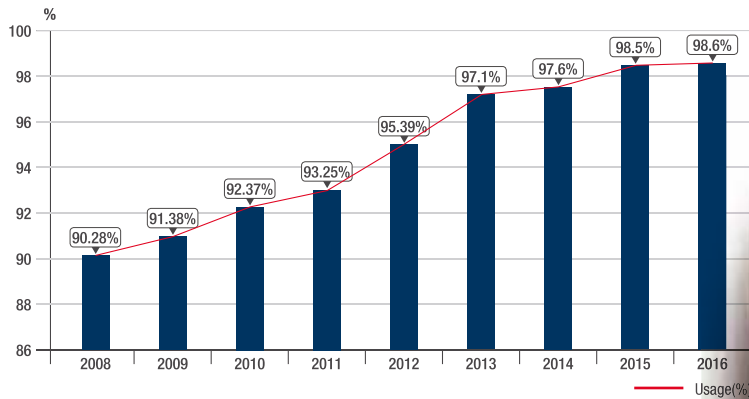


After

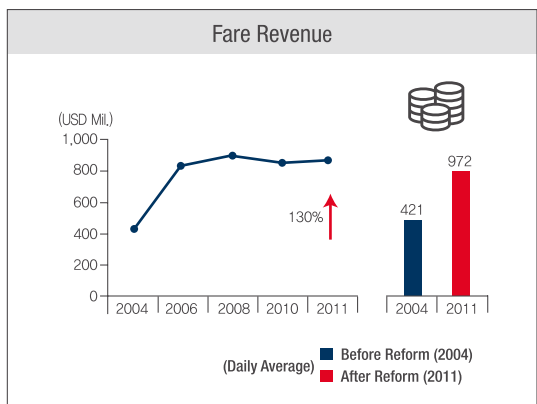
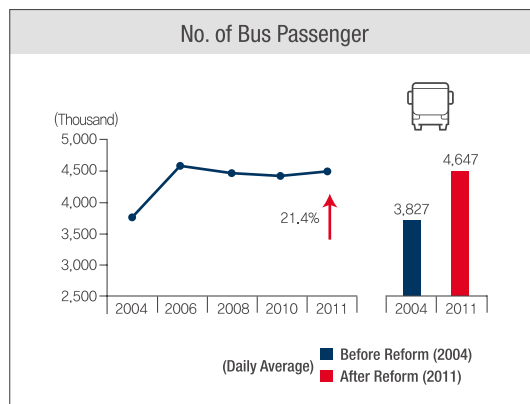


User-friendly Payment Method

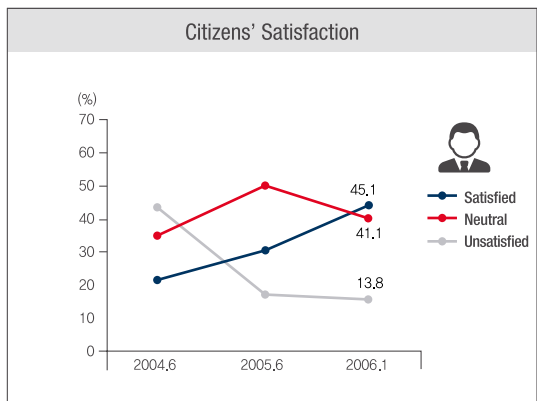
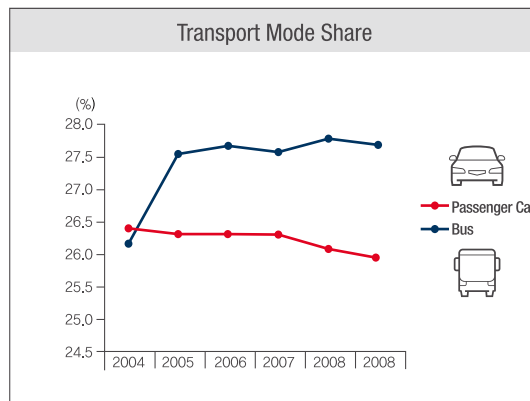
## Card Usage Rate in Seoul : 98.6% of Bus Passengers, 100% of Subway (2016)



## Bus Company - Securing Transparent Fare Management and Increasing Profit



\* Reform refers to Seoul's reform on Bus System in 2014



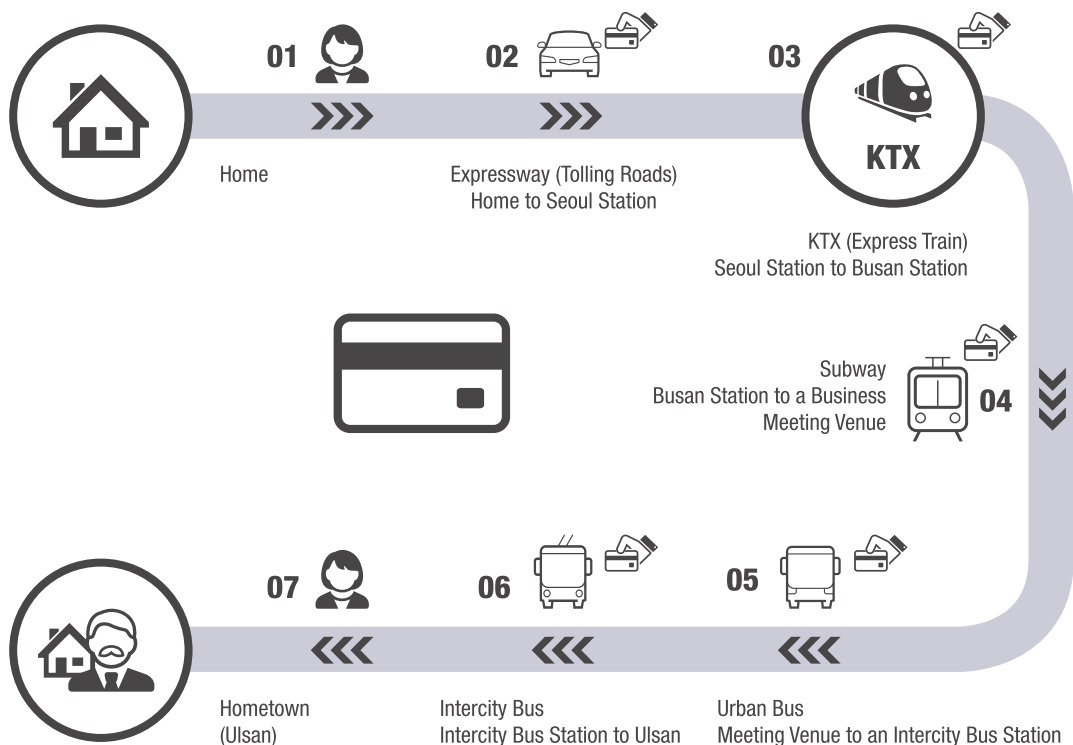
\* Source : Seoul Metropolitan City

## One Card All Pass

- One Card All Pass ; an integrated card for not only taxi, bus, and subway fares, but also train expressway tolls and even parking systems was developed and introduced in 2014
- The first electronic payment system for public transportation was introduced in 1996, Seoul, Korea
- Based on the reform of the Seoul bus system in 2004, with just one transportation card, users can pay for most public transportation modes including taxis, buses and the subway
- Over 95% of bus passengers and 100% of subway passengers in Seoul use this transportation card

### The Way to Go to my Hometown

Mr Kim, living in Seoul, is planning to visit his hometown, Ulsan, and meet his parents after his business trip to Busan  
Let's follow Mr Kim's trip with an integrated transportation card



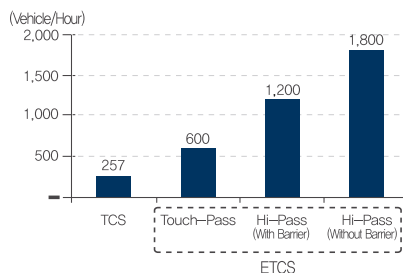
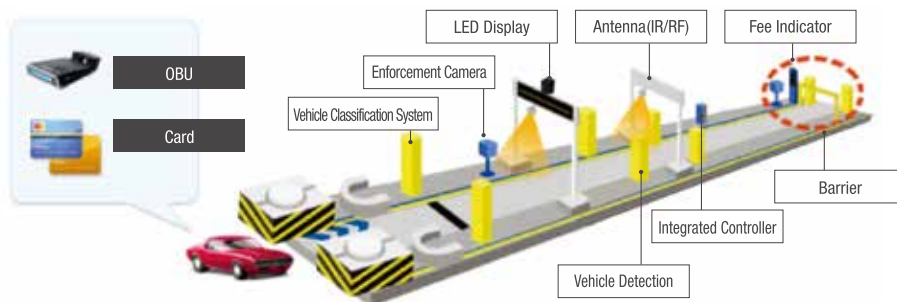
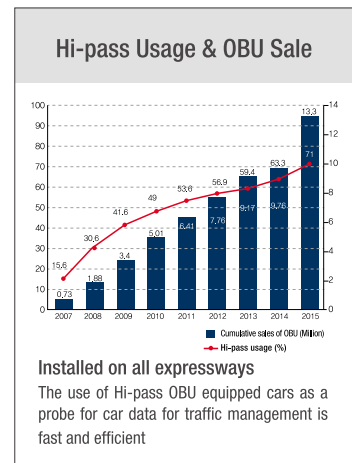
Cooperation (MOU)	Transport Modes	Transport Facilities
<ul style="list-style-type: none"> <li>· Central &amp; Local Governments</li> <li>· Transport Corporations</li> <li>· Card Companies</li> </ul>	<ul style="list-style-type: none"> <li>· Urban Bus</li> <li>· Railway (Express Rail)</li> <li>· Regional Bus (Express Bus)</li> <li>· Subway</li> <li>· Airport</li> <li>· Public Bicycles</li> </ul>	<ul style="list-style-type: none"> <li>· Expressways (Tolling Roads)</li> <li>· Public Parking Lots</li> </ul>



# ETCS

## Electronic Toll Collection System

- Non-Stop payment at tollgate by communication between OBU and antenna
- Automatic fare deduction from inserted smart card in OBU
- No. of toll plaza : 335ea
- No. of OBU distributed : 14.7 Mil , Usage rate : 75% (As of July, 2016)



Expected Reduction Amount per Year				
	Fuel Consumption (KL)	CO2 (Ton)	Nox (Ton)	Fuel Cost (USD Mil.)
Freight	1,485	3,994	44.5	2.4
Passenger Car	4,825	11,305	3.9	8.6
Total	6,310	15,299	48.4	11.0

\* The annual amount of CO2 reduced by installing Hi-Pass is the same as the amount absorbed by 2.01million pine trees  
Source: National Institute of Environmental Research, A press release, 2011. 5. 4

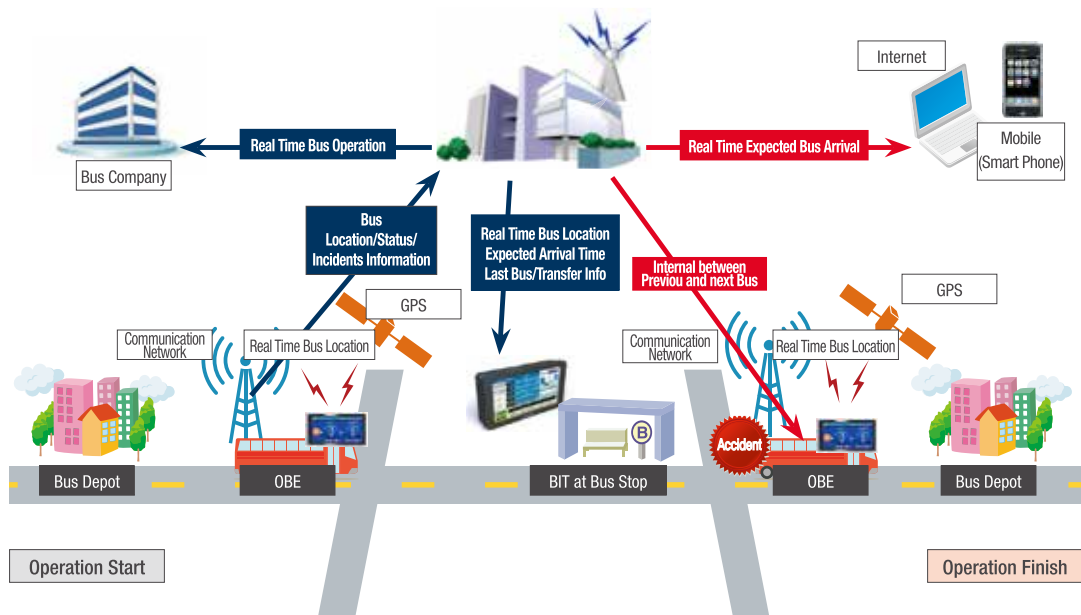
# BIMS

## Bus Information Management System

- Advanced Public Transportation System to increase its modal share of public transportation by providing real-time bus arrival time, bus's current location, and incident information to the public based on collected data
- Real-time bus arrival time provided through smartphone, BIT at bus stop and in subway station
- Arrival time of adjacent subway, transfer and incident information, bus routes, last bus/transfer information etc. (news and city affairs) provided
- Interval among buses and over-speed driving monitored

## BIMS

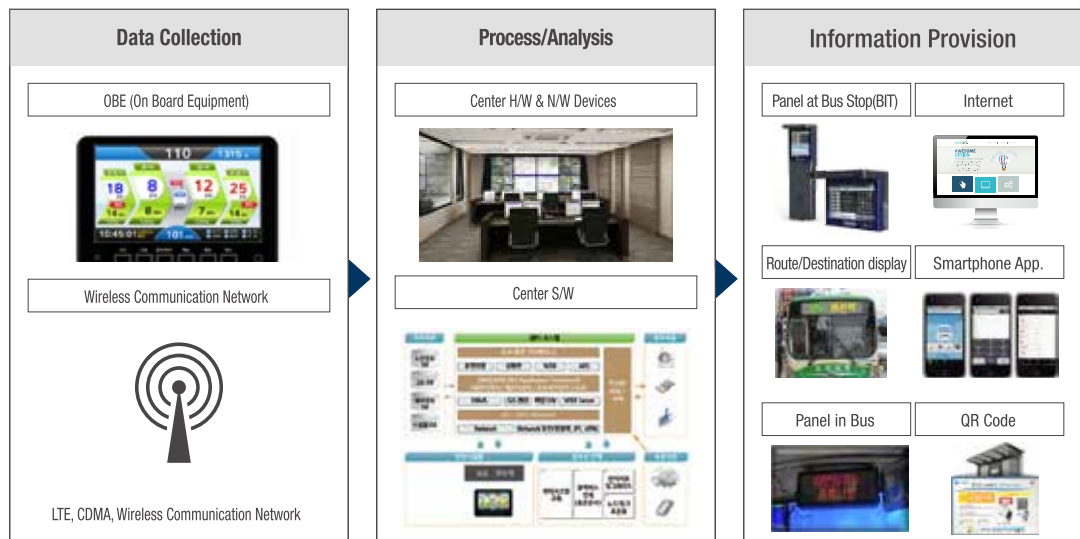
Efficient bus operation and management to improve the bus user's convenience



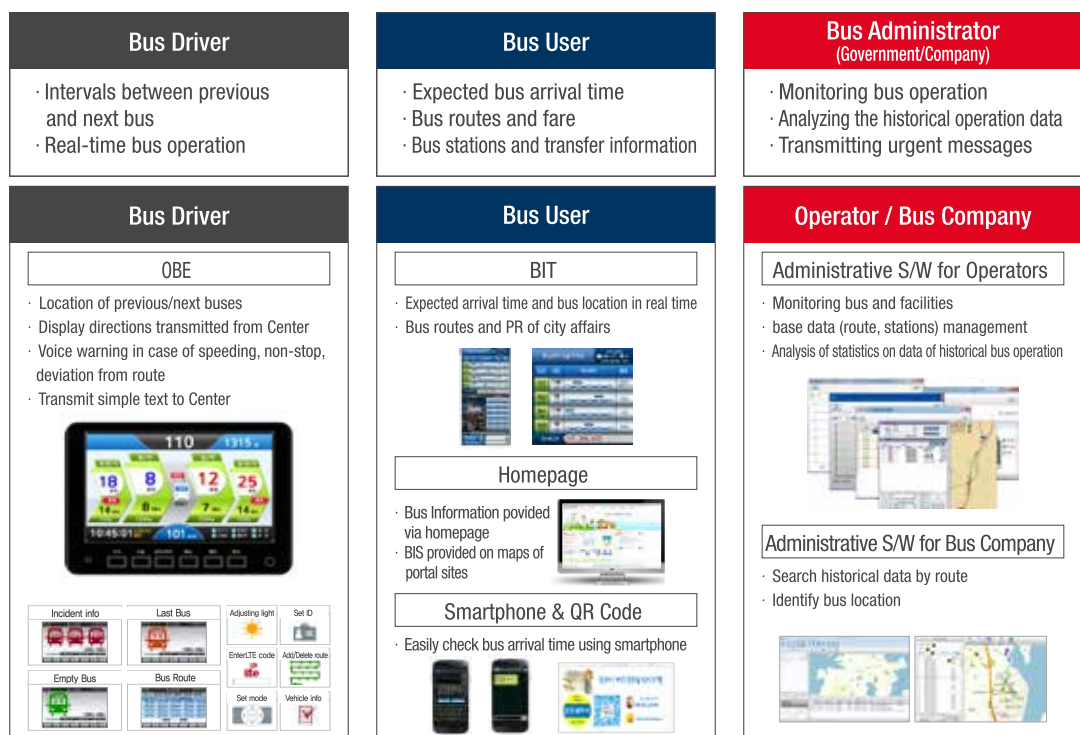
## Benefits

- Improve the quality of public transportation by securing punctuality of bus operation
- Increase users' convenience by fast provision of accurate bus operation info.
- Encourage and increase bus usage with high quality BIS
- Effective bus operation management and monitoring by public organization and bus company

## Process



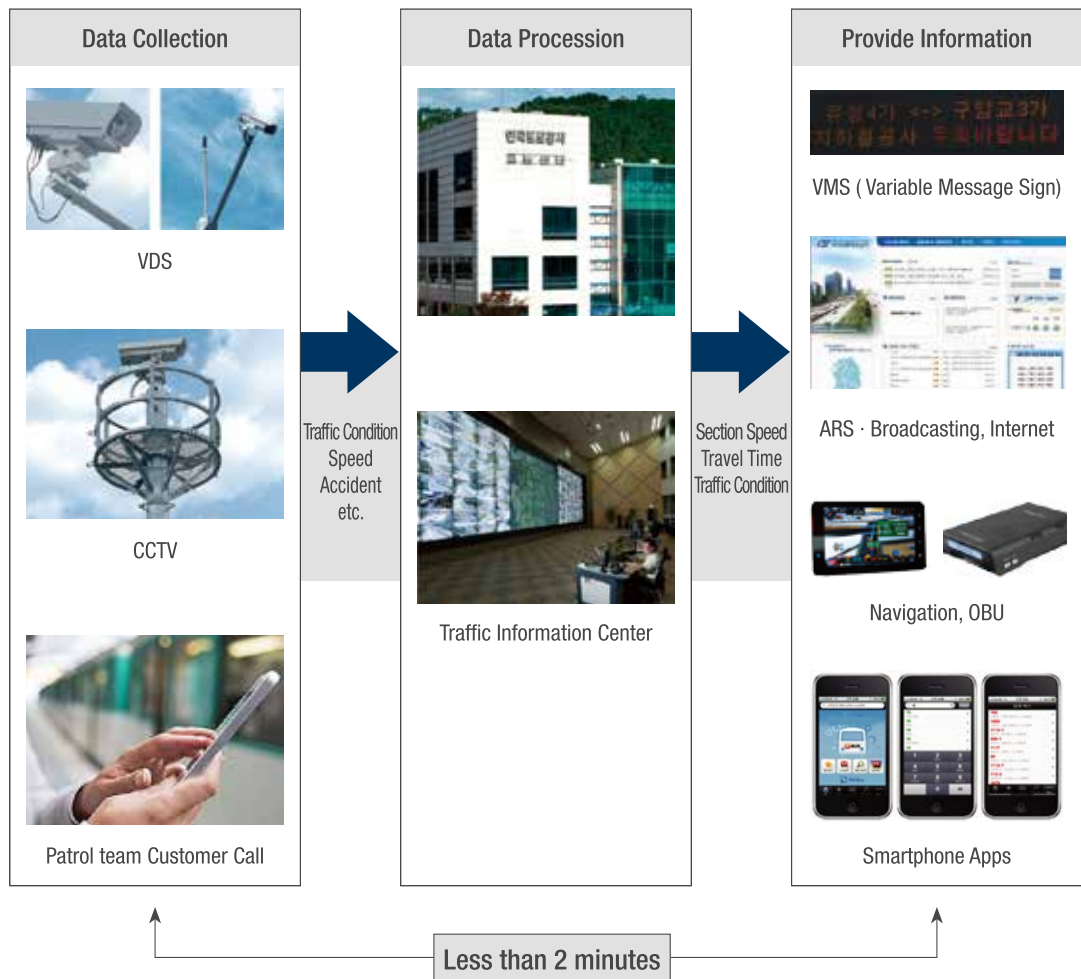
## Information Provided



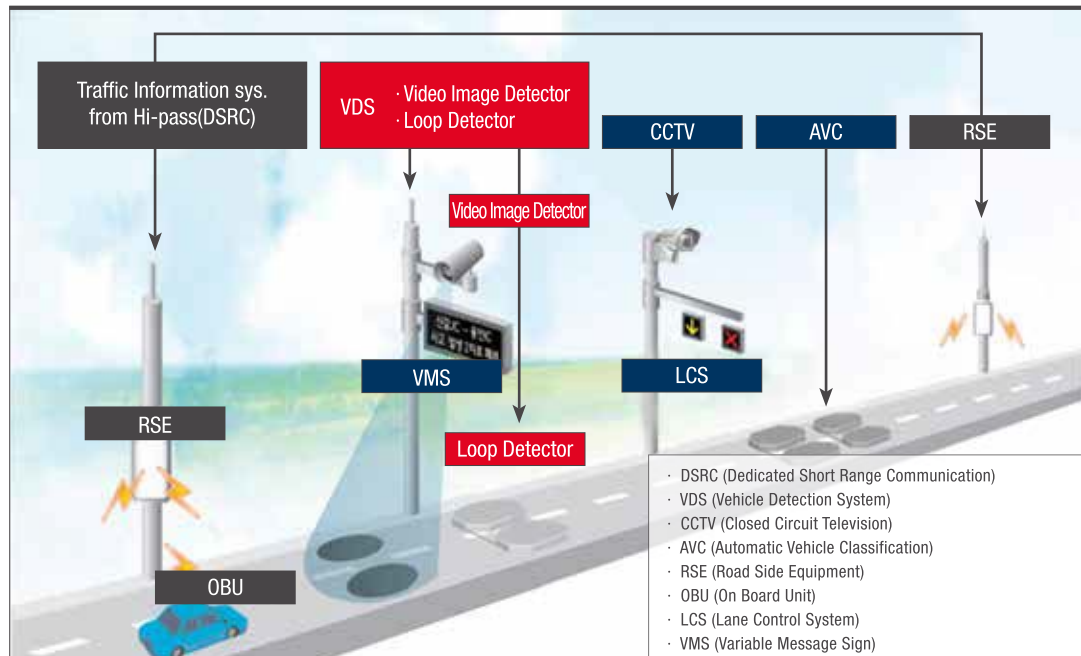
# FTMS

## Freeway (Expressway) Traffic Management System

ITS system to operate and manage the traffic flow on the expressway







Category	Definition	Relevant Systems														
		VDS / AVC	CCTV	VMS	DSRC	En-force-ment Device	RMS	LCS	Hi pass	WIM	Incident Detection System	Tunnel Wireless Communication	RWIS	Business Center	Transfer in rest area	Center System
Basic Section	Major areas where traffic data should be collected	○	○	○	○	○	—	○	—	—	—	—	○	—	—	○
Tunnel / Bridge	Tunnel and Bridge located in basic section	○	○	○	○	○	—	○	—	—	○	○	○	—	—	○
Rest Area	Rest areas located in basic section	—	—	○	—	—	—	—	—	—	—	—	—	○	○	—
Toll Gate	Setting toll at entrance / exit of expressway	—	○	○	○	—	—	—	○	○	—	—	—	—	—	○
Ramp	Exiting and entering on main expressway lane	—	—	○	—	—	○	—	—	—	—	—	—	—	—	○
Traffic Center	Operation and management of expressway	—	—	—	—	—	—	—	—	—	—	—	—	—	—	○

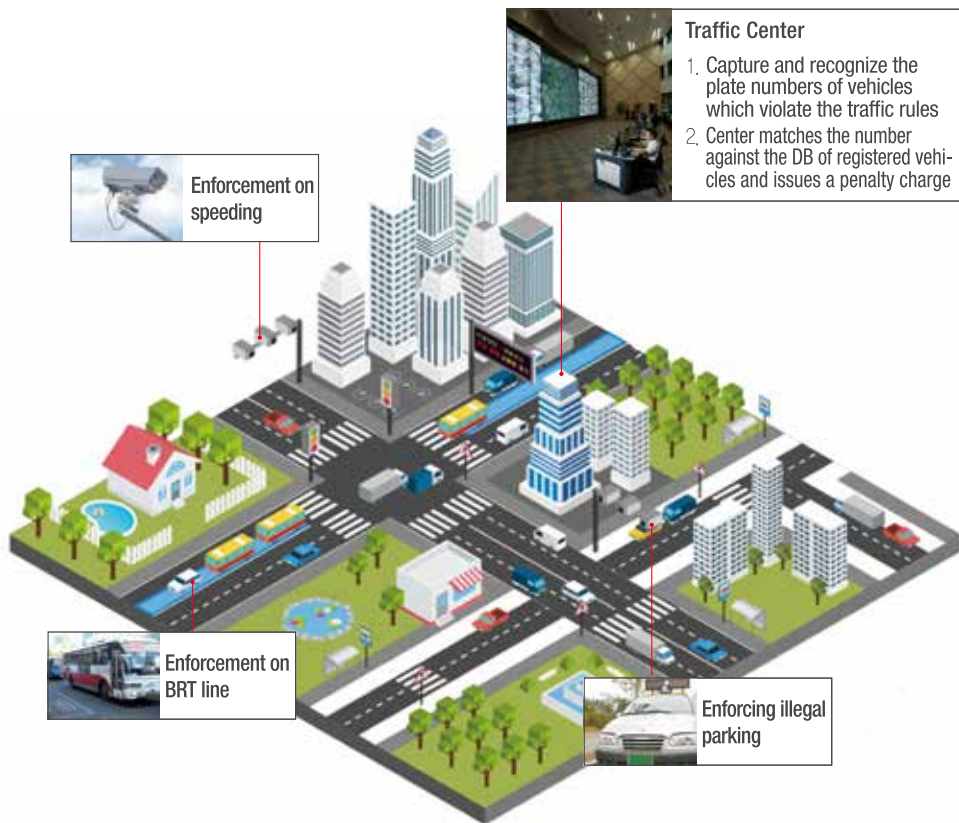
# ATES

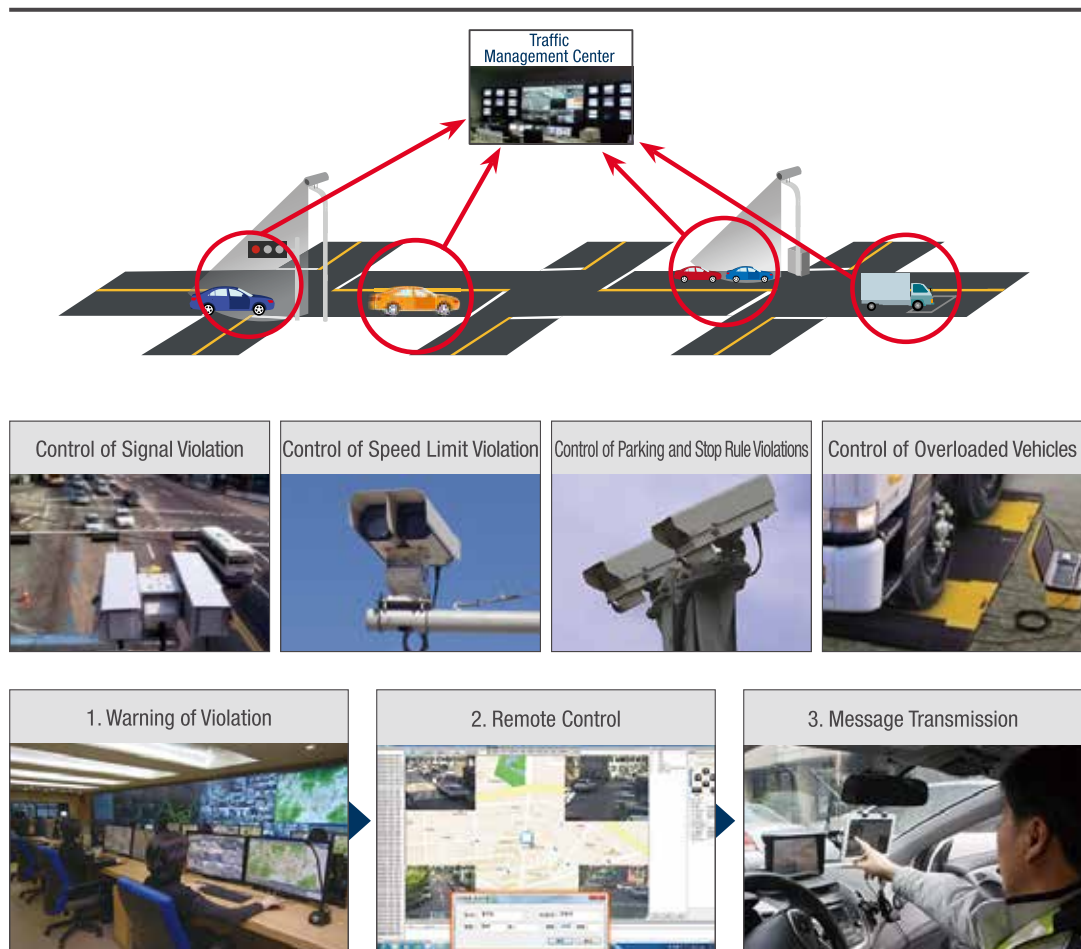
## Automatic Traffic Enforcement System

Automatic Enforcement for speeding, signal violations, illegal parking

### Effects

- Reduce traffic accidents and inconvenience caused by vehicles breaking the rules
- Promote safe bus driving by enforcing the vehicles running on BRT line
- Reduce accidents and smooth traffic flow by enforcing illegal parked cars
- Prevent accidents caused by speeding in advance by installing ATES in areas prone to accident or speeding





Case) Illegal parking enforcement system : Capacity improvement



# WIM

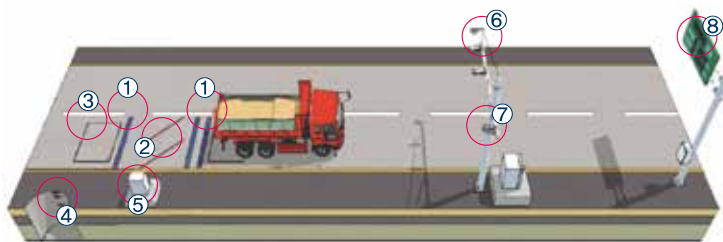
## Weigh In Motion

The goal of WIM is to protect roadway structures and increase traffic safety by measuring the height and weight of freight vehicles and enforcing the violation in cases where the freight vehicle is overloaded

### Damage Caused by Overloading (Cracks on road, collapse of bridge)



## High Speed WIM



- ① Axle load measurement sensor
- ② Wheel location monitoring sensor
- ③ Vehicle detection & classification sensor
- ④ Temperature sensors for axle load data compensation
- ⑤ Data controller
- ⑥ AVI system
- ⑦ CCTV
- ⑧ VMS

**Recognition of Vehicle Plate Numbers**

**Detecting Overloading**

② Camera

③ Variable Message Sign

① High Speed WIM

Seoul 00 가 1234						
Axle1	Axle2	Axle3	Axle4	Axle5	Axle6	
6.1	8.3	8.5	2.3	13.5	12.8	

서울 00 가 1234

Max Axle-Weight 13.5t

Display on VMS

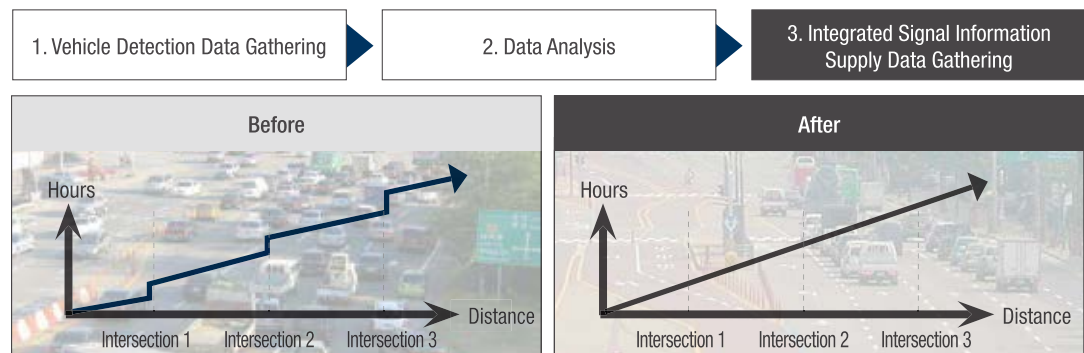
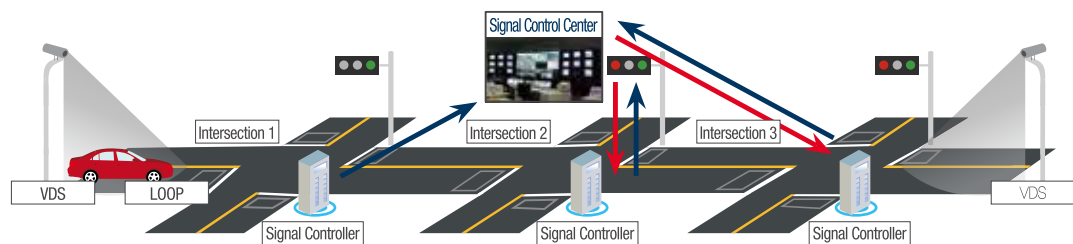


# ATSCS

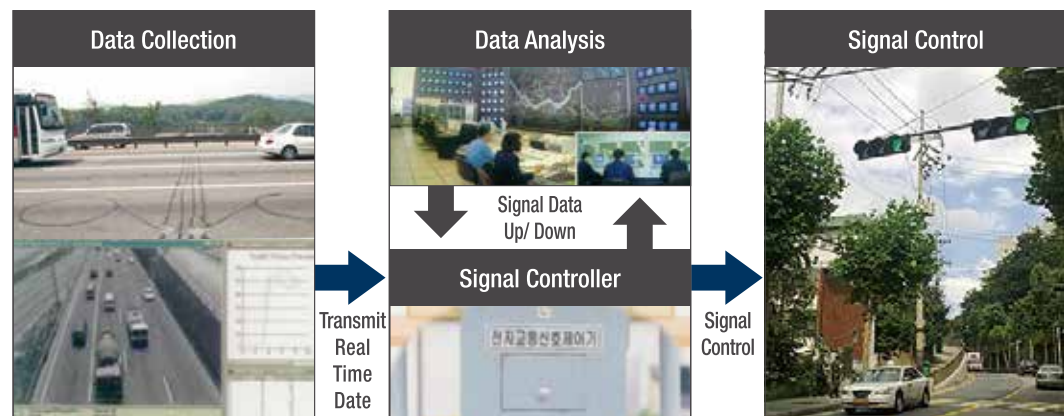
## Advanced Traffic Signal Control System

Both Pre-timed Controls (TOD Operation) and Adaptive Traffic Signal Controls are used

## ATSCS (Advanced Traffic Signal Control Systems)



## Stream Diagram of ATSCS

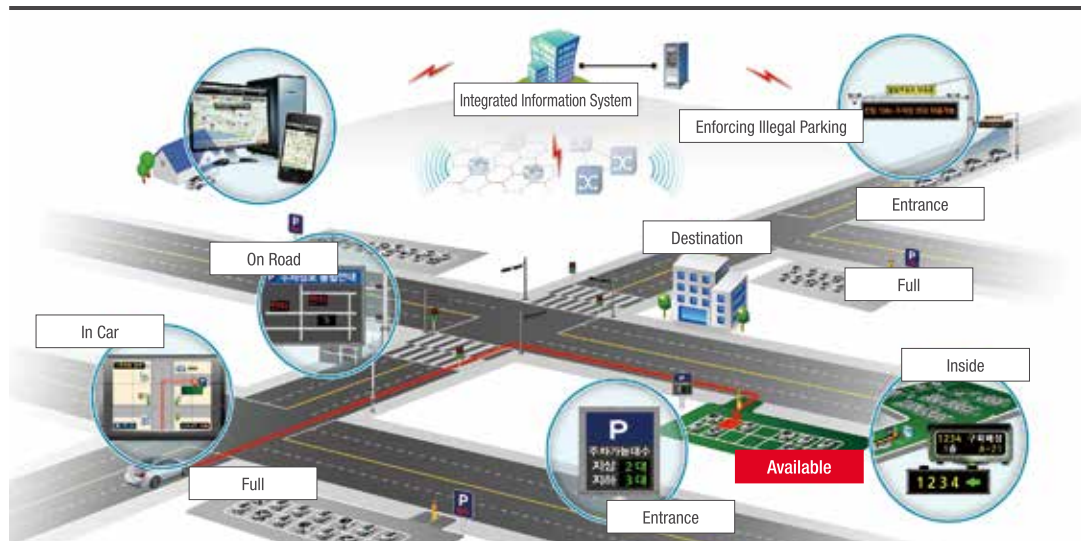


# PIS

## Parking Information System

Integrated parking guidance system to provide parking information based on detecting the available parking space in real time

### System Overview



Wireless Loop Detector		Ultrasonic Detector		Image Analysis (Recognition of Vehicle Plate)		Image Analysis (Recognition of Space Occupancy)	
Detection Area/1ea	· 1 lot	Detection Area/1ea	· 1 lot	Detection Area/1ea	· 3 lots	Detection Area/1ea	· 10-15 (maximum)
Strength	<ul style="list-style-type: none"> <li>· No impact by circumstances</li> <li>· Easy installation</li> </ul>	Strength	<ul style="list-style-type: none"> <li>· High reliability</li> <li>· Inducing parking</li> </ul>	Strength	<ul style="list-style-type: none"> <li>· Easy installation, security function included</li> <li>· Possible to set detection area</li> </ul>	Strength	<ul style="list-style-type: none"> <li>· Easy installation, low cost</li> <li>· Possible to set detection area</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>· Counting error occurrence</li> <li>· High maintenance cost</li> </ul>	Weakness	<ul style="list-style-type: none"> <li>· Sensitive to circumstances</li> <li>· Ineffective installation</li> </ul>	Weakness	<ul style="list-style-type: none"> <li>· Sensitive to circumstances</li> <li>· High initial investment</li> </ul>	Weakness	<ul style="list-style-type: none"> <li>· Sensitive to installed camera location</li> </ul>

# NTIC

## National Traffic Information Center

## National Traffic Information Center

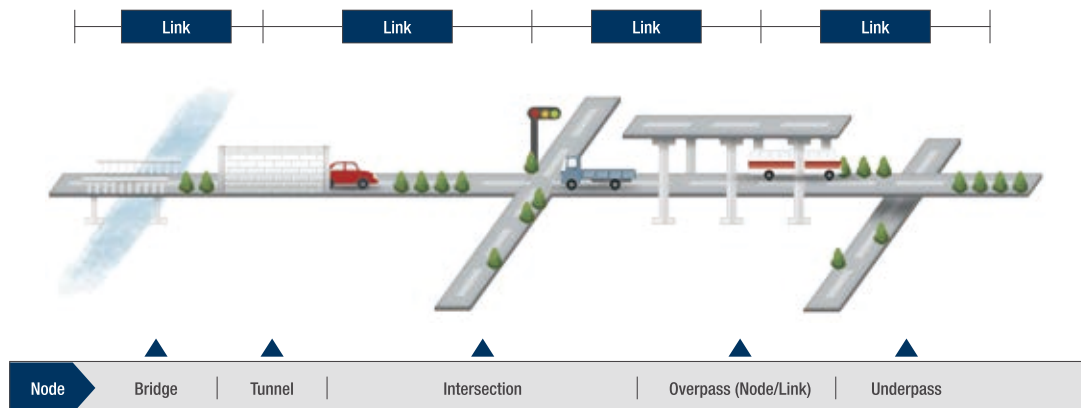
Based on National Transport System Efficiency Act (Article 90. The establishment of NTIC), the traffic data collected by local governments, regional administrations, Korea Expressway Corporation, Expressway concessionaries and private sectors are gathered and processed in NTIC. Subsequently, NTIC provides the refined traffic information back to these providers and the major national organizations including the National Emergency Management Agency and National Intelligence Service as well as private citizens

## Main Roles and Responsibilities

- Connect/Integrated traffic data collected in real time from nationwide as a hub and provide integrated traffic information
- Operation of ITS standards management system
- Operation of task force team to manage the traffic for special occasions (national holidays, major accidents, typhoons, heavy snow)

## Standardized Node / Link Management System

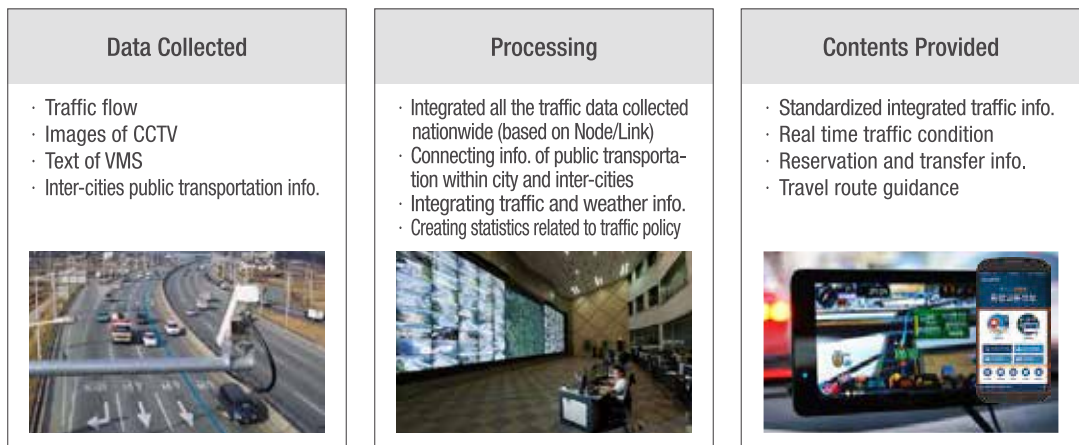
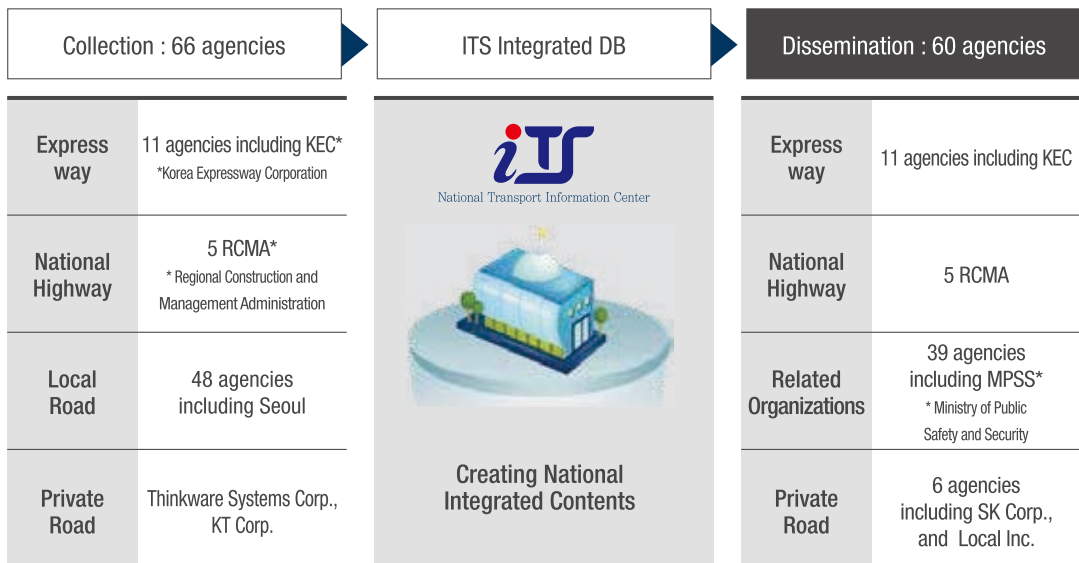
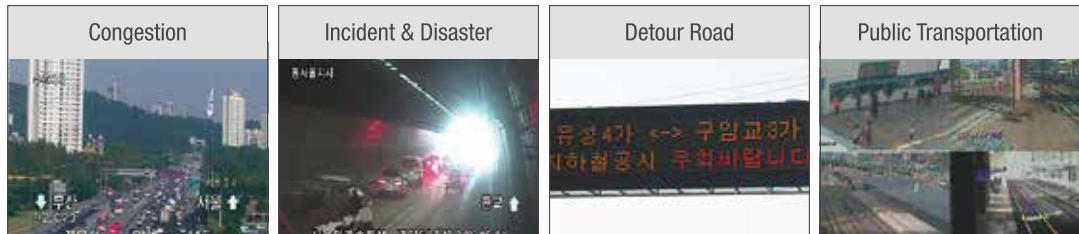
Node and Link, the units of electronic map, are systematically managed at the national level in NTIC so that it provides the unified conditions with various stakeholders like ITS operators and project contractors to efficiently connect the traffic data collected respectively



- Node : A point or specific spots where traffic flows are merged, diverged and changed on roads such as intersections, junctions or the entrance of tunnels
- Link : A linkage of nodes such as roads, bridges, overpasses, underpasses and tunnels



## Real-Time Monitoring & Management 24 / 7



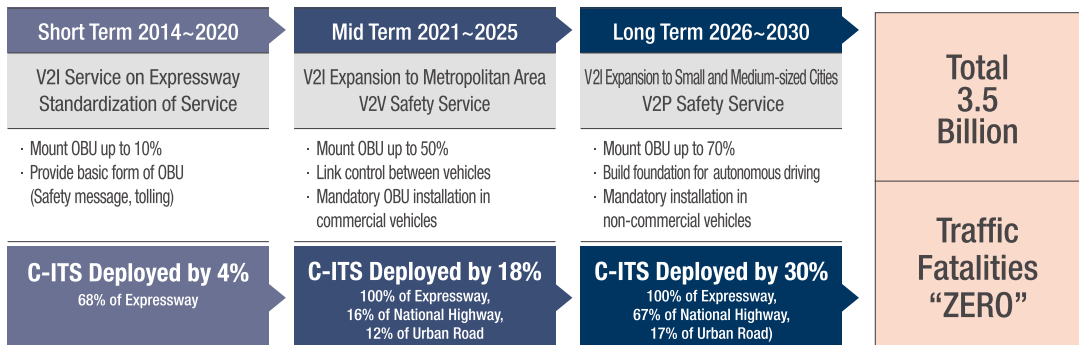
# Latest ITS Trends and Policies

## C-ITS (Cooperative ITS)

### Overview of C-ITS Pre-Deployment Project

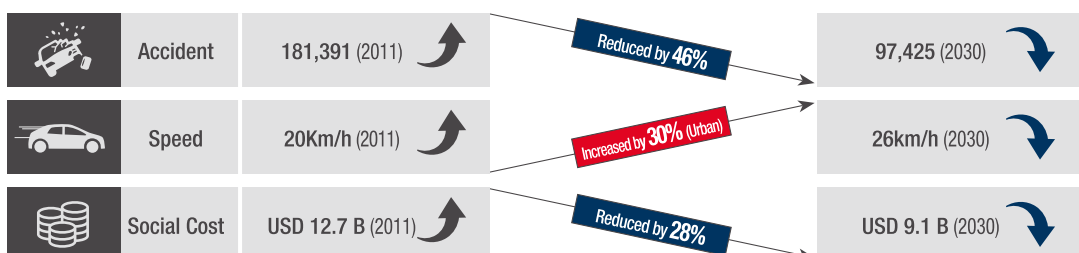


### C-ITS Master Plan



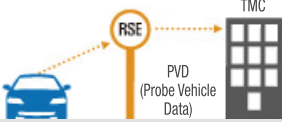







### Expected Effect

If C-ITS is deployed as a Master Plan, it is expected to provide numerous benefits, such as reducing accidents by 46%, social cost savings of 28%, and increasing speed by 30% by 2030



## Major Services

15 services provided to achieve safer transportation

<p><b>01</b> Probe Data Collection</p>  <p>Location based probe data collection (V2I)</p>	<p><b>02</b> Location Base Traveler Information Service</p>  <p>Location based traveler information service such as VMS(I2V)</p>
<p><b>05</b> RWIS (Road Weather Information System)</p>  <p>Microscopic road weather &amp; surface condition information service via RSE</p>	<p><b>06</b> Work Zone Warning</p>  <p>Broadcasting work zone warning via I2V, V2V</p>
<p><b>09</b> Bus Management</p>  <p>Fleets monitoring system via DSRC collecting locations and violating conditions</p>	<p><b>10</b> School Bus Warning</p>  <p>Broadcasting boarding or alighting condition from the school bus</p>
<p><b>13</b> FCW / EEBL</p>  <p>Warns a driver when the front vehicle makes hard breaking or stopping</p>	<p><b>14</b> EV Approaching Warning</p>  <p>The emergency vehicle broadcasts its conditions for priority</p>

### 03 Smart Tolling (Multi Lane Free Flow Tolling)



Multi lane free flow toll collection based on DSRC(WAVE)

### 04 Road Hazard Warning



Radar detector recognizes obstacles on the road then broadcasting warning messages via RSE

### 07 Red Light Violation Cars Warning



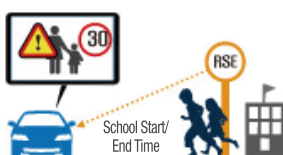
Detecting red light violation cars then broadcasting caution warning

### 08 Right Turn Assist



Notifies a driver who is attempting to make a right turn when it is not safe to proceed

### 11 School Zone Safety



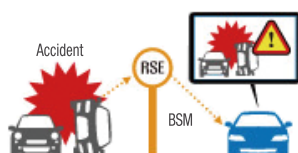
Alerting school zone and advising recommended speed

### 12 Pedestrian Warning



Warns a driver when pedestrians are near a crosswalk

### 15 Emergency Warning



The broken car broadcasts its conditions to prevent secondary accidents

# C-ARS

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## Project Title

Cooperative Automated Driving Roadway System

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## Goal

Development of Road Infrastructure and Systems to Cooperate with Autonomous Vehicles for Safe and Efficient Autonomous Driving

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## Period

July 2015 ~ July 2020 (5 years)

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## Budget

31 Million USD  
(75% of government investment & 25% private investment)

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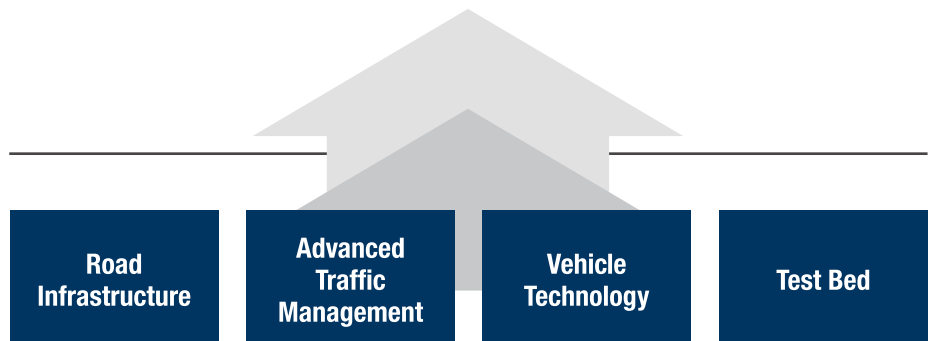
## Vision

“ Safe, Pleasant Road Environment for Autonomous Driving ”

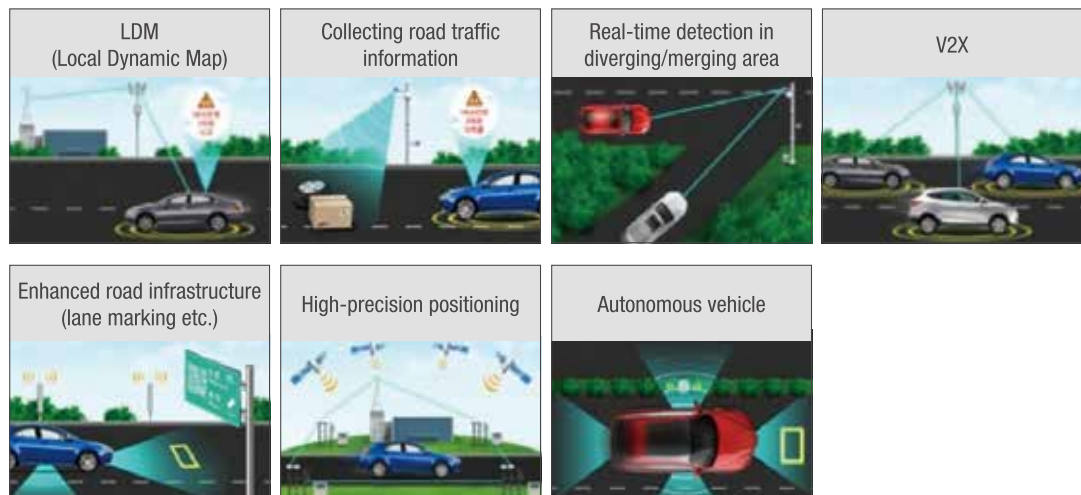
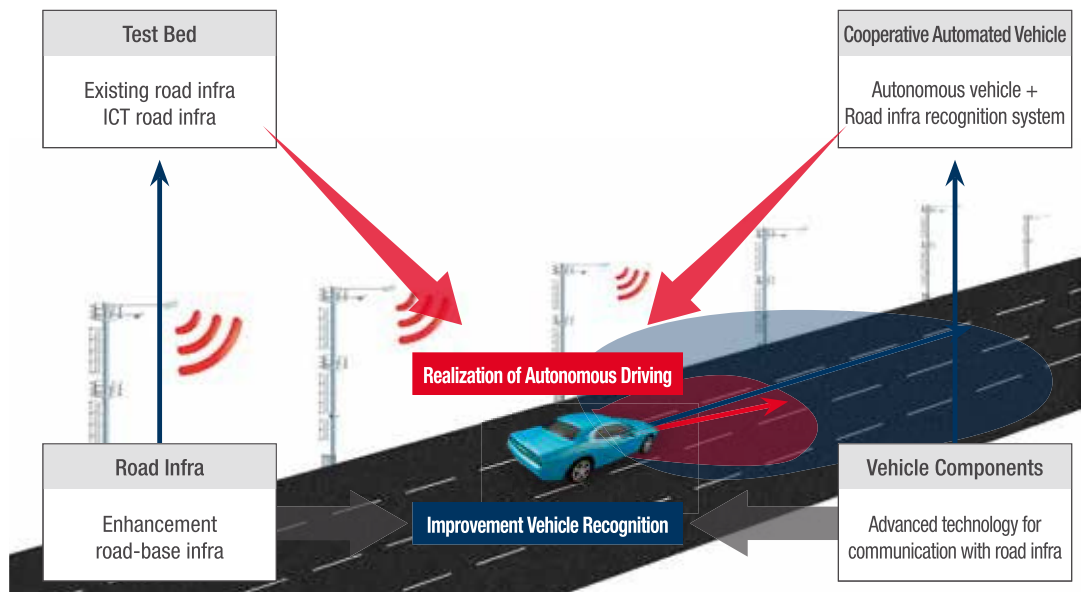


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## Core Value



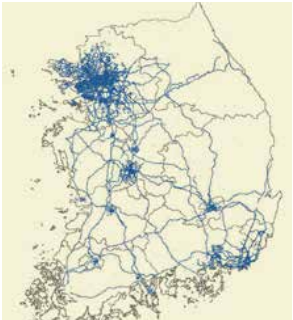
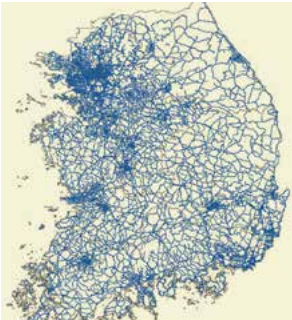
## Implementation Roadmap & Legislation



# Public-Private Cooperation on Traffic Information

Past 20 years	After PPC
<ul style="list-style-type: none"> <li>· Complete 20% of ITS nationwide deployment</li> <li>· Various traffic data generated from public (infra) and private (smart devices)</li> <li>· ITS service focused on traffic information &amp; user convenience</li> </ul>	<ul style="list-style-type: none"> <li>· Provide 100% of nationwide traffic information by collaboration</li> <li>· Save budget for infra deployment</li> <li>· Public concentrates on ITS service for safety issues</li> </ul>

Effect of public-private collaboration in ITS
<ul style="list-style-type: none"> <li>· (Early expansion of ITS network) Secure 49,500Km of ITS unequipped road by using private services</li> <li>· (Budget reduction) Save about 1.2 billion USD to be spent for additional ITS deployment</li> <li>· (Further cooperation) Development of new business model public-private integrate service</li> </ul>

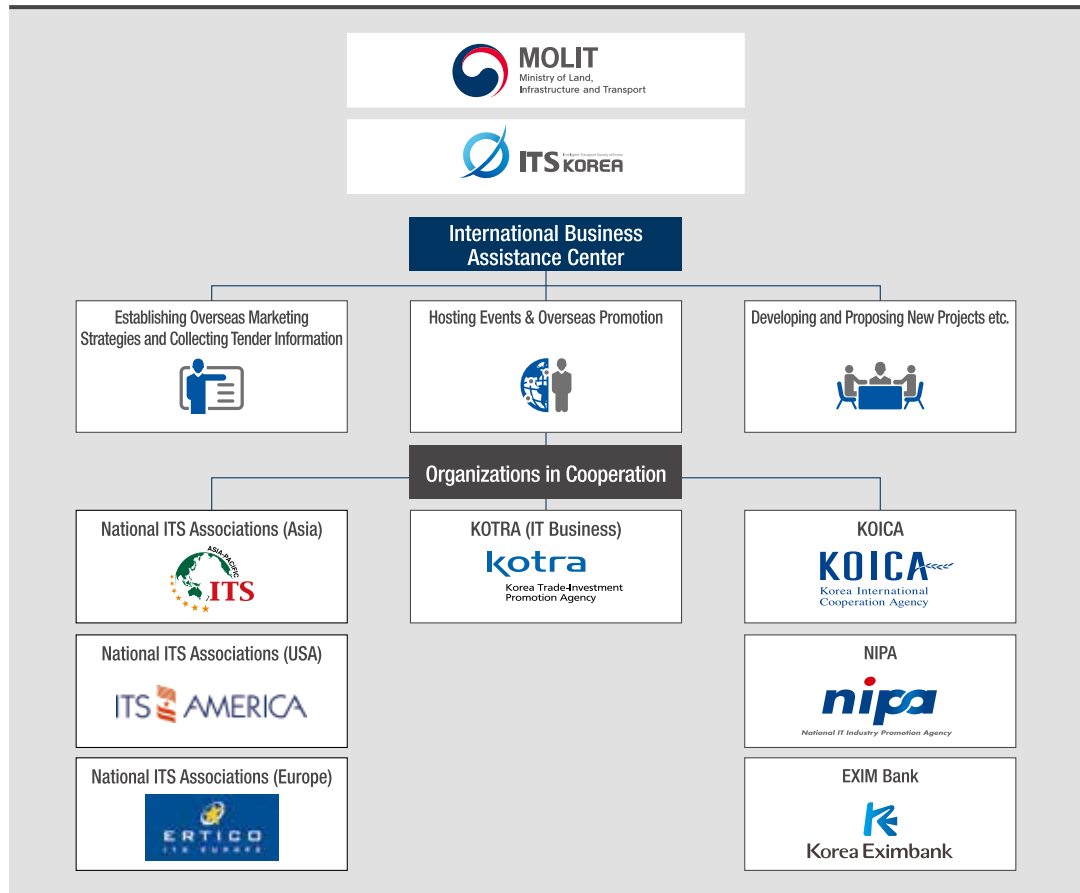
As-is	To-be
<p>Collect traffic data from 13,500Km of ITS-equipped roads</p> 	<p>Immediately collect traffic data on totally 63,000Km of major roads</p> 





# ITS International Cooperation and Overseas Business

## International Business Assistance Center



# Export of Korean ITS

## Main Features

Korea ITS exported to 45 countries and achieved a value of USD 1.2 billion since 2006

· Source : Statistical survey done by ITS Korea

Having strength on Traffic Management (Traffic Center), Automatic Fare Collection (Transport Card), Public Transportation (Bus Information System)

- (Traffic Management) `08 Advanced Traffic Management System ITS system, Baku City, Azerbaijan Republic
- (AFC/Public Transportation) `11 e-Ticketing & Bus Information System, Bogota City, Columbia

Categorized by country, exports concentrate on developing countries in East South Asia and Latin America including Columbia, Azerbaijan, Vietnam, and Mongolia

AFCS : Automatic Fare Collection System

ATMS : Advanced Traffic Management System

PIS : Parking Information System

TIS : Traffic Information System

VDS : Vehicle Detection System

MP : Master Plan

ATES : Automatic Traffic Enforcement System

BMS : Bus Management System

FTMS : Freeway Traffic Management System

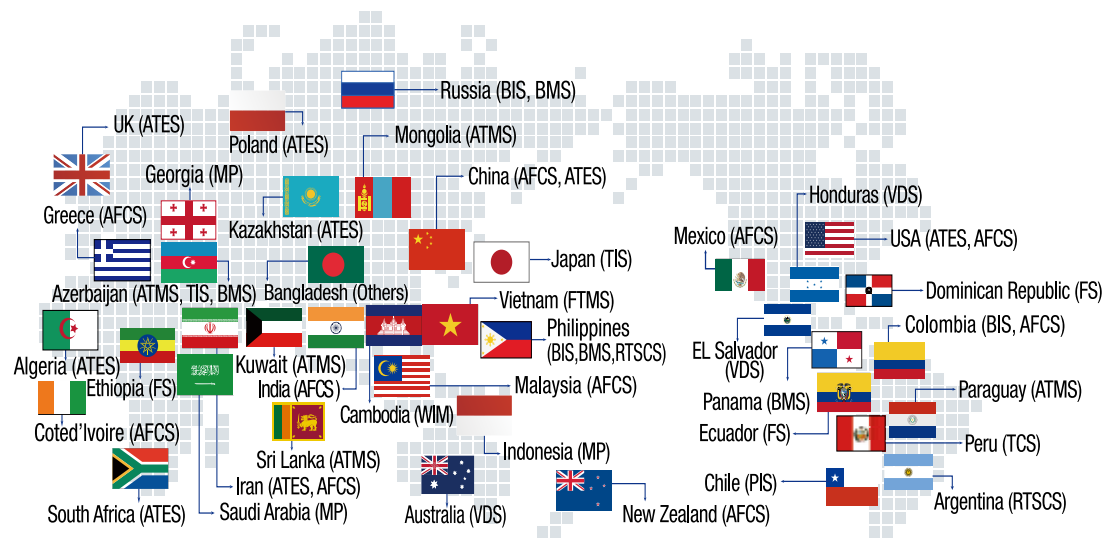
TCS : Toll Collection System

WIM : Weigh In Motion

FS : Feasibility Study

RTSCS : Responsive Traffic Signal Control System

BIS : Bus Information System



## Representative Cases

### Case 1

#### ITS in Bogota, Colombia

- Project : e-Ticketing and integrated BMS (Bus Management System) in Bogota
- Scope of work : Deploy e-Ticketing system and BMS for 40 BRT stations and 12,000 buses
- Contract time : FY 2011
- Contractor : LG CNS

e-Ticketing



Transmilenio



### Case 2

#### ITS in Baku, Azerbaijan

- Project : ITS Establishment in Baku City
- Scope of Work : Deploy Urban Traffic Management System and BIS (Bus Information System)
- Contract Time : FY 2008
- Contractor : SK C&C (Presently merged as SK Holdings)

View of Traffic Center in Baku



Signing Contract



### Case 3

#### ITS in Medellin, Columbia

- Project : Establishment of Medellin ITS Master Plan
- Scope of Work : Support in drawing up ITS Master Plan and designing for Medellin using Korean ODA fund
- Contract Time : FY 2016
- Contractors : ITS Korea, KEC, Tracom

# International Workshop for Capacity Building on ITS

## Objectives

- To understand the concept, background and necessity of ITS introduction in Korea
- To learn Korean strategies including laws and policies to effectively deploy ITS in Korea nationwide
- To learn individual ITS services in aspects of technology – Advanced Traffic Management Systems, Bus Information System, and Electronic Toll Collection System etc.
- To learn the recent technological developments in ITS
- To exchange statistical facts and ideas on urgent issues facing each city and find customized solutions to deal with those problems
- To strengthen future cooperation in the ITS area

## DETAILED PROGRAM SCHEDULE

Date / Time	Program Description
<b>1 Day Arrival</b>	
–	Move to KOICA
	Hotel check-in & free time
<b>2 Day KOICA Orientation (OT Schedule can be subject to change)</b>	
09:30~10:20	Introduction to KOICA & Program
10:20~10:50	Commemorative photo shoot
10:50~11:20	ICC (International Cooperation Center) tour
11:20~12:00	Homepage registration
12:00~13:20	Welcoming luncheon
13:20~14:30	Introduction to daily life in Korea
14:30~16:30	Training in basic Korean
16:30~17:30	Training on ODA or gender issues
<b>3 Day Orientation / Lecture / Country Report</b>	
08:30~09:00	Orientation
09:00~12:00	[Lecture 1] Current status of ITS in Korea
12:00~14:00	Lunch
14:00~16:00	Presentation on the country report (by each city)
16:00~17:00	Action plan methodology
<b>4 Day Lectures</b>	
09:00~12:00	[Lecture 2] National ITS policy & plan
12:00~14:00	Lunch
14:00~17:00	[Lecture 3] ITS standardization
17:00~18:00	Group discussion on Action plan
<b>5 Day Lectures / Study Visit</b>	
09:00~12:00	[Lecture 4] Transportation policy in Seoul city
12:00~13:00	Lunch

13:00~14:00	Move to TOPIS
14:00~16:00	[Study visit] Seoul TOPIS & hands-on experience of public transportation
16:00~17:00	Move to LG CNS
17:00~18:30	[Study Visit] LG CNS
18:30~19:30	Move back to KOICA
<b>6 Day Field Trip</b>	
08:00~11:30	Move to Daegu
11:30~13:00	Lunch
13:00~14:00	[Field trip] KIAP(Korea Intelligent Automotive Parts Promotion Institute) - Proving ground for driving
14:00~16:00	Move to Busan
16:00~17:00	[Field trip] : Busan traffic information center
17:00~18:00	Move to hotel and check in
18:00~	Dinner & free time
<b>7 Day Field Trip</b>	
10:00~12:00	[Field trip] Samwon FA – transportation card system and facilities
12:00~14:00	Lunch
14:00~18:00	Busan city tour
18:00~20:00	Move on to Gyeongju and dinner
<b>8 Day Field Trip</b>	
09:00~12:00	Gyeongju cultural experience
12:00~16:00	Lunch and return to KOICA
16:00~	Free time
<b>9 Day Free Time</b>	
<b>10 Day Lectures / Study visit</b>	
09:00~12:00	[Lecture 5] Introduction of ITS in expressway

12:00~13:00	Lunch
13:00~14:00	Move on to Anyang city
14:00~16:00	[Study visit] Anyang U-traffic center
16:00~17:00	Move to KOICA
<b>11 Day Lectures</b>	
09:00~12:00	[Lecture 6] Traffic signal management & control
12:00~14:00	Lunch
14:00~17:00	[Lecture 7] Traffic center system
17:00~18:00	Group work on Action plan
<b>12 Day Lectures / Study Visit</b>	
09:00~12:00	[Lecture 8] Weigh-in-motion system
12:00~13:30	Lunch
13:30~14:00	Move to Korea Expressway Corporation (KEC)
14:00~16:00	[Study visit] Smart Highway demonstration
16:00~16:30	Move to KOICA
<b>13 Day Lectures</b>	
09:00~12:00	[Lecture 9] Bus information system
12:00~14:00	Lunch
14:00~17:00	[Lecture 10] Electronic payment for public transportation
17:00~18:00	Group work on Action plan
<b>14 Day Cultural Experience</b>	
09:00~18:00	Seoul city tour
<b>15 Day Free Time</b>	
09:00~18:00	Free time
<b>16 Day Lectures / Study Visit</b>	
09:00~12:00	[Lecture 11] ITS communication and Network
12:00~13:30	Lunch
13:30~14:00	Move to Korea Expressway Corporation (KEC)
14:00~16:00	[Study visit] KEC traffic information center
16:00~16:30	Move to KOICA
16:30~18:00	Group work on Action plan
<b>17 Day Lectures / Study Visit</b>	
09:00~11:30	[Lecture 12] Traffic information and Big data
11:30~12:30	Lunch
12:30~14:30	Move to National Traffic Information Center (NTIC)
14:30~16:00	[Study visit] NTIC (National Traffic Information Center)
16:00~18:00	Move to KOICA
<b>18 Day Lectures</b>	
09:00~12:00	[Lecture 13] Parking information system
12:00~14:00	Lunch
14:00~17:00	[Lecture 14] ITS project process flow
17:00~18:00	Group work on Action plan
<b>19 Day Lectures</b>	

09:00~12:00	[Lecture 15] ITS performance evaluation
12:00~14:00	Lunch
14:00~16:00	Review and final check-up on Action plan
16:00~21:00	Farewell dinner - Seoul N Tower
<b>20 Day Action Plan / Closing Ceremony / KOICA Evaluation</b>	
09:00~12:00	Action plan presentation by each city and giving feedback
12:00~13:00	Lunch
13:00~14:00	Action plan presentation by each and giving feedback
14:00~14:30	Closing ceremony
14:30~16:00	KOICA evaluation
16:00~17:00	Departure orientation
<b>21 Day Departure</b>	

#### Lectures



#### Field Trip to TOPIS



#### Field Trip to KEC Center



#### Award Certificate







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