



Seoul's Challenges & Achievements

in Sustainable Urban Transport

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- Provision of decent public transportation service
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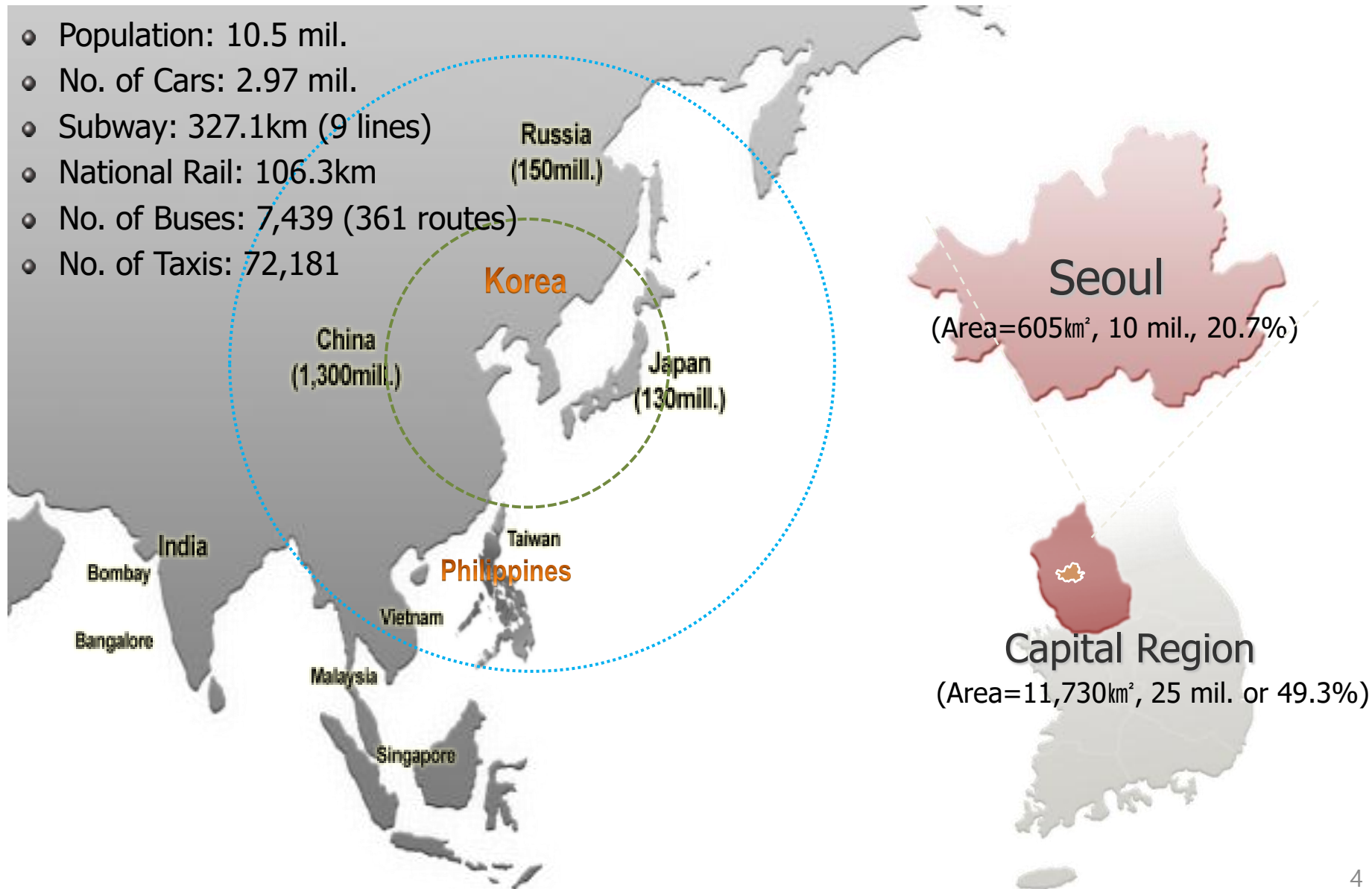
01

Introduction



Back ground

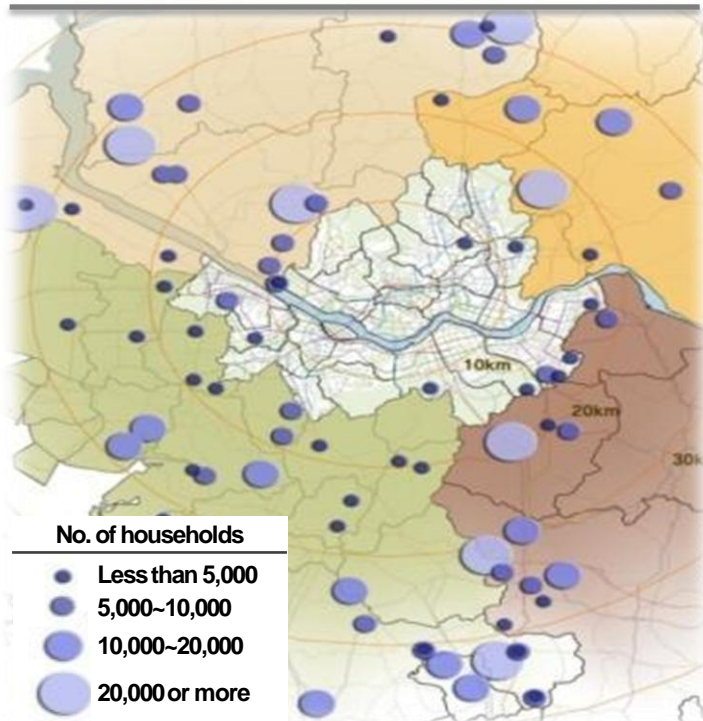
- Population: 10.5 mil.
- No. of Cars: 2.97 mil.
- Subway: 327.1km (9 lines)
- National Rail: 106.3km
- No. of Buses: 7,439 (361 routes)
- No. of Taxis: 72,181



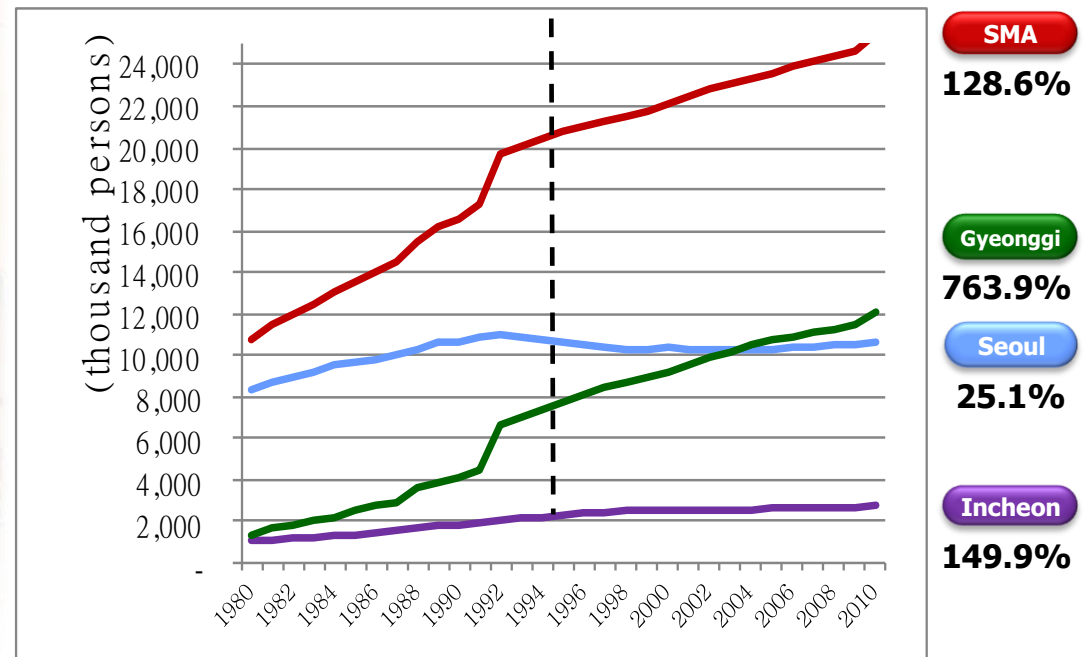
Housing

- Housing Site Development in Seoul Metropolitan Area → Population Congestion Metropolitanization
- Income level ↑ → No. of registered cars increased rapidly(↔ limited expansion of roads)
 - No. of vehicle : 2.97 mil. ⇒ Increased by 1,341.8% than in 1980
 - Length of road : 8,096km ⇒ Increased by 22.5% than in 1980

Housing site development in SMA



Population growth (1980~2010)

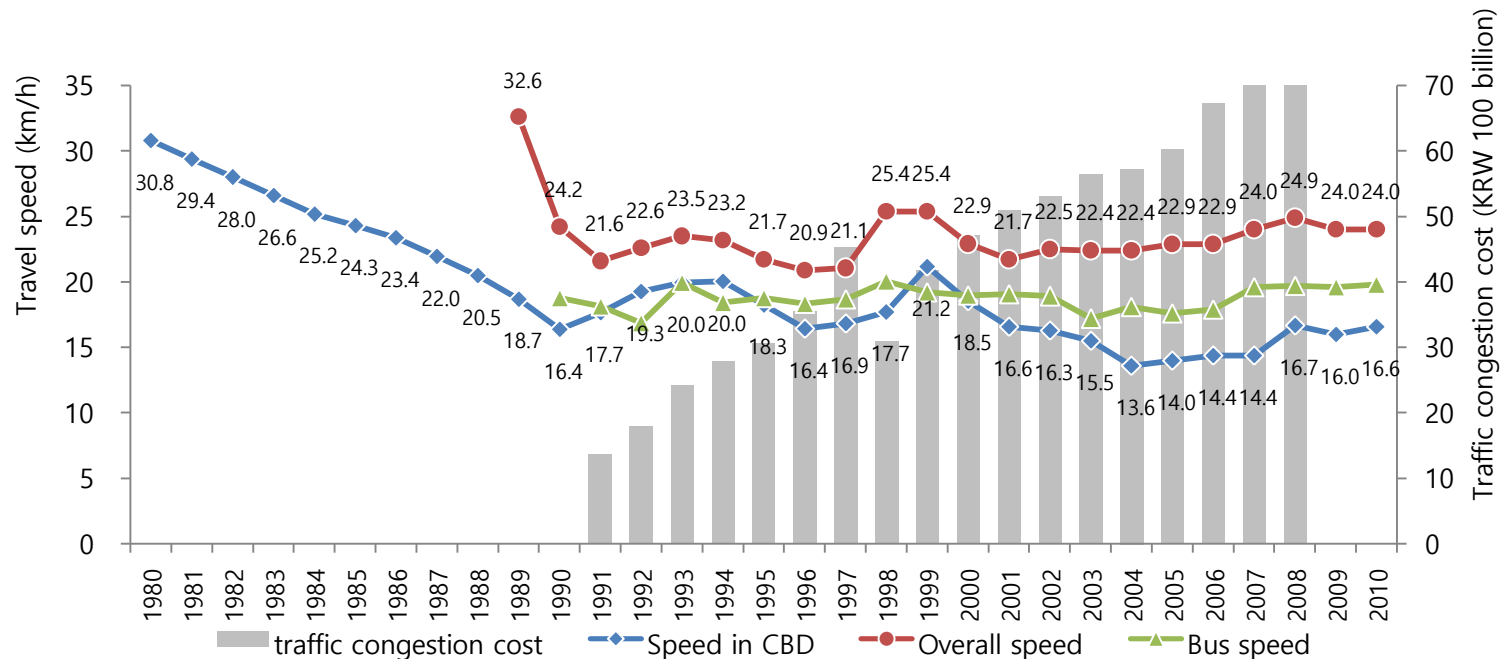


Transportation conditions

- No. of trips: 32.0 million/day
 - Modal share: Bus 28%, Subway 37.1%, Passenger car 23.5%, Taxi – 7%, Bicycle and others – 4.4%
 - Passenger car: 16.6km/h (CBD), 24.0km/h (all areas)
 - Bus: 19.5km/h, 20.1km/h (median bus lane)

Shift in travel speed & traffic congestion cost in Seoul (1980~2010)

Speed (km/h)

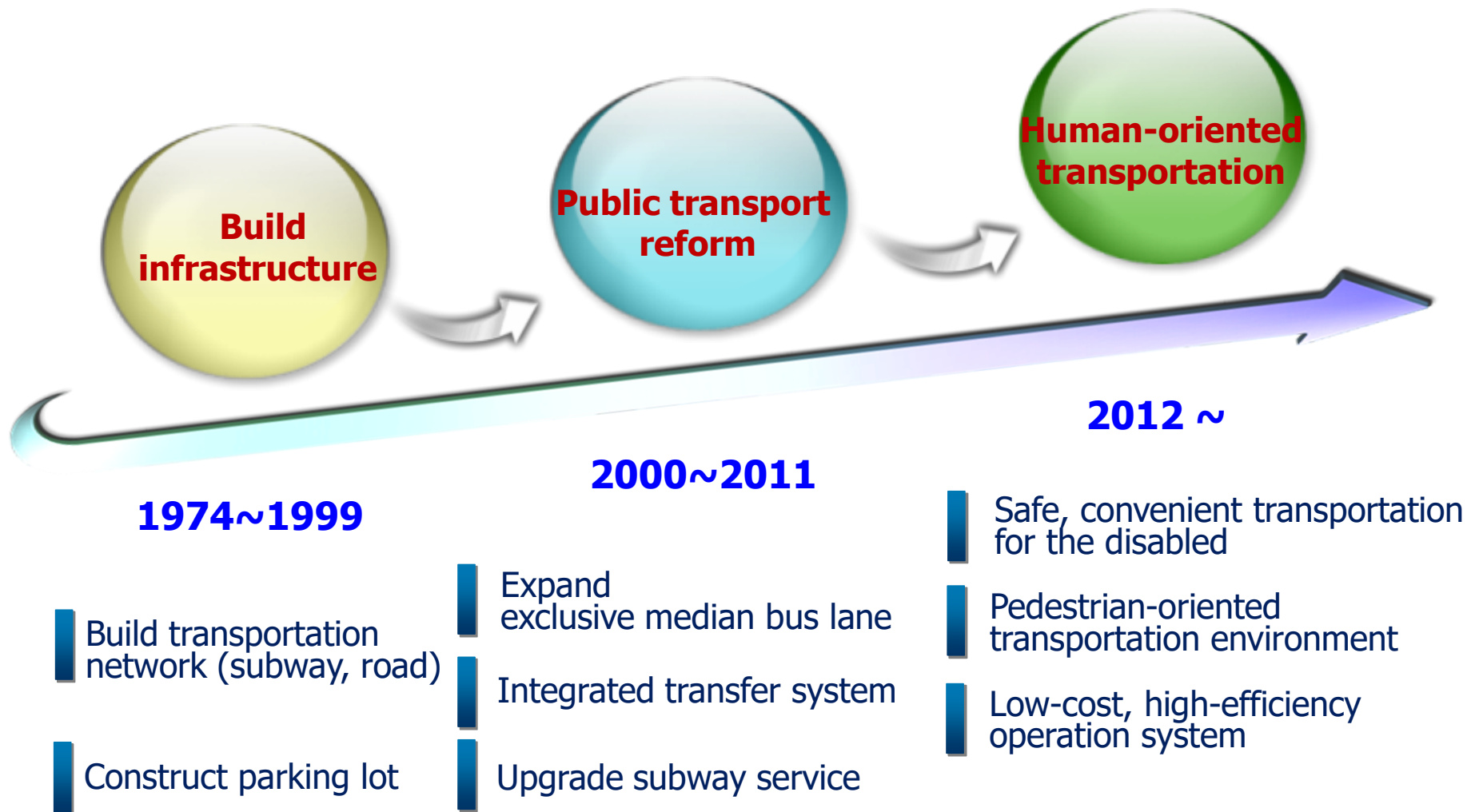


02

Changes in policy framework, setting a new goal



Changes in policy



Goals and objectives of transportation policy

Human-oriented transportation

Supply-oriented transportation system

Provision of decent public transportation service

Dependent on fossil fuels

Eco-friendly, human-oriented transportation system

Vehicle-centered city

Strengthening travel demand management

Intelligent Transportation System (ITS) base establishment

03

Efforts of seoul for sustainable urban transport

1. Provision of decent public transportation service
Subway / Bus / ITS / Taxi

2. Eco-friendly, human-oriented transportation system



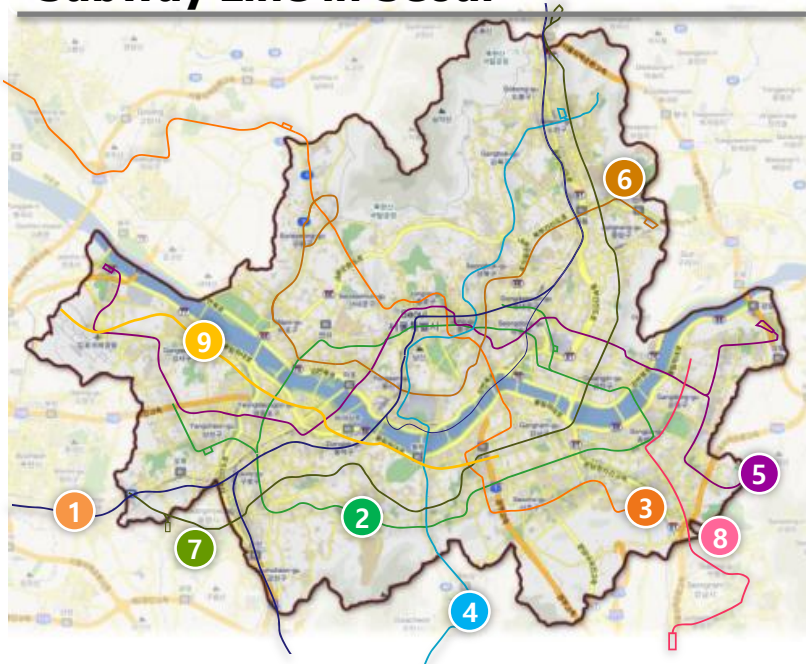
Efforts of Seoul for Sustainable Urban Transport

1. Provision of decent public transportation service

Subway

- Opening Line 1 (1974): 7.8km, 9 stations
- Present (Line 1~9): 327.2km, 292 stations, 3,691 rolling stocks
 - ※ No. of passengers : 5.1 million/day
- Operator: Seoul Metro(Line 1~4), Seoul Metropolitan Rapid Transit(Line 5~8), Seoul Metro Line 9(Line 9)
- Safe and Pleasant Seoul Subway
 - Installation of platform screen doors at all stations, Improving indoor air quality

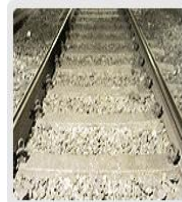
Subway Line in Seoul



Platform Screen Doors



Pebble base rail



Concrete



High-pressure sprinkler



Dust suction vehicle



BUS

- City bus: 7,439 buses/361 routes
- No. of passengers a day (average): 5.7 million
- Median bus lane: 12 corridors, 118km



Bus - Transportation reform

✓ Background

Limitations

Supply / Demand

- Urban & Sub-urban development
- Traffic increase
- Socio-economic cost increase



Road Construction

- Developed Area
- \$50~80 million/km



Subway Construction

- \$100 million/km
- Long Construction Time (5~10 years)



Problems

Routes

Complicated, Centralized in Particular Lines

Company

Small Size, Low Willingness to Invest

Operation

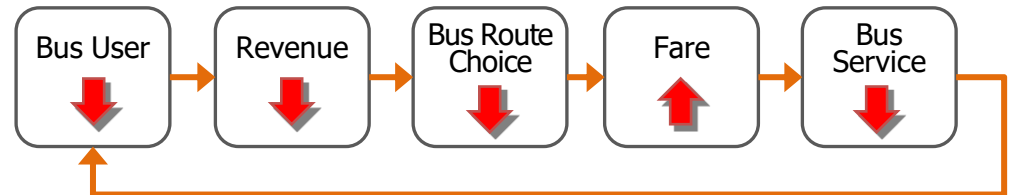
Slow, Not on time

Drivers

Poor Welfare, Unfriendly

Passengers

Uncomfortable



Where do we go?

Public Transportation Reform
(Not a Choice But a Must)

Bus - Transportation reform

Bus routing/operating system

- 1) Public ownership, Private operation
- 2) Establishment of trunk and feeder lines
- 3) Scientific operation management

Infrastructure

- 4) Expansion of median bus lanes
- 5) Improvements in transportation centers
- 6) Introduction of high-quality buses

Assistant system

- 7) Fare system (Subway + Bus)
- 8) Information and Communication Technology

Social consensus

- 9) Citizens' Committee

New Era
July 1, 2004



**Monitoring
&
Adjustment**

*Enhancing
Customer
Satisfaction*

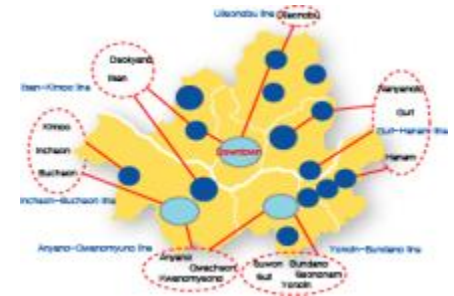
Bus - Transportation reform - Reorganized bus routes and numbering system

- Introduce trunk and feeder line by function, categorized by color

(sub) Urban areas ↔ (sub) Center cities
Meet the demand of private cars.



Inter-regional Lines



Connecting suburban areas and center cities
Punctuality and speed



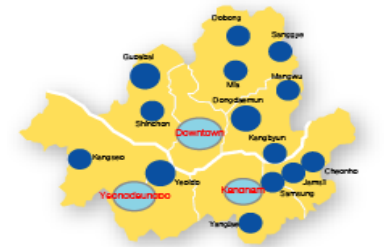
Trunk Lines



Link trunk line buses or subways for easy transfer.
Satisfy the local needs and secure accessibility.



Feeder Lines



Circular bus service for business and shopping in urban areas







Circular Lines

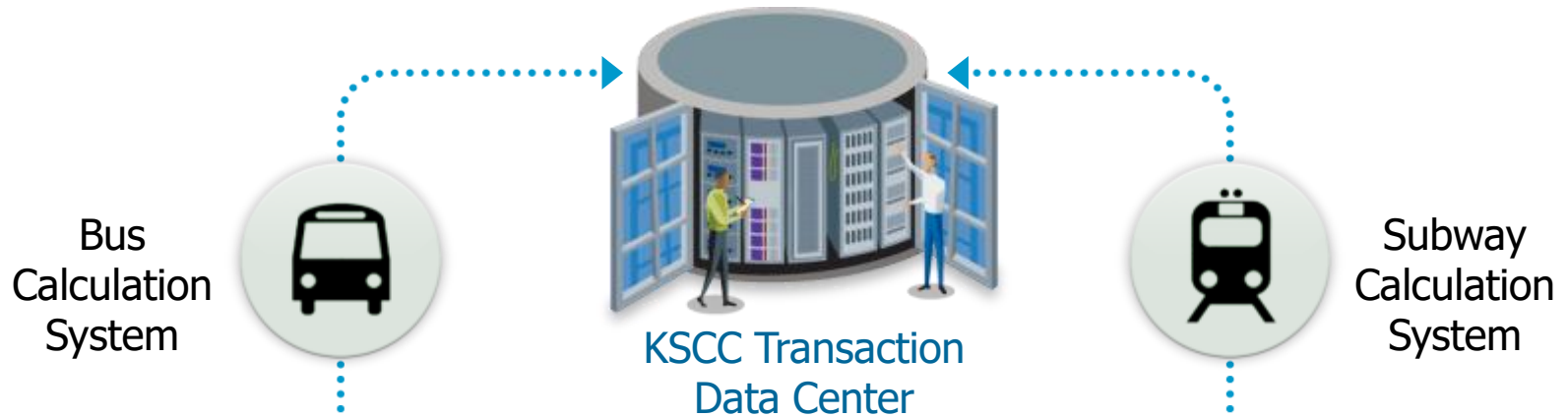
Bus - Transportation reform - Integrated distance based fare system

- Introduction to new fare system with transportation reform
- Free transfer between bus-bus and bus-subway, within 30 minutes (maximum of 5 times)
- Fare Structure
 - Subway (single ride): Basic Fare of KRW1,050 for 10 Km
Distance-based Fare of KRW100 for 5Km up to 40Km and for every 10Km thereafter
 - Bus [single ride] : Flat Fare of KRW1,050

Example for new fare system

Method of fare calculation	Bus	Subway	Before reform	After reform
  5km (by bus) + 4km (by bus)			1,200 1,200 = <u>2,400 won</u>	<u>1,200 won</u> (Basic rate within 10km)
  5km (by bus) + 7km (by subway)			1,200 1,250 = <u>2,450 won</u>	Basic rate +100 won (additional fares for 10km to 15km) <u>1,350 won</u>

Bus - Transportation reform - Smart card system



- No. of Bus Routes
- Boarding Bus Stop
- Boarding Time
- User's Basic Info. (Adult/Student/Child)
- Alighting at Bus Stop
- Alighting Time
- Total Distance
- Total Fare

- Subway Station
- Time of Transit Passage
- Subway Station
- Alighting Time
- Total Distance
- Total Fare

Bus - Transportation reform - Smart card system

- T-money, with the terms of payment in the public transport sector, is vastly expanding the service to e-money market, and is providing various beneficial services to customers
- Card usage rate: Bus 99% / Subway 100% / Taxi 68%



A large oval contains logos of various partner businesses for T-money, including:

- Public Transport: Bus, Taxi, Subway
- Retail & Dining: McDonald's (i'm lovin' it), GS25, Starbucks, Homeplus, CU, Baskin Robbins, Watsons, 7-Eleven, Paris Baguette, Lotte Cinema, Etude House.
- Services: Online Shopping mall, Bookstore etc.



Bus - Transportation reform - Smart card system(ONE CARD ALL PASS)



Taxi



Highway



Express Bus



Subway



Train(KTX)



Bus

Bus - Transportation reform - Median bus lane

- 12 corridors of 118km

- For faster and more reliable bus operations
- To improve passengers' convenience through comfortable shelters, transfer centers

Illegal parking



Obstruct traffic



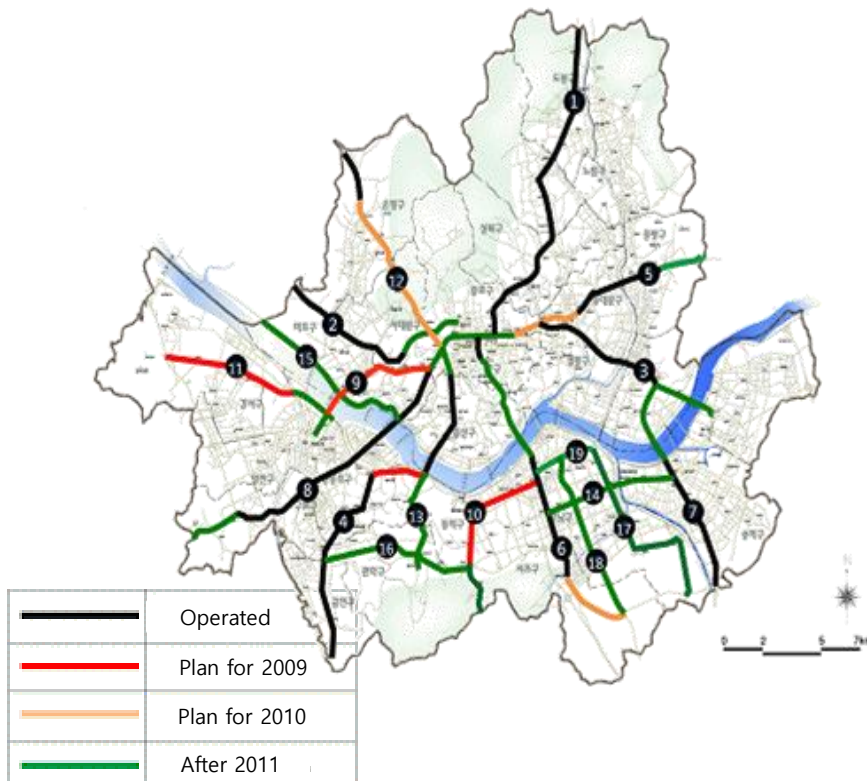
**Illegal parking,
Entry & out to inside road,
Turn traffic conflict**



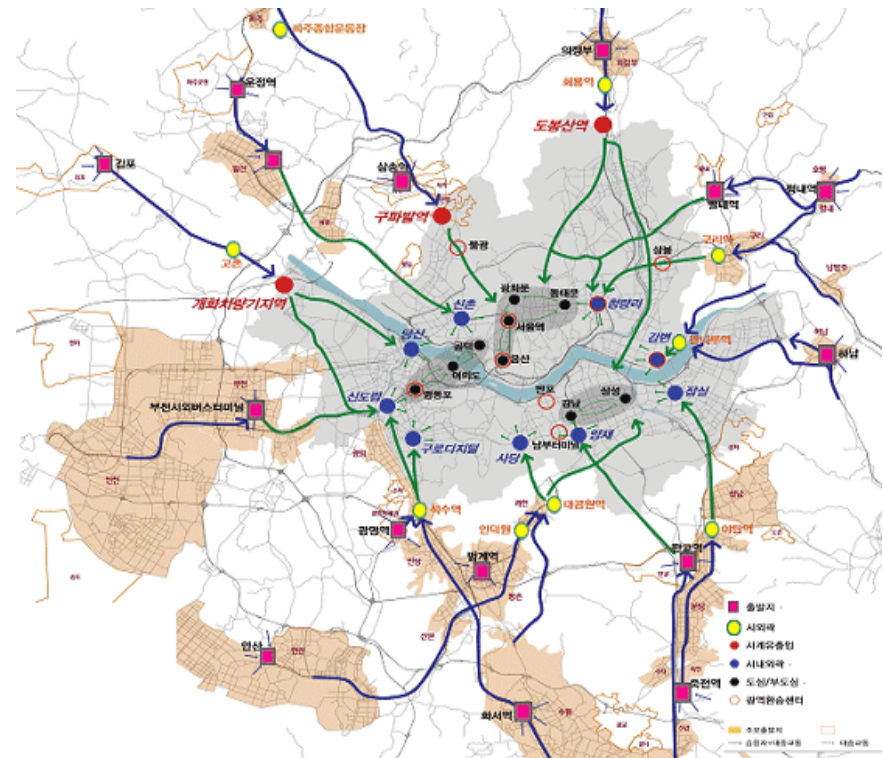
Bus - Transportation reform - Median bus lane

- Expansion of median bus lane
 - Establishing a 214.7km network of 19 corridors
 - Connecting with 22 corridors of BRT in the Metropolitan area

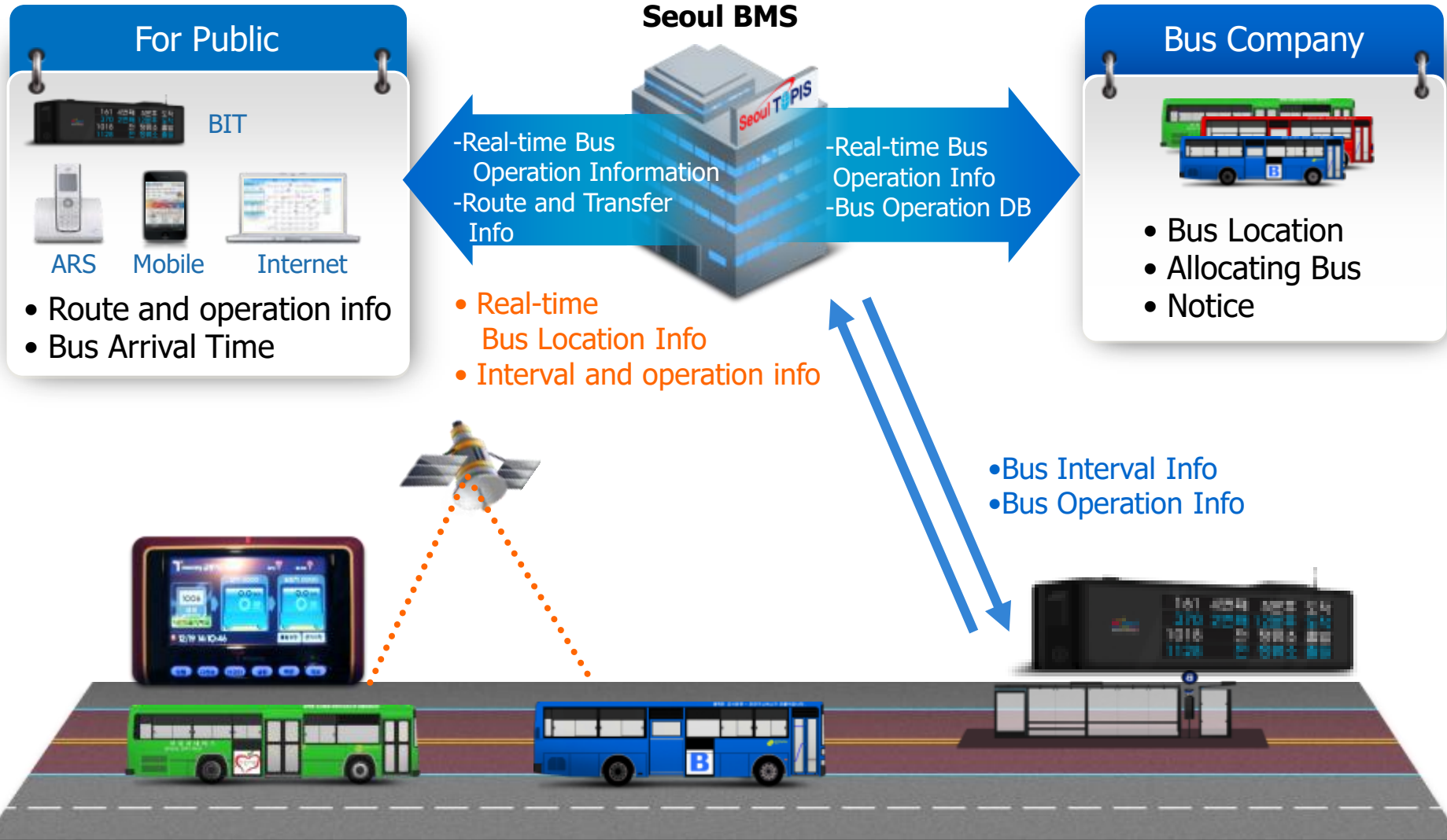
Median bus lane (present & Extension plan)



BRT in metropolitan area



Bus - Transportation reform – BMS(Bus Management System)

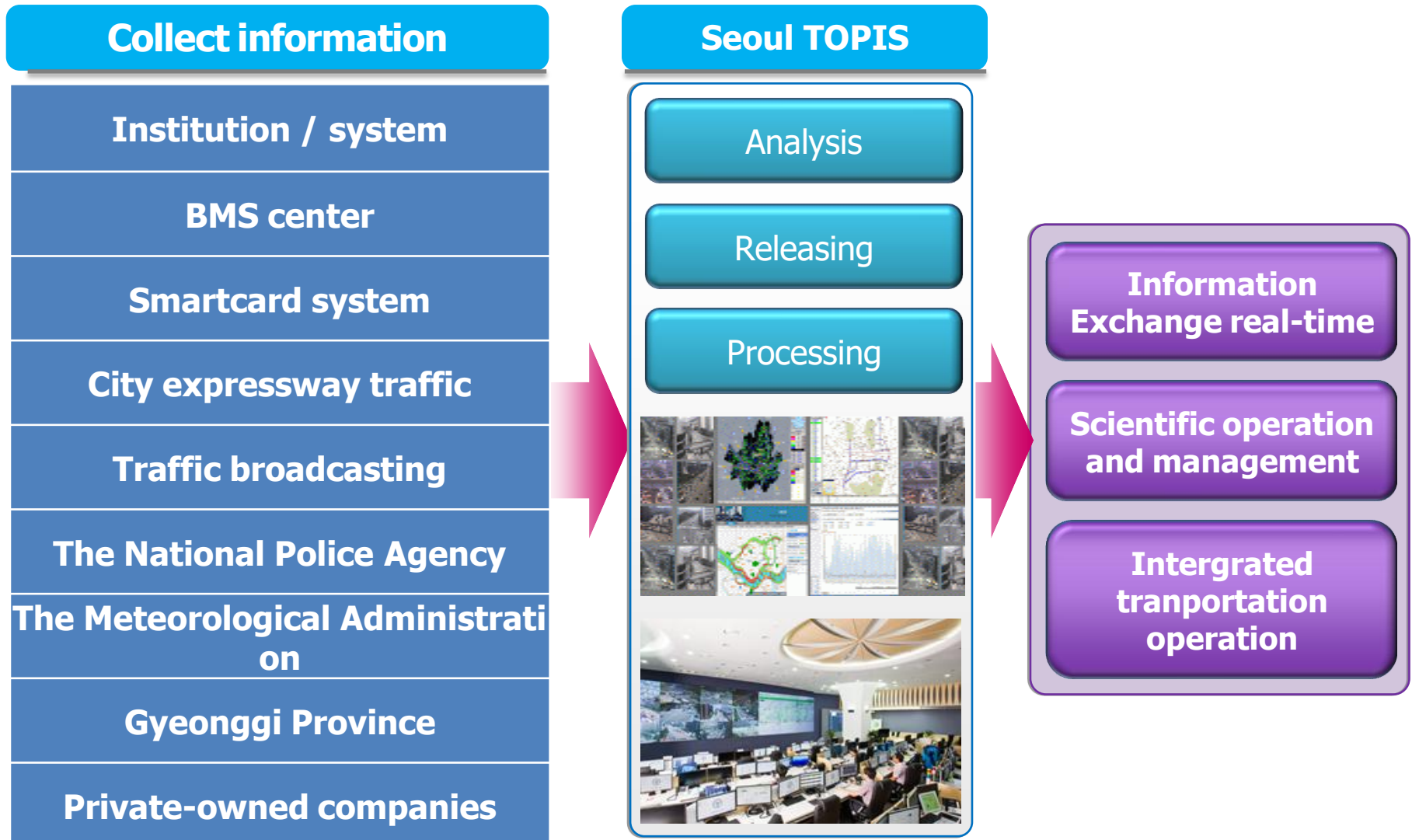


Bus - Transportation reform – BIS(Bus Information System)

- Information provision(Expected bus & subway arrival time and last time) in bus stop and subway station
- Service extension (Connection with red bus of Gyung gi and Incheon province)



Bus - Transportation reform – TOPIS



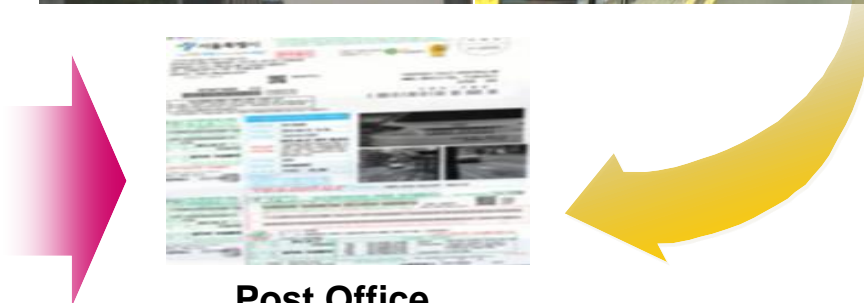
Vehicle Enforcement System(VES) – TOPIS

Remote Control Enforcement Systems

- 1 step Warning via Road-side Speaker
- 2 step Remote regulation



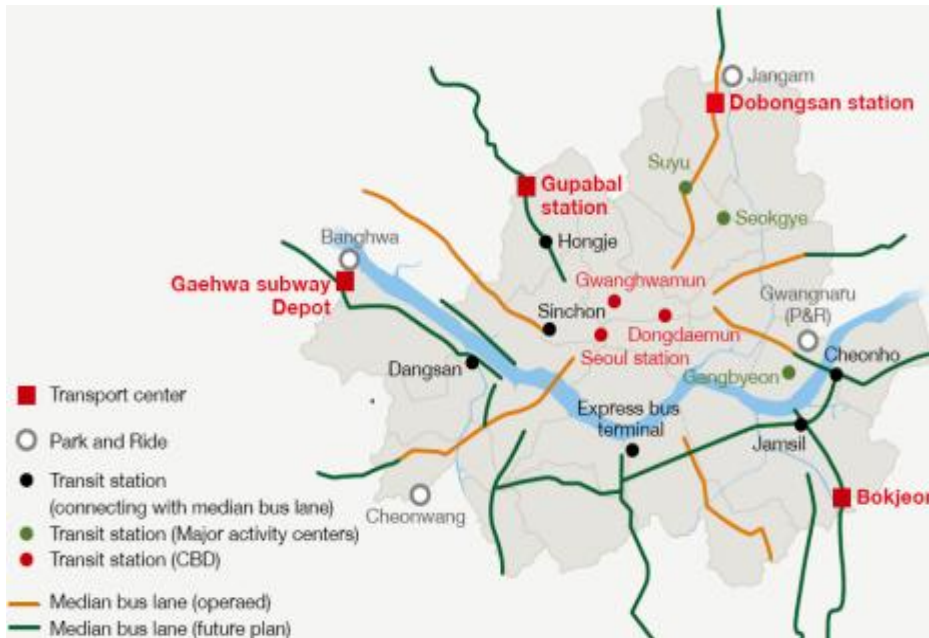
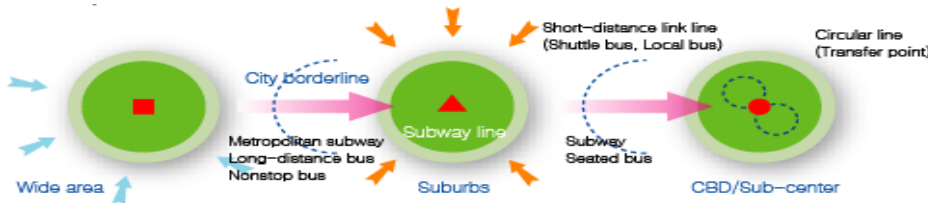
VES in bus lane



Post Office

Expand public transportation infrastructure connecting the metropolitan area

- Wide-range BRT (Bus Rapid Transit) links to median bus lanes
 - Suburban Transportation Centers for wide-range transfer demand
 - CBD/Sub-center Transportation Centers for short-distance feeder bus demand
 - 4 Transport center, 4 park and ride, 4 Transit station



Suburban Transportation Center

Gupabal



Gaehwa



CBD/Sub-center Transportation Center

Cheongnyangni Station



Seoul Station



Operating Public Depot for bus

- No. of Public Depot for bus: 11
- The Gross Area: 378,335m²
- Project Costs: 294,830million won
- No. of Using bus: 3,187veh



Depot Sub-Facilities

<Car Wash>



<Auto Repair Shop>



<CNG Station>



<Parking Lot>



CNG BUS retention status

(March. 2016)

Total	Diesel Bus	CNG Bus			Electronic Bus
		Total	Normal	Low floor	
7,439	-	7,430	4,734	2,696	9

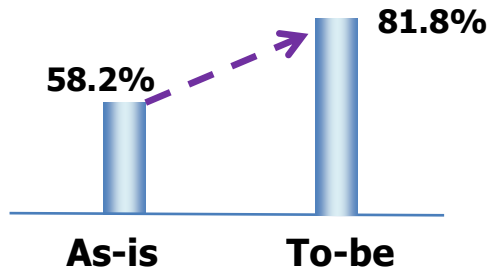
CNG BUS advantage

- LPG is compressed by 200 pressure
- Cleanliness : Emission(PM)0%,
Air pollution source 0%
- Safety : High flash point, Non-toxic
- Engine's useful life is increased
- Silence and ride comfort improvement
- Emission reduction (10 ~ 90%)



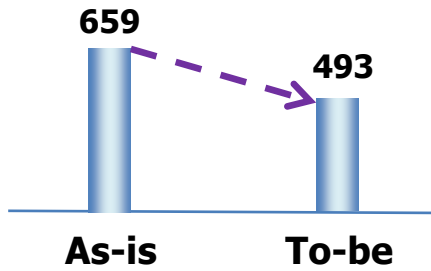
Effect of Bus - Transportation reform

Citizen's satisfaction



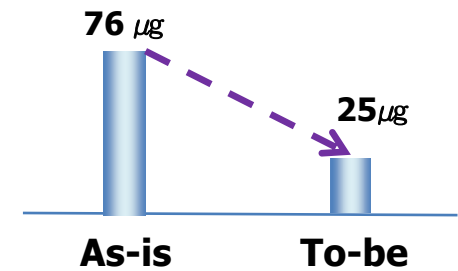
Citizen's satisfaction rate
23.6%p ↑

Average car accident



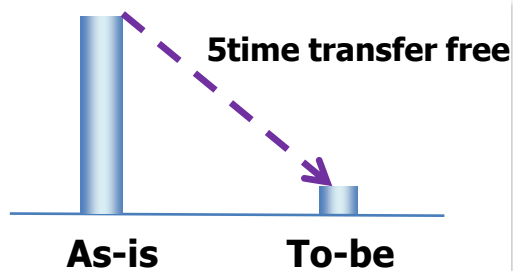
166 cases (25.2%p) ↓

Air pollution problem



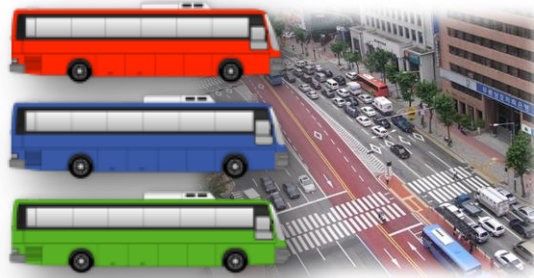
Fine dust 1/3 ↓

Citizen's burden of expense



Transportation fee 6,500php
(1 person/1 year) ↓

City's aesthetic aspect



Modern color, Design

Social finance improvement

- Travel time 79.6 Bphp ↓
- Vehicle operation 12.3 Bphp ↓
- Car accident 1,864 Mphp ↓
- Air pollution 1,644 Mphp ↓

Every year 95.4 Bphp ↑

Efforts of Seoul for Sustainable Urban Transport

2. Eco-friendly, human-oriented transportation system

Pedestrian Priority

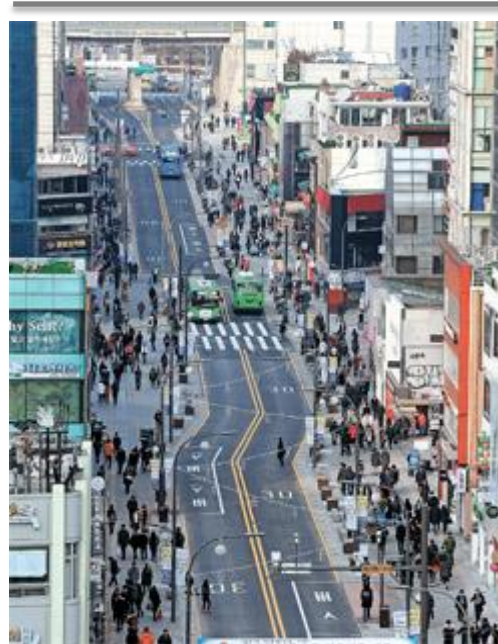
- Operating Car-free Day, Car-Free Street, Transit mall etc.
- Traffic calming : speed table, child-priority scheme
- Expand children safety zone concept
 - street around facility → zone including school, park, kindergarten, etc.
- Designate 'child safety zone' based on citizens' opinion and given road condition

Car-free Day



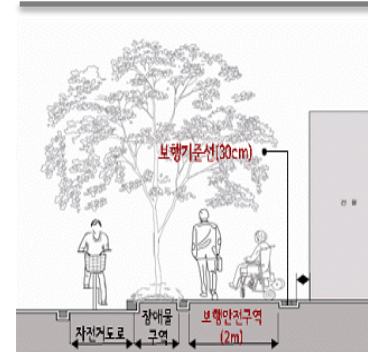
<Gwanghwamun ~ Sejong-ro>

Transit mall



<Sinchon Yeonse-ro>

Walk space



Child safety zone



Bicycle (Promotion for riding bicycle)

- ◆ Bicycle lane
 - Total 303 lines, 674km of lanes
- ◆ Public bicycle rental service
 - Started on Oct 2010 (Sang-am area, Yeouido area : total 440 of bicycle, 43 of bicycle station)
- ◆ Convenience facility for bicycle
 - Bicycle elevator , Bicycle-only parking center , locker , shower room etc

Bicycle rental service station



Current condition of bicycle facilities



Electric Vehicle (Eco-friendly vehicle)

1) Electric car



2) Hybrid taxi



3) Electric taxi



Thank You for your attention

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