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Seoul, ready to share with the world!

# Seoul Public Transportation



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*We dream of a city where citizens  
can live in comfort without having  
to drive cars*



## Seoul Public Transportation

Seoul public transportation has improved remarkably since 2004 when the city reorganized its entire public transportation system. It is now widely regarded as one of the most enviable public transport services in the world in terms of convenience, safety, punctuality, and economic efficiency. An aggregate total of four billion citizens use the public transportation each year, making it the most widely used means of transportation in Korea.

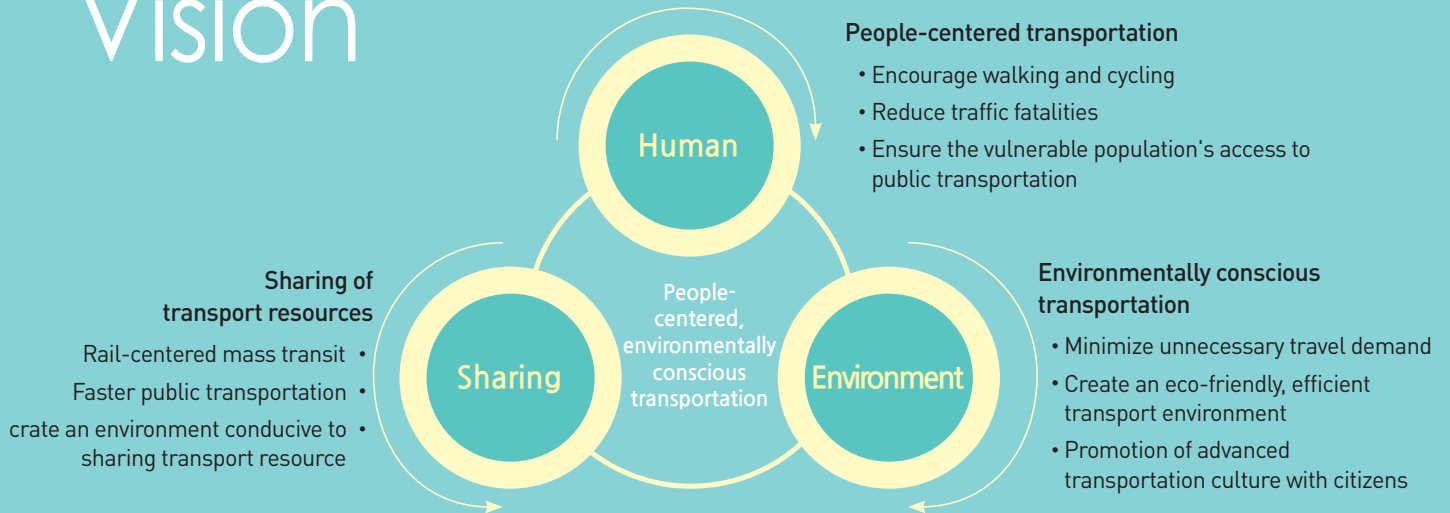


# Seoul Public Transportation



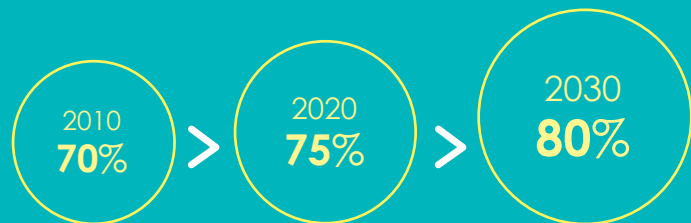


# Vision



# Goal

Increase the green transportation mode share to **80%**



\*Green transportation mode includes public transit, walking, and cycling.

2030

## Triple30

Reduce passenger car travel  
by **30%**

Reduce average commute time using public transit  
by **30%**  
(53 mins. at present)

Proportion of green transportation area  
**30%** increase  
(14.7 mins. at present)

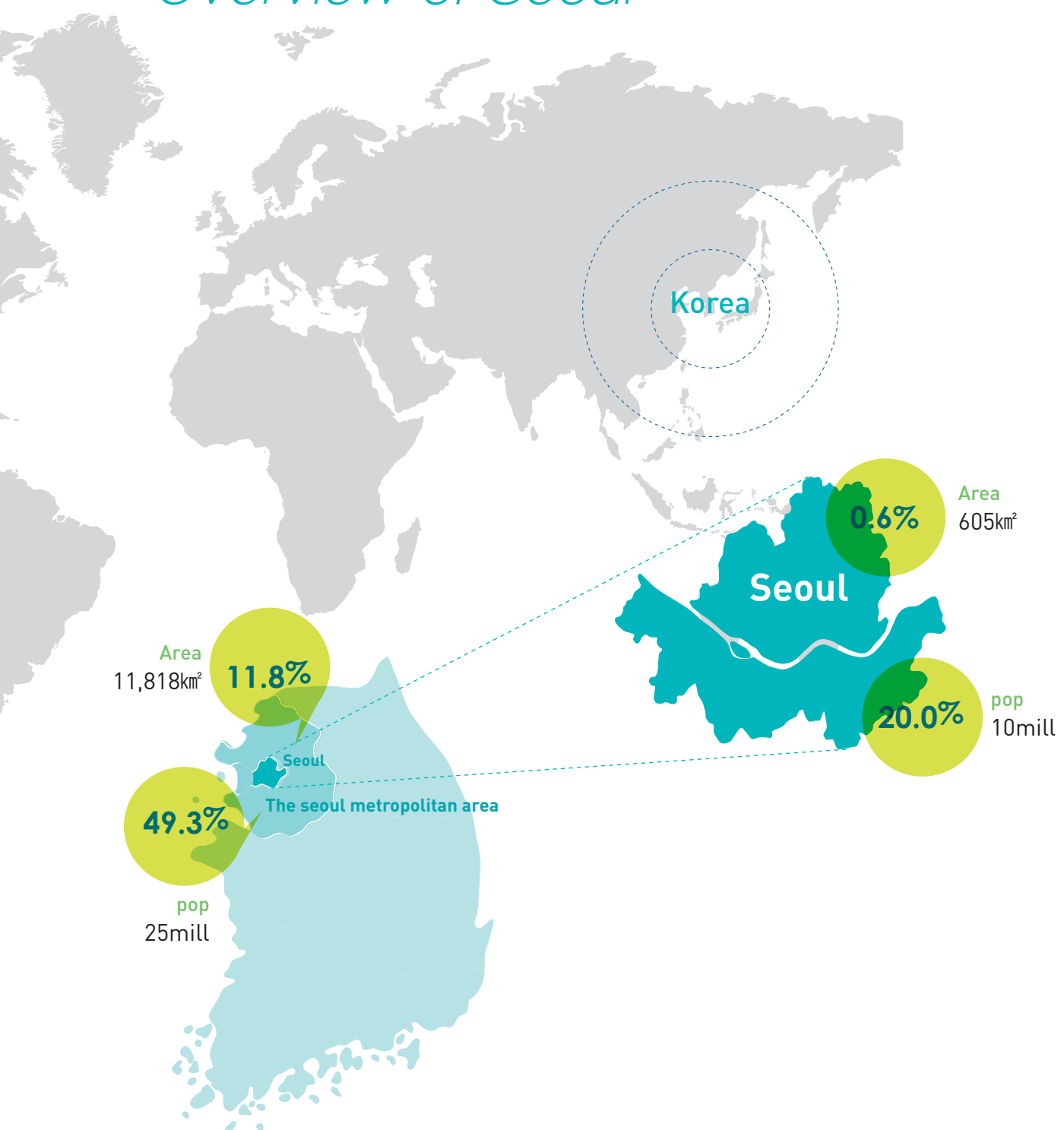
**GHG emissions**  
Reduce by **0.2t/y**  
**Energy consumption**  
per citizen

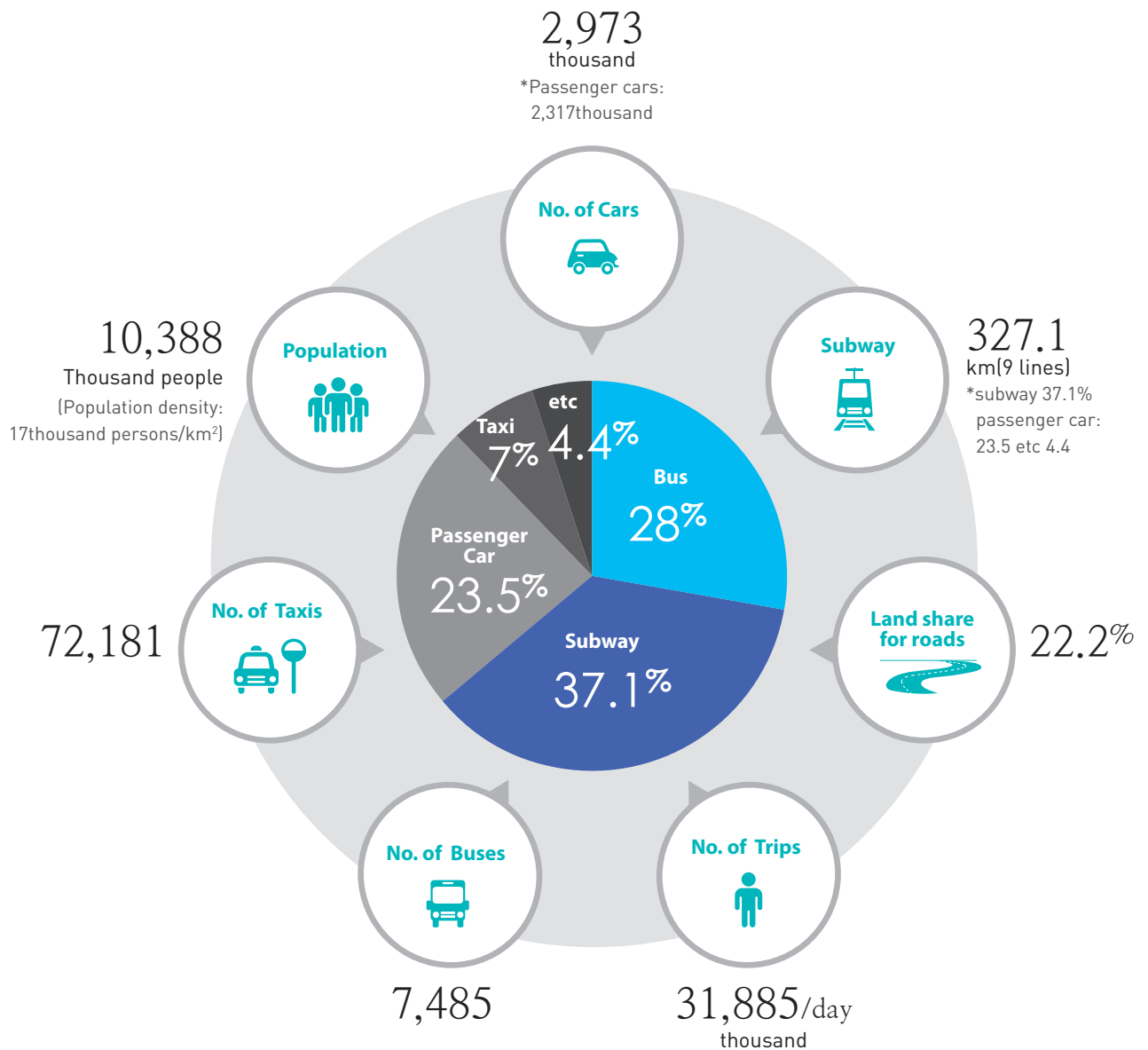


\*The combined effect of GHG reductions and energy conservation is equivalent to planting 86 pine trees in 2020 and 146 pine trees in 2030. (Such positive impact is the result of changes in the transportation mode share, improved fuel-efficiency, and introduction of eco-friendly vehicles.)

\*The green transportation area includes dedicated median bus lanes, bike lanes, and sidewalks.

# 01 Overview of Seoul





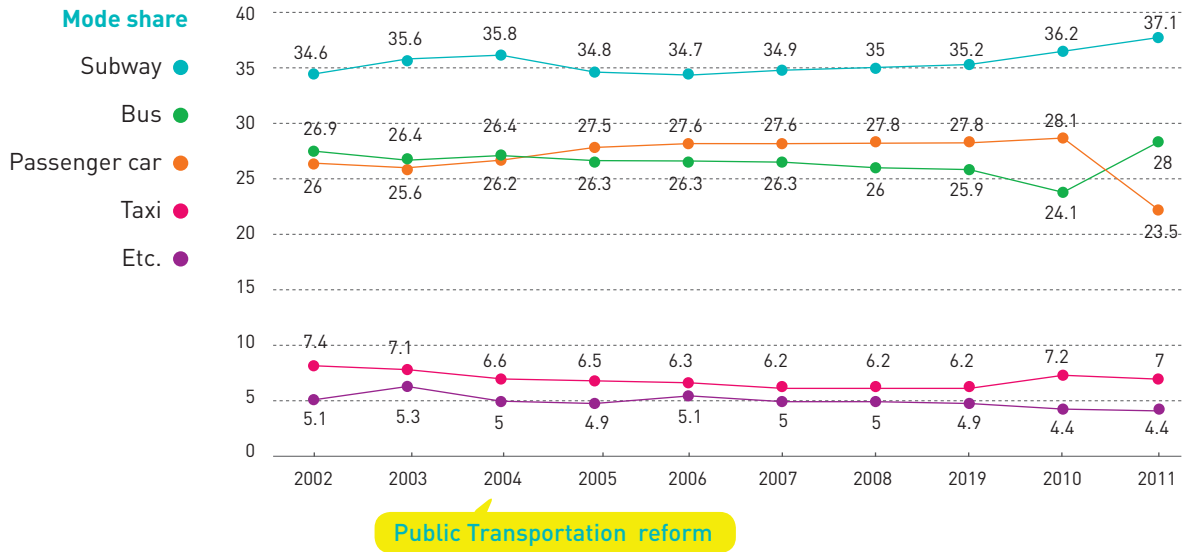
The population of Seoul increased sharply between the 1960s and 1980s. The number of vehicles began to increase remarkably in the 1980s in line with the citizens' enhanced purchasing power. As of 2009, passenger cars in Seoul and the metropolitan area were up 1,314 percent and 2,907 percent, respectively, compared to the beginning of the 1980s.

In contrast, the road network was expanded by a mere 22.6 percent during the same period. Thus, the traffic conditions in Seoul worsened leading to a rapid increase in the traffic congestion costs. As the transportation policy focused on increasing the supply of public transit reached its limit, Seoul turned its attention to managing the demand for public transportation. Such change in the policy direction led to the city-wide public transformation reform in 2004.

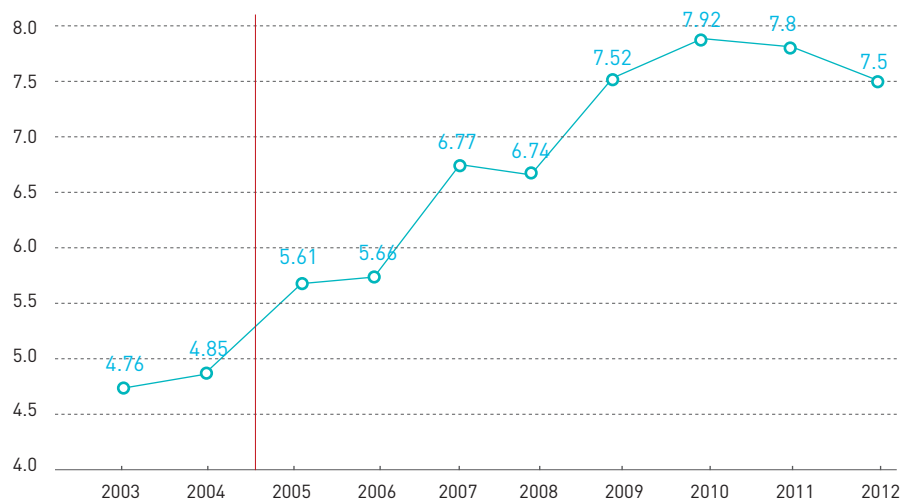


### Seoul's Public Transportation at a Glance

In 2004, the SMG(Seoul Metropolitan Government) carried out reforms in its public transportation system, through which Seoul has emerged as a model city for public transportation. As a result, modal share of public transport reached 65.1% as of 2011 (with bus and subway accounting for 28% and 37.1%, respectively).

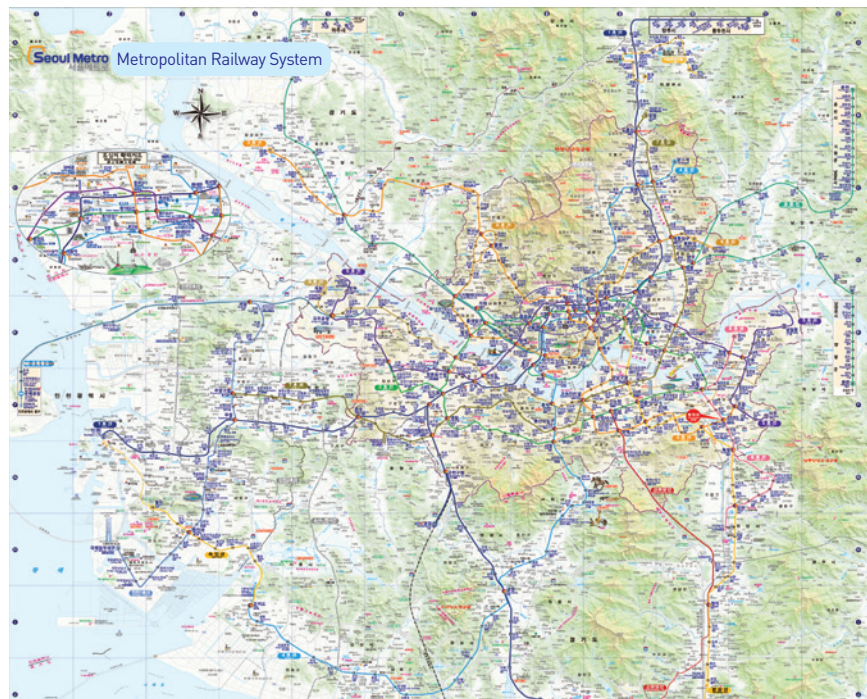
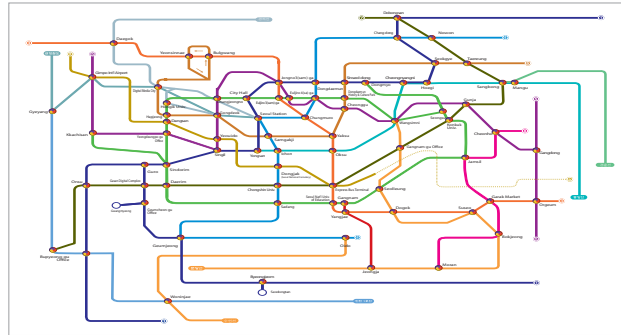


Citizens' satisfaction level with the reorganized public transportation service kept rising, and reached the 7.5 mark on a scale of 0-10 in 2012.



\*Rating is based on a scale of 0 to 10.  
Source: 2012 Seoul Survey

The subway plays a central role in public transport connecting Seoul with the metropolitan areas. The total length of the subway system is 965.5km with Seoul and Incheon government running 353.6km and the central government and private companies operating 611.9km.



As a result of the 2004 reforms, the bus service in Seoul is classified into four categories: inter-regional, trunk, feeder, and circular line services. As shown in the table below, the buses are color-coded to help citizens easily identify them. As of 2013, a total of 7,485 buses that run 361 routes are operated by 66 companies.

	Classification	Companies	Routes	Buses
Blue Bus	Trunk Lines	55	122	3,703
Green Bus	Feeder Lines	59	215	3,462
Red Bus	Inter-regional Lines	5	11	250
Yellow Bus	Circular Lines	2	4	25
	Night Bus	14	9	45
	<b>Total</b>	<b>66</b>	<b>361</b>	<b>7,485</b>

## 02 History of Seoul's Public Transportation



 **1960**

### Bus-centered road transport

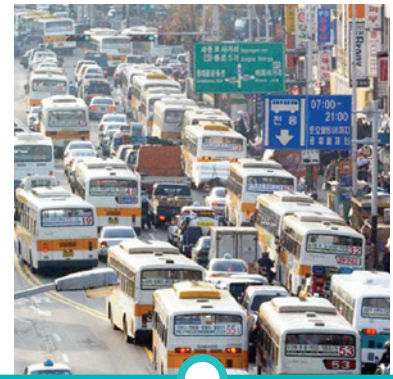
- 1965 Operation of express buses
- 1967 Operation of municipal buses for unprofitable routes
- 1968 Suspension of tram operation & construction of the Seoul-Incheon Highway



 **1970**

### Advent of the subway era

- 1970 Opening of the Seoul-Busan Highway
- 1971 Completion of the Seoul Transport Master Plan
- 1974 Launch of Subway Line 1
- 1977 Establishment of the Completion of Long-term Transport Plan for the Seoul metropolitan area



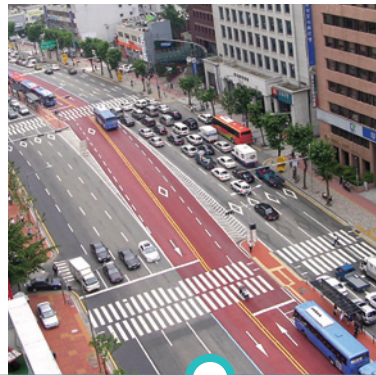
 **1980**

### Overcoming traffic congestion aggravated by the advent of my-car era

- 1984 Completion of the 5-year Seoul Transportation Improvement Plan
- 1985 Launch of Subway Lines 2, 3, and 4
- 1987 Launch of traffic impact assessment policy
- 1989 Launch of TSM (Transportation Systems Management)



SMG reformed its public transportation system with emphasis on mass transit in 2004. It has continuously incorporated cutting-edge information communications technologies into its transportation management systems. As a result, Seoul now boasts one of the most convenient and safest public transportation networks in the world. In an effort to make Seoul a cleaner and more sustainable city, SMG has made a wide range of efforts to promote a green transportation system by encouraging walking and cycling and introducing eco-friendly modes of transportation.



 1990

 2000

 2010

**Management of travel demand**

- 1990 Project launch for the secondary stage subway lines
- 1990 Introduction of the traffic congestion charge system
- 1993 Launch of exclusive bus lane system
- 1996 Introduction of congestion charge at Namsan Tunnels 1 & 3

**Promote the use of public transportation**

- 2003 Removal of Cheonggye elevated freeway
- 2004 Reforms in the public transportation system
- 2005 Restoration of Cheonggyecheon (Stream)


**Introduce eco-friendly, efficient transport policies**

- 2010 Introduction of electric buses
- 2013 Operation of Seoul safety control center (expansion of TOPIS)
- 2014 Creation of transit mall



# Seoul's Public Transportation Policies

In 2004, SMG made some significant reforms in its transport policies such as reorganization of public bus services, introduction of exclusive median bus lanes, shift from private to quasi-public bus operation and implementation of an integrated transit-fare card (dubbed T-Money) system. The positive results of reforms include a sharp increase in bus ridership, improvements in the speed of buses and other vehicles due to the implementation of exclusive median bus lanes, lower cost burden for transportation services, better air quality, lessened fare burdens on the less transport fare burdened for the citizens improved air quality, and greater aesthetic value of the city. Through continuous improvements, Seoul now boasts a public transportation system that is environmentally friendly and well-suited to serve the needs of the vulnerable citizens.

- 
- An aerial photograph showing a large, multi-lane bridge with a green and white truss structure crossing a wide river. To the right, a complex highway interchange with multiple lanes and overpasses is visible. The surrounding area includes urban buildings and green spaces.
- 01 / Reorganization of the bus route system
  - 02 / Introduction of a median bus lane system
  - 03 / Introduction of a quasi-public bus operation system
  - 04 / Establishment of an integrated transit-fare card system
  - 05 / Improvements in bus vehicles

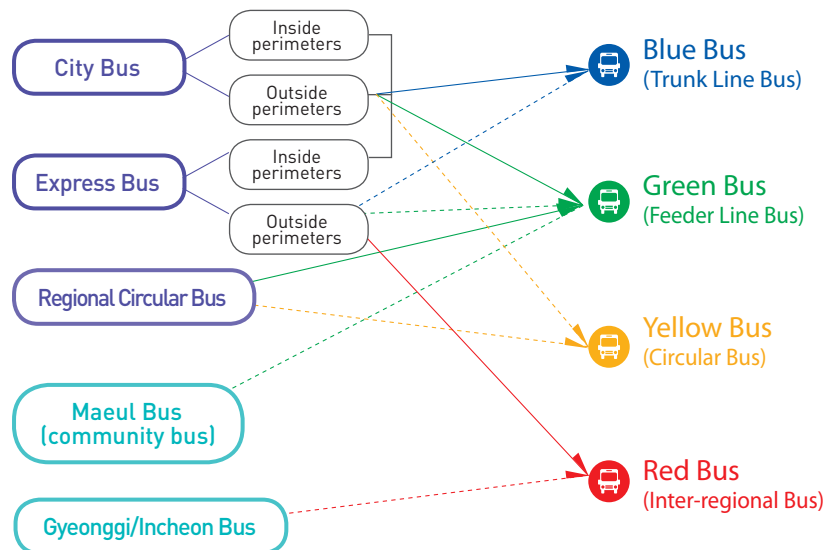


# 01 Reorganization of the bus route system

The SMG restructured its bus route system in July 2004. It replaced the previous unreasonable bus routes with a Hub-and-Spoke based dual system of trunk and feeder lines. In addition, regarding some problematic bus routes with too many curves or redundant long-range services, overhaul was made in a way that operation efficiency could be maximized. Also, connectivity between mass transits was enhanced.

## Comparison of the old and new bus classification systems

Previously, bus routes were divided into city, express, and circular. Now, the buses are classified into trunk, feeder, inter-regional, and circular lines and color-coded so that citizens can easily distinguish them.



Details of the new classification


## Distinctive roles of trunk and feeder line bus services


Trunk Lines	Blue Bus	<ul style="list-style-type: none"> <li>• Connect the city center, subcenter, and suburbs</li> <li>• Focus on mobility and punctuality</li> </ul>
	Red Bus	<ul style="list-style-type: none"> <li>• Connect the metropolitan area with the (sub) CBDs</li> <li>• Meet motorists' demand for travel to the city boundaries</li> </ul>
Feeder Lines	Green Bus	<ul style="list-style-type: none"> <li>• Connect to the trunk lines and the subway</li> <li>• Meet the intra-regional travel demand</li> </ul>
	Yellow Bus	<ul style="list-style-type: none"> <li>• Offer circular operation within CBDs or subcenter</li> <li>• Meet the travel demand within CBDs or subcenter</li> </ul>



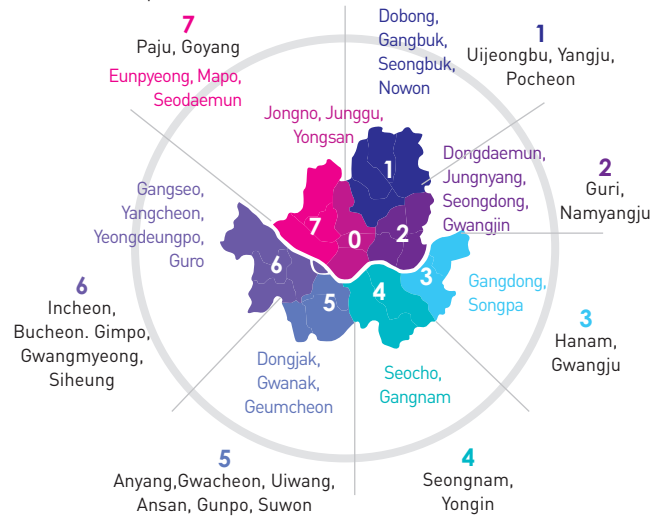
### A new bus numbering system


Instead of the previous numbering system with virtually no significance at all to the citizens, the new bus numbers clearly indicate where buses originate from and end their trips.


- 9112** 

An inter-regional bus (as indicated by the red color) leaving the Uijeongbu-Yangju-Pocheon area (as indicated by the number 1) has 12 as its bus serial number.
- 41** 

A circular bus (yellow color) circulating around the Gangnam area (number 4) and having serial bus number 1



- 101** 

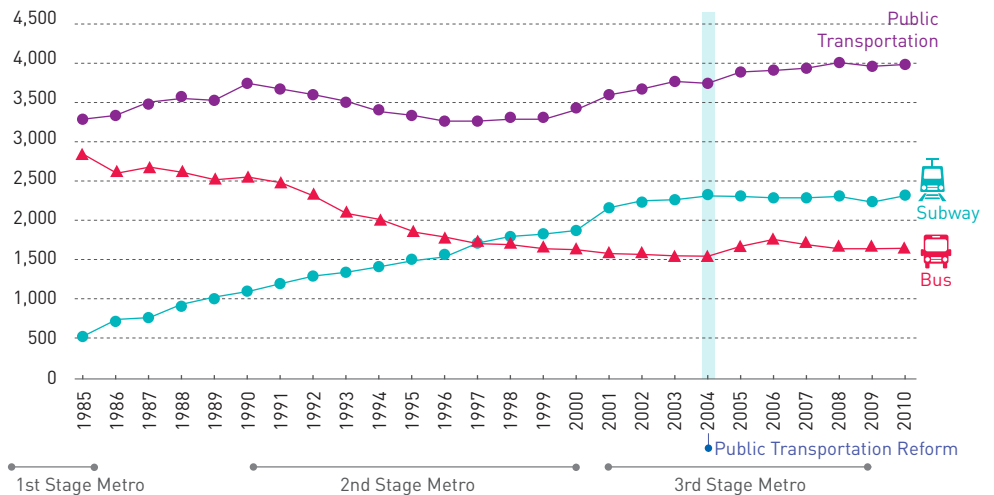
A trunk line bus (blue color) leaving Dobong-Gangbuk-Seongbuk-Nowon (number 1) bound for the city center (number 0) and having serial number 1
- 1412** 

A feeder line bus (green color) leaving Dobong-Gangbuk-Seongbuk-Nowon (number 1) bound for Secho, Gangnam (number 2) and having serial bus number 12

### Reform results

Since the reorganization of the bus route system, bus operations in Seoul have improved considerably in both mobility and accessibility, marking a turnaround from the downward spiral in ridership.

**Ridership**  
(Million Person)



### Results of the bus route reform

Goal	Evaluation Index	Improvements
Mobility	Bus operation speed (km/h)	17.2(2003.11) → 18.1(2004.11)
Accessibility	No. of subway stations connected per route	9.66(2002.10) → 10.3(2005.6)

## 02 Introduction of an exclusive median bus lane system

Along with reforms in bus routes, SMG introduced the exclusive median bus lane system in 2004. Since then, the bus service has become much faster. SMG has continued to expand its BRT network. Currently, the network covers a total length of 115.3km (as of 2014). SMG will expand it to 210.5km in the coming years.

### Reform directions

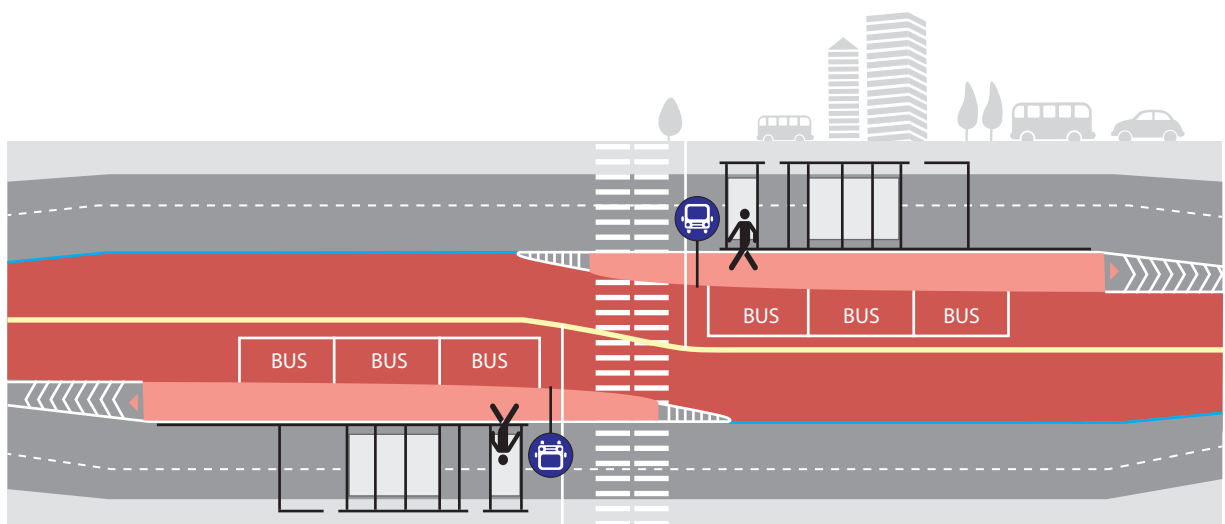
Optimization of bus operations:

Focus on punctuality, faster service, and maximum convenience for the citizens. The exclusive median bus lane system also means that the buses are given the propriety on the roads.



### Median bus stops

- Median bus stops have reinforced passengers' convenience and safety with their comfortable shelter functions and cutting-edge bus information systems.
- 329 median lane bus stops are in use (as of March 2014).

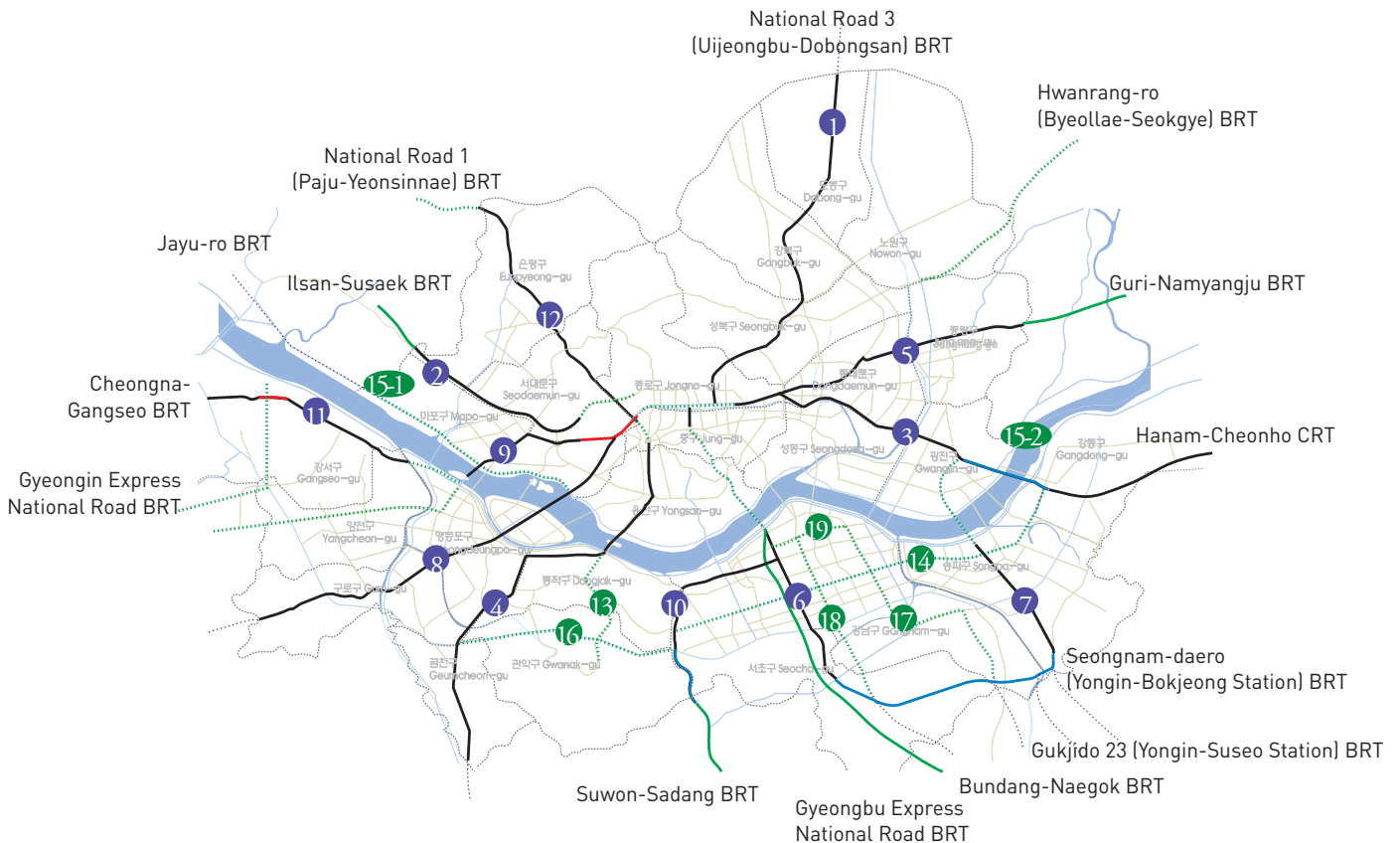


### BRT Construction Plan

- Under operation —
- 2013 —
- 2014~2016 —
- After 2017 - - -

A network of 12 corridors that stretch 115.3km was completed by 2012 [SMG has plans to expand the network to 223.3km in the future]

Ser. No.	Corridors	Total length (km)	Under operation	'14	'15-'16	After 2017
	Total					
	Total	223.3	115.3	4.0	15.2	88.8
①	Dobong-Mia-ro	15.8	15.8			
②	Susaek-Seongsan-ro	9.9	6.8			3.1
③	Cheonho-daero	16.0	12.7		3.3	
④	Siheung~Hangang-ro	17.7	17.7			
⑤	Mangu-Wangsan-ro	14.3	10.4			3.9
⑥	Gangnam-daero	21.3	5.9		9.7	5.7
⑦	Songpa~Jayang-ro	9.6	5.6			4.0
⑧	Gyeongin-Mapo-ro	16.2	12.1	1.2		2.9
⑨	Yanghwa~Sinchon-ro	7.5	5.2	1.0		1.3
⑩	Dongjak~Sinbanpo-ro	8.4	6.2		2.2	
⑪	Gonghang-ro	10.3	5.8	1.8		2.7
⑫	Tongil~Uiju-ro	11.6	11.1			0.5
⑬	Gwanak-ro	6.1				6.1
⑭	Teheran~Olympic-ro	14.7				14.7
⑮	Gangbyeonbuk-ro	12.8				12.8
⑯	Nambusunhwan-ro	7.6				7.6
⑰	Yeongdong-daero	10.9				10.9
⑱	Eonju-ro	9.3				9.3
⑲	Dosan-daero	3.3				3.3

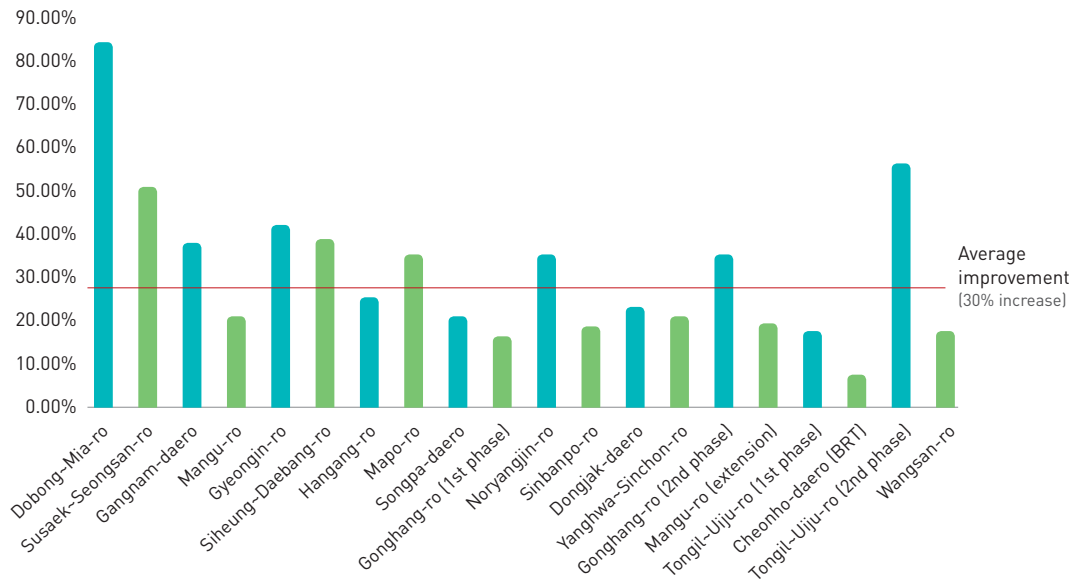


### Effect of exclusive median bus lanes

Through the implementation of exclusive median bus lanes, bus speeds have improved by an average of 30%.



### Speed improvement rate





# 03 Introduction of a quasi-public bus operation system

The SMG laid the foundation for efficient and reasonable operation of public transportation by jointly managing the operating revenues and transferring the rights to route decisions to citizens with the introduction of a quasi-public bus operation system. Also, the SMG prepared institutional arrangements to improve the environment in which the bus companies operate in order to boost the overall quality of the bus service in Seoul.

## Reform directions

Private bus companies' selective operation of buses on profitable routes was a concern for SMG as it was against the public interest and deteriorated the quality of the bus service. To address this problem, SMG introduced the quasi-public bus operation system in which Seoul manages the bus routes and the revenues while the private companies operate the buses.

## Reasons for introducing the new system

External factors	<ul style="list-style-type: none"> <li>• Increase in car ownership (leading to congestion)</li> <li>• Completion of Subway Lines 5-8</li> <li>• Expansion of maeul (community) bus services</li> </ul>
Internal factors	<ul style="list-style-type: none"> <li>• Failure to make reasonable changes in routes due to companies' exclusive route ownership</li> <li>• Bus companies' financial difficulties due to higher costs and lower ridership</li> <li>• Growing dissatisfaction with bus services among the bus passengers</li> <li>• Lack of strong external motivation for profit creation</li> <li>• Bus companies' difficulties in hiring drivers and workers due to low wages</li> </ul>
Policy factors	<ul style="list-style-type: none"> <li>• Failure to make changes in routes due to companies' resistance</li> <li>• Excessive regulation on bus company operations</li> <li>• Insufficient support for bus companies' management and limited opportunity for citizens' participation</li> <li>• Lack of mid- to long-term policies on the city's bus services</li> </ul>

## Before and after the reforms

Before (private operations)	After (quasi-public operation)
<ul style="list-style-type: none"> <li>• Revenues collected by individual bus companies</li> <li>- Revenue depending on ridership</li> <li>- Suspension of unprofitable routes</li> <li>• Excessive competition leading to poor services</li> <li>• Bus companies' rejection of unprofitable routes</li> </ul>	<ul style="list-style-type: none"> <li>• Revenues jointly managed by SMG and bus companies</li> <li>- Revenue depending on the service distance (km/bus)</li> <li>- Subsidy to offset losses from unprofitable routes</li> <li>• Competition for service quality improvements</li> <li>• Reorganization of bus routes based on citizens' demand</li> </ul>

## Effects of the quasi-public bus operation system

- Transfer of route adjustment rights to SMG → Reasonable decisions on bus routes
- Better treatment for drives and elimination of cut-throat competition → Improved operation environment → 49% reduction in traffic accidents and 32% increase in citizens' satisfaction with bus services
- Introduction of evaluation and incentive systems → Enhanced competition for management efficiency
- Introduction of Seoul's "quasi-public bus operation" model in other major cities such as Busan, Daegu, Daejeon, Gwangju, and Incheon.

# Bus Transfer Center

Bus transfer centers are designed to facilitate citizens' transfer between different modes of transportation like subway, buses, taxis, private cars, etc., at key locations throughout the city.

## Installation effects

Reduction in transfer time (12 → 3 minutes: Seoul Transfer Center)

Reduction in transfer distance (300 → 50m: Cheongnyangni Transfer Center)



Before [Cheongnyangni Station Bus Transfer Center]



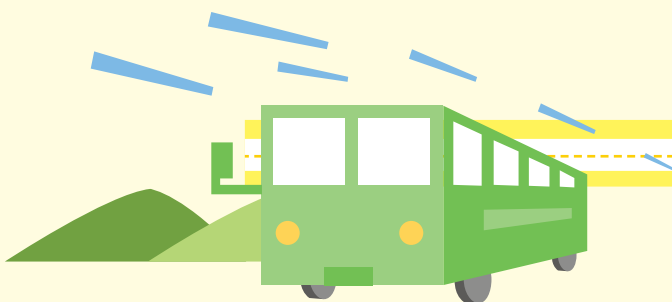
After [Cheongnyangni Station Bus Transfer Center]



Before [Seoul Station Transfer Center]



After [Seoul Station Transfer Center]



# 04 Establishment of an integrated transit fare card system

Through the reforms of 2004, SMG has integrated all the public transport charging systems into one that applies not just to Seoul but also to the entire Seoul metropolitan area. Moreover, it charges based on the total travel distance of passengers instead of the number of trips. Previously, different modes of transportation charged for trips independently, not based on the person's total travel distance. The new charging system has reduced citizens' burden of transportation costs considerably.

### Old and new public transport fare systems

	Transportation Card		Cash
	Independent fare system	Integrated fare system	
Adult	Independent payment for trips	<Basic fare> covering the first 10km (free transfers) <Extra fare> 100won for every additional 5km *The new fare system ensures that the total fare will not exceed the aggregate of independent fares no matter how far a passenger travels.	N/A
Youth		20% discount	
Child		50% discount	

### Operation history

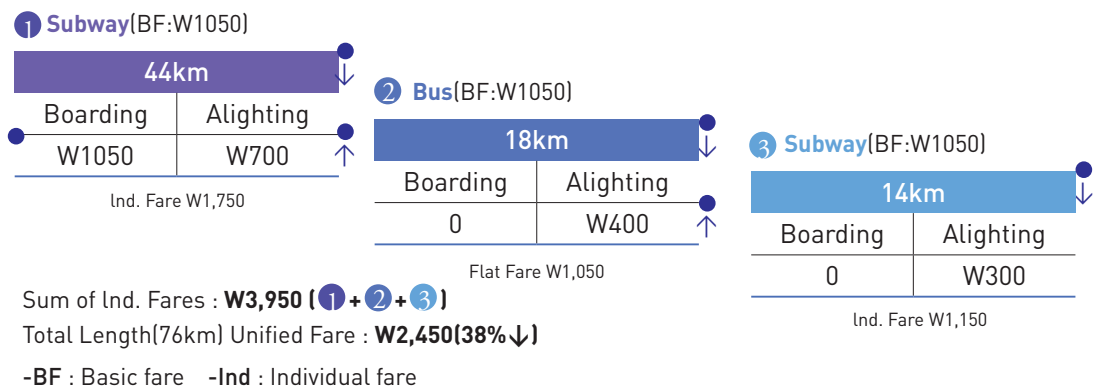
SMG has expanded its integrated transit fare card system to all transportation modes operating in the Seoul metropolitan area in collaboration with other local governments in the area and Korail.

- July 2004** Implementation of the card system for Seoul buses
- July 2007** Expansion of the system to Gyeonggi-do buses and Korail services
- Sept. 2008** Expansion of the system to express bus services
- Oct. 2009** Expansion of the system to Incheon City buses

### Operation effects

- Reduced burden in transportation expenses: 510,000 won per person a year
- Increased demand for public transportation services

### Example





# T money Card

People can use public transport including the bus, subway, and taxi with a single card anywhere in the country.

The city's integrated transit fare card system became complete with the introduction of T-money, a new rechargeable transportation card. The previous transportation card system was outdated, had reached its capacity limit, and failed to meet the international standards. With the introduction of the new transportation card system, SMG was able to replace the outdated system, adopt an integrated transit fare system, ensure the transparent management of bus companies, and boost citizens' convenience by introducing more stores that accept T-money as a payment method.



## T-Money characteristics

- Compliance with international standards
- Secured standard subsidiarity
- Secured new technologies such as digital money
- SMG holds technology ownership
- Unified card issue and settlement process
- Transparent settlement procedure

## Examples of digital money usage



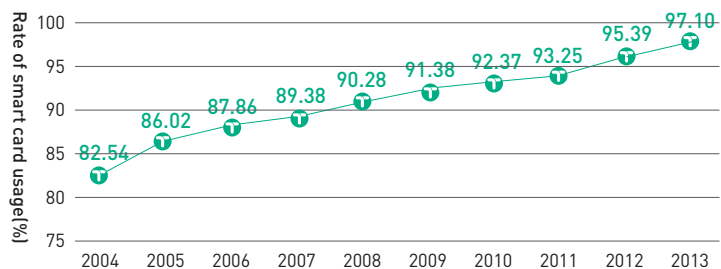
## Usage of T-money

T-money is used to pay for public transport services such as buses, subway, and taxis. It is also used for other purposes including toll gate fee payment.

### Uses of T-money

- Payment by T-money
- Bus 97%
- Subway 100%
- Taxi 59%

T-money usage for buses



Source : Seoul Metropolitan Government(Oct. 2012) Year

## 05 *Improvements in bus vehicles*

Since the public transportation reform in 2004, SMG has replaced its buses with those powered by CNG (compressed natural gas) or electricity. It has also increased the number of low-floor buses for the transportation-vulnerable.

### Introduction of CNG buses

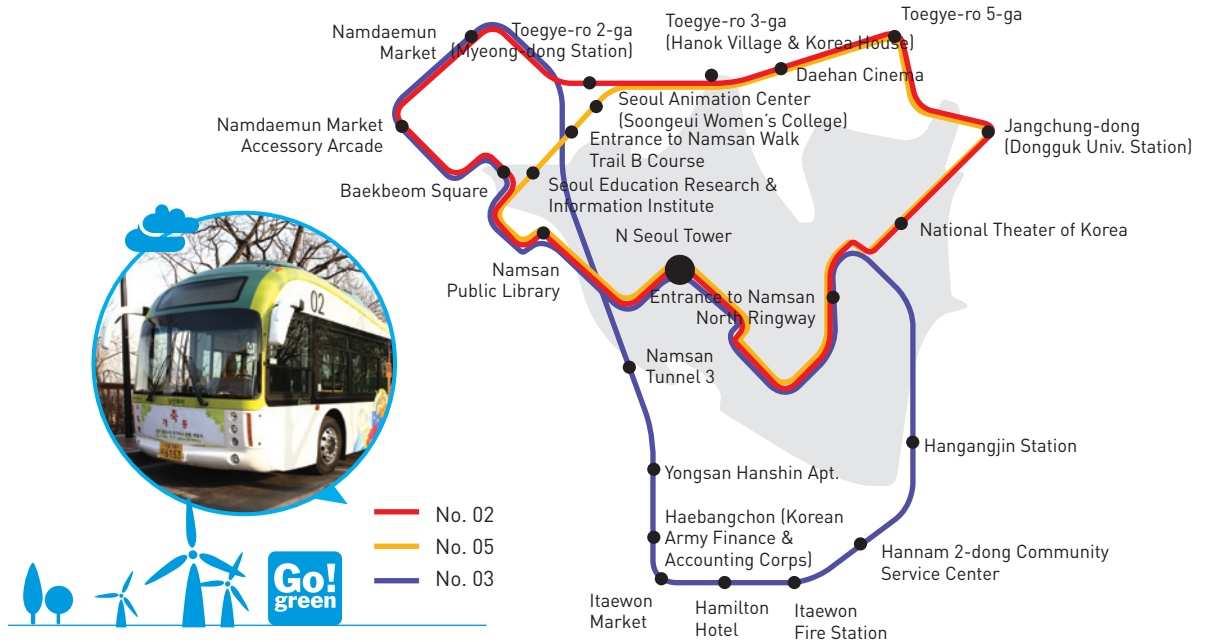
In order to improve the air quality of Seoul which is affected by ultra fine dust and exhaust, SMG has replaced its diesel-based buses with CNG buses, which emit less exhaust and are more economical. SMG is now focusing its efforts on replacing maeul buses - which travel around in communities and residential areas - and tourist buses with eco-friendly bus vehicles.

Classification	Total	diesel bus	CNG Bus				Others (Electronic Bus, and etc.)
			Total	General	Low Deck	Bendy Bus	
City Bus	7,485	16	7,460	5,232	2,222	6	9
Maeul Bus	1,470	446	1,024	1,024	-	-	-
Chartered Bus	2,760	2,713	47	47	-	-	-
Special Bus	682	217	-	-	-	-	465
City Tour Bus	14	8	6	6	-	-	-



### Introduction of Electric Buses

SMG joined forces with local bus manufacturers to develop electric buses free of exhaust or noise. In December 2010, SMG began to operate electric buses around Mount Namsan and the downtown area. At present, electric buses run through the Seoul Zoo and around the Seoul Energy Dream Center.



### Introduction of low-floor buses

SMG began to introduce low-floor buses in 2003 to help those with disabilities as well as children and seniors. It now runs 2,703 low-floor buses which account for 29.9 percent of the total number of buses under operation (as of May 2013).





# TOPIS, the center of the world's advanced transportation

TOPIS is the Seoul Metropolitan Government's integrated transportation management center that collects information from and provides information to the city's Road Traffic Management System, Bus Operation Management System, Unmanned Enforcement Systems, Traffic Broadcasting System and Seoul Metropolitan Police Agency and exerts comprehensive control and management of traffic situations in Seoul.



- 01 / Functions of TOPIS
- 02 / Major systems: BMS & BIS
- 03 / Major systems: Unmanned enforcement systems
- 04 / Major systems: Smart urban management



# 01 Functions of TOPIS

**01** Manage real-time traffic flow / Supply information on traffic congestion

Monitor traffic situations and supply congestion information promptly

**02** Support scientific transportation administration

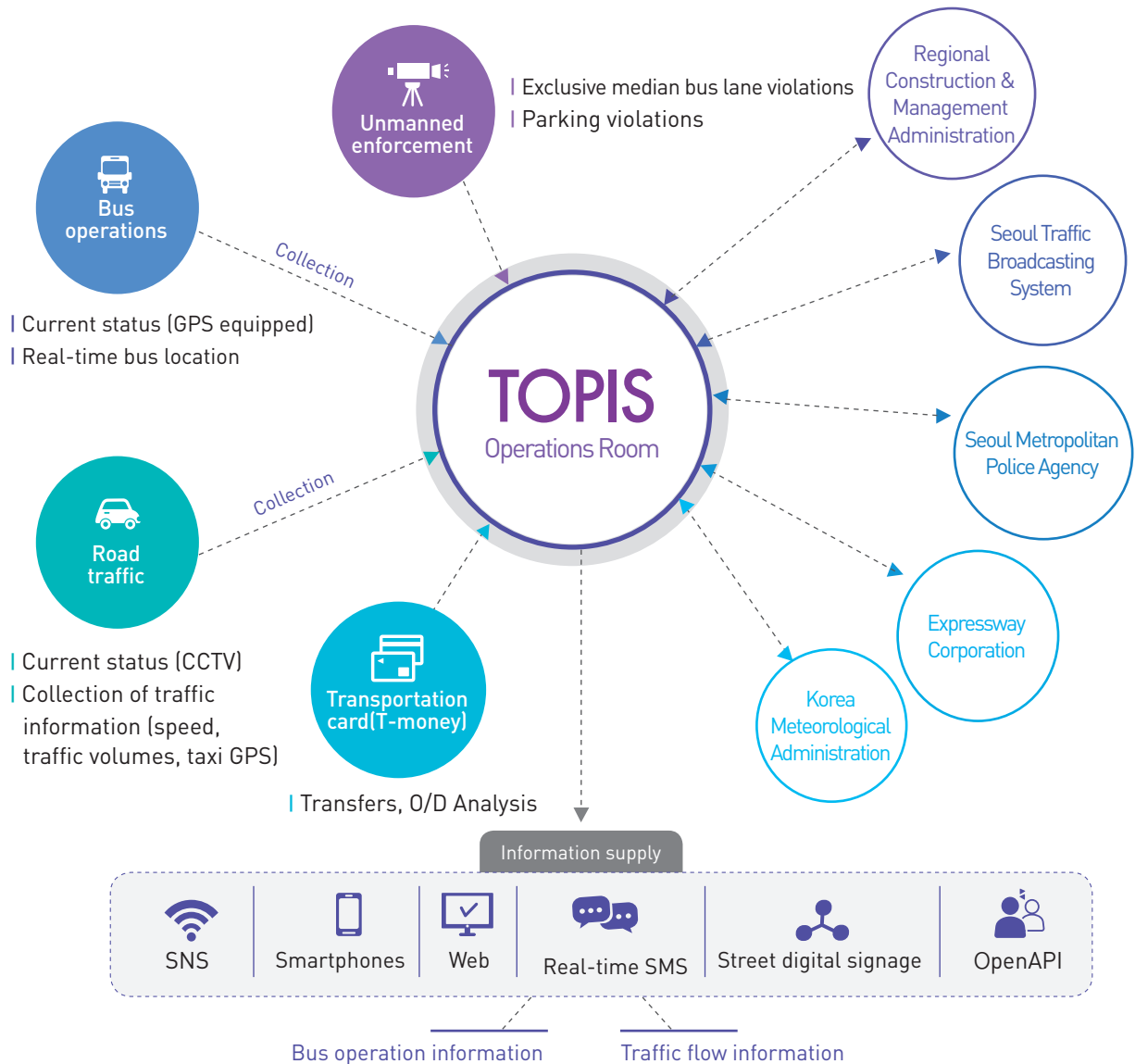
Bus operation support & bus operation planning / Improve traffic flow and surface transport planning

**03** Real-time management of bus operations

Supply information on bus operations / offer bus detour and assignment orders

**04** Operate vehicle enforcement systems

Crackdown on violations of exclusive median bus lanes and illegal parking



## 02 BMS & BIS

### BMS Bus Management System

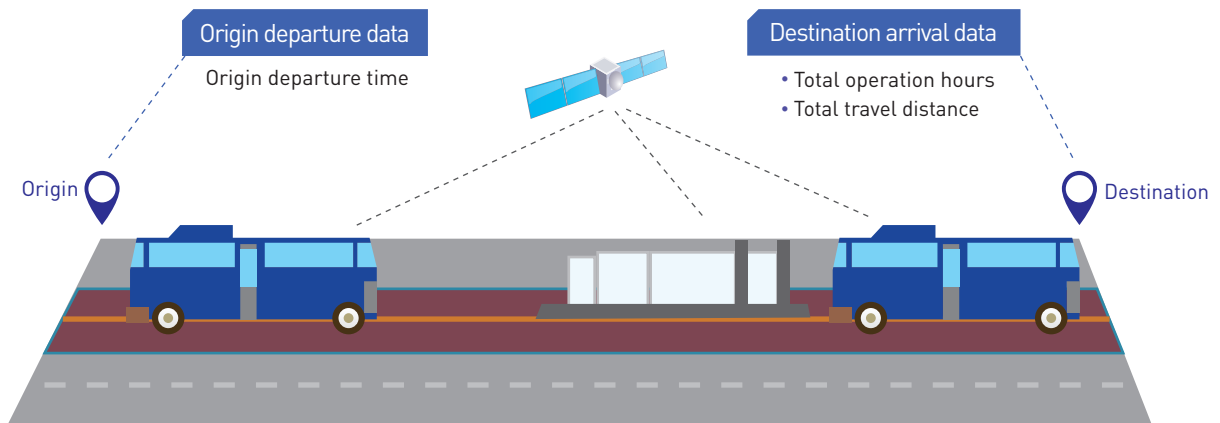
BMS is designed to identify optimal bus operation intervals and enhance the punctuality of bus operations based on GPS (global positioning system) and wireless communications.

### Setup status(2013)

BMS collects and manages real-time information from 7,851 buses (city buses on 395 routes and airport buses on 34 routes).

### Major functions

- Bus operations control: Monitoring for any emergency and bus operating.
- Bus dispatch support: BMS helps with SMG's policy analysis and O/D (origin and destination survey) analysis per route, analysis of boarding and alighting passengers per bus stop, and demand analysis per route.



Interval data	Bus stop arrival data	Bus stop departure data	Emergency data
<ul style="list-style-type: none"> <li>• Bus location information</li> <li>• Bus speed information</li> <li>• Entrance to crossroads information</li> </ul>	<ul style="list-style-type: none"> <li>• Name of bus stop(ID)</li> <li>• Arrival time</li> </ul>	<ul style="list-style-type: none"> <li>• Name of bus stop(ID)</li> <li>• Departure time</li> </ul>	<ul style="list-style-type: none"> <li>• Time of incident</li> <li>• Emergency type</li> <li>• Emergency location</li> </ul>

## BIS Bus Information System

Public transportation information collected through BMS and others is provided to the citizens over various channels in real-time. Citizens have easy access to real-time information on buses, maeul buses, subways which allow them use public transportation in a more convenient.

### Overview

Information on all types of public transportation (bus, maeul bus, subway, railway system) including the current location, estimated arrival time, first and last operation time of the day, operation status are available to the public via smartphone application, BITs, TOPIS website, and others.





### Usage

- More than 3.77 million use the internet and mobile web and smartphone apps.
- Disclosure of bus information by linking Open API and DB
- Installation and operation of 1,342 BITs (Bus Information Terminals)



### Seoul Public Transportation Smart app



# 03 Vehicle Enforcement Systems(CCTVs)

## Illegal parking and bus lane enforcement systems

The SMG is operating a CCTV system for parking violations and infractions of the median bus lane regulation to ensure efficiency in traffic management.



Description	Illegal parking	Violation of exclusive median bus lanes
Enforcement points	252	45
Enforcement criteria	Illegal parking for over 5 minutes	Lane use by a vehicle with fewer than 35 people
Enforcement hours	07:00~22:00	During hours when lane exclusion applies
Enforcements records	2012: 137,326 cases	2012: 78,997 cases
	2013: 130,427 cases	2013: 89,994 cases

## Running bus-based vehicle enforcement systems

SMG has been running on-board CCTVs successfully since 2011, too, as follows:



### Setup of On-board CCTVs

2010: 12 buses on 3 routes  
(Route No.: 471, 152, 260)

2011: 16 buses on four routes  
(Route No.: 148, 370, 350, 602)

### Number of law enforcement cases

2012: 5,267 illegal parking violations  
134 violations of median bus lanes

2013: 2,850 illegal parking violations  
111 violations of median bus lanes

# 04 Smart City Management

Transportation + Disaster+ Emergency : SMG has integrated its TOPIS functions with the emergency response functions performed by the Seoul Safety Control Center Smart Urban Management (SUM).

- Integrated round-the-clock monitoring of Transportation + Disaster+ Emergency drills
- Supply of real-time transportation + emergency information on 1,141 digital signage boards
- The country's first transportation simulation program that anticipates emergencies based on the speed of vehicles



## Establishment of the Comprehensive Seoul Safety Control Center (Transportation + Disaster + Emergency)

Establishment of the Comprehensive Seoul safety control center (Transportation + Disaster+ Emergency) - Future-oriented smart city management.



# International Recognition in Transportation



2006

The 2006 Sustainable Transportation Award (from ITDP, TRB and ED)

Institute for Transportation and Development Policy (ITDP)



2006

The 2006 UITP Award for Innovative Solutions

The International Association of Public Transport (UITP)



2007

EASTS Outstanding Transportation Project Award

Eastern Asia Society for Transportation Studies

Excellence of the reforms in mass transit in Seoul including transfer discounts and median bus lanes



2011

Golden Chariot Awards

The Russian Federation Parliament, The Ministry of Transport, The Government of the Russian Federation

Contributions to transport industry development and international cooperation



2011

UITP PTx2 Regional Award

The International Association of Public Transport (UITP)

Improvements in accessibility for mass transit services including median bus lanes and transfer centers



2011

UITP PTx2 Showcase Award

The International Association of Public Transport (UITP)

Contributions to the promotion of mass transit through an intelligent transport system



2013

Local Government Award

The Intelligent Transportation Systems Society

The global ITS technology innovations and the development of citizen-engaged information services

## Export of Seoul's Intelligent Transportation System

- '06 Beijing, China | Establishment of Seoul Smart Card System(Cashless Transit Ticketing System)
- '07 Almaty Kazakhstan | Establishment of Seoul Smart Card System(Cashless Transit Ticketing System)
- '08 Baku, Azerbaijan | Establishment of Intelligent Transport Management Center, Traffic Management System Bus Management&Information System, etc.
- Ulaanbaatar, Mongolia | Establishment of Transportation Information Center, Traffic Management System, etc.
- Wellington Auckland, New Zealand | Establishment of Seoul Smart Card System(Cashless Transit Ticketing System)
- '10 Kuala Lumpur, Malaysia | Establishment of Seoul Smart Card System(Cashless Transit Ticketing System)
- '11 Bogota, Colombia | Establishment of Bus Management&Information System, Seoul Smart Card System(Cashless Transit Ticketing System)
- '13 Bangkok, Thailand | Consulting of Seoul Smart Card System(Cashless Transit Ticketing System)



# Q&A

## Q1. Many cities are faced with a number of obstacles in the establishment and implementation of transportation policies. How has the city of Seoul overcome these obstacles and set up policies to solve them?

In the aftermath of urban sprawl and explosive growth, Seoul, the capital city of Korea, experienced serious transportation problems. Nonetheless, SMG successfully addressed the various issues that the city faced at different stages of development by improving the mass transit system including the subway and the bus system. In addition, SMG has implemented policies to promote walking and cycling in the city and improve the overall quality of the public transportation services.

### **Phase 1** A rapidly growing megacity - building transportation infrastructure including road network

Seoul underwent drastic urban sprawl in the 1960s and 1970s and became a huge metropolis in a short period of time. The existing transportation infrastructure including the road network could not keep up with the city's explosive population growth. To address this issue, Seoul expanded the road network including Samil Elevated Highway and the Olympic Expressway while implementing policies to increase the number of vehicles in order to meet the growing travel demand. As a result, the road ratio soared from 8.7% in the 1960s to 22.32% in 2013, with the total road network expanding to over 8,197km over a surface area of 83.61km<sup>2</sup>. Moreover, SMG upgraded the traffic signals at intersections, implemented reversible lanes along the arterial roads, and built the Seoul Traffic Control Center, all in an effort to upgrade the transport infrastructure of Seoul befitting its elevated status as a global city.

### **Phase 2** Solution to traffic congestion - Raising the proportion of mass transit through the reorganization of the entire public transportation system including the quasi-public operation of bus companies

In line with the advent of the "my car" era, traffic congestion emerged as a serious social problem in Seoul. In the beginning of the 2000s, the traffic situation got even worse as citizens turned their backs on mass transit. The reasons for such dissatisfaction arose from the bus companies' suspension of unprofitable routes under financial difficulties, making sudden stops to get more passengers on board, speeding to get ahead of other buses, and refusal to serve the disabled and the elderly.

To address this problem, SMG launched deep reforms to overhaul the mass transit system including the introduction of the quasi-public bus management scheme. Through the reform, SMG made the mass transit service accessible to those living in the outskirts of the city and accommodated the citizens' opinions to expand or adjust the bus routes.

As a result, citizens' satisfaction with the city's public transport rose from 58.2% in 2004 to 81.8% in 2005 while the number of passengers increased by 5.5% on a daily basis (511,000 passengers a day), offsetting the extra traffic congestion caused by the increased number of cars on the roads.

The quasi-public bus operation system put an end to the excessive competition between bus companies for profit. Also, the bus drivers' reckless driving and unfriendly attitude towards the passengers were addressed, leading to higher quality of the bus service. In addition, the implementation of exclusive median bus lanes led to faster travel via buses.

### **Phase 3** City space for humans - A paradigm shift in focus from automobiles to pedestrians and cyclists

In the past, the roads in Seoul were solely designed for automobiles leading to frequent accidents as shown in the fatality rate which stood at 4.2 people per 100,000 citizens compared to 2.4 in London and 1.6 in Tokyo, respectively. Soon the public consensus was reached that the road design failed to take into consideration the citizens and other modes of transport such as cycling or walking. To address the situation, SMG shifted its focus to a citizen-centered transportation policy taking into account the various needs of pedestrians and cyclists. Through "road diet," pedestrian-only streets that stretch across 17.9km in 56 locations and exclusive cycling trails with a total length of 676.7km in 292 locations were established throughout the city. By 2020, SMG plans to double the length of the pedestrian-only streets to 40km in 120 locations and develop "walking trails (promenade)" that connects the Seoul fortress walls, ancient palaces, and downtown shopping districts. SMG continues to put the citizens first when implementing transportation policies. One example is the traffic signals at crosswalks which turn green more often and stay green longer so that the citizens can safely cross the streets.

## **Q2.** What are some transportation development models, policies, or technologies that differentiate Seoul from other global cities?

Through the comprehensive reform in 2004, SMG changed the operation and fee system of the mass transit services and established a unique, state-of-the-art public transportation system that is unprecedented in the world. In addition, SMG has incorporated cutting-edge information technology to better serve the citizens.

### **Case 1** "Integrated Transit-Fare System for the Metropolitan Area" to boost the ridership in the metropolitan area

In the past, a passenger transferring to a different mode of public transport had to pay the basic fare for each trip. However, with the new, integrated transit-fare system, the passenger is charged for the total travel distance, allowing for up to 5 transfers irrespective of the modes of transport. SMG launched the new fare system for Seoul buses in 2004. Then the Gyeonggi Province and Incheon Metropolitan government joined the system in 2007 and 2009, respectively. This led to the surge in bus ridership in the metropolitan area and less cars entering Seoul. In a survey in December 2008, 7.5% of the respondents said that they switched from driving to taking the inter-regional bus after the introduction of the integrated transit-fare system.

**Case 2 “Quasi-public bus operation system” to better serve the public interest”**

The quasi-public bus operation system of Seoul involves the joint management of revenues by bus companies and the municipal government’s financial assistance to secure the public nature of mass transit services.

SMG began to implement the quasi-public bus operation on July 1, 2004. SMG fully compensates for any financial loss suffered by the bus companies after excluding the actual operation costs.

Through this scheme, SMG was able to offer bus services to areas that had been neglected in the past.

In fact, the bus ridership rose by 13.5% after the introduction of the quasi-public bus operation system.

Also, as the city government provided financial assistance, the bus companies’ balance sheets and labor conditions improved, leading to higher quality bus services for the citizens.

**Case 3 “New, Intelligent Transport Card System (Smart Card)” to utilize information technology to manage public transport**

SMG has incorporated cutting-edge information communications technologies into the city’s mass transit services through TOPIS (Seoul Transport Operations & Information Service), which consists of BMS (Bus Management System), BIS (Bus Information System), TIAS (Transportation Information Analysis System), and RMS (Road Management System).

The full-fledged implementation of T-money, a contactless-type smart card embedded with CPU, is regarded as a best practice for others to benchmark.

T-money enables passengers to pay for the metro, buses, and taxis with a single card. Citizens can use mass transit most comfortably, and operators can save lots of time on fare collection.

Currently, close to 100% and 98.3% of passengers use their smart cards for metro and bus services, respectively.

Furthermore, the introduction of the smart card system has enabled SMG to collect transport data, analyze them, and work out effective transportation policies. The information has also enabled SMG to launch quasi-public bus service operation, distinctive trunk/feeder line system, distance-based fare charging system, and transparent management of revenues from bus service operations. SMG’s introduction of the intelligent transport card system triggered the widespread use of smart cards in the country. It is regarded as one of SMG’s remarkable accomplishment because implementing a smart card system for 10 million residents was a huge challenge.

### Q3. Explain how the city of Seoul has been able to provide public transportation services that are faster and more comfortable than passenger cars.

travel demand in and out of Seoul kept skyrocketing due to new satellite cities and the subsequent increase in cars from the metropolitan area in the 1990s. The number of motorists continued to increase, making the traffic situation in Seoul seem like an unsolvable problem.

Nonetheless, SMG worked hard to make sure that mass transit including the metro and buses deliver more reliable and pleasant services than cars. As a result, the ratio of mass transit increased from 62% in 2004 to 64.3% in 2010, the world’s highest proportion, as shown below.

### Comparison of mass transit in major cities



#### **Factor 1** “Expansion of public transportation infrastructure including the introduction of exclusive median bus lanes and construction of transfer centers

For citizens to favor mass transit over cars, the former had to deliver faster and on-time services and easy transfer to the final destination.

To that end, SMG decided to introduce the exclusive median bus lane system while building a number of transfer centers as part of its campaign to make improvements in the entire spectrum of mass transit infrastructure.

Following the launch of the median bus lane system in 2004, SMG is running a total length of 115.3km of dedicated bus lanes in 12 BRT corridors. The system has enabled buses to run much faster. The operation of transfer centers in four key locations in particular has made it possible for citizens to park their cars in the centers and travel downtown on public transport. As a result, SMG has been able to accommodate most of the citizens’ new demand for transportation through mass transit services.

#### **Factor 2** Upgrade of mass transit vehicles

To promote the ridership of public transportation by making the service more convenient, SMG initiated a policy to upgrade the mass transit vehicles while taking various measures to improve the bus stops in order to reduce the time getting on and off the buses. Also, eco-friendly buses were introduced to minimize air pollution and various measures were taken to help the vulnerable people use mass transit much more comfortably. One example is the operation of low-floor buses. For the past ten years, SMG has put 2,195 low-floor buses into service. It plans to increase the number of low-floor buses to 3,685 or 50% of the city’s total number of public buses by the end of 2015. For the subway, SMG has installed 848 elevators (292 stations) and 195 wheelchair lifts (86 stations) for the disabled as well as 1,919 escalators (251 stations) designed for the convenience of the general public. Currently, 99 percent of all public buses in Seoul are run on CNG (compressed natural gas). Air pollution has decreased, and buses have become much quieter. Citizens find the buses much more comfortable.

#### **Factor 3** Citizens’ expanded access to transportation through IT-based services

SMG makes sure that citizens get access to mass transit information more easily through its various ICT-based services. It now offers a “path guidance service” designed for pedestrians and cyclists which works in the same way as a navigation system for motorists.

Through a free app called “Seoul Transportation Portal,” SMG makes sure that citizens can access real-time traffic information on any segment of the roads in the city, arrival times of the metro and buses, locations and fares of parking facilities, and number of public bicycles available.



## Q4. What are some examples of Seoul's cooperation with other cities in the public transportation field? What are some technologies and policies that Seoul shared with the overseas cities?

Seoul's public transportation reform has drawn much attention from city officials across the world. As a result, SMG has had numerous visits from city representatives who wanted to learn about Seoul's state-of-the-art public transportation system. SMG has shared its experience and know-how on smart transportation card and other IT-based transport services and has also exported CNG-fueled buses. As such, Seoul has strengthened exchanges and cooperation with overseas cities in various areas related to transportation.

### Case1 Sharing excellent policies and experiences

Seoul's public transportation reform was first introduced to the global community at the UITP (International Association of Public Transport) Asia-Pacific Assembly held in Seoul in 2004. More than 1,500 participants from the government, business, and academia gathered in Seoul to benchmark SMG's innovative transportation policy and system. Visitors have paid particular attention to the quasi-public bus business operation, introduction of an integrated transit-fare system, and delivery of real-time transportation information to various stakeholders through TOPIS.

Since its establishment in 2005, TOPIS has had a total of 22,000 visitors from home and abroad. SMG is committed to sharing its know-how and experiences with the rest of the global community.

### Case2 Exporting the transportation system to overseas cities

Seoul's T-money system has also drawn keen attention from many international cities wishing to implement the system in their communities. SMG established the transport card system for Wellington and Auckland, New Zealand in 2008 and 2010, respectively. In 2011, SMG set up a bus fare settlement system for Kuala Lumpur, Malaysia and a bus management system (BMS) and a bus fare settlement system for Bogota, Colombia. In 2012, SMG began to offer consulting services on the integrated transit-fare card system to the city government of Bangkok, Thailand.

### Case3 Building partnerships for exchanges and cooperation

SMG signed MOUs with Beijing (2005), Shanghai (2007), Singapore (2008), Palembang, Indonesia (2009), and Jakarta (2010) to share its transportation policies and know-how through exchanges and cooperation. SMG has actively participated in international conferences on urban transportation issues such as UITP (International Association of Public Transport), Metropolis (World Association of Major Metropolises), and CITYNET. It has introduced its experiences to participants from around the world. In recognition of its efforts to share with the global community, SMG has received the UITP citation (2005), ITDP sustainable transport award (2006), UITP innovative policy award (2006), and EASTS (International Conference of the Eastern Asia Society for Transportation Studies) award (2007).

These efforts have also led to the export of SMG's unique transportation policies and systems.

For more information about Seoul public transportation, contact us at the following, and we will do our best to serve your needs:

### Contact Information

Postal Address : 15, Deoksugung-gil, Jung-gu, Seoul, 100-739, Korea

Phone : +82-(0)2-2133-2220

Fax : +82-(0)2-2133-1048

E-mail : [policyshare@seoul.go.kr](mailto:policyshare@seoul.go.kr)

Website : <http://english.seoul.go.kr/policy-information/traffic/>

