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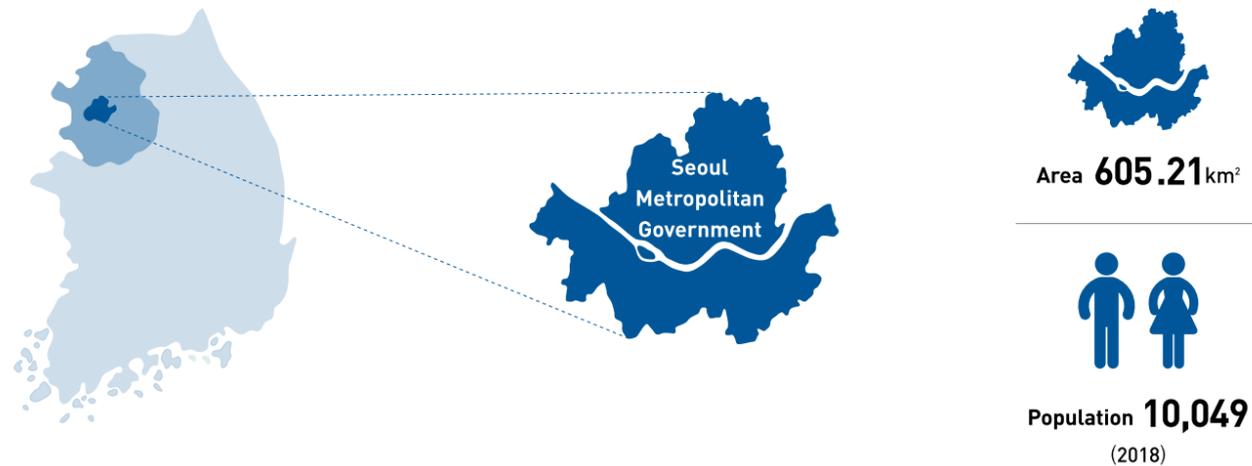
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Safe, convenient,
people-centered

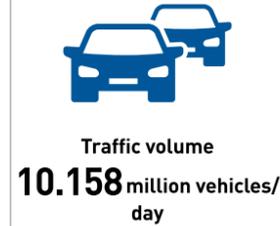
SEOUL TRANSPORTATION

Introduction to Seoul

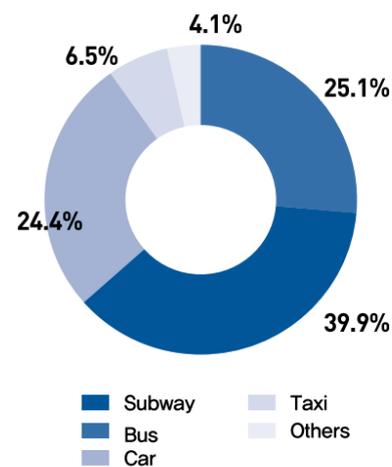
Seoul is a hub of administration, culture, and transportation that is home to 19 percent of the population.



Status of transportation in Seoul

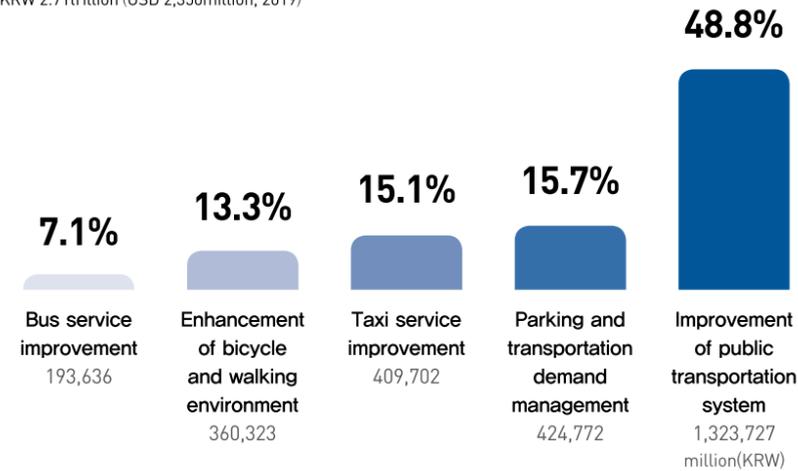


Share by mode of transportation



Budget

KRW 2.71trillion (USD 2,350million, 2019)



Transportation policy and vision of Seoul

Seoul Metropolitan Government is shifting the focus of its transportation system from cars (expansion of road network and pedestrian overpasses) to public transportation and pedestrians. The city is building a convenient and safe transit infrastructure that prioritizes people over vehicles, enabling more citizens to live without owning cars.

Changes in policy

- Safety**
 - Building a transportation system where the top priority is safety**
 - Establish a preventive safety control system for public transportation facilities
 - Reduce the incidence of traffic accidents and number of traffic-related deaths to levels on par with those of major cities of developed countries
 - Repair transportation facilities to make them safe and convenient for mobility disadvantaged people
- Human**
 - Creating a city for pedestrians and walking**
 - Shift the focus of the transportation system from cars to people by expanding pedestrian walkways
 - Promote specialized roads and festivals for walking and riding bicycles
- Future**
 - Envisioning the future of sustainable transportation in Seoul**
 - Foster an eco-friendly transportation environment where walking and cycling are encouraged
 - Build a stable public transportation network that is accessible from every part of the city
 - Improve the mass transit service to make it more convenient than driving a car
 - Manage transportation demand to create a pleasant, safe, and comfortable city

Applications of Seoul Metropolitan Government's transportation policy to overseas

- 2006 China(Beijing) AFC
- 2007 Kazakhstan(Almaty) AFC
- 2008 New Zealand(Wellington, Auckland) AFC
- 2008 Mongolia(Ulaanbaatar) Signal System, Transport Center
- 2010 Malaysia(Kuala Lumpur) AFC
- 2011 Azerbaijan(Baku) Established transportation information center
- 2015 Colombia(Bogota) Established and repaired AFC system in Bogota, Colombia
- 2015 Vietnam(Ho Chi Minh) Designed tracks for Metropolitan Railway No.1
- 2015 Mongolia(Ulaanbaatar) AFC, BIS
- 2015 Cote d'Ivoire(Abidjan) Launched AFC system for buses and supplied terminals
- 2016 Thailand(Bangkok) Consulted on the construction of urban transportation system
- 2016 Vietnam(Da Nang) Conducted study on establishment of a metropolitan transportation network
- 2016 Ghana(Accra) Established urban transport master plan
- 2016 Indonesia(Bandung) Consulted on transport infrastructure support policy
- 2016 Greece(Athens) Built e-ticketing system
- 2017 Colombia Consulted on policy to develop a national public transit system
- 2017 Egypt(Cairo) Consulted on AFC of metropolitan transit system
- 2017 Myanmar(Mandalay~ Myitkyina) Feasibility Study for Railway Improvement
- 2018 Bangladesh Consultation on Purchasing & Manufacturing of Railway Vehicles
- 2018 New Zealand(Wellington, Auckland) Transportation Card System
- 2019 India(Delhi ~ Meerut) Consultation on Express Railway Operation
- 2019 Mongolia(Ulaanbaatar) Railway Safety Education for the National Railroad Administration

Safe and convenient public transportation infrastructure

I·SEOUL·U

Seoul's mass transit system prioritizes the safety and convenience of citizens and is planned and operated in a way that reflects the unique characteristics and strengths of each mode of transportation and ensures sustainable development.



Subway



Bus



Taxi



Transit & Parking

Safe and convenient public transportation

Seoul Metro, moving 8 million citizens a day

Seoul Metro operates 10 lines connecting the CBD to the surrounding metropolitan areas. Seoul Metropolitan Government plans to extend these existing lines and expand the Seoul Light Rail Transit (LRT) in order to create a dense urban railway network, spanning 441 kilometers, and bring the combined mode share of its mass transit system up to 75%.



10 lines, 352.1km
328 stations



8 million users a day

Lines 1 to 8

Seoul Metro operates a subway system, spanning a total length of 300.1 kilometers with 277 stations.

Seoul Metro

Seoul Metro, the operator of Subway Lines 1 to 4, merged with Seoul Mass Rail Transit, the operator of Subway Lines 5 to 8, creating the largest subway operator Korea has seen in 23 years.

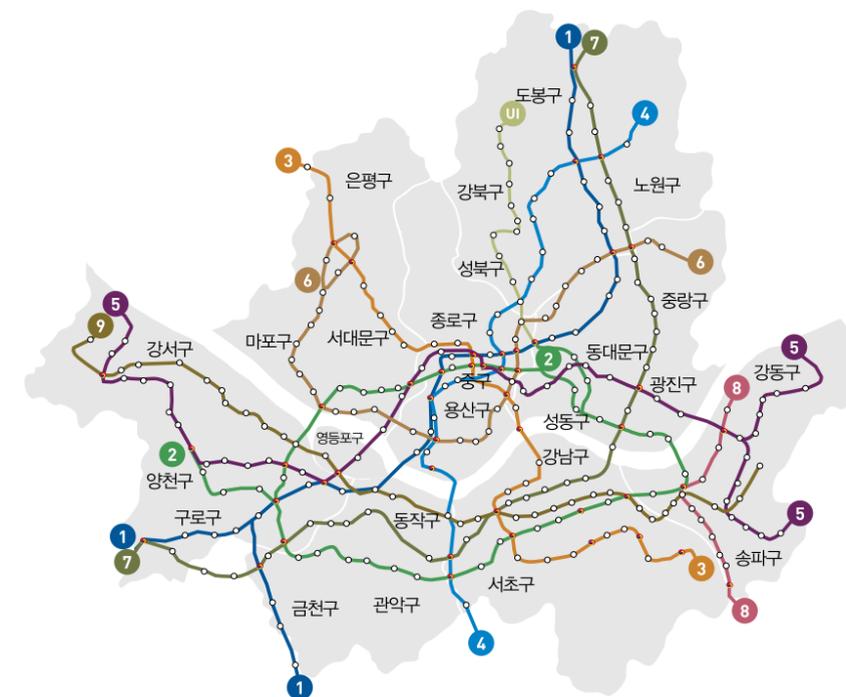
Line 9

40.6km, 38 stations

※ Operated by Seoulmetro Line Nine Co.,Ltd. (Gaehwa-Sinnonhyeon) and Seoul Metro(Eonju-VHS Medical Center)

Ui Light Rail Transit Line

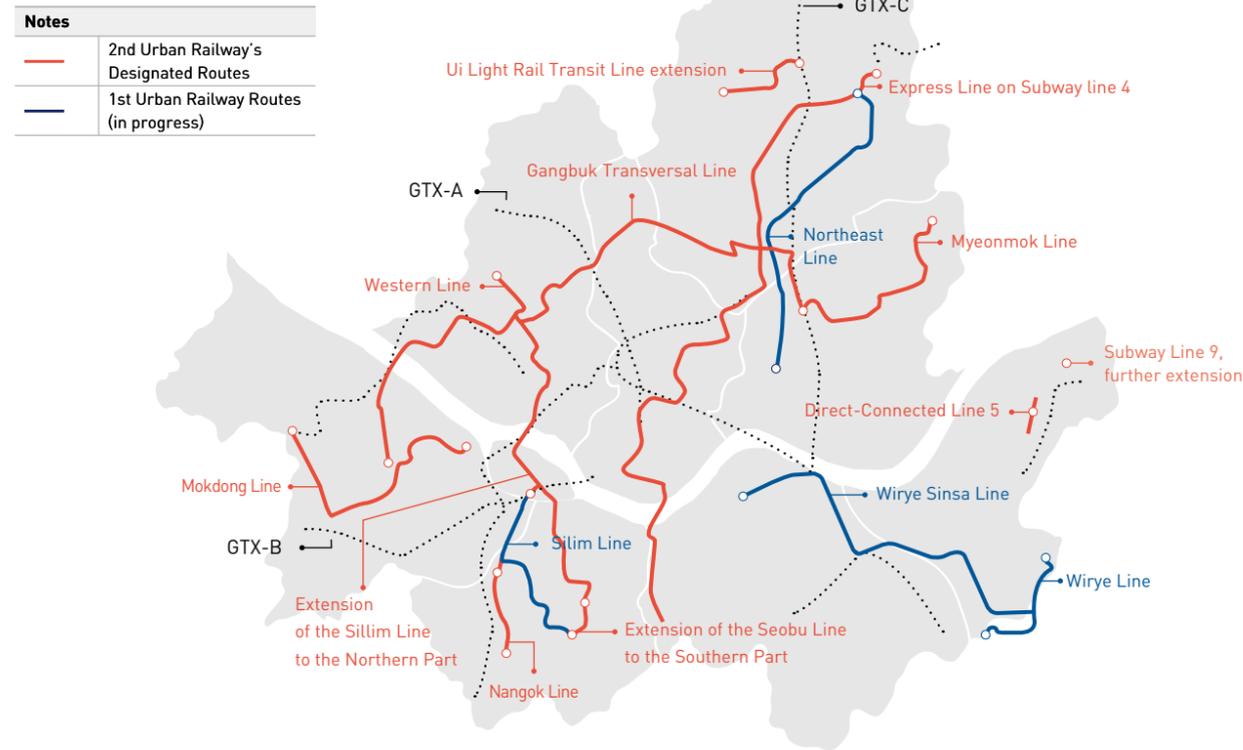
Opened in 2017, the Ui Light Rail Transit Line, the nation's first underground light railway, stretches a total length of 11.4 kilometers with 13 stations. It is operated by the m Ui Light Rail Transit Corporation.



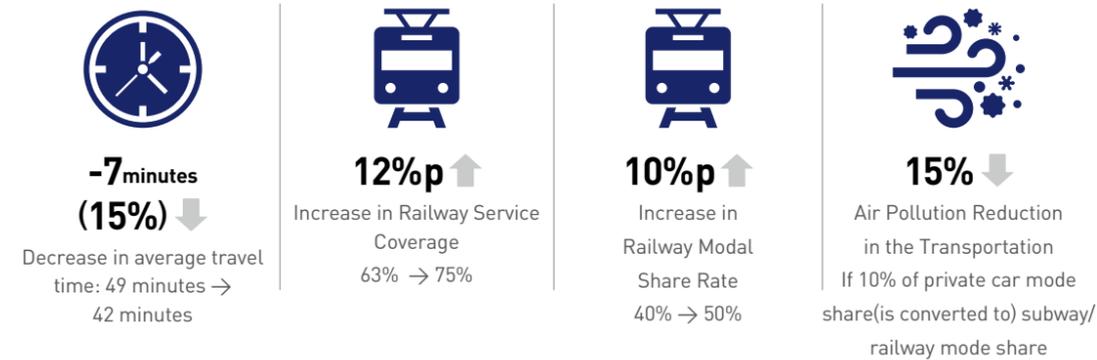
Establishment of the urban railroad network that can be conveniently used anywhere in Seoul

Seoul provides the urban railroad network that strengthens the role of the public so that railway facilities can lead the balanced development of the area. A total of 10 new routes for the development by 2028 will be divided and established into three types - balanced regional development, strengthening network and improvement of the existing railway services.

Seoul Metropolitan Railway Line Map



Benefits of Seoul's metropolitan railway network



Service that reflects the demands of citizens (Amenities)

Human-centered services are offered at all stages, from entry to a station to departure from the destination station.

Facilities for children have been installed and expanded to all subway stations. Elevators and escalators have been installed in all subway stations (328 stations), providing easy access for people with disabilities, senior citizens, and pregnant women.



Elevators
1,015 ea



Escalators
2,448 ea

Seating for pregnant women

Pink-colored priority seats for pregnant women, in addition to the existing priority seats for the elderly, have been installed in all cars of Seoul Metro Lines 1 to 9 and UI LRT Line.

Platform Screen doors on subway platforms

Platform screen doors on all subway station platforms eliminates the risk of passengers falling onto the tracks and reduces noise.



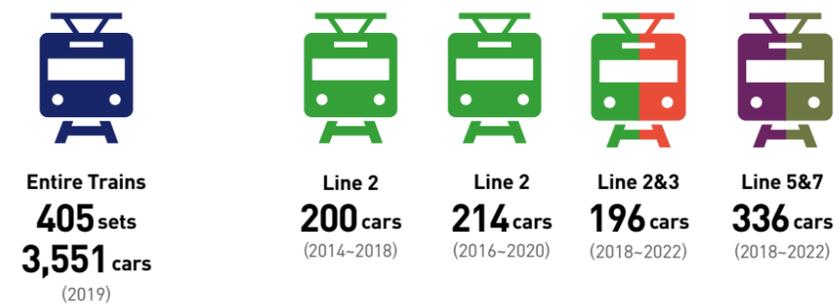
Air quality on subway station platforms
35.3% ↑



Noise
7.9% ↓

Replacing Aging Trains at the Right Time

In an effort to create a safe and pleasant service use environment, old trains are being replaced at the right time by taking into account the train's deterioration grade and failure rate, and precision diagnosis results of the trains.



Establishment of Smart Air Quality Management System

Air quality data of subway stations are collected and analyzed with Artificial Intelligence to predict the time of incidence and prevalence of indoor fine dust for optimal operation of the ventilation system.



Collection of air quality data



Prediction of air quality



Optimal operation of the ventilation system

Installation of High-Performance AirPurifier

High-capacity air purifiers that can filter ultrafine dust are being installed at subway stations.

Increase of Air Quality Improvement Devices

In order to improve indoor air quality in the trains, air quality improvement devices are being installed.



Double discharge air volume



230% improvement in air circulation inside the train

Improving Tunnel Ventilation Facilities and Cleaning Ventilation Slots

Old ventilation facilities are improved and the ventilation openings of all subway stations are thoroughly cleaned to reduce fine dusts flowing into subway stations and trains.

Making Seoul Subways Safer

Seoul has created a system for preventing accidents and inconveniences, allowing all citizens to use the subway safely, securely, and comfortably.

Safety-related facilities

CCTVs, as well as some 9,000 emergency phones, have been installed in all subway stations to help prevent accidents and reduce passenger inconvenience.



CCTVs in subway stations
15,901 units (2019)



In stations 13,353 units
On train cars 2,548 units



Subway patrol officers

Patrol officers work to maintain law and order in the subway system and minimize passenger discomfort by cracking down on vendors, beggars, and public disturbances in the cars.



Subway patrol officers
298 officers (2019)

Safe Zones

To ensure security and safety in subway stations at night, Safe Zones, featuring brighter lights and CCTV cameras for heightened surveillance, have been designated in subway stations near entertainment districts.



Safe Zones
40 stations, 79 zones (2019)

"Subway Safety Keeper" Mobile Application

This free mobile application has been created to help subway users report various inconveniences, such as heating or cooling issues, and emergencies, including medical emergencies. Upon receiving such reports, subway patrol officers and policemen can identify the location of the reporter immediately, allowing for the prompt dispatch of response personnel.



Downloads
29 (2019)



Reports Sent
113,000



Processing Rate
100%



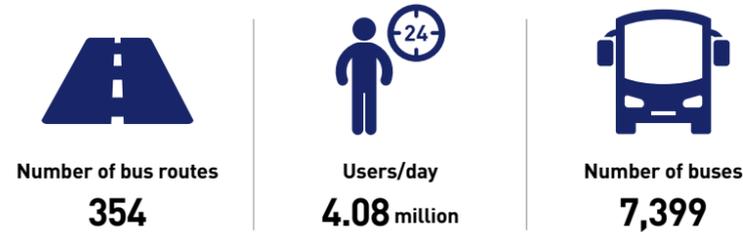
Average Processing Time
13 minutes



Bus system that is faster and more convenient than driving a car

The bus system was reformed in 2004 with the aim of transforming Seoul, which suffers from serious traffic congestion due to high car ownership, into a city focused on public transportation. With the introduction of a semi-public bus system, the overall operation of the bus system, including bus intervals, and the arrival information service are now being managed more efficiently. Moreover, exclusive median bus lanes(BRT) have been introduced to offer better, faster, and more convenient bus service for citizens.

Status of Operation (2019)



Bus system

In general, the bus system is divided into two types of routes: arterial/wide-area bus routes that connect downtown Seoul with the outskirts of the city and circulation/branch routes that are operated within particular districts. Night bus (Owl Bus service) and village bus routes, connecting residential areas to subway stations or shopping centers, are operated as well.



Demand-responsive Bus

Demand-responsive bus services are offered to help passengers during rush hours or late at night, when public transport is unavailable.

Owl Bus (late-night bus)

Owl Buses are run from midnight to dawn (23:30-06:00), and optimal routes are identified based on analyses of big data, such as data on late-night mobile phone usage and call taxi usage.



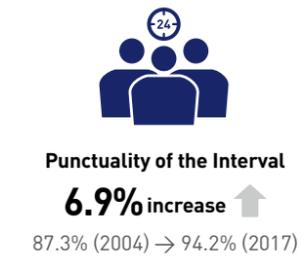
Squirrel Bus (short, customized bus routes during rush hours)

Squirrel Buses are operated periodically along routes with high volumes of commuters and high traffic congestion during rush hours.



Semi-Public Bus Operation System

Since 2004, Seoul Metropolitan Government has operated the Semi-Public Bus Operation System, which jointly manages the profits of bus companies to increase the quality of the mass transit system and enhance the operational efficiency of the private transport sector. The system has helped reduce traffic accidents, increased the number and satisfaction level of users, and drastically improved the welfare of bus operator employees.



Bus-Only median lanes (BRT)

With the introduction of Bus only median lanes(BRT) on routes connecting the city center to surrounding areas, it is now often faster to take a bus than drive a private cars.



Bus only median lanes (BRT)

4 routes 36.1km (2004) ▶ 12 routes 120.5 km (2017)

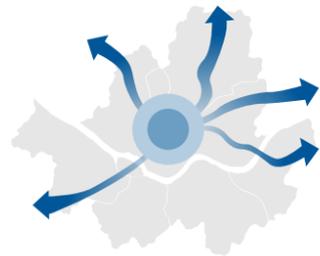


speed

15 km/h ▶ 20.6 km/h (37% increase ↑)

Installation of Bus only median lanes(BRT) in Jongno complete east-west connectivity

Curbside bus lanes in the Jongno area, the only area of the east-west corridor that did not have exclusive median bus lanes, have been relocated to create median bus lanes, drastically improving the punctuality of the bus system, raising the overall traffic speed, and increasing safety by avoiding excessive mixing of buses and cars on the road. With the installation of exclusive median bus lanes to facilitate traffic flows from Gyeongin and Mapo-ro in western Seoul, through the downtown area, and extending to Mangwu and Wangsan-ro in eastern Seoul, complete connectivity between the eastern and western parts of the capital city has been realized.



Gyeongin, Mapo-ro ◀▶ Jongno, (through downtown) ▶◀ Mangwu, and Wangsan-ro



Greater punctuality of buses
±1~2 minutes



Bus running speed in Jongno area
31% increase



Number of buses passing per hour
210 ▶ 160

(decreased bus queueing*)

* A phenomenon where buses line up bumper to bumper at a bus stop, blocking traffic flow.



Convenient and comfortable bus transport environment

Platforms at bus stops are now equipped with route maps and heated seatings for the convenience of users while waiting, and electronic bus information terminals show bus operation information, such as estimated wait time, bus type (low-floor bus), and scheduled time of last bus, on a real-time basis.



Curbside platforms
2,992



Median bus lane platforms
884

Bus stops
6,291



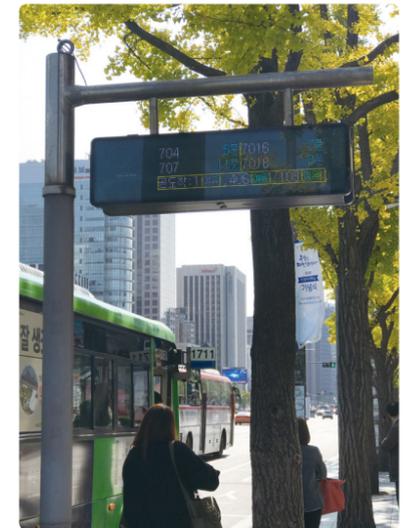
Bus Information Terminal (BIT), providing real-time bus information at a glance

BITs installed at bus stops show estimated bus arrival times and seat availability. The information can also be accessed via smartphones.

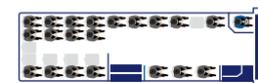


Number of BITs

2,781 (2014) ▶ 3,590 (2017)



Bus Congestion



Vacancy (25 ↓)



Normal (26 ~ 44)



Congestion (45 ↑)

A bus system that protects the environment and caters to the needs of the mobility disadvantaged in Seoul

Diesel buses, which are a major source of airborne particulate matter, have been replaced by natural gas(CNG) buses, and low-floor buses for mobility disadvantaged people, such as wheelchair users, and accessible, barrier-free bus stops are now being introduced.

Zero-emission eco-friendly buses

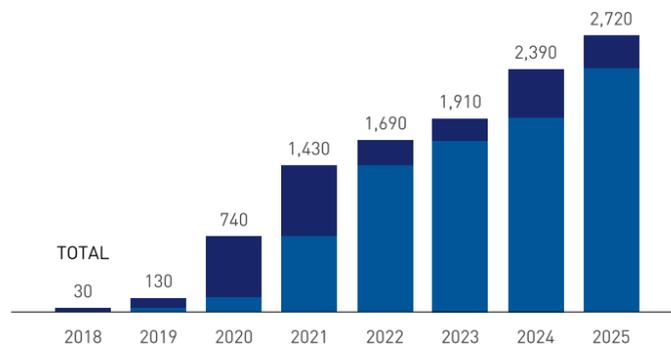
All city buses operating in Seoul are either CNG or electric buses, both of which emit no exhaust gases. Also, by 2025, around 3,000 city buses will be replaced by electric or hydrogen ones by stages.



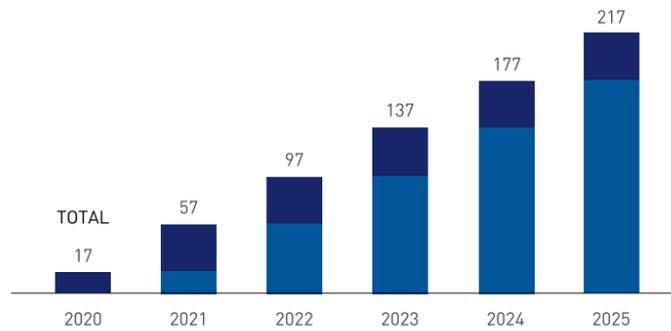
Electric Buses
2,720 by 2025
(135 in operation in 2019)



Hydrogen buses
217 by 2025



■ Added
A Plan for Introduction of Electric Buses by Year



■ Added
A Plan for Introduction of Hydrogen Buses by Year



Expansion of low-floor bus

Seoul plans to continuously increase the number of low-floor buses, which are accessible to wheelchairs and strollers. As of October 2019, low-floor buses account for 53.6 percent of all buses in Seoul.



Barrier-free bus stops

The number of barrier-free bus stops, which feature a universal design and cater to the needs of mobility disadvantaged people, such as wheelchair users, is being increased.



Removal of barriers near platforms



Creation of spaces for wheelchair users to wait



Installation of tactile paving blocks



Audio announcements of bus arrival times

Smart Shelter

Aging bus stands are gradually changed into multifunctional smart shelters with sophisticated design, air conditioning/heating, and air purifier.

Taxis that are safe and secure

Based on the collection and analysis of data on the operation of over 70,000 taxis, a taxi policy that serves to increase the convenience and satisfaction of taxi service users has been implemented.

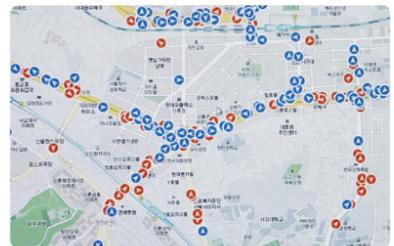


Seoul Taxi Information System

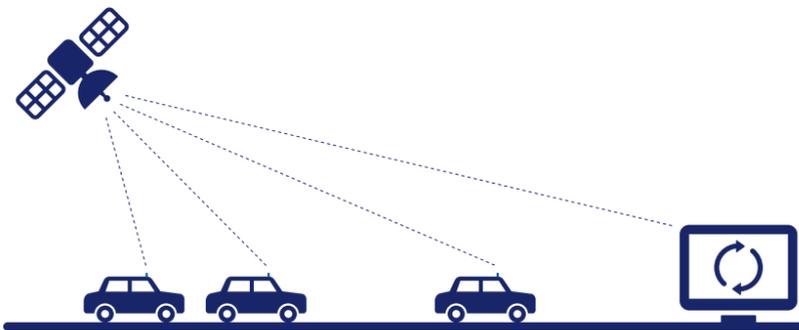
Based on the collection and analysis of data on the operation of all taxis in Seoul, including taxi location, speed, passengers, and fares, a reasonable taxi policy has been established and implemented.

Outcomes

- Data collected as basic resource for the establishment of taxi policy
- Taxi operation controlled through real-time monitoring system
- Traffic status updated through GPS-based speed analysis



-  Vacant taxis
-  Occupied taxis



Information updated every 2.5 minutes

Offline card payment authorization system that eliminates concerns over system errors

Even in the event of an online payment system failure, the payment terminals have a built-in offline system that enables payment settlement.



Effect of taxi fare payment with cards



Allows extra services, such as return of lost articles



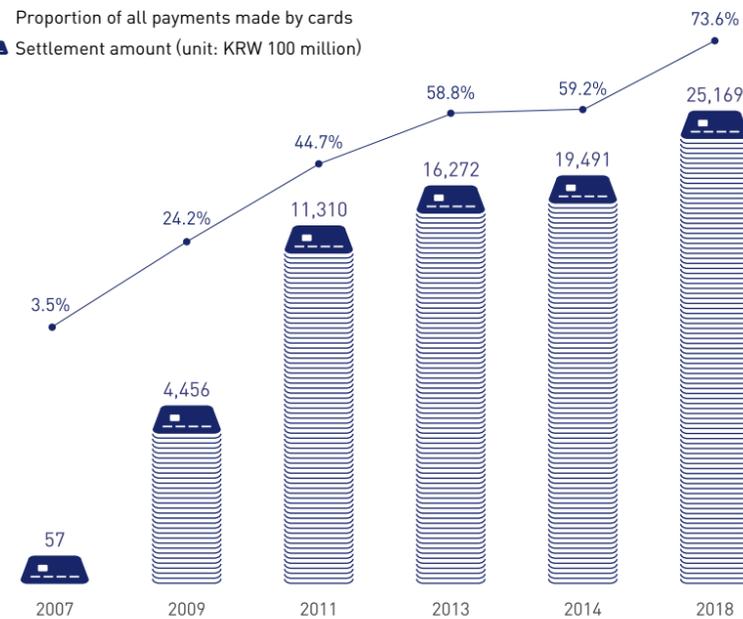
Increases transparency in taxi revenue



Makes payment more convenient

Status of taxi fare payment by cards

-  Proportion of all payments made by cards
-  Settlement amount (unit: KRW 100 million)

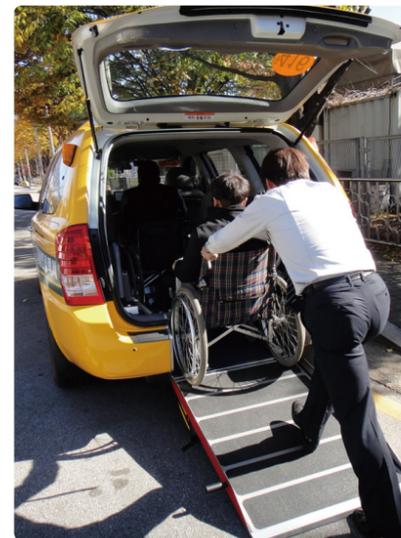


Various convenient taxi services

To offer greater convenience and safety for taxi passengers, taxi services have been improved significantly.

Introduction of GPS-based App Meter

The distance measurement based on GPS and app meter using OBD information in radio shadow areas are introduced to calculate more accurate taxi fares and integrate the latest ICT technology with taxis to provide various additional services.

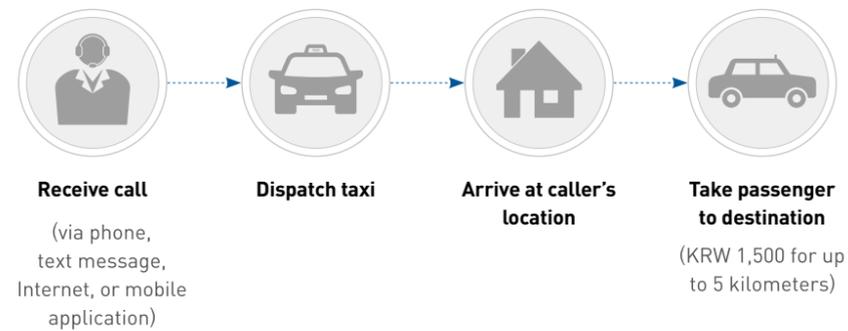


Introduction of QR Code Payment System

As ICT technologies develop, the payment system is also changed from physical card payment to mobile payment. Seoul applies the system that enables mobile QR code payment so that international tourists can use taxis in Seoul more safely and conveniently.

Call taxi for the disabled

Since 2003, call taxis for those with severe disabilities have been operating in Seoul, 12 surrounding cities, and Incheon International Airport.



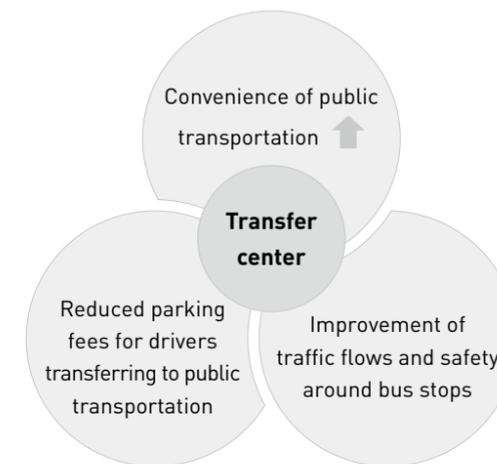
100 taxis (2003) ▶ 437 taxis (2018)
1,171,400 trips (2018)

Expansion of transportation infrastructure to promote public transportation and relieve parking difficulties

To reduce the number of cars entering the city center from the outskirts of the city, transfer centers serving broad areas have been installed in locations along the boundaries of the city.

Operation of transfer centers at key locations in Seoul

By integrating groups of multiple individual bus stops according to their destinations, the city has increased the convenience of its public transportation transfer system.



Jamsil Transfer Center, underground public transport terminal

An underground terminal-type transfer center, the first of its kind in the country, was built in 2016 in Jamsil, one of Seoul's key hubs of public transportation.



Bus transfer center

An LED media façade has been installed to enhance the nighttime visibility of the information displayed, including bus station locations, bus route directions, and bus numbers.



Relieving parking issue in city center through the concerted efforts of citizens, corporations, and organizations

Financial support is provided to ensure that each home has access to parking space, and the parking lots of private buildings are shared to reduce the parking difficulties in high-density residential areas.

Green Parking project

The Green Parking system, was implemented by Seoul Metropolitan Government in 2004 and expanded across the nation in 2006. To ensure that all vehicle owners in residential areas have access to parking space, doors and walls of houses have been removed to establish parking lots equipped with security cameras.



3,921 parking spaces (2004) ▶ **55,381** parking spaces (2018)



Before improvement



After improvement

Parking space sharing

To relieve the parking issue in high-density residential areas, the city is receiving applications from private building owners (schools, commercial facilities, etc.) who are willing to keep their parking lots open at night for public use. If selected, they can receive financial support for the installation of parking spaces and earn profit by collecting parking fees.



33 locations **1,305** parking spaces (2007) ▶ **561** locations **13,507** parking spaces (2017)

Real-time parking information system (Seoul Parking Information Application)

Information on the location of public and private parking lots in Seoul, parking fee, and operation details, as well as real-time information on the number of available parking spaces, can be found anytime, anywhere via the Internet and smartphone app. Seoul makes an effort to provide more real-time parking information based on the cooperation with private sector



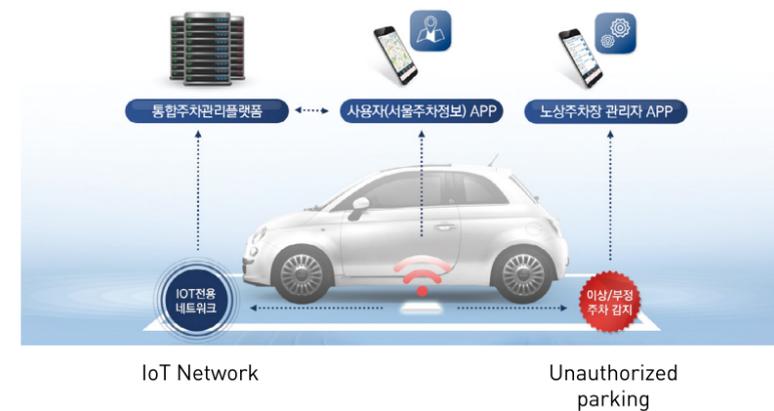
IoT-based Shared Parking Project

In 2019, Seoul implemented the shared parking project that allows citizens to find out available parking spaces in real time using IoT parking sensors. In collaboration with private parking-sharing operators and autonomous municipalities, 500 IoT-based shared parking spaces in residential parking lots.



Operation of Wallet-free Parking Lots

In 2019, the Seoul Metropolitan Government has launched the non-stop parking fee payment system for public parking lots utilizing IT technology. It is intended to provide citizens with more convenient way to automatically pay for the fare without stopping when entering and leaving the parking lot. Also, through the integrated parking management platform, the situation of parking lots is monitored in real time and that information is provided for the citizens.



Sustainable Transportation

As the number of privately owned vehicles decreases, the spaces for people in the city will become larger and safer. By promoting eco-friendly means of transportation such as walking, bicycles, and public transportation, Seoul Metropolitan Government is planning to create a sustainable transportation environment.



Demand Control



Walking



Bicycle



Safety & Order

Transportation demand management to reduce traffic congestion and vehicle emissions

With the aim of transforming Seoul into a metropolitan city that is convenient, safe, and livable, even for people who do not own cars, Seoul Metropolitan Government is taking firm measures to reduce the number of vehicles entering the downtown area and remove facilities that cause traffic congestion. Through "Nanum Car," a public car rental service in Seoul, people's perception of cars is changing from something that is owned to something that is shared.

Green Transportation Zone

To make Seoul a safe, convenient, pleasant, and people-centered city, even for people who do not own cars, Seoul Metropolitan Government designated 16.7 square kilometers of the city center as the nation's first "Green Transportation Promotion Area" in 2017. By restructuring road spaces in the downtown area, the city is curbing the demand for cars and making the city center more accessible to people who walk, ride bikes, and use public transportation. Seoul opens the future of sustainable transportation, focusing on reducing fine dust produced from cars by restricting Grade 5 emission vehicles from the center of Seoul and intensively managing traffic volume. In order to make Seoul a green transportation city, the Seoul Metropolitan Government plans to gradually expand the green transport zones in three urban areas including Gangnam and Yeouido as well as the area within the Seoul City Wall.



Green transportation spaces (walkways, etc.) **2 fold increase** ↑



Percent mode share to green transportation **75%**



Greenhouse emissions **40% reduction** ↓



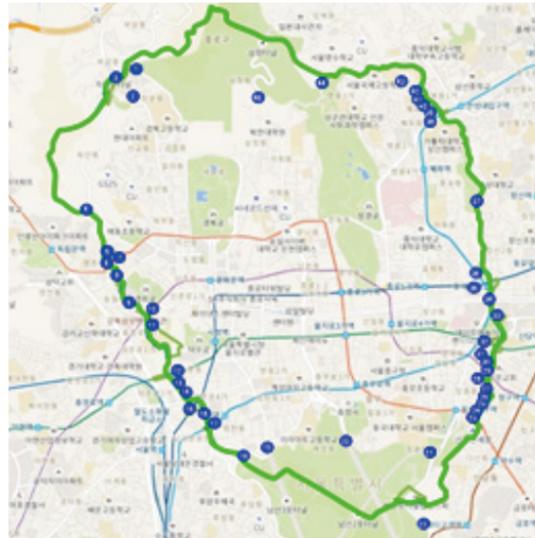
Car traffic volume **30% reduction** ↓



Banning Cars in Green Transportation Zone

In order to reduce both the number of vehicles entering the city center and the amount of fine dust produced by cars, Grade 5 emission vehicles, including old diesel vehicles, will be fined 250,000 won(once a day) if they enter the green transportation zones within the Seoul City Wall.

- **Target area:** Green Transportation Zone(within the Seoul City Wall)
- **Target vehicles:** Grade 5 emission vehicles entering the Green Transportation Zone
- **Period of crackdown:** all year around(including Saturdays, Sundays, and holidays)
- **Time of crackdown:** 6 a.m. – 9 p.m.
- **Method of crackdown:** Automatic recognition of license plates of cars entering one of the 45 boundary roads in the Green Transportation Zones
- **Penalty:** 250,000 won, once a day (500,000 won, the amount stated in the enforcement ordinance, can be added or deducted by 50%.)



● Crackdown point

Controlled Vehicle Operation Due to fine dust Pollution in its Peak season

The Seoul Metropolitan Government enforces the first national initiative to reduce fine dust by controlling the source of pollution in its peak season between Winter and Spring (December - March). During this period, aside from the normally enforced 'Green Transportation Zone' within the city center, level 5 emission vehicles will be prohibited to enter the city. The overall measures include controlled access to government facilities by license plate numbers, surcharges on municipal parking facilities to discourage vehicle operation during the period, and stringent management of industries known to produce air pollutants such as heating-related facilities.



Congestion charges to reduce number of vehicles entering CBD

Congestion charges are levied on vehicles entering the downtown area in order to reduce traffic congestion in the city center.

- **Charging points:** Namsan Tunnels Nos. 1 and 3
- **KRW 2,000 for a vehicle with 10 or fewer seats carrying two or fewer passengers**



Driving speed in city center
21.6 km/h (1996) ▶ 37.2 km/h (2018)



Imposition of traffic congestion charges on facilities and installations causing traffic

Charges are levied on large department stores, hotels, and other commercial facilities. Depending on the extent of their participation in the traffic volume reduction program, these charges may be reduced.

- **Traffic congestion charges:** KRW 700 to 1,200 per square meter (differential charges imposed based on occupancy, as of 2017)
- **List of companies participating in traffic demand control**
- **1,867 companies(2008) → 3,276 companies(2016)**
- **Status of participation in traffic volume reduction program**
- **3,759 programs(2008) → 5,322 programs(2016) – each company participated in 1.6 programs on average**

Participation by type of program



Commuter shuttle bus operation
270



Bicycle use
418



Alternating system for passenger cars (based on license plate number)
683



Paid parking
627



Flextime
165

From “Possession” to “Sharing” of Cars

Continuous increase in vehicles brings about various urban problems related to transport, such as traffic congestion, parking problems, energy problems, and environmental problems. In a bid to lay the foundation for solving transport problems by encouraging the citizens to change their mindset about the ownership and culture of the cars, the Seoul Metropolitan Government has implemented a car-sharing program, called “Nanum Car,” since 2013.



1.54 million members (3.18 million including members living in the metropolitan area), **2,272** operational places, **5,871** sharing cars in operation (as of November 2019)

“Nanum Car” You Can Use Like Your Own Car

You do not have to own a car. Just you can borrow a car anytime and anywhere you need. If you would like to use a Nanum Car, you can sign up for a membership at one of the Nanum Car operators (SOCAR, Green Car, Delivery Car, or People Car), and then make a reservation on a smartphone app. You can open the car door using the app at the reserved location. After use, you can return the car at the place where you picked it up.

- Easily book, pay, and return on your smartphone
- Rent a car as needed by every 10 minutes after at least 30 minutes of use
- Rent diverse types of car at an affordable price

Expansion of Street Rental Centers for Nanum Car & Eco-friendly Electric Cars in the Green Transport Zones

Rental centers for Nanum Car will be increased on the streets in the Green Transport Zones so that citizens use sharing cars more easily. Besides, all Nanum Cars in the Green Transport Zones will be changed into electric cars by 2023 to reduce fine dust and improve air pollution.

- All Nanum Cars in the Green Transport Zones to be changed into electric cars by 2023
- 50 rental centers for Nanum Car to be set up every 500 meters on average on the streets

Building a transportation environment that is safer and more convenient for pedestrians and mobility disadvantaged people

Seoul Metropolitan Government is expanding sidewalks for pedestrians and supplying bicycles as an eco-friendly mode of transportation, based on the belief that pedestrians should take priority over cars.

Putting the streets on a “diet” by widening sidewalks and narrowing streets

Creating an accessible, comfortable, and safe walking environment by reducing the space on roads for vehicles, widening sidewalks, and increasing the signal time at crosswalks



Urban Areas
In all, **27.9** km of **21** main streets will be overhauled by the year of 2025



Life zone
In all, **21,103** m of **52** streets in Seoul are overhauled from 2016 to 2019



Before



After

Increase safe spaces

Increase safe spaces for mobility disadvantaged people, such as children, seniors, and people with disabilities

- limit the speed over 30km/h,
- Install CCTV for speeding, signaling, and illegal parking
- Install ‘Yellow Carpet (special sign for children safety)’ in and around crosswalk
- Install bumps, guide signs, anti-slip packing, and median barriers

Safe areas for children



1,690 locations (2014)
▼
1,721 locations (2019.6)

Safe spaces for seniors and people with disabilities



73 locations (2014)
▼
142 locations (2019.6)



Introduction of diagonal crosswalks at intersections

Diagonal crosswalks allow pedestrians to cross the street at intersections in any direction, including diagonally, at the same time. “□” and “□” type crosswalks in dense urban areas have been changed to “□” type crosswalks. Also, the signal time has been extended to give mobility disadvantaged people enough time to cross the street safely.



Seoullo 7017, Korea’s first pedestrian-only street, was created by renovating an old highway overpass.

The highway was originally built to connect Manrijae-ro, in Mapo-gu, with Toegyero-ro, in Jung-gu, in 1970. Since then, however, it had fallen into disuse and disrepair. In 2017, an overpass on the highway was transformed into a 17-meter-high structure with 17 sidewalks, 645 round flowerpots, performance stages, and exhibition facilities. As the nation’s first pedestrian-only street, Seoullo 7017 is a safe, convenient, and comfortable space for citizens.



Before improvement



After improvement

Streets for people without transportation

Seoul operates pedestrian-only streets for people to walk freely and safely, which makes the streets for people to take a rest in an urban areas and provides high-level cultural contents.

Building a people-centered transportation environment that promotes movement with “two feet and two wheels”

Increasing spaces for pedestrian based on the recognition that the streets belong to the people



Pedestrian-only streets

135 locations

33,214m

Pedestrian only streets in Sejong-daero

- Location: Gwanghwamun 3-way street to Sejong-daero intersection (length: 550m)
- Time: 10:00 to 19:00 on every Sunday
- Event: ‘Rest in Gwanghwamun, the center of Seoul’

Pedestrian only streets in Deahak-ro

- Location: Hyehwa-rotary to Ihwa intersection (Length: 960m)
- Event: Localized Cultural Festivals with artists

Pedestrian only streets in Deoksugung-gil

- Location: Deahanmun to Circular fountain (Length: 310m)
- Time : 11:00 to 14:00 on weekdays, 10:00 to 18:00 on every Saturday
- Event: ‘Luncheon Street’, ‘Visiting Gym’

Pedestrian only streets in Cheonggyecheon

- Location: Cheonggye Square in Cheonggyecheon-ro to Samil bridge (Length: 880m)
- Time : 14:00 to 22:00 on every Saturday, 10:00 to 22:00 on holidays
- Event: ‘Night Ghost Market’, ‘Gwanghwamun Nanum Market’



Pleasant downtown pedestrian walkways in areas rich in history

In order to fully enjoy the 600-year-old capital city of Seoul, five walking trails (Length: 25.4km) in downtown are established by connecting the existing trails with attractions within the four main gates of old Seoul.

Five pedestrian walkways in the downtown area



- Yieum-gil** : (9.5km) Seoul Station – Gwangheemun Gate – Insa-dong – Heunginjimun Gate – Myeong-dong – Seoul Station
- Yetpunggyeong-gil** : (4.5km) Waryong Park – Unhyeongung Palace – Toegye-ro 2-ga Intersection
- Neulcheongchun-gil** : (3.8km) Hyehwamun Gate – Daehak-ro – Dongguk University Entrance
- Jongnounjong-gil** : (4.0km) Seodaemun Station – Jongno – Dongdaemun Gate
- Cheonggyemul-gil** : (3.6km) Former NTS annex building – Cheonggyecheon-ro – DDP



Ttareungyi : public bike rental service promoting riding bikes in Seoul

Since its launch in 2015, Ttareungyi, Seoul's public bike rental service, has been expanded to cover the entire city. Thanks to the service's simplified rental procedure, foreigners are able to use the service without going through the member registration process. Seoul Public Bicycle "Ttareungyi" can be used anywhere and at any time at an affordable price using a smartphone app through its 24-hour unmanned rental system. Since it was launched four years ago, the number of users has accumulated to 30 million, meaning that each one citizen uses it more than three times for the four years.

Rental Fee one-day ticket

1hr - KRW 1,000 | 2hrs - KRW 2,000 | over 2hrs KRW 200 every 5 min.

Status of Operation

as of Nov. 2019



Bicycle
25,000
rental centers
1,540
(in entire Seoul)

Objective of 2019



Bicycle
30,000
rental centers
2,140



- 1** 2015 (5 major areas, 2,000 bicycles)
- 2** 2016 (11 autonomous districts, 5,600 bicycles)
- 3** 2018 (25 autonomous districts, 20,000 bicycles)



Status of Seoul Public Bicycle Use

1.3 times increase from 2018, 1.6 times increase in the number of members, Average Number of Use Per Day

Category	2015	2016	2017	2018	Oct. 2019 (from 2018)
Bicycle (cumulative)	2,000	5,600	20,000	20,000	25,000 (1.3 times)
Rental Center (cumulative)	150	450	1,290	1,540	1,540 (1.0 times)
No. of Use (daily average)	1,093	4,403	13,784	27,566	54,788 (2 times)

Improving environment for bike riding, eco-friendly mode of transportation

To promote bike riding and its safety, festivals and forums are being held and certifications and customized education provided



Bike paths
482 km (2001) ▶ 916 km (2018)
Ratio of length of bike paths to total length of roads
6.1% (2001) ▶ 11.1% (2018)



Bike racks
5,237 locations 146,671 bikes

Bicycle Road

Total: 562 Routes, 916.0km (as of Dec. 2018)

Category	Extension of Ordinary Road(km)	Extension of Bicycle Road(km)	Rates of Bicycle Roads over Ordinary Roads(%)
2016. 12	8,240.6	868.7	10.5%
2017. 12	8,243.1	888.7	10.8%
2018. 12	8,245.78	916.0	11.1%

	Total	Bicycle Roads	Bicycle Lines	Bicycle Preferred Roads	Combined Roads (Separate type)	Combined Roads (Non-Separate type)
Extension(km)	916.0	138.8	55.0	110.6	410.4	201.2
No. of Routes	562	95	48	97	186	136

Bicycle Parking Facilities

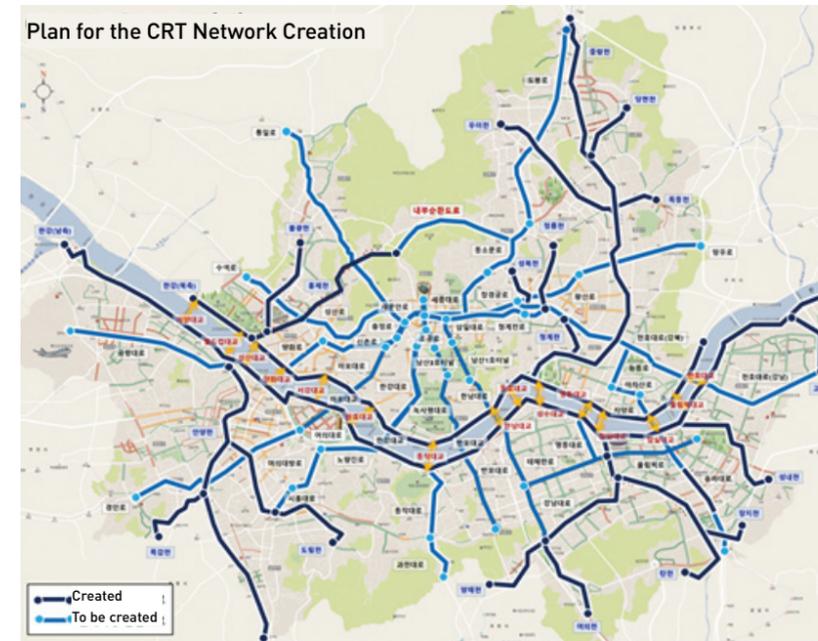
(as of Dec. 2018)

Category	Total	Bicycle Racks	Bicycle Parking Lots	Bicycle Parking Box
No. of Places	5,237	5,201	23	13
No. of Racks	146,671	140,602	5,770	299

“Bicycle Revolution” in 2020

Seoul will start the “Bicycle Revolution” in 2020 when the bicycle road network linking Cheonggyecheon-ro and downtown Seoul to the Hangang(Han River) will be established. Seoul creates bicycle-only roads(CRT, Cycle Rapid Transportation) for citizens to move by bicycle both safely and fast on the streets of Seoul without conflict with other means of transportation.

※ When citizens ride a bicycle on the CRT, ① connectivity, ② safety, and ③ independency are guaranteed.



1st Stage: Cheonggyecheon-ro, Hangang-daero (2020)



Creation of Culture of Safe Bicycle Use

To promote bike riding and its safety, festivals and forums are being held and certifications and customized education provided

Seoul Bicycle Festival and forum

By hosting bicycle festivals and forums in which citizens and domestic and international bike specialists participate, Seoul Metropolitan Government is working to change citizens' perceptions of bike riding and promote its safety.



Bike riding tests and licenses for kids

To promote safety when riding bikes, the Seoul mayor is issuing bike riding licenses for children through a multiple-choice exam and real-world cycling test (four courses and 10 riding courses) to ensure that they have the skills they need to cycle safely.



Customized bicycle education

The city provides bike safety education tailored to adults, students, and children, as well as weekend sessions for office workers and special training for people with hearing impairments. A bicycle maintenance class and bike instructor training course are also offered.



Seoul Transportation System, the best in the world and the safest in Korea

Seoul's traffic accident fatality rate (per 100,000 people) is the lowest among all cities and provinces of the nation, with its road traffic death rate falling as low as 0.8 deaths per 10,000 vehicles.



Least traffic accident fatalities in the nation **3.1** deaths per 100,000 people (2018)

Number of road traffic deaths per 10,000 vehicles **4.2** people (1994)

▶ **0.8** people (2018)

Speed limit: 50/30

To prevent pedestrian traffic accidents, the speed limit in Seoul was lowered to 50km/h for arterial roads and 30km/h for side roads, beginning with key locations in the city.



Lanes marked in pink at intersections

At non-standard intersections and crossroads, where the directions drivers can follow are unclear, lanes are now marked in pink to ensure that all drivers including novice ones are able to navigate safely.

• Accident risk in streets has decreased by **32%** of accident risk on average by installing driving lines for recent 3 years from 2016 to 2018



"Yellow Carpets" installed to increase safety of children crossing roads on their way to and from school

The walls and ground at intersections near schools have been painted in yellow and lamps installed that turn on when people pass by at night in order to make children walking to school more visible to drivers.

• Increase in visibility with installation of yellow carpets :

34% ▶ **85~95%** increase ↑

• Yellow carpets have been installed in **107** locations in Seoul (as of end of 2016).



Creating a safe and orderly traffic environment together with citizens

Penalties for violations of parking regulations and bike lanes are now being enforced to ensure safety and order on the streets of Seoul. Thanks to cutting-edge IT technology, citizens are also participating in and monitoring the status of this effort.

Seoul Smart Reporting Mobile Application

Citizens can send reports by taking pictures of vehicles parked illegally at crossroads, intersections, or sidewalks and vehicles violating bus lanes.



Monitoring system

Vehicle owners can check any penalties applied to their vehicles and make statements or file objections over the Internet.



Bicycle patrol squad

A 16-member bicycle patrol squad actively cracks down on pedestrians violating bike lanes and drivers violating traffic laws on heavily congested roads.

Team dedicated to reducing transportation inconveniences for foreign tourists

A team of 13 members from multicultural families or foreign language speakers monitor and work to reduce transportation inconveniences for foreign travelers.



Cutting - edge smart transportation technology

Seoul TOPIS (Seoul Transport Operation and Information Service) is a smart city management hub that conducts round-the-clock monitoring of emergency situations, including traffic accidents, disasters, and wars.

The implementation of the smart transportation card system and Metropolitan Unity Fare (MUF) system has increased citizens' use of the public transit system.



Seoul TOPIS (ITS)



Smart Transportation Card



Transfer Discount System



Future Transportation Innovation

Seoul TOPIS (Seoul Transport Operation and Information Service)

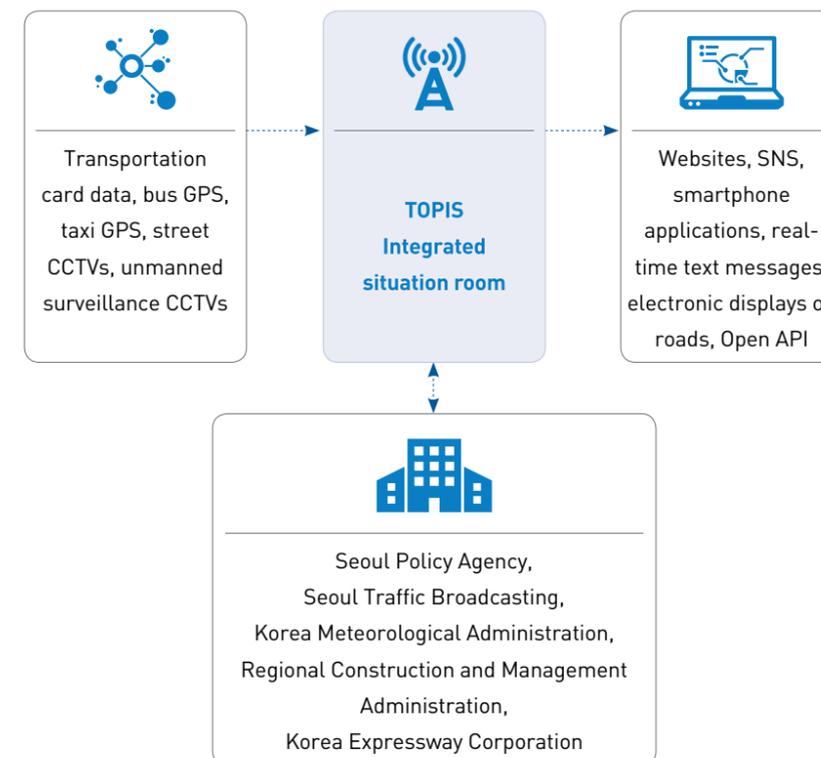
Seoul TOPIS is the Intelligent Transportation System(ITS) brand of Seoul Metropolitan Government. The first service of its kind in Korea, it was introduced in 1998 to address urban transportation problems.

TOPIS 3.0, a city management hub drawing worldwide attention

Launched in 2013, TOPIS 3.0 is a smart metropolitan city management hub that manages transportation, disasters, and other security-related events in an integrated manner. It is an advanced transportation information system that allows prompt judgements and responses to be made in times of emergency and predicts and prevents transportation problems before they occur through big data analysis. TOPIS 3.0 has gained significant recognition overseas, leading to its export to Azerbaijan and Mongolia and drawing over 1,500 visitors, including representatives of foreign governments and transportation specialists, to Korea on an annual basis.



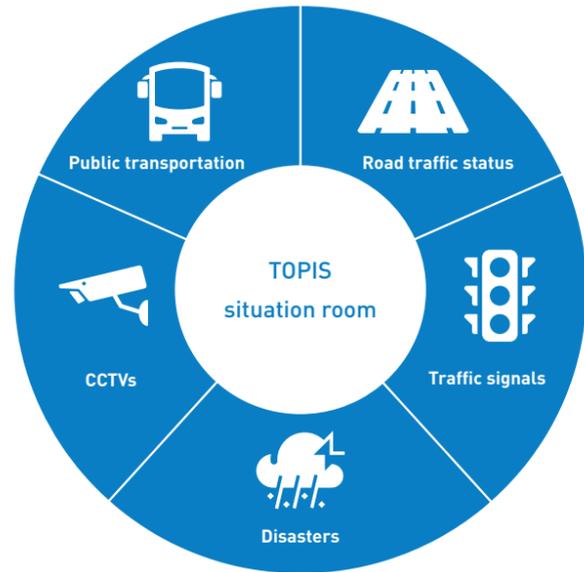
Information flow chart



Functions of TOPIS

Round-the-clock integrated management of transportation, disasters, and security situations

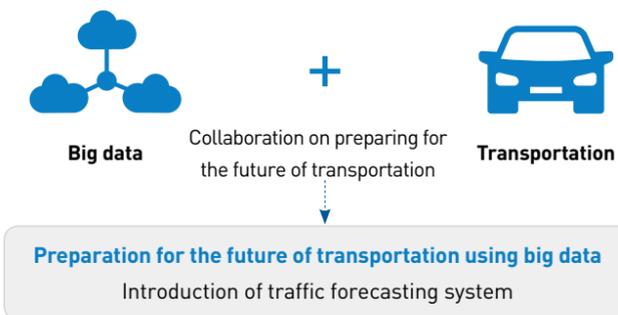
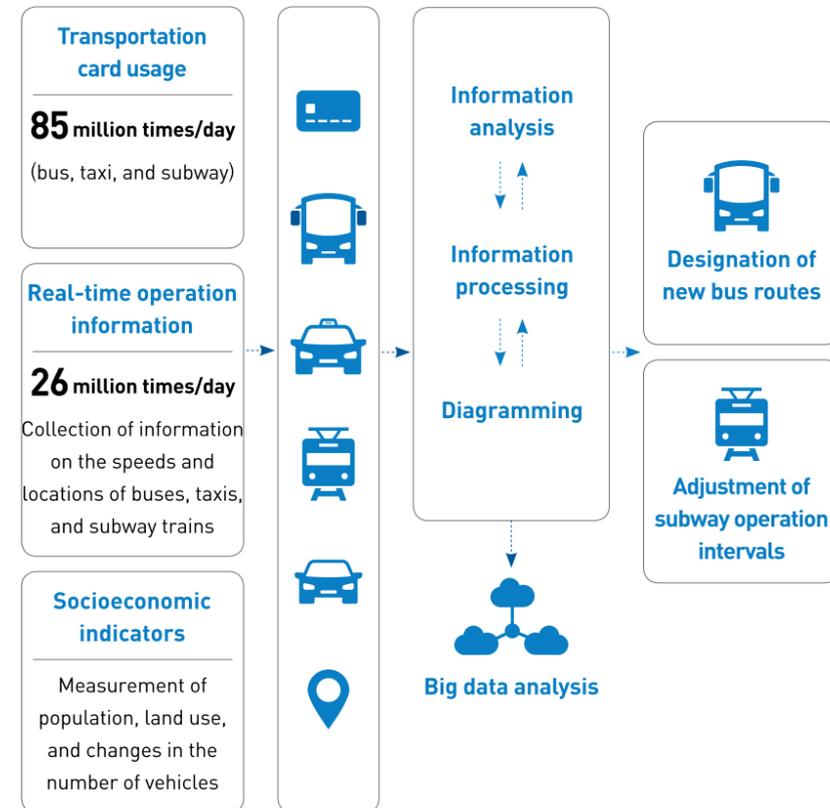
Using cutting-edge equipment and devices, TOPIS monitors indicators related to Seoul's transportation system, disasters, and security situations on a 24-hour basis throughout the year and allows prompt responses, thereby minimizing any potential damages.



Establishment of transportation policy based on big data analysis

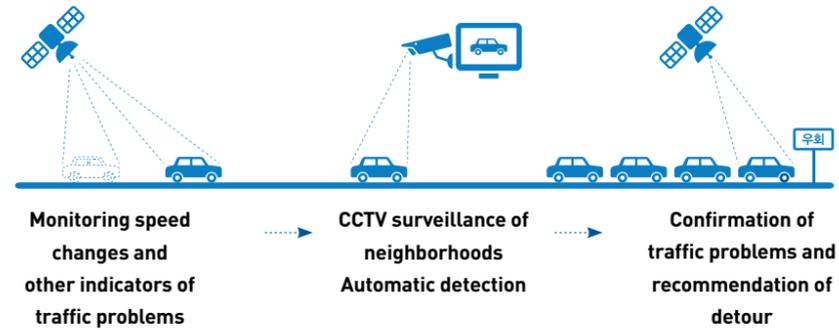
Big data analysis supports the development of more scientific operation plans for road traffic and public transportation and is used to find solutions for areas with high traffic congestion and create or adjust public transportation routes.

Establishment and assessment of transportation plans using big data



Real-time road traffic control

With the establishment of a transportation information collection system that spans all roads in Seoul, it is now possible to provide road traffic information on a real-time basis. After automatically identifying and analyzing traffic problems, such as speed changes or road congestion, the system recommends a detour so that the user can avoid traffic jams.

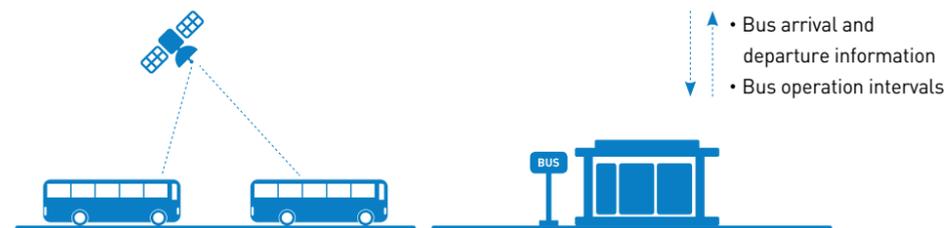
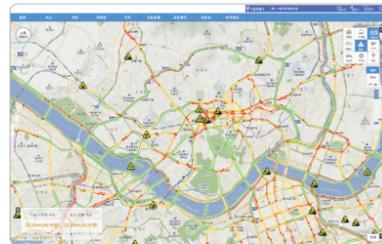
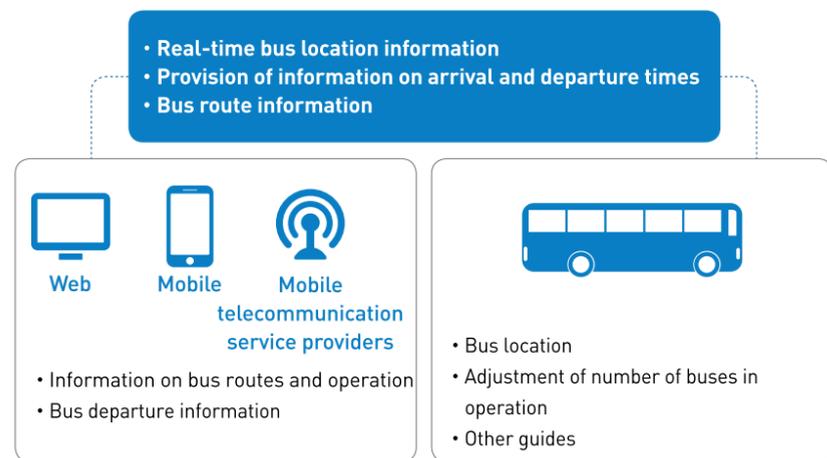


Real-time bus operation management

Based on data collected from GPS-equipped buses and transportation cards, bus operation intervals and detours are planned and managed. Through the Bus Information Terminals (BITS) installed at bus stops and available via websites or smartphone applications, passengers can obtain information on the location of a specific bus as well as its estimated arrival time and seating availability. road congestion, the system recommends a detour so that the user can avoid traffic jams.



TOPIS

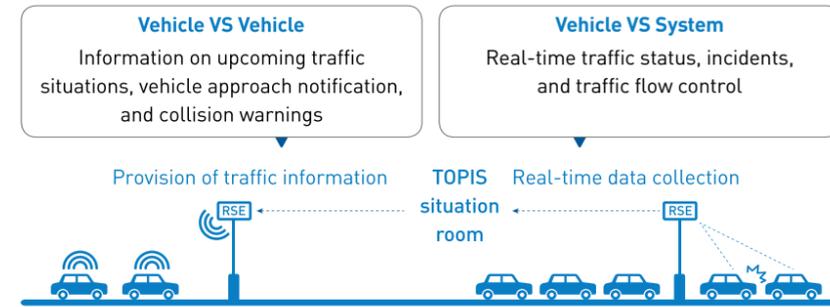


Cutting-edge, unmanned, traffic violation monitoring system

Unmanned CCTVs detect vehicles violating bus lanes or bike lanes or vehicles parked illegally and issues notices regarding fines through an automated process.

Transportation forecasting using big data

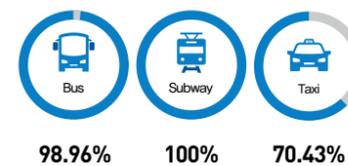
Based on an analysis of big data on traffic speeds and volumes over a 10-year period, future road traffic situations are being predicted and announced. To plan optimal routes and departure times, citizens can refer to the traffic forecasts posted on the TOPIS website or mobile application. Private companies are also using such data to create maps and navigation services.



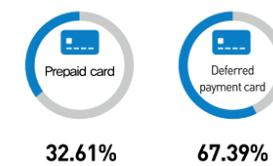
Smart transportation card, the cornerstone of a cutting-edge, IT-based transportation system

Currently, transportation cards are being used 13.90 million times a day to pay KRW 225.2 billion in transportation fares, and cities worldwide are showing strong interest in Seoul's experience with operating its smart transportation card system and related technology.

Transportation card usage by mode of transportation(2018)



Transportation card usage by card type(2018)



Number of transactions and amount of payment per day(2018)

Daily average transactions
 Seoul : **12 million, KRW 11.2 billion**
 Metropolitan Area : **18 million, KRW 16.7 billion**



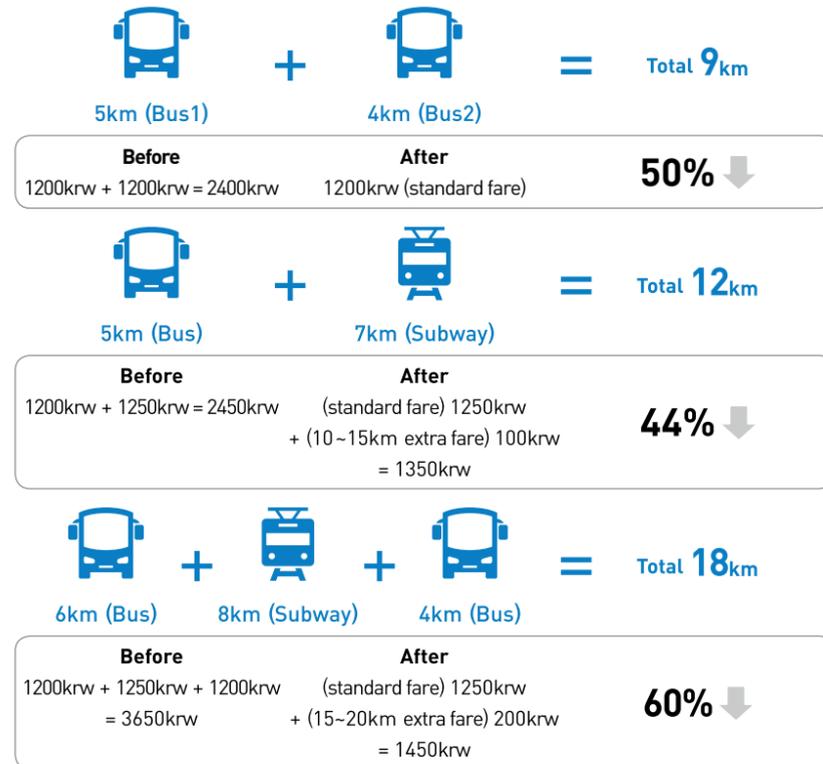
Metropolitan Unity Fare, increasing the convenience and efficiency of transportation in the Greater Seoul Area

The Metropolitan Unity Fare system allows passengers with transportation cards to pay the basic fare only once and extra charges depending on distance thereafter. The system was launched in Seoul in 2004 and was extended to Gyeonggi Province and Incheon Metropolitan City in 2009, benefitting 25 million people in the Greater Seoul Area.

Comparison of fare systems

	Transportation Card		Cash
	Individual fare system	Metropolitan Unity Fare (since July 2004)	
Adults	Pay fares per mode of transportation	Basic fare: up to 10km (free transfers) Extra charge: KRW 100 for every 5km traveled after initial 10km	Not applied
Youths	20% discount on adult fare		
Children	50% discount on adult fare		

Before and After



* Up to 4 consecutive transfers within 30 minutes are free (from 9 pm to 7 am next day, within 1 hour), and must be validated by the use of transportation cards on each getting on/off.

Diverse fare discounts

To reduce the burden of transportation costs on citizens and promote public transportation, various fare discounts are offered.

Early morning reduced fares

In 2015, Seoul introduced the first early morning discounts in the nation's public transportation system.



Prior to 6:30 in the morning, the fare for the first mode of transportation is discounted by **20% ↓**

Subway commuter pass



Offers up to 60 trips in 30 days, allowing users to save **KRW 240,000** annually ↓

No fare for senior citizens and people with disabilities



Senior Citizen, the Disabled a men a merit issue special transportation card for fee transport use

Youth discount



Discounting transport fee for middle and high school student

Revolution of Future Transportation: Autonomous, Connected Cars

With vehicles and V2X(Vehicle to Everything) connected to 5G and C-ITS, Seoul will commercialize the world's leading autonomous mobility by 2025 through future mobility innovations based on self-driving and connected cars.

Sangam Self-driving Test Bed, 1st Place for Future Transportation Innovation

Characteristics

- The World's Only 5G Converged Self-driving Test Bed on the Non-Downtown Road

Scale

- 1.9km², 19.7km in total

Supports all V2X communications, including the world's first 5G network and WAVE Establishes a total of 70 types of C-ITS infrastructure (cooperation in self-driving) including traffic signals and blind spot monitoring (Test bed for self-driving that opens 24 hours for free to private enterprises) Specialized control center, etc.

Demonstrates self-driving mobility (established cooperation with 25 self-driving companies/schools/organizations)

Self-driving shuttle bus (Nov. 2019)



Operating routes
3.3km
(inside the DMC in Sangam-dong)

- Digital Media City Station - Sangam World Cup Park 6danji Apt. Complex
- Digital Media City Station (Circuit)



Number of operations
3 in total
(collaboration with SKT, KT, and MDE)



Frequency of operations
24 times, 3 days a week

Self-driving-based Mobility

- To demonstrate self-driving sharing/ valet parking mobility services (collaboration with Yonsei Univ. & Hanyang Univ.)
- e.g. Self-driving car-sharing service using a mobile device To demonstrate Robot-delivery mobility (unmanned solution)

The World's Best Self-Driving Mobility Platform City to be established by 2024

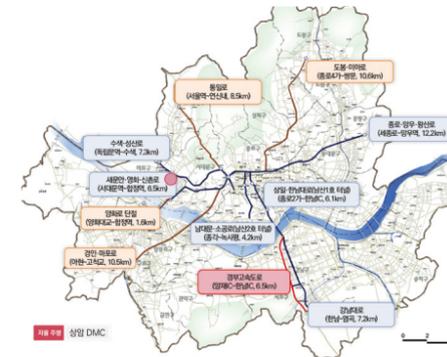


To demonstrate connected-based C-ITS centering on safe transport

To create state-of-the-art roads on the 121.4km-long median bus-only lanes To introduce 5G-connected cars to a total of 1,700 buses and taxis for the first time in the world

Create C-ITS-based state-of-the-art roads (121.4km)

- A total of 1,083 types of C-ITS infrastructure, including traffic signals and blind spot monitoring
- 306 locations where traffic signals on all intersections open (C-VIB boards)
- 332 locations for deep learning-based risk monitoring at crossroads and pedestrian monitoring in blind spots
- 395 locations for bus safety systems, such as overtaking vehicles in the median bus lanes and occupancy status on the stopping lane
- 4 locations for traffic condition alerts on dangerous curved roads, 46 ones for monitoring of unexpected situations inside the tunnels



Supply of the world's first 5G connected car's "All-In-One" terminal

Bus operation management + transportation card + communication between vehicles (V2X) + transport safety sensor (ADAS) + 5G integration

+
=

City Bus 1,600 + **Taxi 100** = **City Bus + Taxi 1,700 in total**

A total of 30 transport safety services are provided

- Risk alert services for forward collision, lane departure, jaywalking pedestrians
- Services for recognition of any risk on the roads such as potholes or construction, and detour guidance service
- Ultra-low-latency services that provide various risk conditions in 0.1 seconds
- ※ Beyond vehicles and vehicles (V2X), connected services that allow to mutually exchange risk situations between vehicles and pedestrians (V2P) and vehicles and bicycles (V2B)



SEOUL
TRANSPORTATION

SEOUL TRANS PORTA TION

사람을 먼저 생각하는
안전하고 편리한 서울 교통

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