

Seoul Urban Solutions

Towards co-prosperity of world cities
through transferring urban development solutions
the city of Seoul has built



Seoul's excellent urban policies that made Seoul great



- Public Transportation
- Waste Management
- Water Management
- Housing Solution
- Recovering Nature's Strength
- Metropolitan Rapid Transit
- e-Government
- Fire and Disaster Response

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Why Seoul?

I Overview of Seoul

Geographical Features

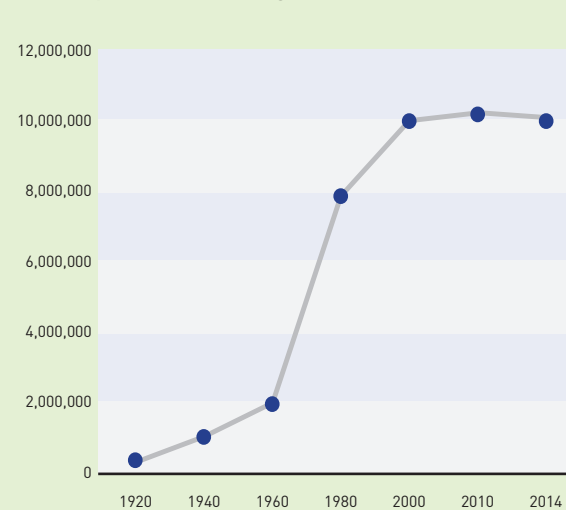
Source: stat.seoul.go.kr



Intensive Economic Growth Rising Income (GRDP)



Population Change



I Seoul's Unique Urban Development Experience

Seoul in 1950's



Seoul in 2000's



The city of Seoul had grown rapidly from the ashes in the aftermaths of the Korean War in the 1950s. Six decades after, Seoul continues to evolve into a livable, high-tech yet green and smart metropolis: Seoul is now a model city full of urban development best practices. Learnings accumulated from Seoul's trial-and-error and know-how from years of overcoming urban challenges are the city's assets.

Seoul rose to a world-class city with the development support of global community. By sharing our growth experience, Seoul can provide support in improving urban livelihood for other cities to grow into smart, livable, environmentally and economically sustainable urban domain.

Seoul Metropolitan Government (SMG) launched Seoul Urban Solutions Agency (SUSA) in 2015 to serve this purpose. Legally a part of SH Corporation, a public company fully financed by SMG, SUSA is able to collaborate with the public sector, private corporations and financial institutions. As a dedicated entity, SUSA will actively support to provide urban solutions to challenges that cities face in creating a prosperous and healthy environment.

I Growth of the City

1950	1960	1970	1980	1990	2000	2010
Aftermath of the Korean War: Destruction of Seoul's urban foundation and identity	Rapid post-war reconstruction to establish urban foundation	Expansion of city center to accommodate economic and population growth	Han river rejuvenation in preparation for global events – Seoul 1988 Olympics	Large scale urban regeneration project and new town developments	Installations of physical features to facilitate enhanced quality of life for Seoulites	Transforming to a city with a historical heritage, culture and identity

Expansion of Seoul Administrative District



I Key Features of Seoul's Urban Planning

High-density and compact

Transit-oriented development

Segmented planning:
- Regional planning
- Neighborhood area

Citizen participatory planning

Purpose-focused new town developments

Continued urban renewal
- Retrofitting

I The Next 100 Years

Challenges

- Side-effects from rapid growths
- Stagnant economic growth
- Reverse pyramid population growth
- Increase in youth unemployment



Public Transportation

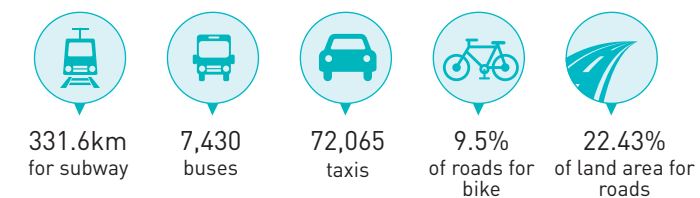
Seoul public transportation has improved remarkably since 2004 when the city reorganized its entire public transportation system. It is not widely regarded as one of the most enviable public transport services in the world in terms of convenience, safety, punctuality, and economic efficiency. An aggregate total of 4 billion citizens use the public transportation each year, making it the most widely used means of transportation in Korea.

01 Overview of Transportation

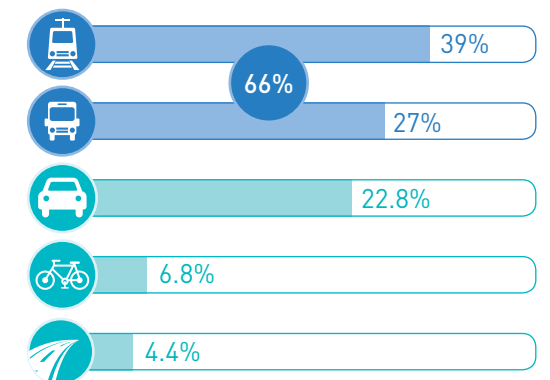
Seoul's Public Transportation at a Glance

In 2004, the Seoul Metropolitan Government (SMG) 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.

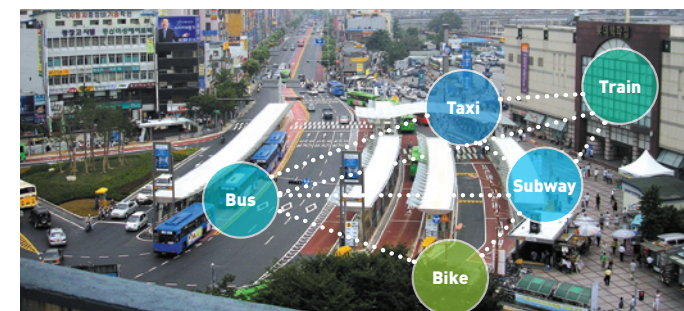
Public transportations and roads in Seoul



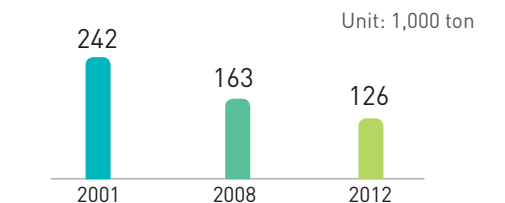
Mode share



Seamless Integration: Transfer Center connects various transportations in one place



Amount of mobile source emissions



02 Introduction of 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 115.3 km (as of 2014). SMG will expand it to 210.5 km in the coming years.

Reform directions

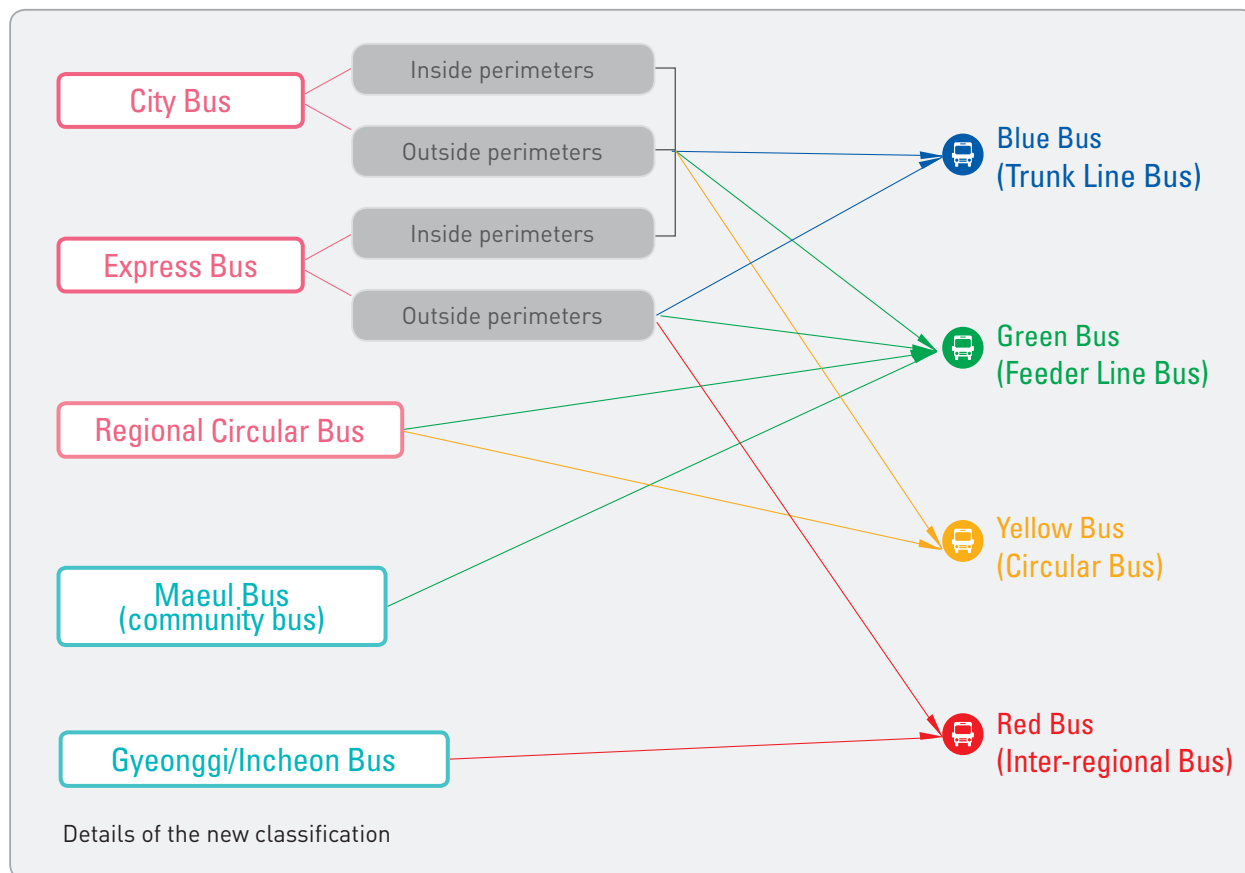
Focus on punctuality, faster service, and maximum convenience for the citizens. The exclusive median bus lane system also means that the buses are given the proprietary on the roads.



03 Reorganization of the Bus Route System

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.



04 Introduction of a Quasi-public Bus Operation System

Before and after the reforms

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

05 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 and promoted public transportation utilization.



Tmoney 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.

06 Improvements in Bus Fleets

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 over-the-road buses for physically-challenged passengers.



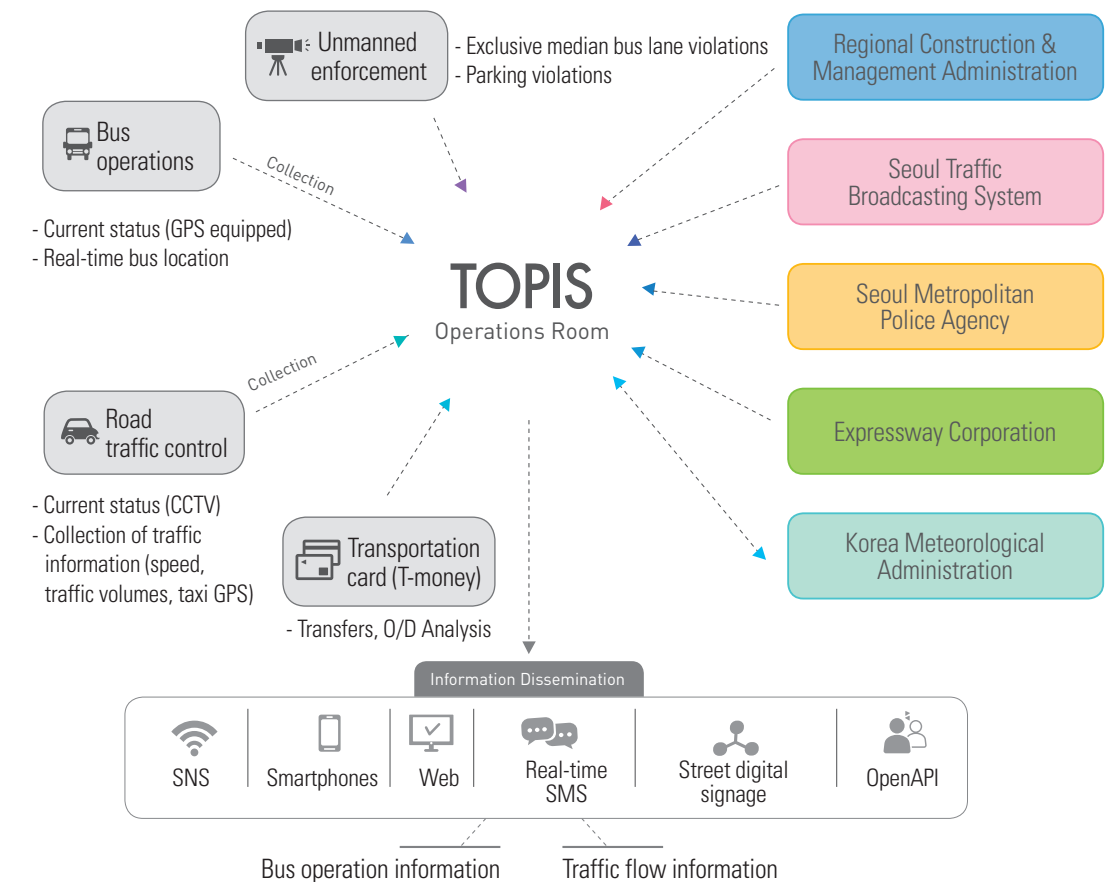
07 TOPIS - Integrated Transport System for Efficient Management

TOPIS* is SMG'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. It functions as a comprehensive control and management center to mediate Seoul's traffic situation.

Main Functions of TOPIS

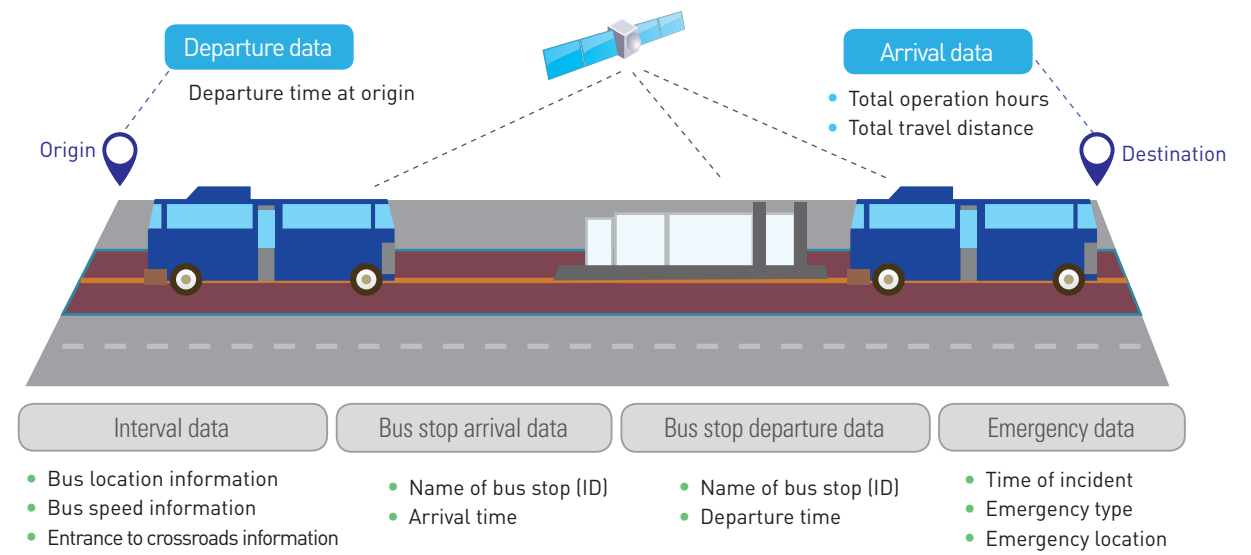
- | | |
|---|--|
| <p>01 Manage real-time traffic flow and supply information on traffic congestion
Monitor traffic situations and promptly supply congestion information</p> | <p>02 Plan and support bus operation
Provide support for bus operation planning and operation of fleets and improve traffic flow</p> |
| <p>03 Manage bus operation in real-time
Supply information on bus operations / offer bus detour and assignment orders</p> | <p>04 Operate vehicle enforcement systems
Monitors and fines traffic violation such as illegal parking and illegal use of bus-exclusive lanes</p> |

* Transport Operation and Information Service



Bus Management System (BMS)

BMS is designed to identify optimal bus operation intervals and enhance punctuality of bus operations based on GPS and wireless communications.



Bus Information System (BIS)

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

CCTV Systems for Unmanned Enforcement

SMG installed remote-controllable CCTVs for illegal parking and violation of exclusive median bus lanes enforcement.



CCTVs installed on buses enables moving law enforcement on roads.

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)

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 on Asia-Pacific Best Policy Award

The International Association of Public Transport (UITP)

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



2011
UITP TPx2 Regional Award in Innovative Technology Field

International Association of Public Transport (UITP)



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

- 2006** Beijing, China | Establishment of Seoul Smart Card System(Cashless Transit Ticketing System)
- 2007** Almaty Kazakhstan | Establishment of Seoul Smart Card System(Cashless Transit Ticketing System)
- 2008** 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)
- 2010** Kuala Lumpur, Malaysia | Establishment of Seoul Smart Card System(Cashless Transit Ticketing System)
- 2011** Bogota, Colombia | Establishment of Bus Management&Information System, Seoul Smart Card System(Cashless Transit Ticketing System)
- 2013** Bangkok, Thailand | Consulting of Seoul Smart Card System(Cashless Transit Ticketing System)

Waste Management Policy

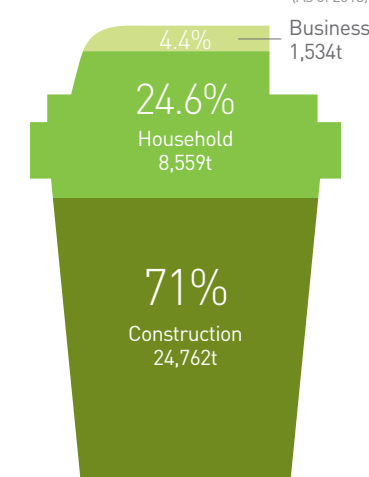
To meet the growing demand for a better waste disposal system, the SMG has committed to providing innovative cleaning services and coming up with a waste disposal system which can satisfy sanitation workers and the general public by 2020 the SMG is dedicated to managing waste to reach further a 71% recycling rate and 30% reduction in food waste, and to minimize landfill waste .

01 Principles of Waste Management 'Minimizing Landfill Waste, Maximizing Recycling'

The city government began to share the responsibilities of waste disposal with the citizens rather than assuming the full responsibilities. Through a series of policies, SMG encouraged its citizens to participate in a collective effort to reduce waste towards the vision of making Seoul the "World's cleanest and best resource-recirculation city". Further, the government is working to strengthen financial investment in the facilitation and waste processing capability.

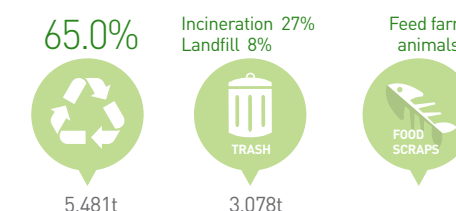
Status of Waste Management in Seoul

Amount of Waste Generated in Seoul
(As of 2013)

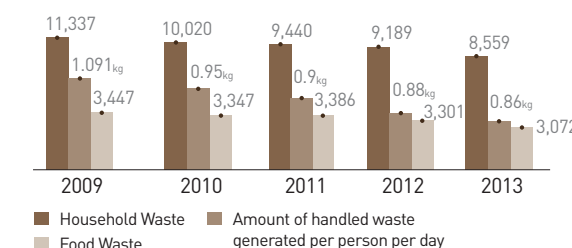


Daily Generated Waste
Total 34,855 t(100%)

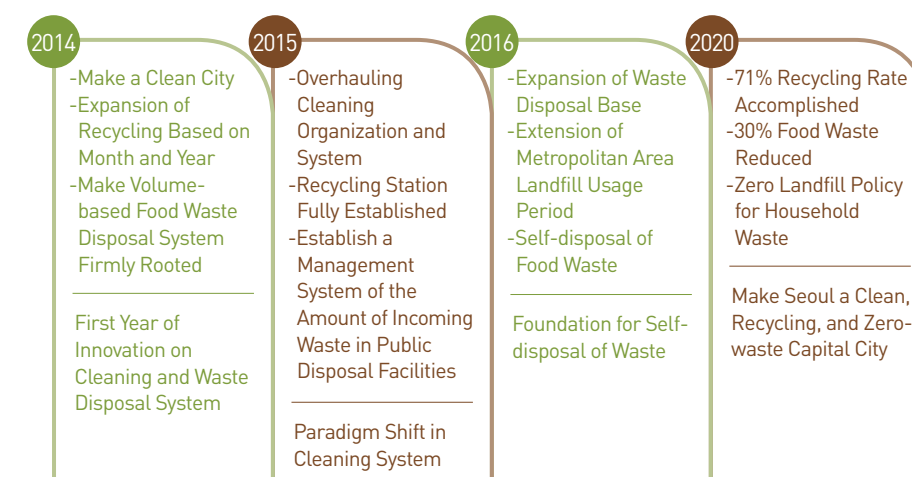
Amount of Household Waste Disposed of in Seoul



Amount of Household Waste Generated (Unit: t/day)



Seoul's 4 Stages of Waste Policy

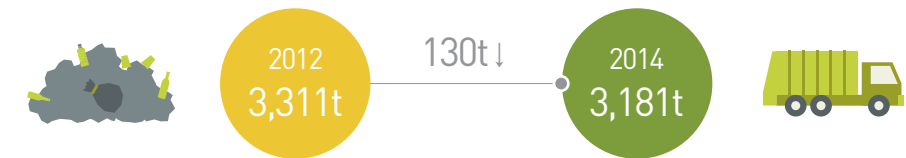


02 Efforts to Reduce Food Waste

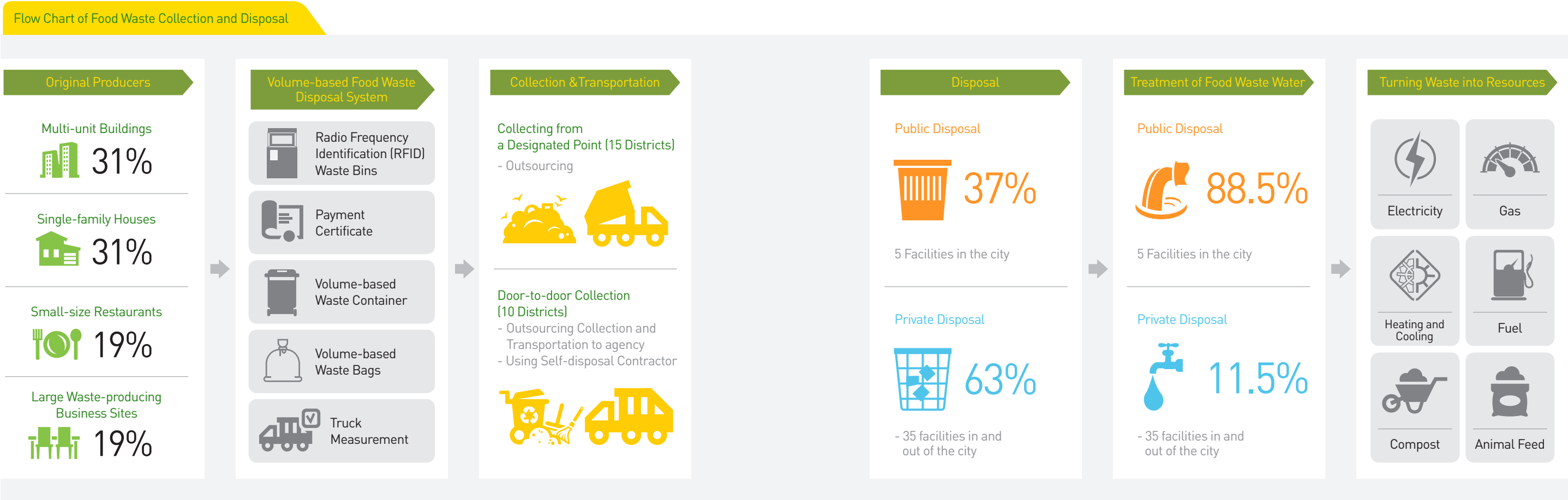
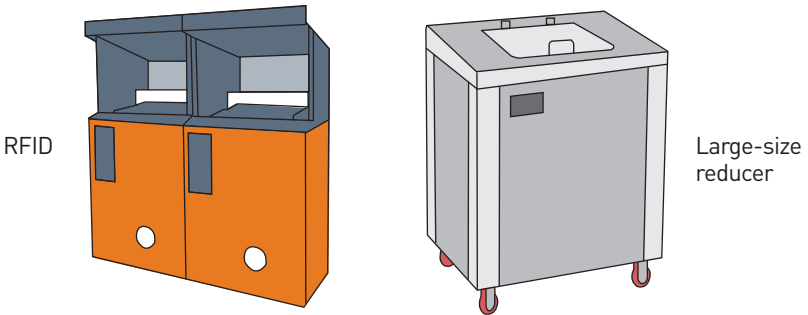
Food Waste Generated on a Daily Basis

Since 2013 the city government has fully established the "volume-based food waste disposal system" to cut huge cost related to strengthening regulations on food waste disposal and waste disposal. "Volume - based food waste disposal system" is a mechanism the charges citizens the cost of disposing food waste based on the volume of the waste. therefore the volume of waste is reassured unitizing different schemes most suitable for dwelling area and type. Food waste is dried and processed to feed animals and food waste water is treated in waste water treatment facilities.

Food Waste Generated on a Daily Basis



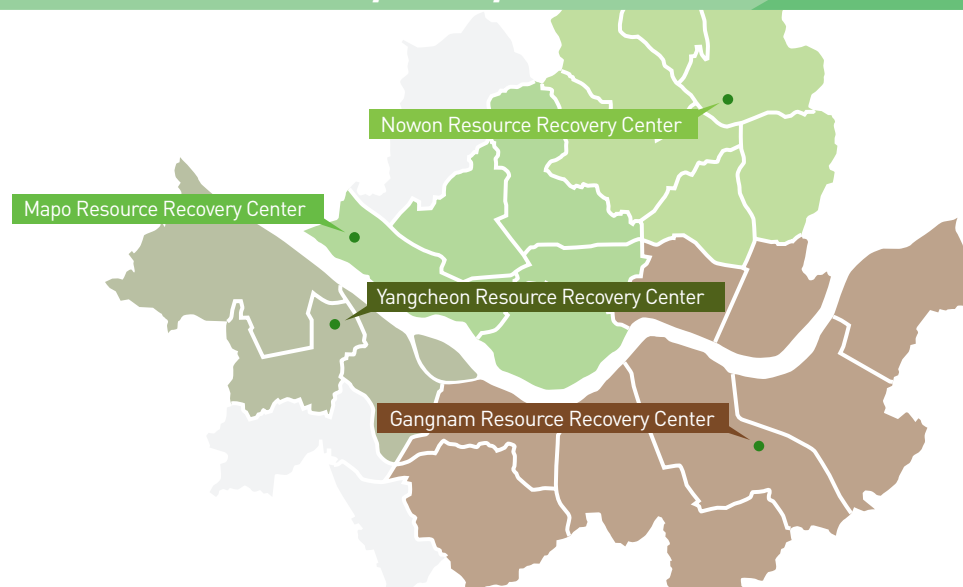
There is increasing interest in large-size reducers and Radio Frequency Identification (RFID) volume-based food waste disposal systems which can cut down on waste by 80% and 30% respectively thanks to the full adoption of the volume-based food waste disposal system. Seoul has been working on achieving the goal of applying the RFID system to 70% of multi-unit buildings in the city. The government encourages each district to purchase and install a large-size reducer with proper performance at affordable prices by setting up quality guidelines for the reducer, as the equipment boasts great performance in waste reduction, offsetting its high price tag.



03 Stable and Clean Operation of Resource Recovery Facilities

Seoul opened resource recovery facilities from 1996 as part of the efforts to ensure hygiene in household waste disposal while addressing the problem of insufficient landfills. Today, 4 facilities have the capacity to handle as much as 2,850 tons of waste every day. High-temperature waste heat generated in the process of incineration can be leveraged as energy source to meet the demand of cooling and heating of 518,000 nearby households (as of 2013).

Location and Status of Resource Recovery Facility



Category	Gangnam	Nowon	Mapo	Yangcheon
Capacity	900 t/day (300 t/day × 3 units)	800 t/day (400 t/day × 2 units)	750 t/day (250 t/day × 3 units)	400 t/day (200 t/day × 2 units)
Completion Date	December 2001	January 1997	May 2005	February 1996
Site Area(m ²)	63,818	46,307	58,435	14,627
Construction Cost (KRW million)	101,080	74,279	166,547	31,815
Waste Disposed(t)	266,712	195,000	203,925	108,206
Waste Incinerated(t)	266,074	199,254	204,245	106,628
Electricity Generated(kW)	40,189	29,008	35,431,253	12,995,400
Electricity Sold(kW)	Uses all electricity generated	Uses all electricity generated	12,584,012	4,427,964

* As of 2013, Yangcheon and Mapo facilities are generating electricity by cogeneration, Nowon and Mapo facilities by solar photovoltaic generation.

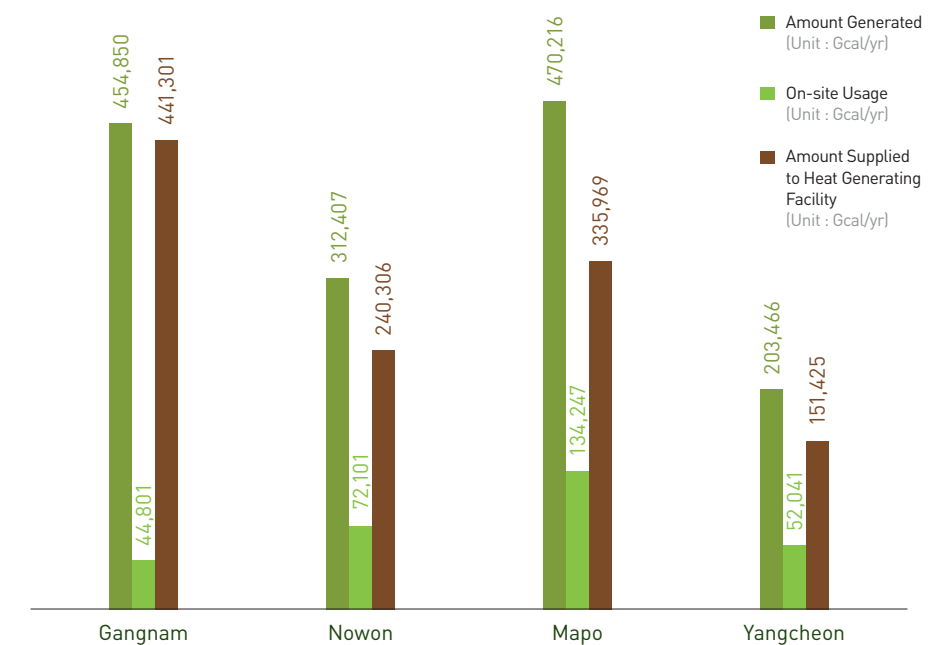
The Resource Recovery Facilities have various processes including waste receiving equipment, incinerators, waste heat boilers, heat suppliers and pollutant removers. These facilities optionally process air pollutants to a level greatly less than the legal standard. Smokestack Tele-monitoring System of the Ministry of Environment monitors emitted pollutants in real-time around the clock. Such data are disclosed to the public via websites.

Disclosure of Facility Information that Strengthens Trust



Usage of Waste Heat by Facility

The surplus electricity remaining after being used to run the plant is transferred to the Power Exchange for residential supply.



Four Resource Recovery Centers directly contributed in reducing the amount of trash going to the landfills in Seoul. However, the facilities' operation remained far behind its capacity as local residents' objection in the initial stage of their operation. To relieve the anti-sentiment, the government has held consultations with local residents approximately 600 times since 2001, contributing to reaching agreement to operate the facilities smoothly. The city will remain committed to maintaining public confidence with transparent disclosure of information, and an open administration.

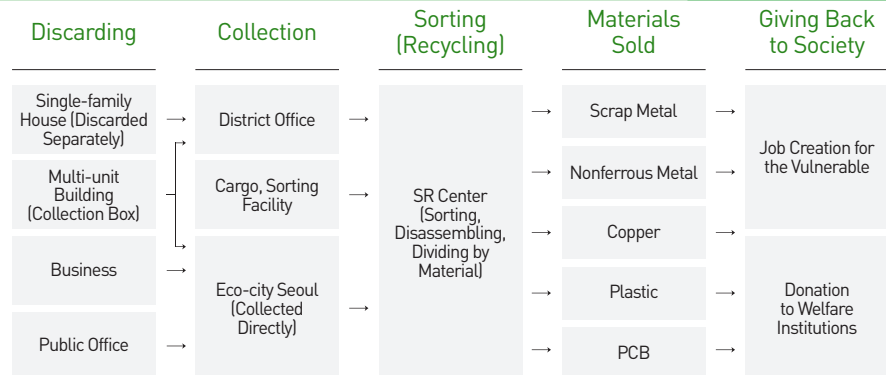
04 Seoul Resource Center at the forefront of Urban Mining Project

Seoul has been pushing ahead with the Urban Mining Project which has contributed to recycling resources such as discarded electronics (small-sized electronics, office devices and cell phones), and environmental preservation. The project has created jobs for the vulnerable. To that end, since 2009 the government has operated the Seoul Resource Center to extract rare materials from disposed home appliances and cell phones, and utilize them as resources.

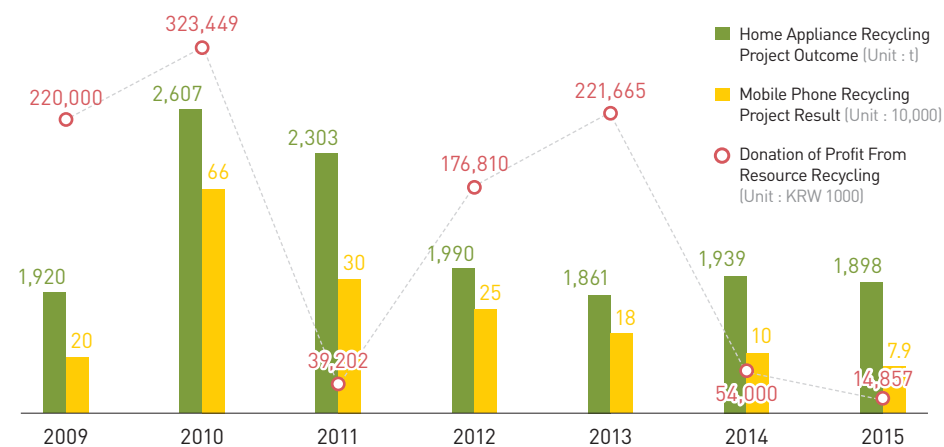
High Efficiency of Urban Mining



Flow Chart of Small-size Home Appliances Collection and Disposal



Outcome of Seoul Resource Center



05 Future-Oriented Recycling Station Project



While the separate waste disposal system worked well in apartment complexes or multi-unit buildings, it did not quite work in single-family houses, small-size multi-family houses, or small commercial properties. Recyclables lost their value, and the cost for collecting and sorting recyclable materials increased. Given the fact, the city government has applied the system under the Recycling Station policy, which disposes of and collects recyclables separately at designated points for single-family houses, small-size multi-family houses and small commercial properties. As a result, more recyclables were collected and jobs were created for the vulnerable. Furthermore, the station contributed to creating more beautiful Seoul by making streets cleaner.

Recycling Station Policy – Quality, Efficiency, Sanitary



Water Management

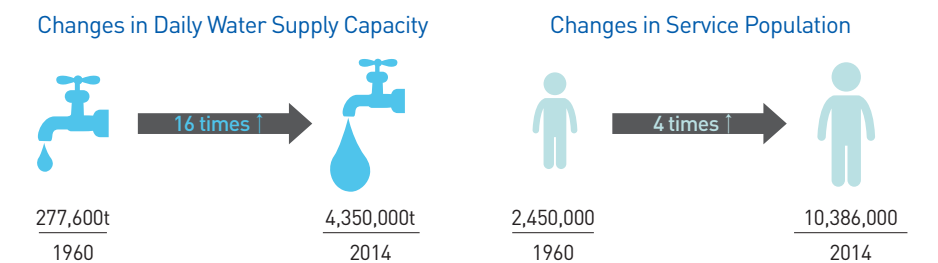
Seoul has made all-out efforts to supply clean tap water and treat sewage in an eco-friendly way in order to create a city where humans, water resources and nature can coexist. 'Arisu' is the brand name of Seoul's tap water supplied to 10 million Seoul citizens. Arisu is the essence of Seoul's water supply policy which has been improved over the last 10 decades, boasting world-class water quality.

Arisu – Seoul's Quality Tap Water


01 Overview

The Han River, which runs across Seoul, is the source water for 10 million citizens in metropolitan areas including Seoul. The quantity of water intake per day is 7.99 million tons. SMG has conducted joint projects like Water Quality Improvement Project with neighboring cities and organizations such as the Han River Watch Group and the Han River Source Water Management Fund. The city differentiates its tap water by naming it Arisu. Arisu won the United Nations Public Service Awards in 2009, Global Water Industry Innovation Award in 2010 and International Business Awards in 2010, and acquired The National Sanitation Foundation (NSF) certification for its quality and reputation.

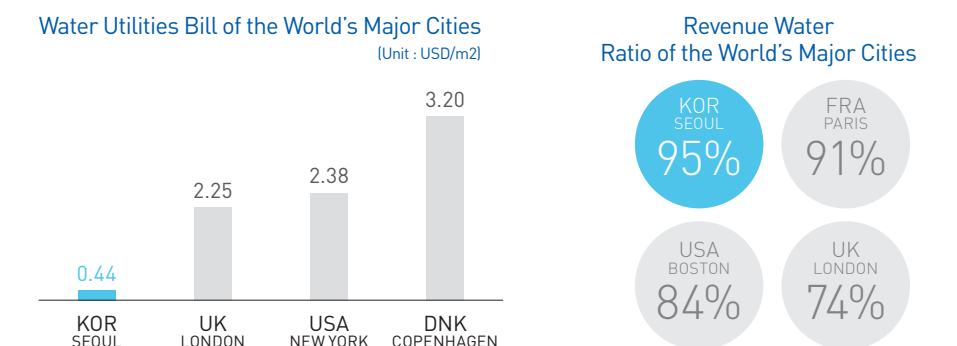
Daily Water Supply



Systems for High-quality Water Production

	Around-the-clock Water Quality Monitoring		Separate Guideline on 9 Key Components for Healthy and Tasty Water					
	Quality Testing on 164 Substances			Advanced Purification System				
	Membrane Filtering Purification System			Chlorine Re-dispersion Facility				
	Large Reservoirs Ensuring Emergency Water Supply and Reliable Water Supply Free of Outage							
				Water Supply Geographic Information System				
Number of Water Quality Items Tested	Location	WHO	Seoul	USA	Japan	France	Australia	
	#of Items tested	163	163	102	121	63	199	

Inexpensive & 24/7 Supply



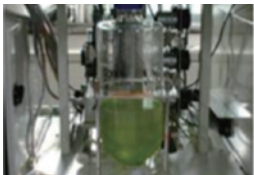

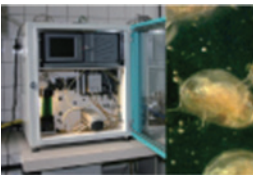
02 Management of Water Sources

The precipitation gap between the four different seasons in Seoul leads to significant differences in the quality of water sources. Furthermore, the Han River is subject to numerous sources of pollution from Seoul and the metropolitan region. To tackle these issues, the city strictly manages the water quality from the water sources by applying scientific pollution control and measurement method.

Scientific Source Water Condition Measurement Systems

- Biological alarming system utilizing microorganisms, algae and water fleas in intake stations
- Oil-inflow prevention systems around intake stations
- Odor alert system: when an abnormality is detected, appropriate chemicals are automatically injected to maintain the optimal quality of the purified water

Bio-alarm Devices

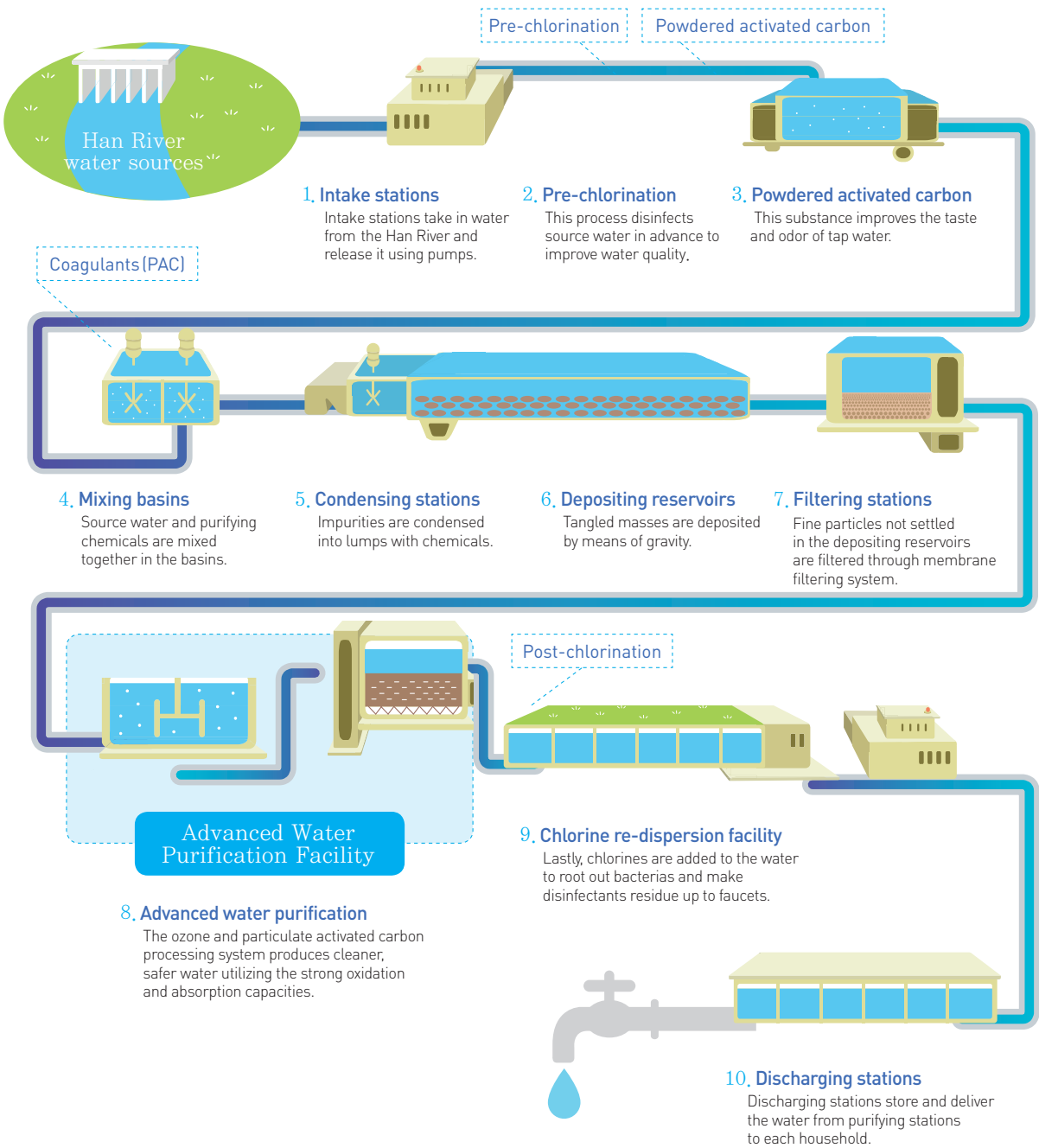
Type	Green algae	Microorganisms	Water fleas
Species			
Measurement mechanism	Changes in fluorescence by photosynthesis	Changes in current amount	Changes in swimming behavior

Water Quality Measurement and Monitoring System

- Regular water quality tests
 - 42 items at 33 water source points
 - 142 items at 6 intake points.
- Automated water quality monitoring system
 - monitoring 8 substances, including algae and phenol.

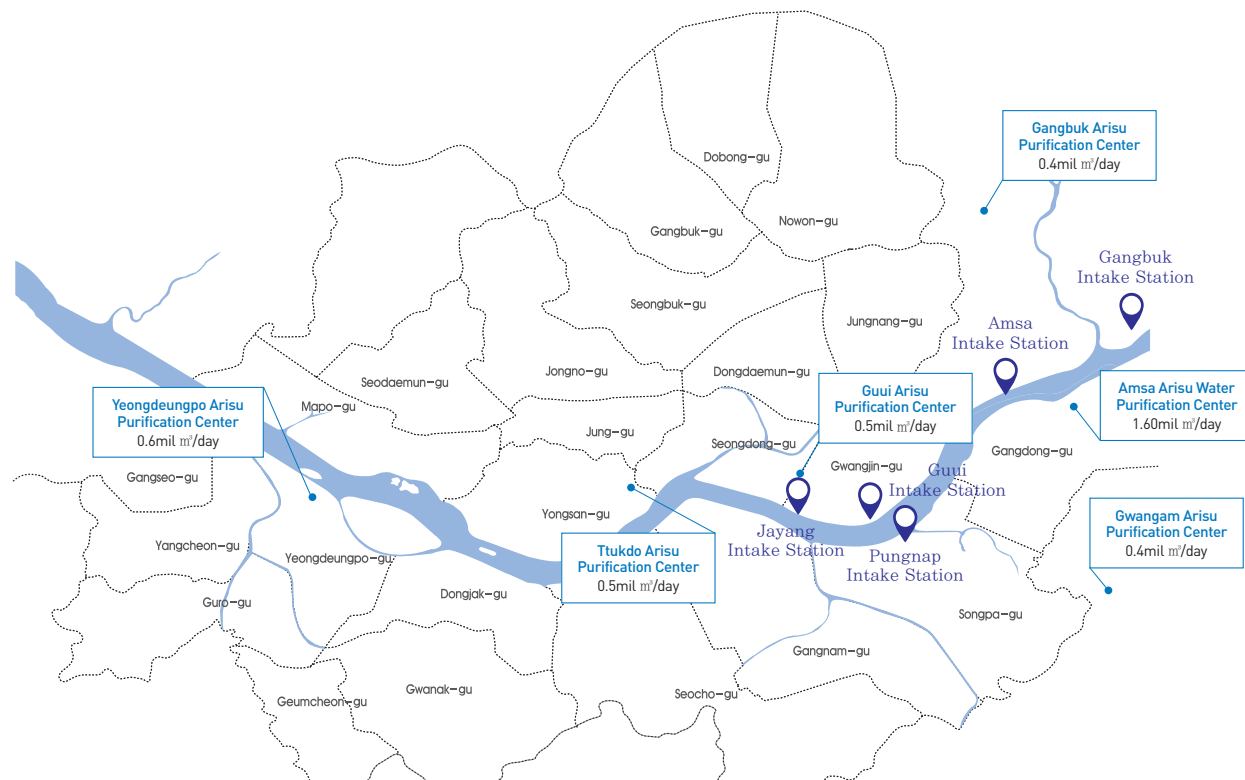
03 Purification Technology

Arisu is free of odor. It has no chemical odor or soil-like taste and contains none of the environmental hormones (such as antibiotics) commonly found in tap water. We produce top-quality water through our own membrane filtering, advanced purification, and chlorine re-dispersion systems, all of which are designed to eliminate strange odors and hormones.



04 Installation & Operation of Purification Centers

Approximately 3.2 million m³ of water is required to serve ten million citizens each day. To produce such a vast amount of tap water, SMG operates six Purification Centers and five intake stations.



05 Tap Water Piping Network and Water Flow Rate Management

Equally as important as the production of clean water is leakage-free supply of tap water to citizens. The key is effective management of water flow rate by blocking and indirect water distribution mechanism.

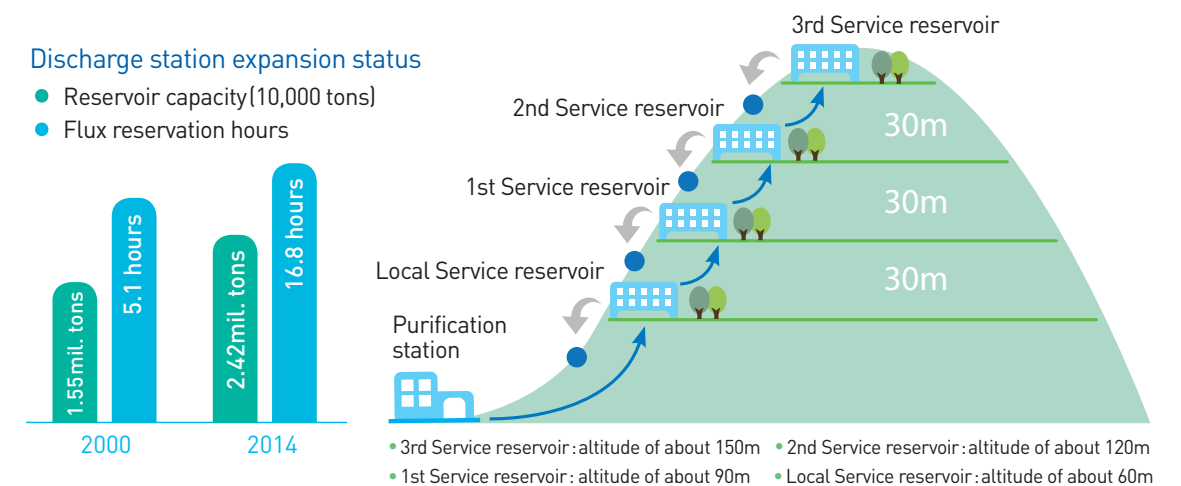
- Tap water piping network: 13,846 km
- 2 million hydrants
- Rate of water flow 94%

Maintenance of Water Pipes

Zinc, iron and PVD pipes susceptible to frequent leakages due to the expiry of their life cycle are replaced with durable, rust-free stainless steel and ductile cast iron pipes.

06 Reliable Water Supply around the Clock

To ensure Seoul's citizens access to use their desired amount of water 24hours, the Arisu System uses cutting-edge seamless water supply instruments including reinforced outlet zones and an outage-free pipe replacement mechanism that requires no digging work.



07 Operating System

Arisu Combined Info System(CIS)

The CIS is a "real-time response and control system" which monitors major tap water facilities through CCTVs and enables video conference upon a situation for discussions between different operations to come up with a solution. With this integrated information system, which is divided and managed by each operation, we could drastically save the production cost.



Seoul Water Now System's website

Tap Water Geographic Info System (TWGIS) Database

The TWGIS is designed to accurately collect and analyze information on tap water facilities, including their location, for the effective forecasting of tap water demand and the prevention of accidents. The TWGIS operates in the following mechanism.

Mobile Arisu

This app has been of great help in boosting the image of Arisu by enhancing communication with the citizens, providing tap water related information online including outages and the likelihood of outages or frozen/burst pipes, and receiving citizens' complaints real time.

Mobile tap water website (m.arisu.seoul.go.kr)

- One of eight tap water websites composed of key information and popular menus
- Bill checking, movement cost payment, complaints
 - Bulletin boards for citizens
 - Introduction of Arisu/Office of Waterworks
 - Location-based services (Water quality info, Arisu Spring)



Mobile tap water application (App)

- Links to the mobile website
- Push service
 - Warning service
 - Emergency outage, freeze prevention, etc.
- Links to embedded mobile cameras
- Bulletin boards for citizens



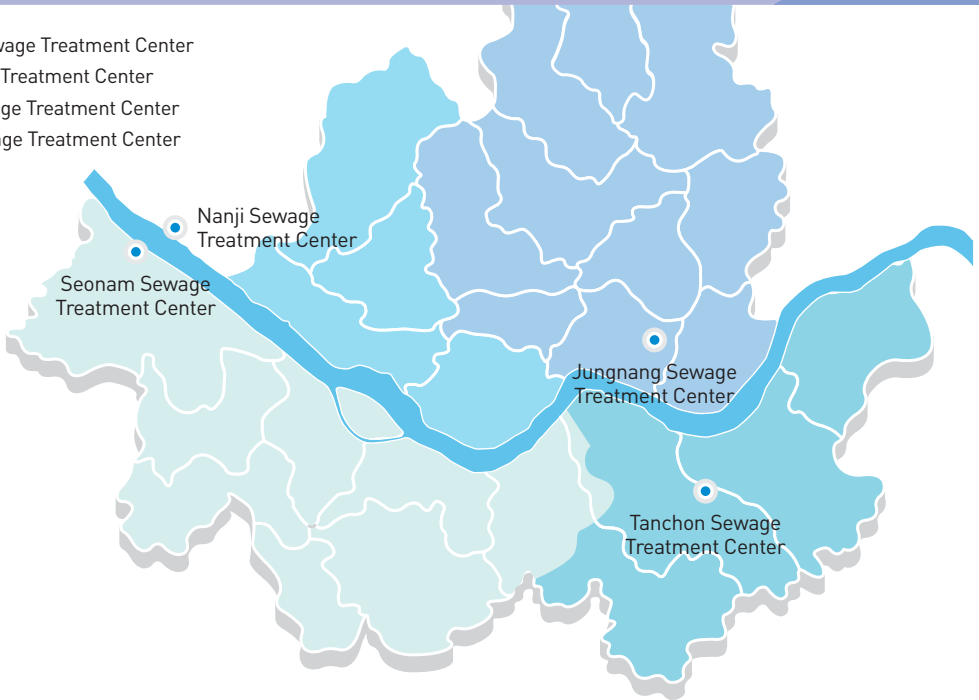
Waste Water Management








01 Sewage Treatment Center Clean Sewage Treatment

Seoul operates 4 Sewage Treatment Centers to treat 5 million tons of sewage, excreta and food waste water in a clean and safe manner. The center contributes to water quality improvement in rivers and a healthy aquatic ecosystem. The facilities, the nation's largest sewage plants, have become exemplary ones for eco-friendly management and sophisticated sewage treatment equipment.

Location of Sewage Treatment Centers

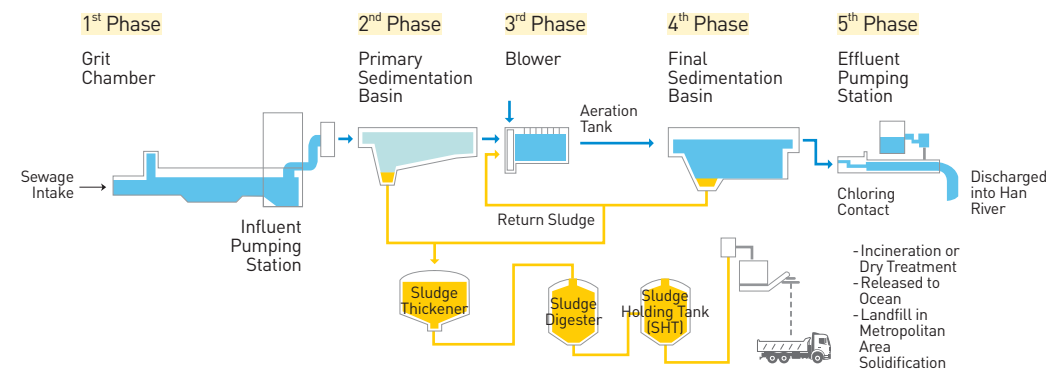
- Coverage of Jungnang Sewage Treatment Center
- Coverage of Nanji Sewage Treatment Center
- Coverage of Seonam Sewage Treatment Center
- Coverage of Tanchon Sewage Treatment Center



						
Size	Population	Sewer	Sewage Treatment Rate	Capacity	Amount Treated*	Level of Treatment
605.33km ²	10.38 million	10,392km ²	100%	5.8 million m ³ /day	Sludge 700 tons/day	Sewage BOD 130~170mg/L → Less than 10mg/L

*Sewage 4.98 millionm³/day Excreta 10,500m³/day Food Waste Water 900m³/day

Sewage Treatment Process



Turning Sewage into Resources



Reuse of Treated Waste Water

Reclaimed effluent water in the process of sewage treatment is sent upstream to maintain water flow or leveraged as cooling water of boilers, cleaning water and sprinkling water at construction sites. At the same time, the water is given to road cleaning trucks or subway depots to wash cars.



The Use of Digestion Gas & Sale of Renewables

Captured and refined digestion gas generated by sewage treatment is leveraged as renewables.

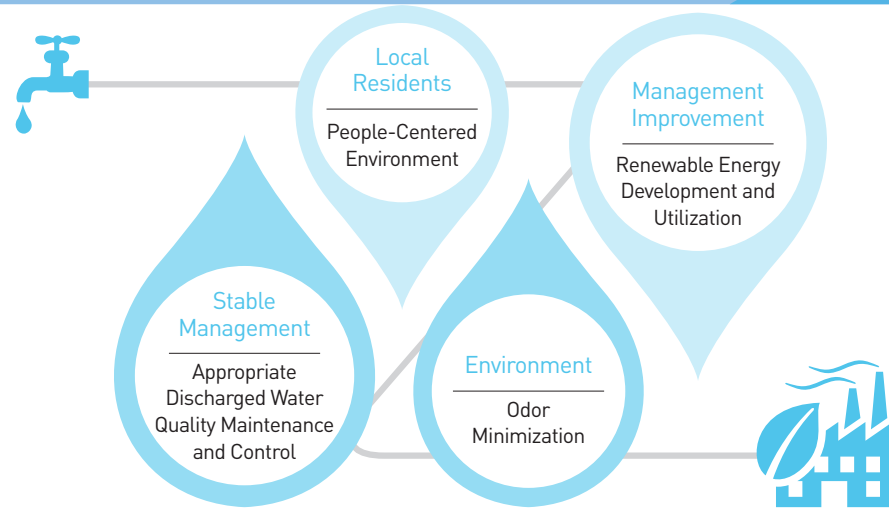
- The gas is utilized as fuel (alternative to LNG) at heated digesters and sludge drying facilities.
- Refined gas is sold for power generation, for households and vehicle charging.



Recycling of Sewage Sludge

Dehydrated and dried sewage sludge is sold as alternative fuel for cement raw materials and thermal power plants.

Healthy Promise of Sewage Treatment Center



Arisu recognized by the world!
Arisu reaching out to the world!

Through constant investment in facilities and technological development, SMG has gained recognition for the outstanding water quality of Arisu and the relevant patents that it holds.

Domestic and International Appraisals



June 2009

Awarded the UN's Grand Prize in the public administration service category

Won the UN's Grand Prize for real-time, online disclosure of water quality information and free quality testing for all households; internationally acclaimed for transparency and confidence in quality assurance



May 2010

Acquired certification as "Korean Superior Service Provider" (in public administration)

Obtained the central government's official certification for high-quality service in public administration



September 2010

Won the 2010 Global Water Industry Project Innovation Award

Awarded the certification by the Minister of Knowledge Economy, which is the only official accreditation granted by the Korean government for service quality

September 2012

Awarded the Global Honor Award

Awarded the "Global Honor Award" for technological development and standardization achievements related with the combined remote metering system, which uses electric lines as a medium of communication



September 2010

2010 International Business Award

Selected as "Best Organization of the Year" from the Stevie Awards Inc. in recognition of the knowledge efficiency performance



August 2012

Quality certification by the National Sanitation Foundation International (NSF)

Tested and certified by NSF International as safe, high-quality drinking water
*NSF International is a respected independent certification organization for public health and environment

Housing Solution

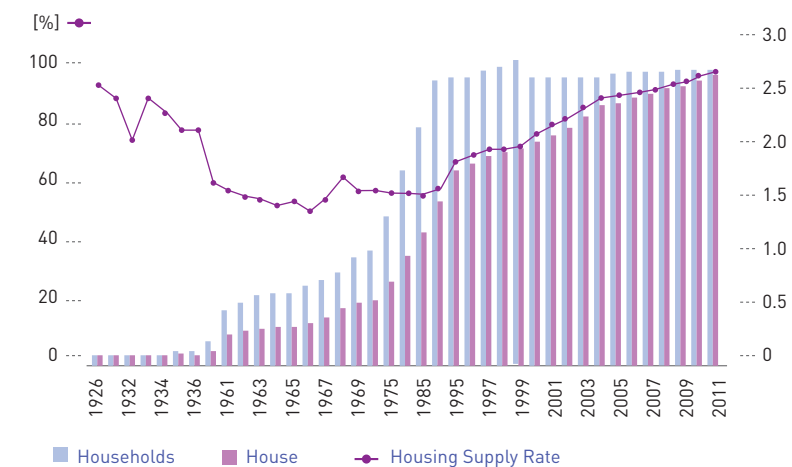
As the result of rural-urban migration in 50s to 60s, Seoul has suffered from severe housing supply shortage. Seoul addressed the issue with mass housing supply and urban district development. As of today, SMG has supplied 260,000 public housing units for low-income households, achieving the housing supply rate of 97.9%.

01 Tackling Housing Shortage

Massive housing supply via public development enabled the SMG to achieve almost 100% of housing supply ratio. In 1989, Seoul Housing & Communities Corporation (SH) was established as a public land and housing developer, and has contributed to the residential stability of non-homeowners. As of today, the SMG has supplied 260,000 public housing units for low-income households.

Mass Supply of Housing

The number of households and houses in Seoul (1926-2011)

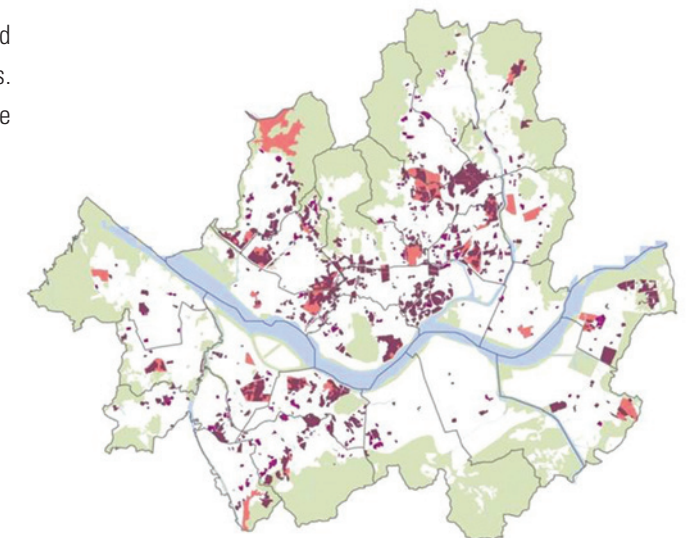


SMG tackled chronic housing shortage by focusing on large-scale housing supply through public development.

Source : Korea National Statistical Office, Population and Housing Census (1926-2011); Seoul Institute, Geographical Atlas of Seoul 2013

Urban District Development

SMG demolished overcrowded shanty towns and replaced with high rise apartments for middle income households. A co-operative was made up with landowners and private developers to redevelop a area on a massive scale.



02 Affordable Housing Development

In more recent years, Seoul has experienced a structural change in the housing market. Elderly citizens and the number of single-person households continue to increase, while young adults suffer from high unemployment rates and the heavy burden of housing costs. With housing subsidy policies, SMG attempts to provide public housing based on the tenant groups' lifecycle needs.

Socio-economic Structural Change

Acceleration of population aging & Growth of single-person households



The elderly aged 65 and over



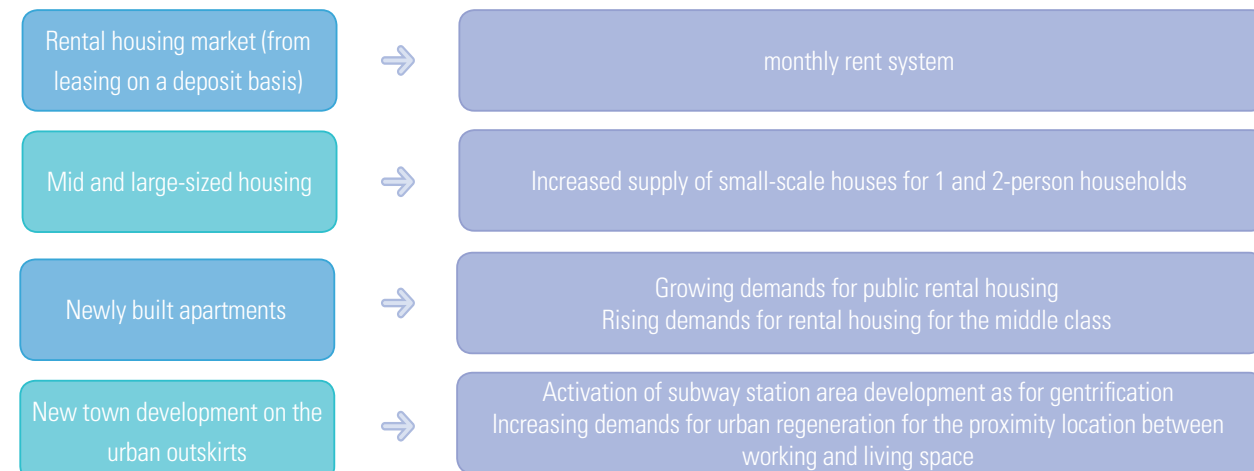
Number of single-person households



Job insecurity and high unemployment rate of the youth

Young single-person households spending more than **30% of income on housing costs** : 57%

Structural Change in Housing Market



Types of Housing

Supplying various types of customized housing based on the life cycle style

SMG contributes to the residential stability of citizens in various groups by supplying more customized rental housing for the niche income group not satisfied with the existing public rental housing.

University students



Balsan Dormitory /
382 rooms ('14. 4 completed)



Jeongneung Youth Housing /
54 rooms ('12. 1 completed)

Youth/Female



Youth Zone to support
the startups by youth
('15. 5 completed)



Housing for the safety of female
residents in Cheonwang /
96 rooms ('14. 12 completed)

Family, Cooperative Society



Hongeundong Youth
Cooperative /
32 households ('14. 8 supplied)



Sinjeong City Village
(for newlyweds) / 92 households
('14. 4 completed)

Seniors & Other Cooperative



Remodeling of the small-lodging
house under Yeongdeungpo
Overpass

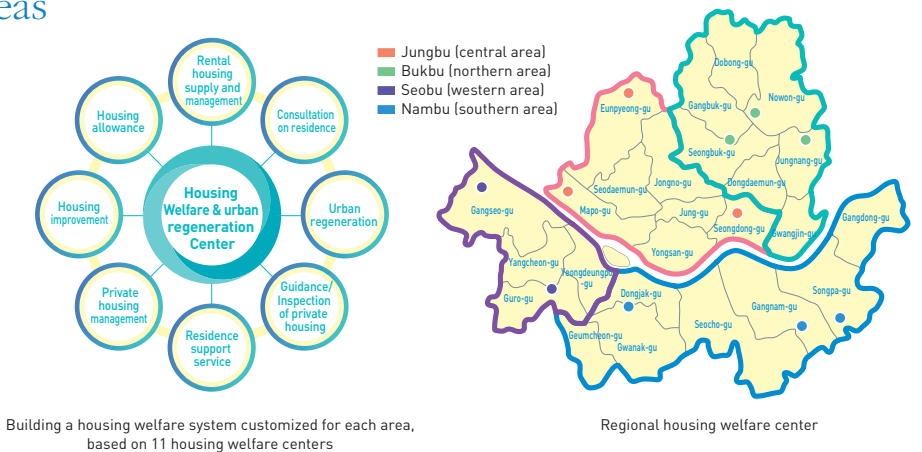


Medical care secured housing in
Sinnae / 222 rooms
('15. 7 completed)

Housing Welfare Service

A complete housing welfare system focused on 11 housing welfare centers in 4 areas

SH Corporation controls and operates approximately 160,000 rental housing units in Seoul Metropolis as of the end of 2014, and will run 11 housing welfare centers in 4 areas to manage rental housing close to the customers, and build a regional housing welfare system to offer residents with better housing management service to improve their life quality.



Recovering Nature's Strength

Seoul has achieved unprecedented growth, known as the 'Miracle on the Han River', making itself a prime example of urban development in the world. The city, however, degraded its nature and historical value as it concentrated too much on development while putting efficiency and functions first. In response to it, Seoul pushed ahead with the Han River Renaissance project with the vision of "Clean and Attractive Global City, Seoul". As a result, Seoul has become a city whose citizens live well with high quality cultural and ecological places. For example, Nanjido landfill was transformed from a mountain of garbage to an ecological park. Annually, thousands of citizens visit clean Cheonggyecheon after it was restored. The Han River has become a landmark of Seoul thanks to the restoration of the ecological environment and installation of cultural places. The SMG will continue to pursue environmental policies to recover its clean nature.

01 Revival of Han River Moving Away from an Icon of Development to a Symbol of Ecological Recovery

Excessive development and overuse of the Han River degraded the river. Committed to recovering the river, the city government conducted the Han River Renaissance Project. It has greatly contributed to recovering the river by planting trees and creating an attractive habitat for many flora and fauna. Eventually, the efforts worked and those plants and animals that had once left Seoul came back. As a lot of recreational and cultural facilities were built, citizens come and rest in Han River parks. Concrete revetment of the Han River was reformed to create fish way and to ensure the water was of high enough quality to swim in. With ecological, cultural and historical services, the Han River has become cleaner.

Han River, a rest area for citizens



Han River Swimming Pool



Banpo Han River Park



Floating Island



Ttukseom Culture Complex



Mulbit Square



Ecological Wetland Parks

Restored Ecology of Han River



Concrete Revetment



Natural Revetment



Forest Created in Substructure of Seongsudaegyo Bridge

02 Nanjido Landfill Recovery Project Transformation of Nanjido, Land of Death, to Ecological Park

Seoul suffered from surging waste as an adverse effect of rapid development and urbanization. It decided to designate 'Nanjido', low-lying island located in the Han River, as a landfill. Ten years later, Nanjido became a land of death that oozed leachate, malodor and harmful gases in the 1980s. To address this problem, SMG started a project to recover Nanjido and transform it into an ecological park in 1991. Nanjido was reborn as an ecological park with the name of World Cup Park after a 10-year long plan, design and construction from 1991 to 2002. Annually, about 3,000 public officials from home and abroad visit the park to learn about Seoul's experience and insight. In fact, Seoul won the Special Award from United Nations Human Settlements Program (UN-HABITAT) for its outstanding landfill recovery project.



Nanjido, a land of waste



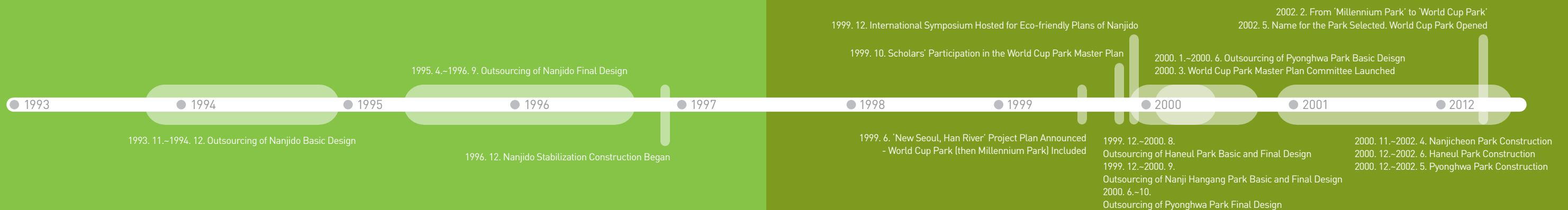
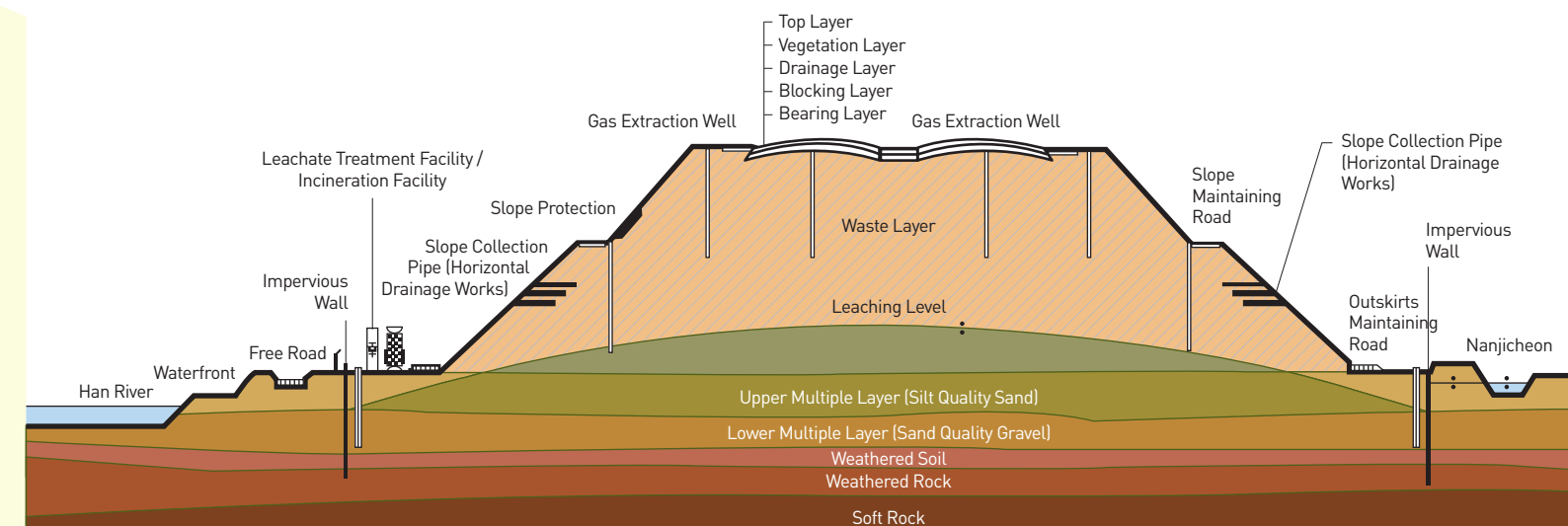
Reborn as an ecological park

World Cup Park consists of 5 parks - Nanjicheon Park, Noeul Park, Haneul Park, Pyonghwa Park and Nanji Han River Park. Today, World Cup Park attracts 10 million visitors annually. The park offers a wide range of special programs and performances. It also serves as a popular destination for camping and fun golfing outings. The number of species found in Nanjido has skyrocketed from a mere 438 species in 2000 (before the park construction) to 1,092 species in 2013. It proves that Nanjido is no longer a land of death.

Increase in Species of Plants and Animals in Nanjido (Major Classification)



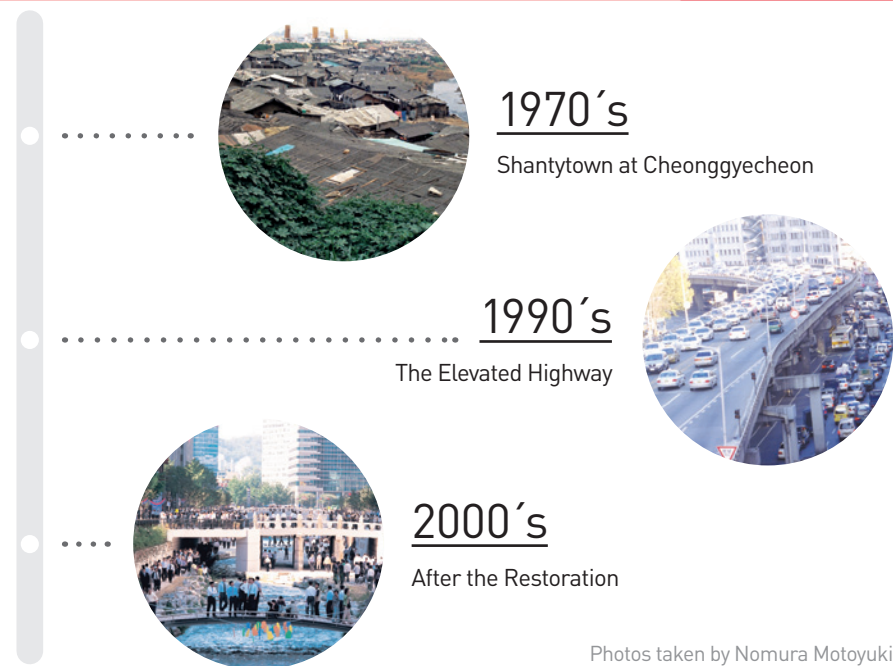
Side View of Nanjido Ecological Park



03 Cheonggyecheon Vibrant with Life and Energy

Cheonggyecheon is a 10.92km stream flowing across downtown Seoul, one of the Han River's water systems. It, however, was covered with concrete from 1925 during the Japanese occupation to 1977 losing its function as a stream. The Seoul government was concerned about the safety issue of the covered concrete and an old elevated highway. To address this issue, Seoul removed the elevated highway and restored the stream to revive the ecosystem and environment for aquatic diversity. In addition, the project was intended to restore cultural assets which had been buried under the concrete. The undertaking revitalized Seoul and opened a new chapter in becoming an ecological city.

History of Cheonggyecheon



Restored Cheonggyecheon



A restored cultural asset
[Gwangtonggyo]



Cheonggyecheon with healthy
ecosystem



Rest area for citizens

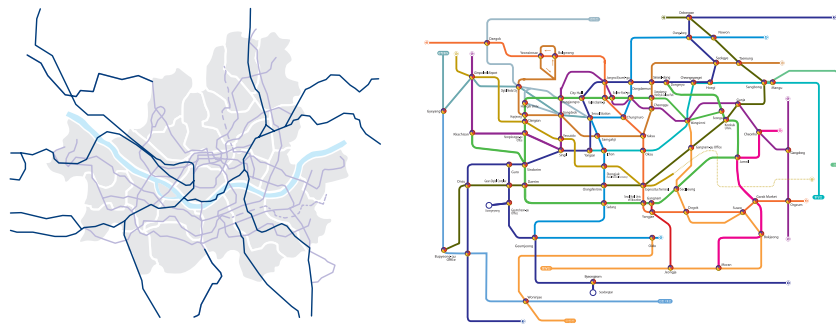
Metropolitan Rapid Transit

Seoul Metropolitan Rapid Transit, despite of its short 40-year-long history, has grown into one of the world's largest urban railway networks, boasting world-class travel volume, punctual operation, and safety. It is the only subway system in the world that provides mobile phone services and Wi-Fi services, incorporating information technology and other cutting-edge technologies. In addition to convenient services, it ensures the highest energy efficiency in the world. SMG's commitment and efforts to create a more convenient and pleasant urban railway system has strengthened the competitiveness of Seoul Metropolitan Rapid Transit, which will not settle for the status quo, but challenges itself to continue to develop new technologies and pursue innovation.

01 Overview of Seoul Metropolitan Rapid Transit

Seoul Metropolitan Rapid Transit was created to relieve traffic congestion and reduce air pollution, problems caused an enormous increase of cars and buses due to rapid urban development. Today, it has become the main means of transportation for 20 million people, including Seoul citizens and Seoul metropolitan area residents. Despite its short 40-year-long history, the Seoul Metropolitan Rapid Transit has grown to become one of the world's largest urban railway networks, with 9 lines extending 327 km (including 290 km underground). The average number of passengers per day is 7.2 million and per year is 2.6 billion.

Subway Maps



9 lines extending 327.1 km, 7.2 million passengers per day, 2.6 billion passengers per year

	No. of lines	Total length	No. of stations	No. of passengers	Operators
Total	9	327.1km	302	7.2 million/day	
Line 1	4	137.9km	120	4.18 million/day	Seoul Metro
Line 2					
Line 3					
Line 4					
Line 5	4	162.2km	157	2.64 million/day	Seoul Metropolitan Rapid Transit Corporation
Line 6					
Line 7					
Line 8					
Line 9	1	27km	25	0.38 million/day	Seoul Metro 9 (private corporation)

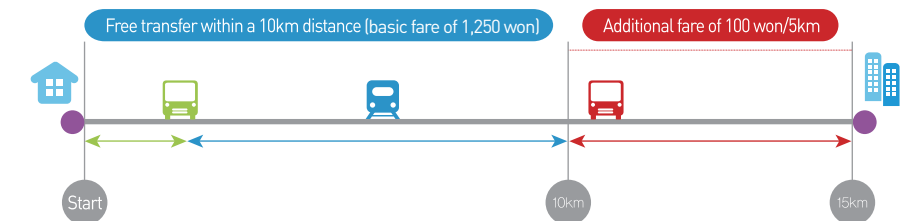
02 Convenient and Pleasant Urban Railway

Seoul Metropolitan Rapid Transit offers convenient and pleasant transit experience through high-end IT solutions.

The all-in-one fare system and transportation card system enables citizens to transfer between urban railway and bus more conveniently.

All-in-one Fare System

Under the all-in-one system, passengers are charged with only a basic fare on their transportation card if traveling within a 10km distance (transfer between different means of transportation is free of charge). If they are traveling more than 10km distance, they are charged with an additional fare of 100 won per every 5km on their transportation card.

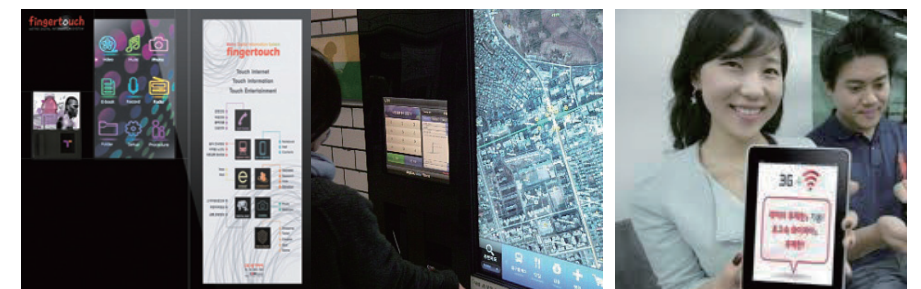


Wireless Communication Network, Free Access to Internet

Cutting-edge information technology allows passengers to enjoy wireless internet, radio and DMB services inside the train.

Effect of application

Multimedia information system provides passengers with useful information such as subway lines, tourist attractions, and living information.



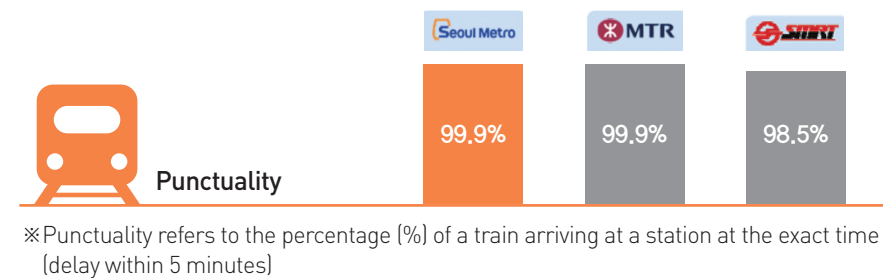
Multimedia information system

Free access to Internet

03 Fast and Safe Urban Railway

Punctual Operation

Seoul Metropolitan Rapid Transit's accurate prediction of arrival system ensures punctual operation, enabling citizens to manage their schedules better.



Dual Operation of Ordinary and Express Trains

The dual operation of ordinary trains and express trains on the same track enables busy citizens to arrive at their destinations earlier than anticipated.

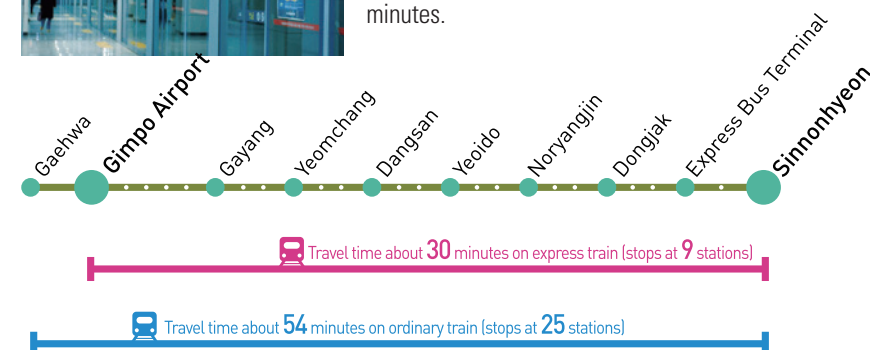
Adopted technology

Automated operation and protection systems automatically sense and control the acceleration and brakes of the train to ensure fast and safe travel.



Effect of application

The operation of the express train from Gimpo Airport Station to Sinnonhyeon Station reduced passenger travel time from 54 minutes to 30 minutes.



04 Application of Cutting-edge Technologies

To overcome the geographic drawbacks of Seoul, which has a number of hills and mountains sitting along the Han River, the city has adopted a series of high-end construction technologies.

Economical and Environment-friendly Construction Methods

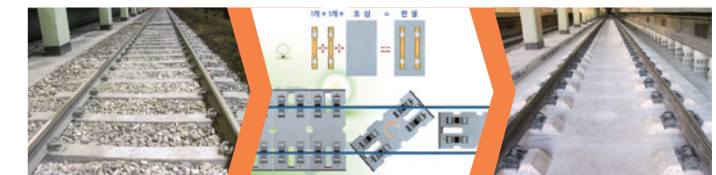
Various digging methods were applied to ensure safety, economic efficiency, and construction feasibility. Six railway bridges and two underwater tunnels crossing the Han River were built. Also, Shield Tunnel Boring Machine Method, which is very economical, has minimal impact on ground traffic, and generates little construction pollution, was applied in the urban railway sections of lines 9 and 7, for large-scale digging and tunnel construction.



Repair of Aged Tracks Using Innovative Method

An innovative B2S (Ballasted Track to Slab Track) Method was applied to renovate the existing ballasted tracks to concrete slab tracks.

B2S (Ballasted Track to Slab Track) Method



- ▶ Reduction of construction cost : by 500 million won (traditional method 2.4 billion → B2S method 1.9 billion won)
- ▶ Increase of construction efficiency : 7~10m/day → 12~15m/day
- ▶ Environment-friendly construction : noise/vibration 14dB, decrease of concrete use by 25%
- ▶ High quality : no cracks on the road surface, outstanding performance
- ▶ Minimal complaints from residents due to excellent anti-noise, anti-vibration performance

- Economic efficiency comparison (per km): B2S (860 million won) < US LVT (910 million won) < France STEDEF (920 billion won)
- Patents: registered Korean patents (in 2006) for technologies developed in 2002 and foreign patents in EU and Germany (in 2007)

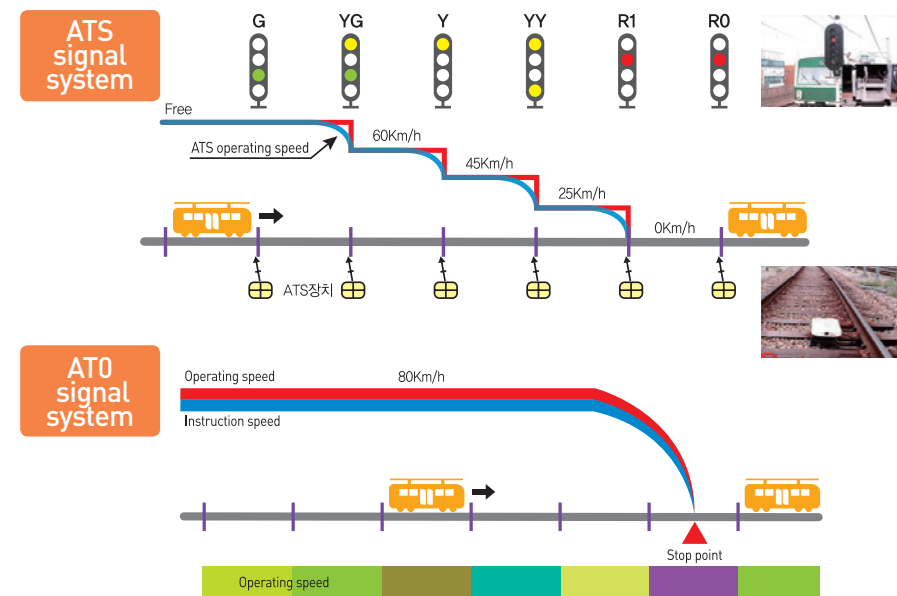
05 Smart Operation of Urban Railway

Seoul Metropolitan Rapid Transit boasts of economical, efficient, and safe operation implemented by a command center, a cluster of cutting-edge technologies designed to ensure safe and convenient railway service.

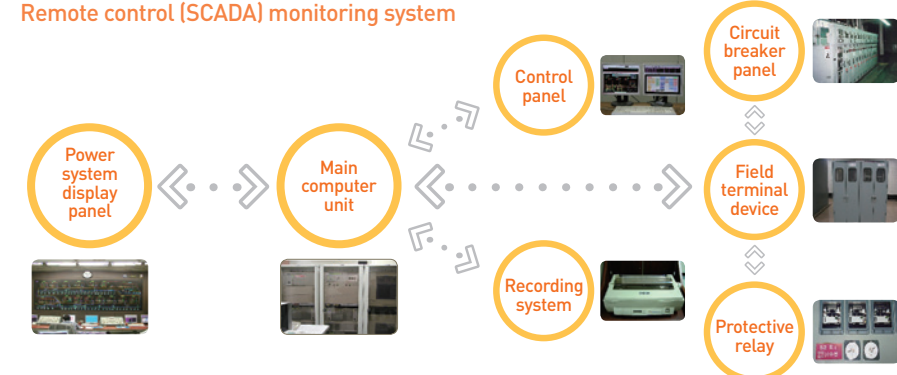
Automated Control System

An automated control system accurately and quickly transmits voice and image data about train operation information, station management, facilities and equipment regarding stations, communications, AFC, signals, substations, and disaster prevention.

Auto Train Stop (ATS) and Auto Train Operation (ATO) system



Remote control (SCADA) monitoring system



Control system

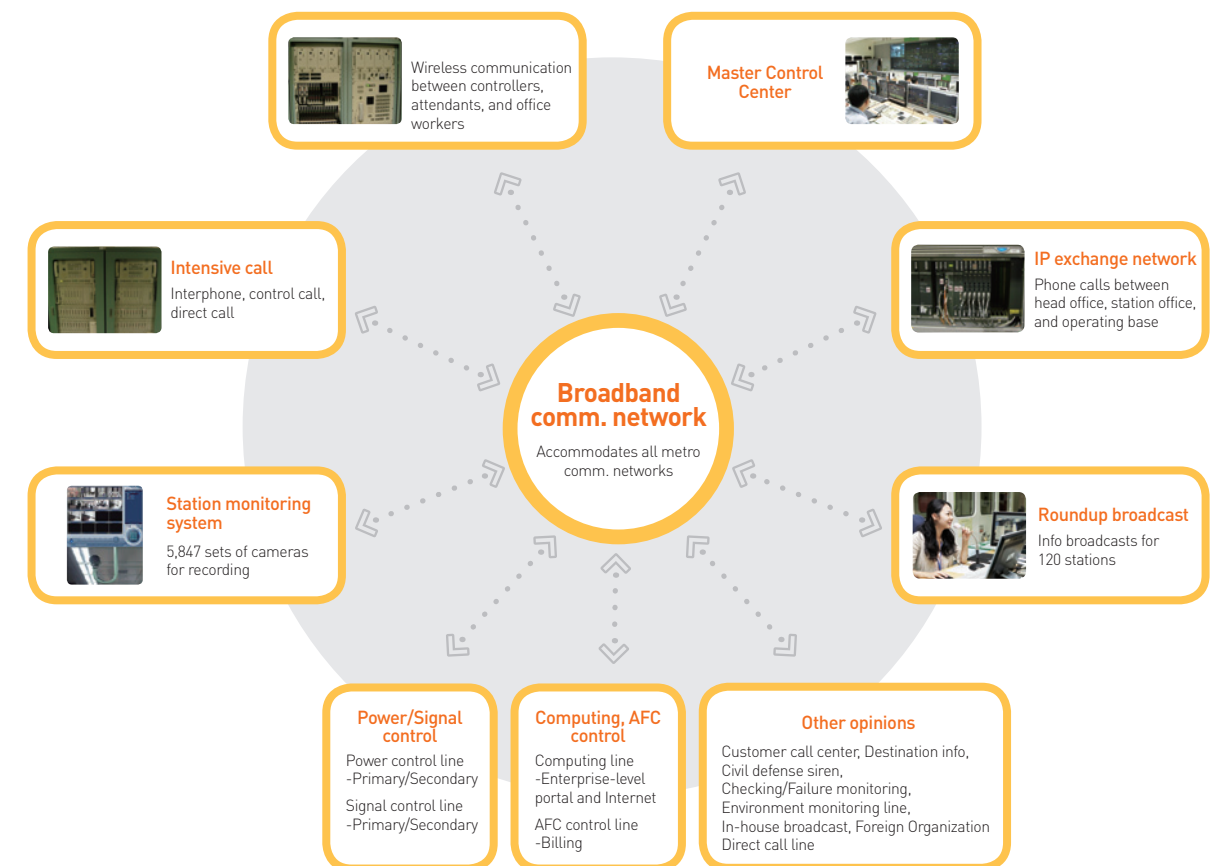
Signal system for safe train operation, center control room for comprehensive management, monitoring system for train operation, electrical equipment, convenient facilities in station, and safety facilities.

New control system

A task force team was created to develop technologies to update the obsolete control system, plan a broadband, consolidated network, and redesign the overall layout of the master control center, while utilizing existing infrastructure. A total of 15 billion won was saved.

Effect of application

Video control, digital data display, minimized space and workforce through integrated operation of lines 5 to 8, train, passenger, communications, signals, facilities management function, etc.



e-Government

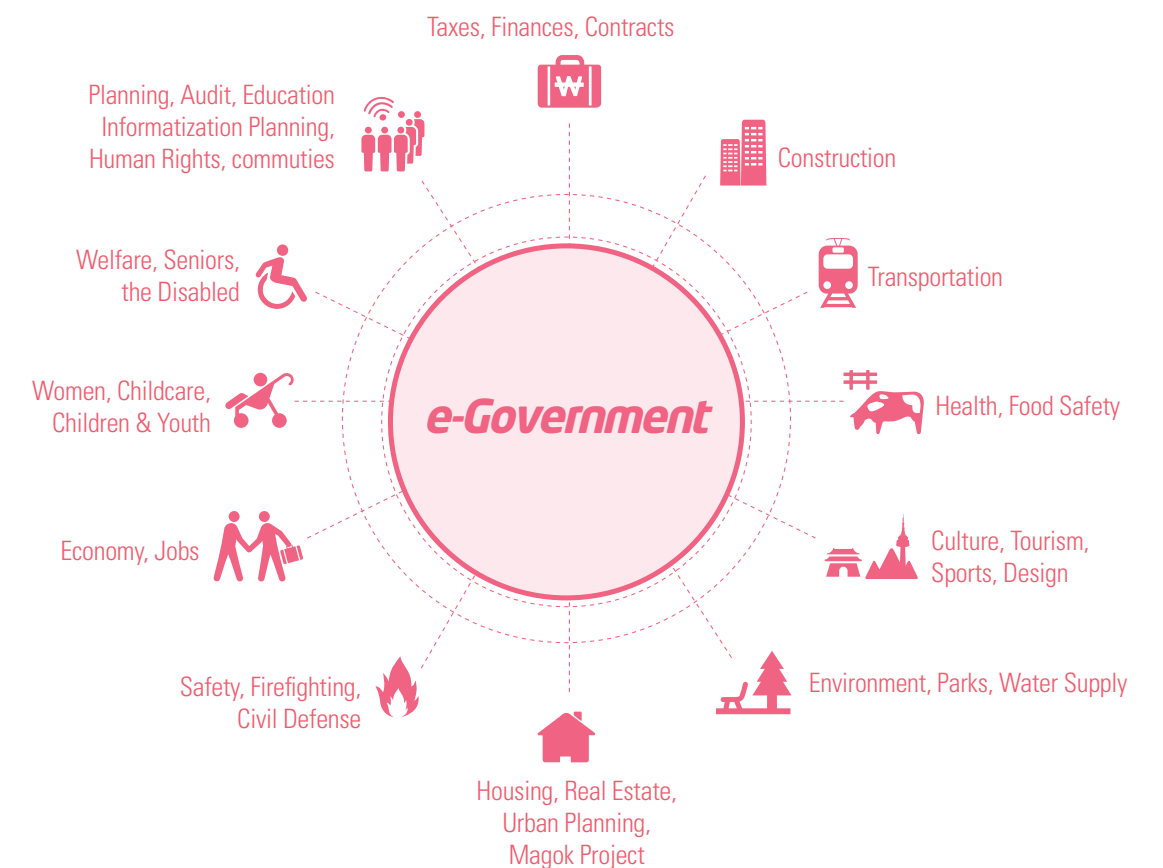
Seoul e-Government pursues drastic improvements in administrative efficiency and quality by incorporating advanced information and communications technologies into public services. SMG has realized open government, enabling fast and easy communication with the citizens for a wide range of issues.

01 Seoul's e-Government System

SMG has established an array of information systems covering all of the city government's public services, built its own telecom network connecting 16 affiliated organizations, and set up an extensive e-government promotion group headed by the chief information officer (CIO).

Area Served

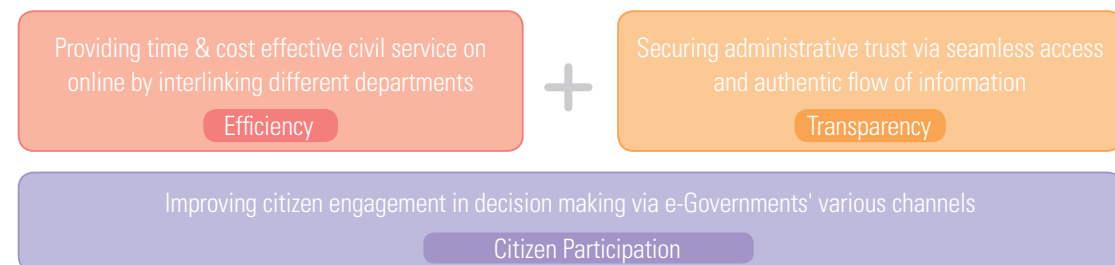
For IT-based highly efficient city administration, SMG has set up a total of 477 types of information systems covering the entire range of its public services including urban planning, culture, tourism, transportation, and housing for its 127 divisions. Seoul Data Center performs integrated control of the systems through its 973 servers, 272 pieces of telecom equipment, and 89 information protection systems.



02 e-Governance

In addition to improving administrative efficiency and quality of public services, SMG also adopted e-governance that enables two-way communication between the government and the citizens.

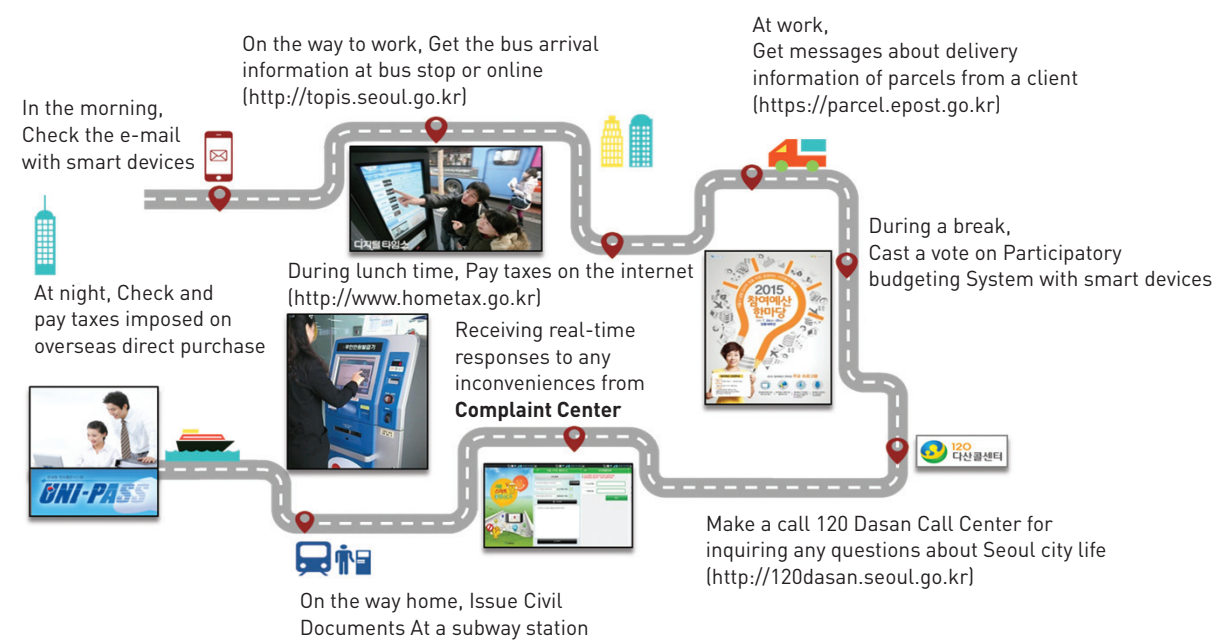
Three Objectives



Elements of e-Governance

IT infrastructure	Citizen Services	Citizen Participation
<ul style="list-style-type: none"> IT Super Highway Public WiFi 	<ul style="list-style-type: none"> Public smartphone charging station Seoul website Information Communication Plaza 	<ul style="list-style-type: none"> Oasis of 10 Million lamination m-Voting Smart complaint report

A Day of Seoulites with Smart Governance



03 Worldwide Recognition

Since 2003, SMG has topped the Municipal e-Governance International Survey conducted by Rutgers University and sponsored by the United Nations (2003~2009) for five consecutive times. For the last 10 years Seoul has become the benchmark for many cities worldwide in terms of digital governance.



Seoul was the highest-ranked OECD municipality, and Hong Kong was the highest-ranked non-OECD in 2011. The table below presents the overall score for each municipality grouped into OECD member countries and non-OECD member countries.

Results for OECD Member Countries (2011)

Rank	City	Country	Score
1	Seoul	Korea(Rep.)	82.23
2	Toronto	Canada	64.31
3	Madrid	Spain	63.63
4	Prague	Czech Republic	61.72
5	New York	United States	60.49
6	Stockholm	Sweden	60.26
7	Bratislava	Slovak Republic	56.74
8	London	United Kingdom	56.19
9	Vienna	Austria	54.79
10	Helsinki	Finland	54.22

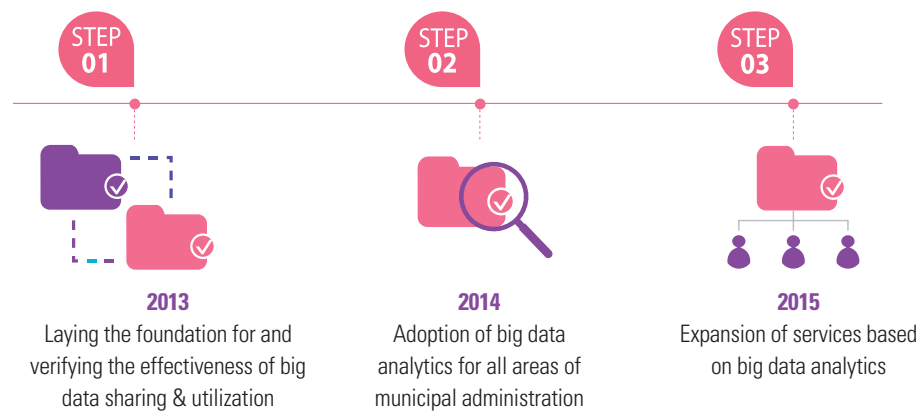
1st in the 2011 survey
1st in the 2009 survey
1st in the 2007 survey
1st in the 2005 survey
1st in the 2003 survey

※ The "Municipal e-Governance International Survey" has been jointly conducted by Rutgers University and Kent State University in the USA every two years since 2003.

04 Smart Administration Based on Sharing and Collaboration

Settlement of Administrative Issues with Big Data

SMG is implementing big data utilization policies to address diverse complex administrative issues.

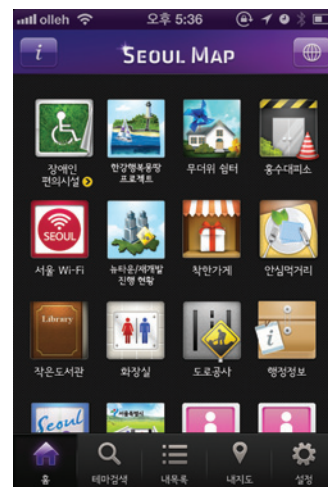


Communication and Collaboration based Internal Administration Portal

Knowledge administration based on communication and collaboration has emerged as a critical factor in improving public servants' work efficiency.

"Seoul-type Map Tacking" for Convenient Map-based Administrative Services

SMG is fully using "Seoul-type Map Tacking" services for a whole array of its public services to enhance its citizens' convenience.



"Smart Seoul Map App"
Administrative services available on maps



"Yeouido Camping Site"
Information on an event in HanRiver Park

International Recognition in e-Government and e-Governance

2007

Government Technology Awards for e-Government Technology of Seoul Metropolitan Government

UNDP and Alphabet Media of Singapore
Awarded at 2007 Annual Government Technology Summit

2008

UN Public Service Award: Fostering participation in policy-making decisions through innovative mechanisms

UNDESA
Cyber of Information System Planning Bureau

2011

SAG Award for GIS Portal System

ESRI

2003, 2005, 2007, 2009, 2011, 2013

UN Public Service Award – e-Government Survey Special Award

UNDESA, Rutgers University-Newark
Winner of 6 consecutive surveys

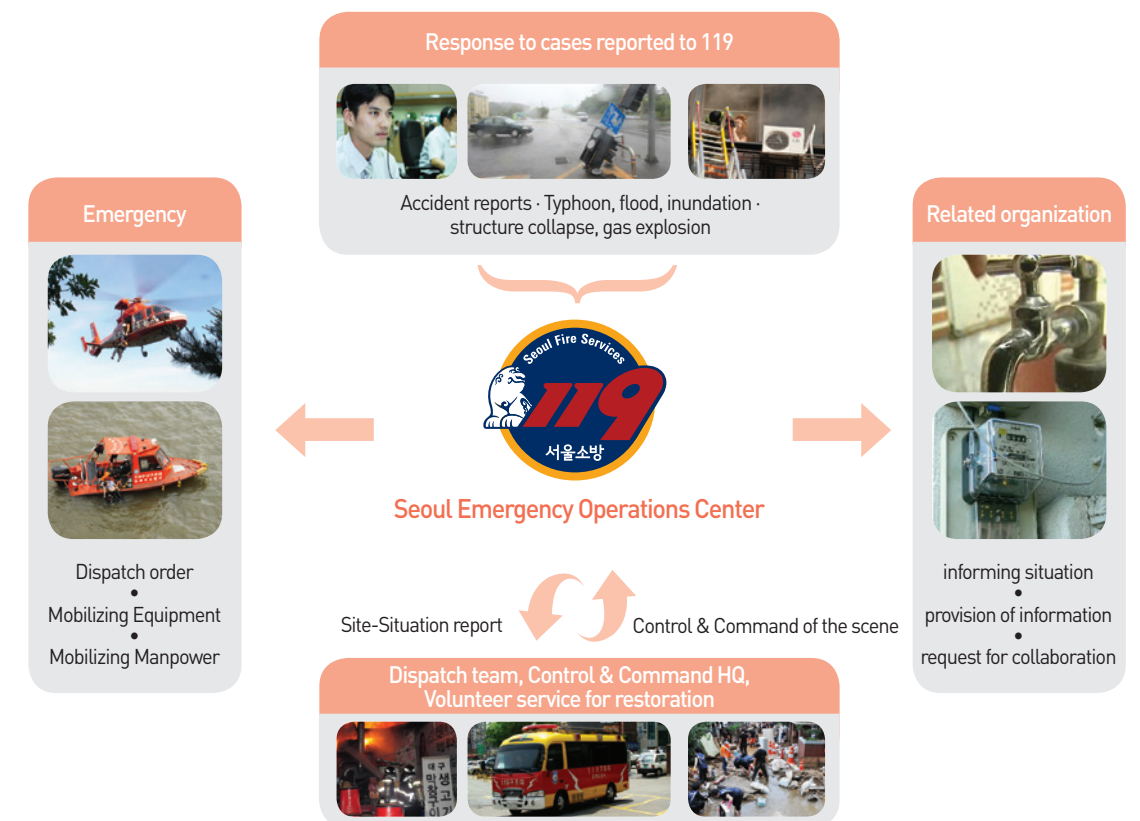
Fire & Disaster Response

As the city of Seoul grew into a more complicated metropolis with introduction of tall skyscrapers and a complex network of underground facilities, the risks posted by accidents and disasters became greater. To minimize the damage and maximize the safety of its citizen, SMG is managing the integrated emergency response center. The center carries out immediate, systematic and effective prevention and restoration activities for accidents and disasters. The center also responds to medical emergency, gas leakage, senior and child abuses by close cooperation with other agencies and entities.

01 Emergency Operations Center

Whatever the nature of a disaster, we carry out rapid, systematic, and effective prevention and restoration activities.

The risks posed by accidents, disasters, and calamities are becoming ever more complex and serious in nature. As such, a more comprehensive and organic prevention system can minimize the damage and maximize safety. The Seoul Emergency Operations Center identifies all disasters immediately and rapidly responds to every kind of emergency situation to minimize the damage.





“The competitive edge of Seoul Emergency Operations Center is our systematic and efficient disaster prevention”

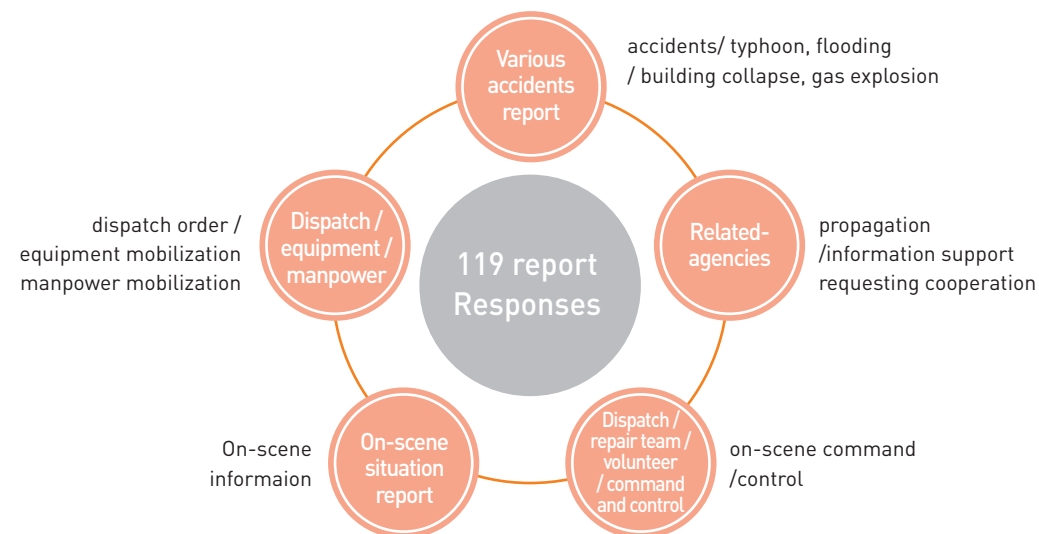
Every the comprehensive report regarding disaster situations are integrated into the 119 call system. 119 integrates, situation room, emergency medical support management center and civil defense warning and control center into one structure and manages them through the central system. We do our best to deal with any kind of disaster situation with rapid response, effective disaster prevention and repair activities. 24 hours a day, 365 days a year.

02 Advanced System

Geographical Information System (GIS)

“We can receive accident site information the moment you report an accident to 119”

Can't remember where to report various situations? where do you report gas leaks, building collapses, burst water pipes, electrical problems or contamination? Just dial 119 whenever you face any of these situations. Seoul Emergency Operations Center will take care of these problems quickly.



3-Way Calling System

“You can receive instructions from a doctor while an ambulance is on the way.”

Every second is precious in a life-threatening situation. A 3-way calling system is activated whenever an emergency call is received. Emergency situation management center, staffed by 3 medical doctors, six 1st grade paramedics and nurse-qualified firefighters and 16 emergency situation managers, can protect precious lives of people 24/7 by providing medical instructions through state of the art system such as video teleconference.



Stereoscopic Field Command

The fire engines on route to the scene are provided with detailed information regarding the location through state of the art equipment such as GPS and MDT. Detailed information assessed by accident type is swiftly relayed to various agencies including fire department, KT (Korea Telecom), police, army and KEPCO (Korean Electric Power Coporation), enabling systematic support.



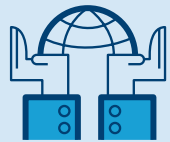
03 Professional Firefighters

The Fire Academy, the cradle of elite firefighting experts!

The Fire Academy cultivates professional firefighters to guarantee our future safety.

We train professional firefighters to actively cope with the ever-changing firefighting environment. As their job is to protect the safety of ten million citizens, the academy provides a high level of scientificallybased firefighting education, and conducts effective physical training and advanced professional techniques for lifesaving and fire extinction and control.

Seoul Urban Solution Agency



What We Do

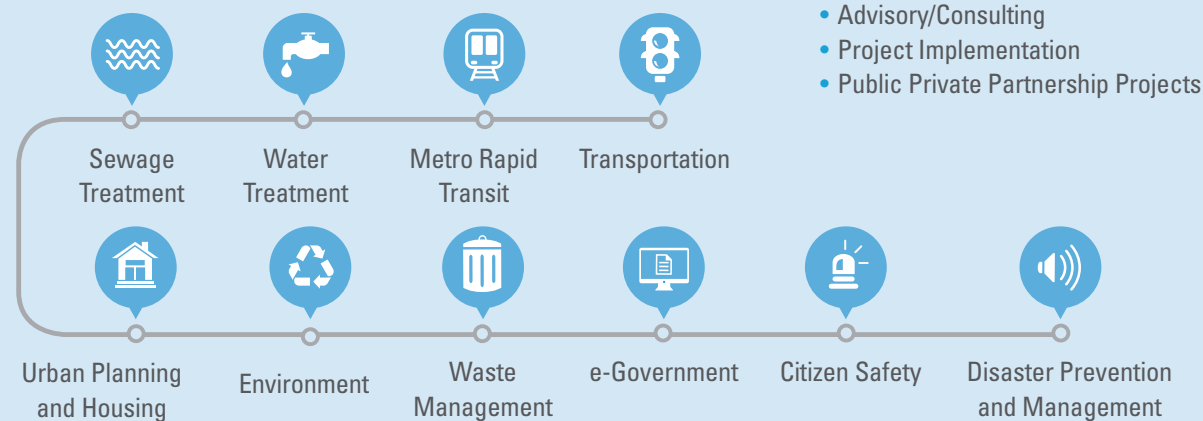
From cultivating project opportunities to providing technical consultation, project implementation and evaluation, SUSA works to bring public/private expertise and resources together. By creating partnerships that leverage each other's competencies, the focus is on bringing integrated urban solution including transferring policy knowledge and operation expertise to ensure sustainability.

Overseas Project Process



Areas We Work In

Seoul has smart green urban solutions in the following areas



Services We Provide

- Study Visits
- Training Program
- Advisory/Consulting
- Project Implementation
- Public Private Partnership Projects

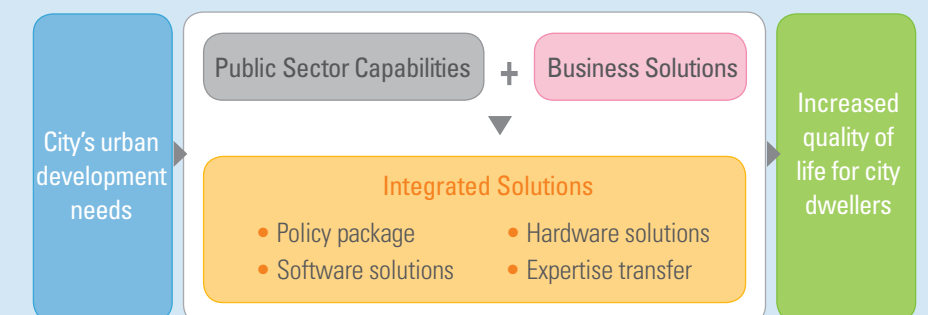


How We Work

With Seoul's policy prowess as the driver in building a city of Seoul's caliber, we will engage Seoul's competencies by utilizing public sector capabilities with business solutions. SUSA's aim is to bring an integrated solution by marrying government/citizen-led policy package with hard and software solutions of the private businesses.

The policy package will outline Seoul's policies and urban development practices that brought viable solutions to the problems that the city faced. The business solutions, on the other hand, will bring policies to life in the form of infrastructure, facilities and IT systems among others. The result will be increase in quality of life for city dwellers with increased citizen safety, reduced commute time and air and tap water, more green spaces, affordable housing, etc.

The solutions package may come in a variety of mix including knowledge sharing, consultation, business and financial solutions, and training based on the needs of the destination cities.



MISSION FOCUSED MULTI-SECTORAL APPROACH

SUSA works as the agent that bridges various players with keen understanding of the role and stake each party has in accomplishing the mission.



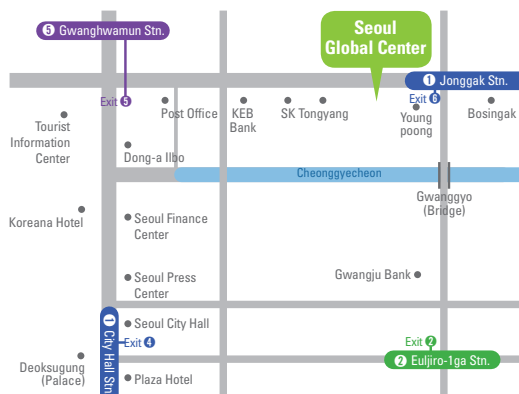
Contact

SEOUL URBAN SOLUTIONS AGENCY

Address Seoul Global Center 13F, 38, Jong-ro,
Jongno-gu, Seoul, 03188, Rep. of Korea

Tel +82-2-734-3456 **Fax** +82-2-739-3456

eMail overseas@i-sh.co.kr **Website** www.seoulsolution.kr



SH was established by the Seoul Metropolitan Government in 1989 with a mandate to bring solutions to urban development needs.