Seoul's Challenges and Achievements
for an Environmentally Sustainable Healthy Urban Transport System

Background

Changes in Seoul's Transportation Conditions

Traffic Congestion, Resultant Air Pollution and Health Effects

Changes in Policy Framework and Setting a New Policy Target

Efforts by the Seoul Metropolitan Government
for an Environmentally Sustainable and Healthy Urban Transport System

New Challenges and Achievements, Reform of Public Transportation System

Upgrading Public Transportation Services

Building an Eco-friendly and Human-Centered Transportation System

Conclusion and Proposal
Background

Changes in Seoul's Transportation Conditions

The Korean population began to concentrate in Seoul with the rapid urbanization beginning in the 1960s. The heavy concentration of population in the Seoul Metropolitan Area was exacerbated with the development of the capital area after the 1990s. Combined with increased income and the boom in owner-drivers following the 1988 Seoul Olympics, such developments led to a surge in the number of registered automobiles. More than half of all automobiles nationwide are in the Seoul Metropolitan Area, and the number of automobiles in Seoul increased from one million in 1990 to more than two million in 1995. As of 2009, there were approximately 3 million cars in Seoul, which is 17.1% of all automobiles nationwide.

Although the population and automobiles in Seoul accounting for a greater percentage of figures in Korea made traffic increase heavily, there is a limit to providing roads to accommodate the increased traffic. This brought about an exacerbation of traffic congestion on Seoul's roads. The travel speed in the central business district (CBD), which was 30.8 km/h in 1980, dropped to 13.6 km/h in 2004 (however, the travel speed has been gradually improving during the past five years). The socio-economic costs incurred by congestion (congestion cost) surpassed KRW 7 trillion, which is five times that of 1991. As such, Seoul's traffic issue has become a task that must be solved in order to enhance the city's competitiveness.
The quantitative growth in automobiles and traffic congestion have become important issues to resolve for creating a sustainable and healthy city as they lead to deterioration of the air and lower quality of life. According to research by the National Institute of Environmental Research, among air pollutant emissions in the Republic of Korea, 73.6% of carbon monoxide (CO), 35.3% of nitrous oxides (Nox), and 36.9% of particulate matter (PM10) are emitted from automobiles. Seoul in particular has a far higher percentage of pollutant emissions from automobiles than other regions.

<table>
<thead>
<tr>
<th>Air Pollutant Emissions - Current Status</th>
<th>(Unit: Tons/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM10</td>
<td>Nox</td>
</tr>
<tr>
<td>Nationwide</td>
<td>64,795</td>
</tr>
<tr>
<td>Road Transportation</td>
<td>23,911</td>
</tr>
<tr>
<td>(Contribution)</td>
<td>(36.9%)</td>
</tr>
<tr>
<td>Seoul</td>
<td>3,433</td>
</tr>
<tr>
<td>(Percentage of National Total)</td>
<td>(5.3%)</td>
</tr>
<tr>
<td>Road Transportation</td>
<td>2,690</td>
</tr>
<tr>
<td>(Contribution)</td>
<td>(78.4%)</td>
</tr>
</tbody>
</table>


Meanwhile, greater interest worldwide in the harmful effects of air pollution on the public's health is increasing social demand on improving the air quality\(^1\). In particular, PM10 emitted from automobiles are ultrafine particles (UFP) sized approximately 2.31 \(\mu\)m. Of them, 98% are carbon substances, making them more dangerous than ordinary dust. Therefore, controlling PM10 and exhaust emissions from cars are extremely important.

The Seoul Metropolitan Government has been measuring PM10 concentrations in the air from 1995. As of 2009 it was 53.8 \(\mu\)g/m\(^3\), higher than the national environmental quality standard of 50 \(\mu\)g/m\(^3\), but it is the lowest since measurement was first conducted. This issue needs consistent management, as it is approximately twice that of major developed nations.

\(^1\) Globally, 800,000 people each year die prematurely due to PM10 (WHO, 2004). In the United States, 1 million people suffer from respiratory problems and 400,000 from asthma (EPA, 2002). In Korea also, a wide range of research results are being announced regarding air pollution and the adverse impact on health. They include research saying 7,400 fewer people will die from air pollution-related causes if the Special Measures for Metropolitan Air Quality Improvement is implemented and health benefits could reach a maximum of KRW 17 trillion (Korea Environment Institute, 2006).
<table>
<thead>
<tr>
<th>Year</th>
<th>PM10 (㎍/㎥/yr)</th>
<th>Nox (ppm/yr)</th>
<th>Sox (ppm/yr)</th>
<th>CO (ppm/8 hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>54 (51)</td>
<td>0.035</td>
<td>0.005</td>
<td>0.6</td>
</tr>
<tr>
<td>2008</td>
<td>55 (53)</td>
<td>0.038</td>
<td>0.006</td>
<td>0.6</td>
</tr>
<tr>
<td>2007</td>
<td>61 (57)</td>
<td>0.038</td>
<td>0.006</td>
<td>0.7</td>
</tr>
<tr>
<td>2006</td>
<td>60 (55)</td>
<td>0.036</td>
<td>0.005</td>
<td>0.6</td>
</tr>
<tr>
<td>2005</td>
<td>58 (56)</td>
<td>0.034</td>
<td>0.005</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Air Quality Standards

- 50 (Korea)
- 20 (WHO)
- 0.03 (Korea)
- 0.02 (WHO)
- 9 (Korea)

Note 1) The () for PM excludes concentrations during dust- and sandstorms in Seoul


Changes in Policy Framework and Setting a New Policy Target

Since the term "sustainable" became the global buzzword in urban policy, a wide variety of efforts have been under way to increase sustainability in the environment, energy, and economy, etc. The transportation sector is no exception, and the Seoul Metropolitan Government is pushing a transportation policy to achieve its vision of a “Clean, Attractive Global City, Seoul.”

Paradigm Changes in Seoul’s Transportation Policy

Accordingly, the Seoul Metropolitan government’s policy direction in transportation is the “Provision of Decent Public Transportation Service,” to reduce demand for cars. Another policy aim is the “Creation of Eco-friendly and Pedestrian-centered Transport Environment,” thereby establishing a sustainable transport system by making a city for both people and the environment.
Efforts by the Seoul Metropolitan Government for an Environmentally Sustainable and Healthy Urban Transport System

1. New Challenges and Achievements, Reform of Public Transportation System

Background

First, an overview will be introduced on the reform of public transportation systems, which is regarded as having re-written the history of public transportation. Although the city of Seoul expanded its subway network (Lines 5 to 8) in the 1990s, the public transportation environment did not substantially improve. A look at the percentages of each transportation mode in 1996 shows that public transportation accounted for 59.5% (subway 29.4%, bus 30.1%), while cars accounted for 24.6%. This did not improve much over the years, with public transportation in 2002 accounting for 59.5% (subway 33.3%, bus 26.2%) and cars 27.5%.

In particular, buses considerably lacked competitiveness. In 2003, when the Seoul Metropolitan Government was pushing for an overhaul of the transportation system, the city buses in Seoul were on a downhill trend, with the number of bus companies reducing to 57 from 103 in 1997. This resulted in excessive competition among bus operators to grab the most lucrative routes, and low-profit routes disappeared. Therefore, the circumstances did not allow consideration of public convenience, and the quality of service deteriorated by the day. Bus drivers often treated passengers like cargo, trying to board as many as possible, however crowded their buses were. Moreover, drivers engaged in reckless driving, refused to allow the disabled and the elderly on their buses, and at times skipped bus stops. Moreover, the congestion on roads made the buses always run late and move slowly, making the public in Seoul increasingly reluctant to use buses. The number of passengers declining each year led to a vicious cycle of undermined profitability of bus companies, which prompted them to raise fares repeatedly, then provide increasingly deteriorating services.
Key Details

In order to resolve these problems, the first consideration by the Seoul Metropolitan Government was to make the privately operated buses into a semi-public operation system, which emphasized the contribution to the public good of bus operators. The basic framework of a semi-public operation system was a joint management of income from bus fares and a bidding for bus routes. The joint management of bus fare income refers to pooling all fare income from buses and allocating them depending on the operational performance. The fares were managed and settled by an organization for that purpose, and any shortfalls were made up by the city government's subsidies. This made bus operations stable as it prevented bus companies from operating at a loss. The bidding system for bus routes is a method to increase the efficiency of urban transportation, where each unit route is bid upon by bus operators and route management consigned to the bus company. The private company selected through bidding operates suburban routes and is encouraged to cut costs through efficient management of the bus fleet and workers. All routes in Seoul are managed by the Seoul Metropolitan Government and routes are subject to change depending on public demand. In the beginning there was friction among interested parties including the bus operators and bus driver unions, but the Seoul Metropolitan Government steadfastly pushed through with its plan and successfully made the bus route system citizen-friendly. This enabled buses to go to areas lacking in public transportation, which had been shunned by bus companies due to poor profitability. In addition, the bus authorities immediately accommodated and resolved the inconvenience of the public. This completed a system where all routes were supplemented and adjusted at all times.

The Route System was reformed under the principle of organically linking the subway and bus systems with no break in the public transportation network. By changing bus routes to suburban and branch routes, thereby streamlining long-distance, overlapping routes, as well as routes that go roundabout on their way to destinations. As a result, unnecessary bus route operations were reduced and new routes were added. This improved speed and convenience led to increased bus use. The branch route buses strengthened the link with suburban routes and subways, which increased the use of transfer between buses and subways by a large amount. In addition to reforming routes, the color and number systems by bus route type were changed as well. The bus numbers are coded depending on the areas they operated in. The Seoul area was divided into 8 districts, with the starting and final destination districts differentiated in numbers. This enabled bus users to know where the buses operated by looking at the numbers.
Fares for public transportation have changed as well. Before the reform, buses and the subway were operated under separate fare systems, which charged separate fares when transferring. This made fares burdensome for the passengers. To make the fares similar for all regions, the Seoul Metropolitan Government implemented an integrated distance-based fare system when transferring from bus to bus, bus to subway, or subway to subway. Under the new fare system, when riding the bus just once, the same fees are charged. When transferring, only the basic fare is charged when the distance traveled is less than 10 km. When the distance exceeds 10 km, KRW 100 is added for every 5 km. This fee structure was possible due to the introduction of a new transportation card. Previous transportation cards had increased in use since their introduction in 1996, but their ability to process amounts was small, and could not be used by both buses and the subway. The new transportation card system, which was introduced for the integrated fare system, enables a wide variety of traffic policies including a fee proportionate to the total distance traveled, and a discount for transfers. Under the new system, passengers can use all modes of public transportation with just one transportation card. Transportation card fares are charged in one lump sum at the transportation card charge center, and allocated to each bus operator depending on their performance. This has made public transportation fees more transparent, and resolved the issue of unreasonable transfer fees for short distance travelers who had to transfer buses often. In addition, the new transportation card can be used to pay for entrance fees to theme parks or for watching performances, as well as being used for small-amount fee payment on the Internet.

<table>
<thead>
<tr>
<th>Method of Calculation</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>5km (by bus) + 1km (by bus)</td>
<td>900 + 900 = 1,800 won</td>
<td>900 won (basic rate within 1km)</td>
</tr>
<tr>
<td>5km (by bus) + 7km (by subway)</td>
<td>500 + 900 = 1,400 won</td>
<td>Basic rate + KRW 100 won (additional fare for 11km to 15km) 1,000 won</td>
</tr>
<tr>
<td>5km (by bus) + 8km (by subway) + 4km (by bus)</td>
<td>900 + 900 + 900 = 2,700 won</td>
<td>Basic rate + KRW 200 won (additional fare for 16km to 20km) 1,100 won</td>
</tr>
</tbody>
</table>

Fares Derived Using Integrated Fare System(Left), Central Bus Exclusive Lane(Right)
The Bus Management System (BMS) which was implemented at the same time, is a case that is almost unprecedented globally. It applies the latest IT industry system to public transportation, and has become the foundation for scientific public transportation operations management. The BMS enables real-time management of bus operation information, helps buses run on time, and helps prevent reckless driving. The Transport Operation and Information Service (TOPIS) functions as a comprehensive traffic management center that gathers and processes all traffic information, including the transportation card system, remote monitoring system, traffic broadcasting, police stations, road maintenance work by Korea Expressway Corporation. This would not have been possible without the technology of the Republic of Korea, which is an IT powerhouse. Perhaps because of this, the Seoul TOPIS is the system that transport authorities from abroad are the most impressed with on their visit to Seoul.

In order to supplement the basic operations systems and to supplement the infrastructure for bus operations, Seoul has fully implemented the Median bus lane system. In 2002, bus-only lanes in Seoul covered a total of 64 sections and 219.1 km. Most of them were at the sides of the roads, and the bus-exclusive lanes were only 4.5 km long. The roadside bus-only lanes had a high likelihood of incurring delays and accidents due to friction with vehicles flowing in and out of local roads and illegal parking. The Seoul government therefore decided that to ensure the speed and timeliness of bus operations, expanding the area covered by the bus-only lanes was essential. Accordingly, the Seoul Metropolitan Government opened a median bus lane on a 1.1 km stretch on Samilno in May 2004 and opened the 36.1 km Phase 1, 3 routes of the median bus lane on July 1. This had the effect of doubling bus travel speed at the maximum and vastly improved areas that consistently had heavy congestion.

Key Results

The reform of the public transit system greatly increased the number of passengers on the bus and subway, which had been on the decline before the reform. The integrated network of the bus and subway increased their use at the same time. In particular, bus usage improved notably. This increased fare income, improved operation margins, and the travel speed of buses and cars increased. In addition, the expanded median bus lane was the turning point for the Seoul government's public transport policy direction to shift from a focus on cars to bus operations. With the Seoul Metropolitan Government's scientific and rational public transportation operations management gradually generating results, a survey of public satisfaction found the citizens gave the new systems extremely high results. The successful case of public transportation reform were introduced overseas, and is benchmarked by major cities worldwide.
2. Upgrading of Public Transportation Services

After the 2004 public transport reform, the Seoul Metropolitan Government has been consistently making efforts in a wide variety of areas to provide even more convenient and pleasant Public Transportation services.

First, aside from the nine subway lines currently being extended, the existing metro railway lines will be extended and connected with the Seoul Metropolitan Area, and by supplementing the railroad network through the Public-Private Partnership Light Rail Transit in addition to the current nine subway lines, the project targets making metro railway accessible within five minutes' walking distance anywhere in Seoul.

In order to prevent accidents on the subway and to make the subway station environment pleasant, all subway tracks now have screen doors. The effect of installing screen doors does not only help prevent accidents, but also helps cut down on air pollution (PM10) from the tracks and reduces noise, thereby upgrading the environment in subway stations².

² An analysis of air quality at the Line 2 Sadang station where screen doors were installed first shows that the PM10 was reduced from tracks by 35.3%, and by 26.9% in the waiting rooms after screen doors were introduced. Noise from the tracks was reduced from 78.3dB to 72.1dB.
In addition, the gravel ballasts were replaced with concrete ballasts, as the gravel that had seen wear and tear from the trains caused air pollution (PM10). In addition, dust collectors and water tank trucks were operated, which cleaned the tunnels and stations of various pollutants and PM10. Other efforts to improve air quality in the subway include improving the aged ventilation facilities and retrofitting high-functional air filters.

Another important project in improving the public transportation service is the expansion of the integrated fare system, which integrates the fare system for public transportation in the Seoul Metropolitan Area, to make a Metropolitan Unity Fare. In July 2004, Seoul began the integrated Metropolitan fare system on city and maeul buses, and to railways in the capital area. It has been expanded to buses in the Gyeonggi area in July 2007, express buses in September 2008, and to Incheon city buses in October 2009. As a result, using the public transportation system conveniently at a low price with a transportation card is possible anywhere in the capital area. For example, a Gyeonggi Province resident who commutes to Seoul saves an average of KRW 1,500 a day, or some KRW 500,000 a year at the maximum. This has increased transfer passengers on public transportation to approximately 460,000. A survey shows that as many as 55% say they use the bus rather than their cars. Moreover, the transfer discount for public transportation also reduced the number of cars traveling between Seoul and Gyeonggi Province (some 12,000 in 2008; some 38,000 in 2008) and reduced the massive social cost occurring from traffic congestion. The integrated fare system in public transportation has been exported to Wellington, New Zealand, and other foreign countries are showing high interest in it.

In addition, the Seoul government has devised a plan to spread the Median bus lane to 19 road arterials over 214.7 km and implement the project in annual phases. As of late in 2009, 12 arterials and 92.6 km have been built and operated. For median bus lanes already in operation, the government has considered changes in the environment after opening and are working on improving their functions, including expanding the bus stops, making new street crossings, and adding road space for buses to stop. In addition, a project is under way to build a Bus Rapid Transit (BRT) system into the outside of Seoul in the capital area. A section 23.1 km long that links the Cheongna district in Songdo, Incheon, and a section 10.5 km long that links Hanam in Gyeonggi Province and the Gangdong district in Seoul are being implemented as trial projects. The areas will be gradually increased to 22 routes (540.4 km). After spreading the BRT to the capital area surrounding Seoul, it will be connected with the median bus lanes, thereby establishing a fast, convenient wide area traffic system and contributing substantially to relieving congestion in the capital area.
Meanwhile, traffic conditions in Seoul before the transportation reform had been deteriorating as excessive numbers of buses and cars were entering the CBD from the outskirts. In this situation, transport authorities predicted that traffic in Seoul could be vastly improved if users of cars and buses entering the CBD transfer to buses or the subway from transportation centers. In addition, the government expected that the number of people using public transportation would increase if inconvenience in using public transportation stemming from the long distance between transportation modes was eased. Accordingly, the city government analyzed the traffic situation and local conditions, then designated a total of 22 districts (3 in CBD, 8 in secondary CBD, 7 in the Seoul-Gyeonggi border and the 4 in the capital area outskirts) as sites for transportation centers. The city is now pursuing the project.

When reforming the public transportation system, the Seoul government came up with a plan to improve the quality of the buses, to make buses more convenient than cars. First, low-floor (non-step) buses and jointed buses were introduced for the passengers’ convenience. Environmentally-friendly CNG buses were introduced to cut fuel costs and, at the same time, improve the air quality in Seoul. The low-floor buses require no stepping up to board the bus, allowing the disabled, the elderly and infirm to ride the bus more easily, while jointed buses have two ordinary buses connected to transport twice as many passengers than ordinary buses. This efficiency lowers transportation costs and is contributing to more efficient management by bus companies. The Seoul government has established a plan to introduce differentiated buses gradually over years. As of late in 2009, there are currently 20 jointed buses, 1,215 low-floor buses, and 6,759 CNG buses operating in Seoul.
Recently at bus stops, heating systems were introduced, including near infrared ray electric heaters and heated benches, making it possible for passengers to stay warm while waiting. In addition "u-Shelters" that are highly technology-intensive places that connect IT technology and weather/air sensors, have been established. This provides a variety of information that can be useful for everyday life including information on the local area and stores, weather and air quality updates as well as bus arrival information. Such convenience features in public transportation allow them to be closer to the lives of the public.

In addition, all bus stops in Seoul are smoke-free. It is part of a project to eliminate passive smoking by designating all public spaces as smoke-free areas, thereby protecting the public health and encouraging smokers to stop smoking in order to reduce the percentage of smokers in Korea. After operating in a few test areas between June-August 2007, a survey on the public revealed that 72.3% were satisfied with the operation of smoke-free bus stops, and as many as 89% wanted to have all bus stops smoke-free. The Seoul government is therefore operating all bus stops (approximately 8,600) as smoke-free, and the cases of smoking were found to have dropped 63% in a survey three months after introducing the smoke-free rule.
The Seoul Metropolitan Government plans to replace all its 7,600 buses in Seoul to CNG buses. As of late 2009, 6,759 vehicles (89%) have already been replaced and are in operation. All city buses by the end of 2010 will be CNG buses. In addition, hybrid taxis that cut down on air pollutant emissions and fuel costs by half have been introduced for the first time in Korea and are on trial operations. Taxis often waste energy and pollute the air due to idling stops while waiting for a long time at taxi stands or on the road, but hybrid taxis have mechanisms that automatically prevent engine idling, which leads to expectations that air pollutant emissions from idling stops will be substantially reduced. The Seoul Metropolitan Government plans to increase hybrid taxis in full swing in the second half of 2011 and make all taxis electric or hybrid by 2020. In addition, the city government is pursuing trial operations of eco-friendly and energy-saving vehicles such as hybrid and electric buses, which emit no harmful exhaust fumes at all.

In addition, to cut down on air pollutant emissions by cars, the Seoul Metropolitan Government has made low pollutant emissions mandatory in cars from 2008. First, it has required diesel particulate filters (DPF) to be retrofitted on large, aged diesel cars, conversion of LPG engines, and early scrapping of old cars. From the second half of 2010, the Seoul Metropolitan Government plans to restrict the operation of cars that have not followed the requirements to reduce pollutant emissions.

---

3 The city will support KRW760,000-7,150,000 (KRW930,000-7,540,000 for low income groups) depending on the device or car model when a car owner retrofits emission reduction devices or converts to a low-pollution engine (LPG). Owners of cars with retrofitted low-emission devices will be exempted from environmental improvement charges and close examination of exhaust emissions for three years. Non-compliance
3. Building an Eco-friendly and Human-centered Transportation System

In order to create a sustainable urban environment, the Seoul Metropolitan Government has made a transportation system that makes using public transit convenient, thereby encouraging less use of cars. In addition, the city government has overhauled the car-centered roads to be human-centered, pleasant walking networks, thereby cutting down on transportation demand. It is also implementing a "weekly no-drive day" to solicit the public to voluntarily refrain from using cars once a week. In this section, the best examples of human-centered road changes and the weekly no-drive campaign will be briefly introduced.

Cheonggyecheon Stream Restoration

Between July 2003 and September 2005, the covered Cheonggyecheon Stream that occupied 5.8 km in the heart of Seoul was uncovered and restored. Through these efforts, the nature and ecosystem in the central business district (CBD) were recovered, and a stream blending culture and history was created, thereby providing new vigor to the CBD. With the dismantlement of the Cheonggye elevated highway, the amount of traffic entering the CBD was reduced, and the air quality improved. The PM10 concentration was 74.5 ㎍/㎥ in April 2003, and dropped to 66.9 ㎍/㎥ in May 2006 after the waterway's restoration. The concentration of NO2 was reduced by almost 30% during the same period from 0.063 ppm to 0.045 ppm, which shows that the air around Cheonggyecheon Stream became cleaner. With water flowing in it, the heat island effect reduced as well.

Seoul Plaza

Seoul plaza had a very high risk of accidents due to the complex flow of traffic, where motor vehicles concentrated from all areas around the square. The Seoul Metropolitan Government subjects the owner to a fine of under KRW 3 million in accordance with the Clean Air Conservation Act, and be restricted from driving in the CBD after 2010.

Before restoration, the average temperature in the Cheonggyecheon area was more than five degrees higher than the total average in Seoul. A wind path was made along the restored greenery and stream, which lowered temperatures and the water flowing dropped the temperature by 3.3 degrees.
dismantled the fountain that had been in place before City Hall for some 40 years and renovated the surroundings to make it a space for the public again for use as a square for interchange and public events, which also is pleasant to the eye. The area, which had been filled with motor vehicles, became a place for rest and cultural activities including live performances and events, and is now a popular destination for the public. Although there were worries of traffic congestion initially, it had the remarkable achievements of facilitating better flow of traffic and reducing the number of accidents.

Gwanghwamun Square

Gwanghwamun is the center of public executive institutions, and has been so for hundreds of years. It is Seoul's best-known street and serves as a symbol of the nation. The Seoul Metropolitan Government has dramatically reduced the number of lanes on Sejongno in Gwanghwamun, which was once the widest road in Seoul, and overhauled it as a center of history and culture experiences and a walking path network. After its opening in June 2009, the square is now the venue for a wide variety of festivals and events at numerous times in the day and night, and serves as the best-known square in Korea, unlike the past when it was filled with automobiles.
Weekly No-Driving Day Campaign

The weekly no-driving day campaign refers to car drivers not driving their cars on a weekday of their choice. In order to solicit voluntary participation, the Seoul Metropolitan Government discounts participants' automobile tax by 5% and congestion fees by 50%. Also discounted are parking fees at public parking lots. Among the approximately 2.4 million cars registered in Seoul, even if only 1 million participate in this scheme, PM10 from wear and tear on tires can be reduced by 9% annually, and automobile emissions reduced by 9.3% annually as well. This results in cuts in environmental pollution costs of 33.2 billion won. As of late in 2009, 943,329 vehicles are taking part in the scheme.

Conclusion and Proposals

Seoul's traffic policies, beginning with the public transportation system reform, have been acknowledged for their effectiveness and are benchmarked by numerous cities. In addition, they are exported to countries around the world, thereby exporting public administration services. In addition, traffic officials and media from around the world steadily visit Seoul. The number of visitors to the Transport Operation and Information Service (TOPIS) reached a total of 12,000 since its inception.

These results were possible due to the Seoul Metropolitan Government's clear sense of direction and consistent implementation of urban transport policy. The Seoul Metropolitan Government improved on its transport policy, which had lacked direction and been affected by the soaring number of cars in Seoul, to center round public transportation and making Seoul an enjoyable and convenient city for pedestrians. To that end, the city government made much effort to gather all resources necessary, including facilities, services, policies and technology, etc.

Another important success factor is that the public's participation increased in the process of pursuing policies. A unilateral push from the government is not enough today. In contemporary society, when public interest and demand for participation in government policies are high, the public's participation often makes the difference between the success or the failure of a policy. Seoul's reform of public transportation was successful in part owing to the Bus Transportation

---

5 Seoul has exported over 7,000 units of CNG buses to southeast Asia, Latin America, and the Middle East. More than 20 countries around the world have learned from Seoul's advanced transportation systems. Kuala Lumpur, Malaysia, has imported the T-money card. Apart from this, many cities around the globe are discussing transport technology exchanges with the Seoul Metropolitan Government.
Reform Citizen Committee. The committee, which presented the new paradigm of "New Governance," saw numerous civic groups, experts from each field, and a wide variety of stakeholders play substantial roles from the policy design phase onwards and came to agreement after countless discussions and adjustments in each stage. The committee thus served a highly important role in coming up with reform measures that are centered round citizens’ convenience.

The issue of reduced quality of life stemming from traffic congestion and air pollution that results from increased traffic and public health is not unique to Seoul and is a current issue facing all cities. Accordingly, a large number of cities are pondering a wide variety of ways to secure sustainability and improve the quality of life for their citizens. Yet what is the most important is a clear future vision for an environmentally-friendly and healthy city, and plans that are suitable for urban conditions. Building consensus with civic society on this is just as important. In persuading people to agree with and soliciting their willingness to participate with policies intended to build a sustainable transport system, appealing to the public citing potential health issues and increase in treatment costs would be more effective than presenting overall socio-economic benefits to attempt winning people over.

The Seoul Metropolitan Government plans to implement public transportation-centered and human-centered traffic systems in the future as well. It is the city government's hope that the above experiences and lessons learned from them will be of assistance in numerous cities that share Seoul's vision of sustainable cities to find their role in transport policy and to establish and implement feasible policies.

The future of Seoul is a city where clean environment and the latest traffic systems exist in harmony.