

# Toward Better Public Transport

Experiences and Achievements of Seoul



Seoul Development Institute

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## **Preface**

Seoul Metropolitan Government implemented a comprehensive and integrated Public Transport Reform simultaneously on the 1<sup>st</sup> of July, 2004, which was a major step towards sustainable mobility. The key of its success lies in its integrated approach combining organisational measures, innovative technology, infrastructure development, and transport operation. The reform has generated many benefits: better efficiency of operation by improved coordination between transport capacities and demand, growing number of passengers leading to increased revenues collected by transport operators following the launch of the integrated fare system, etc.

As the outcomes and methods of the reform has been receiving recognitions from home and abroad, this paper was proposed by Dr. Paul Numba Um of World Bank Institute to Dr. Kim Gyeng Chul, Director of the Department of Urban Transit in Seoul Development Institute for the World Bank Policy Research Working Paper.

This paper is to scope the problems in urban mobility which had been facing Seoul in the past and to review the progresses and achievements of the Public Transport Reform in 2004. Lastly it is suggesting the future plans and the way to go forward for sustainable transport in Seoul.

We hope this paper will contribute to giving ideas to all cities around the world suffering from traffic problems and agonizing over finding ways to solve public matters. We send our sincere gratitude to Dr. Paul Numba Um and those who have showed continuous support and interest in Seoul's transport system.

December 2005

Man Soo Kang

President, Seoul Development Institute

## 1. Introduction

Throughout the 1990s, Seoul faced demographic changes that created new transportation demands that Seoul could no longer respond to. These changes in transportation patterns increased private car use, unorganized bus transportation routes and travel. Buses were once the most widely used mode of transportation, but demographic changes devastated the service. The transportation system was in chaos and urged for reform.

The traditional method of piecemeal approaches for the bus system reform no longer worked, as evident in the mid-1990s in Korea. Innovative and intensive reorganization strategies were necessary rather than fragmented approaches. The Public Transportation Reform is a major step towards sustainable mobility. The key of its success lies in its integrated approach combining organisational measures, innovative technology, infrastructure development, and transport operation.

Seoul is one of the rare cities to have implemented such a comprehensive reform in such a short period of time and simultaneously at different levels: construction of median exclusive bus lanes, reorganisation of the bus network (categorization of bus lines into: express lines, trunk lines, feeder lines, local lines), reform of the institutional framework (contract provision of bus operators and semi-public operation system), integrated multimodal electronic fare

system (T-Money), integrated transport operation and information service (TOPIS), CNG (Compressed Natural Gas) buses, car traffic management and enforcement of illegal parking, etc.

The reform has generated many benefits: better efficiency of operation by improved coordination between transport capacities and demand, growing number of passengers leading to increased revenues collected by transport operators following the launch of the integrated fare system and therefore a decrease of overall public transport deficiency and government subsidy, improved traffic conditions for buses, better decision-making process and greater transparency as far as the relationships between operators and Seoul Metropolitan Government are concerned.

This paper reviews how the bus transport reform in Seoul came together at many levels including the establishment of a new institutional and regulatory framework, the restructuring of operation and management of bus services, and the alignment of the investment programs to environmental concerns while ensuring greater quality of services for consumers. Such integration and political leadership are the main highlights of this case study.

The remainder of the paper is organized as follows. In the next section, an overview of the transportation environment and situation in Seoul including its suburb is discussed. Then the bus system reform is explained by looking closely at the determinants of reform, and main

targets of reform. In the third section of the paper, the achievements of the bus system reform are discussed. Section four then outlines the main lessons learned from the bus system reform.

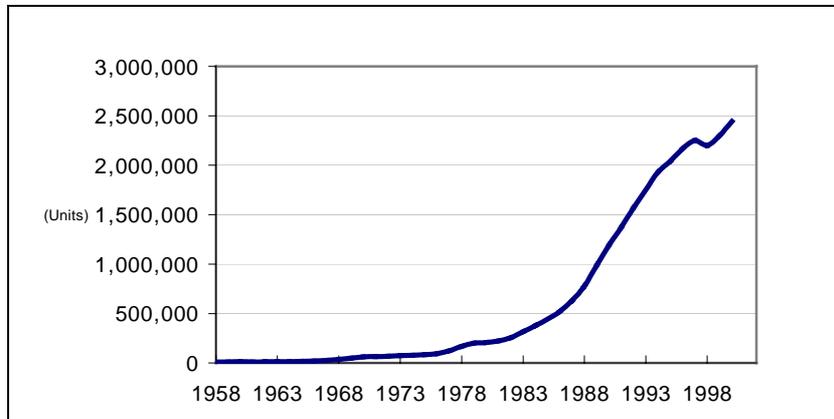
## **2. Seoul's Transportation Overview**

In the early 1950s Seoul began to reform its urban transportation system in response to rapid demographic changes. Since then, Seoul has experienced population growth of at least four-folds within fifty years, and real income growth of at least forty times. Such dramatic changes lead to scarcity of land, rise in housing prices, and traffic congestion in the capital. As a result, overcrowding forced migration into the surrounding suburbs where more than 12 million people now reside. The existing transportation infrastructure could no longer sustain the changes in transportation patterns that have shown increase in the average length of trips and number of daily trips per person. Between 1970 and 2002, the total number of daily trips increased five times, from 5.7 million to 29.6 million, for populations in outer portions of the suburban areas. A continuously growing economy ensures additional growth in travel demands concentrated in these areas.

Private transportation quickly gained popularity as means of traveling throughout the 1980s and 1990s, while the former, buses and taxis were largely disregarded. The rise in the number of passenger cars

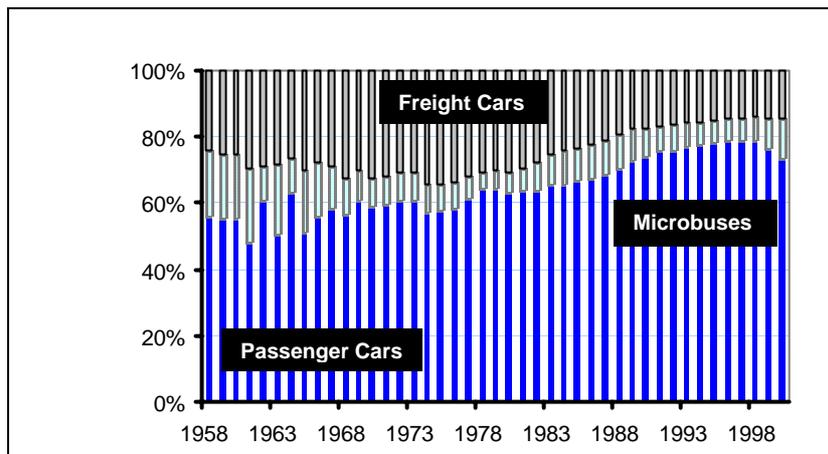
contributed the most to the increase in travel and total number of automobile registered. By 2003, 21.5 percent of the population owned cars jumping from only 0.2 percent in thirty years.

<Figure 2-1> Number of Total Registered Vehicles



Source: Seoul Metropolitan Government and Seoul Development Institute

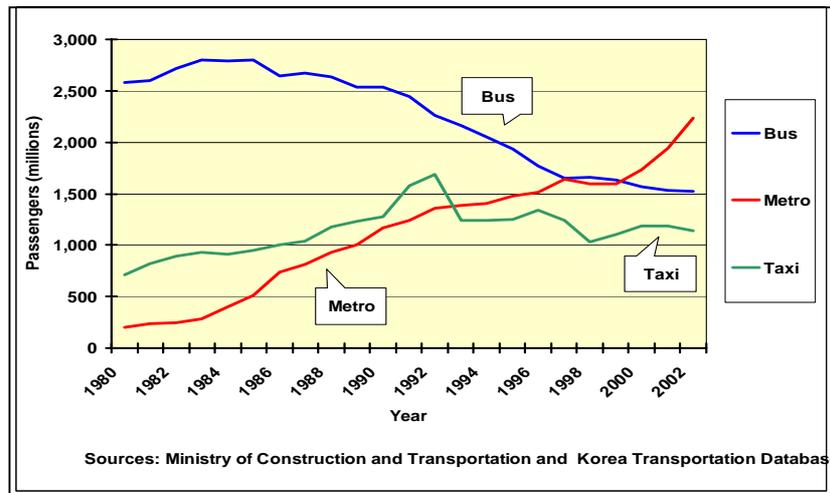
<Figure 2-2> Ratio of Registered Vehicles by Type



Source: Seoul Metropolitan Government and Seoul Development Institute

Previously, buses were the primary means of transportation for over eighty percent of the daily commute; the remainder was taxis (17.6%) and subways (1.1%). The share of buses began to fall sharply as subway lines came into operation, but much of the drop is attributed to rise in private car use. In addition, during the same period governments attempted to reduce traffic congestion by adding more buses, and granting more licenses to private bus and taxi operators.

<Figure 2-3> Change of Mode Share in Seoul



The existing infrastructure was no longer capable of digesting such large increases in private car use, thus resulting in serious traffic congestion within the city and on radial arterial highways connecting the suburbs to the central city. Congestion costs were estimated to exceed \$8 billion a year, amounting to 4% of GDP by 2003. Increased

car use has also caused high levels of air pollution, noise, traffic accidents as well as excessive use of scarce land for roadways and parking facilities.

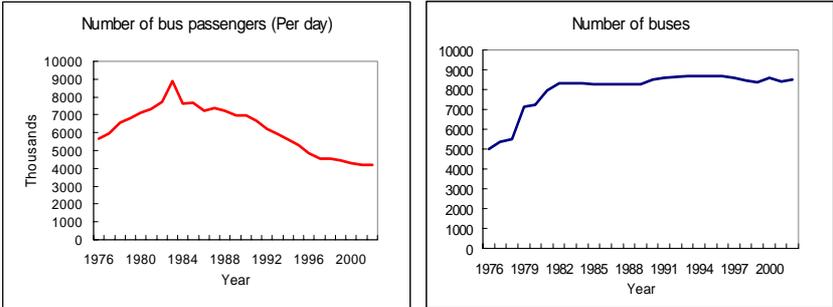
To deal with such problems, the Seoul Metropolitan Government centered its efforts on expanding Seoul's transportation network. It has been implemented in three stages: (i) the development of a mass transit system from 1950 to 1980, (ii) the restructuring of the bus system, (iii) and the implementation of a new strategy in urban land use.

The Seoul Metropolitan Government envisioned a mass transit system that would not only concentrate on developing transportation services within the city but will also serve the suburbs of the city of Seoul. This required coordinating subway lines, buses, taxis, and private car operators. To attract users, bus services needed to compete with the expanding metro service as well as rising car ownership. Private bus operators provided services that were largely low in quality, highly inefficient, uncoordinated, and found dangerous at times. This was largely due to the lack of government regulation in routes, schedules, quality, and safety measures.

Loose regulation drove private bus operators to focus mainly on maximizing profits. Thus, users were often faced with dangerous bus driving behavior, unreliable services, uncomfortable travel, and overlapping routes. The number of bus passengers halved between the late 1980s and 1990s, as transportation patterns began to change, but

private operators faced uniform fares decided by the Seoul Metropolitan Government. Even though operators were provided with government subsidies this was no longer sufficient to cover the decline in fare revenue. By 2002, the number of bus companies had dropped to 58 from 89 in 1995. This large drop was caused by many firms facing financial problems and the Seoul Metropolitan Government consolidating firms to eliminate duplication and improve coordination in services provision. Additionally, local governments were faced with a \$65 million operation deficit and \$66 million capital deficit. Although bus services cover a higher percentage of operating cost from passenger fares compared to metro services (85% vs 75% in 2003), the sharp rise in required subsidies were becoming a critical.

<Figure 2-4> Number of Bus Passengers and Buses in Seoul



Source: Seoul Metropolitan Government and Seoul Development Institute

The metro system was another mass transit system which was simultaneously developing during this time. The first metro line began service in 1974 and accommodated roughly 32 million people per year at its opening. By 2004, the total rail network had expanded to eight

subway lines reaching 487 km, and servicing more than 2.1 billion people yearly. Clearly, the subway has become the most popular means of transportation today.

<Table 2-1> Mode Share Changes

	Total Number of Passengers	Buses		Taxis		Subways		Passenger Cars		Others	
		Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share	Passengers	Share
1985	14,534	7,677	52.8	2,678	18.4	2,268	15.6	1,911	13.1	Included in Passenger Cars	
1986	15,187	7,242	47.7	2,873	18.9	2,522	16.6	2,550	16.8	"	
1987	15,536	7,297	47.0	2,897	18.6	2,657	17.1	2,685	17.3	"	
1988	18,517	9,370	50.6	2,963	16.0	3,111	16.8	3,073	16.6	"	
1989	18,320	9,038	49.3	2,249	12.3	3,592	19.6	3,411	18.6	"	
1990	24,658	10,688	43.3	3,154	12.8	4,632	18.8	3,449	14.0	2,735	11.1
1991	25,091	10,388	41.4	3,161	12.6	5,319	21.2	3,538	14.1	2,685	10.7
1992	25,715	9,989	38.8	3,072	11.9	6,313	24.5	3,740	14.5	2,601	10.1
1993	25,240	10,128	40.1	3,096	12.3	6,717	26.6	3,727	14.8	2,572	10.2
1994	26,440	10,037	38.0	2,569	9.7	7,480	28.3	3,796	14.4	2,558	9.7
1995	27,099	9,934	36.7	2,899	10.7	8,075	29.8	3,950	14.6	2,241	8.3
1996	27,762	8,352	30.1	2,901	10.4	8,165	29.4	5,856	21.1	2,488	9.0
1997	27,203	8,012	29.5	2,752	10.1	8,369	30.8	5,593	20.6	2,477	9.1
1998	27,205	7,922	29.1	2,636	9.7	8,776	32.3	5,466	20.1	2,405	8.8
1999	27,462	7,909	28.8	2,527	9.2	9,282	33.8	5,383	19.6	2,362	8.6
2000	28,030	7,932	28.3	2,467	8.8	9,895	35.3	5,354	19.1	2,383	8.5

Unit: 1,000 persons,%

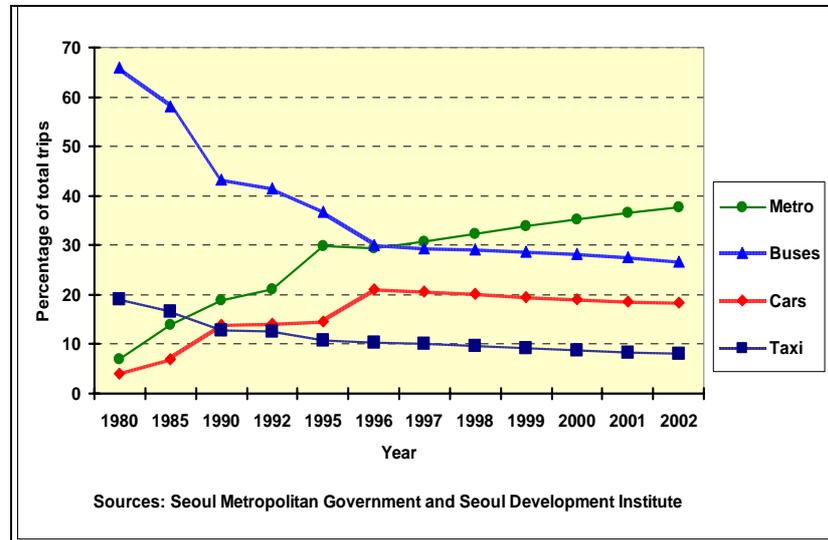
Note: 1. Based on passenger transportation per day

Source: Seoul Metropolitan Government, Seoul Statistical Yearbook

The expansion of Seoul's metro system has been an impressive accomplishment, but has come at high costs. The construction debt from the metro system expansion totaled \$6 billion, of which, 40% was covered by the central government. The annual operating deficit in 2004 was estimated at \$634 million. The service of the debt represents 82% of the Metropolitan Government's total debt. This is largely due to the fact that passenger fares cover only 75% of the

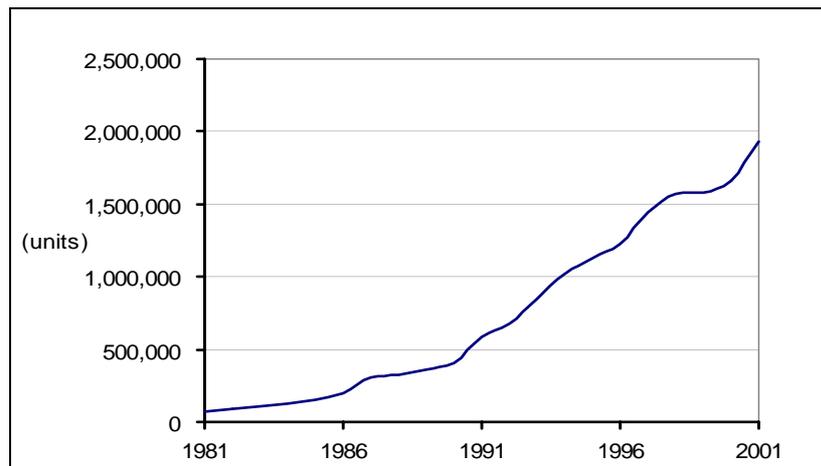
operating costs; and thus, the remaining 25% is covered through various government subsidy programs.

<Figure 2-5> Change in Number of Passengers of Different Models



In complimenting the expanding transportation modes and networks, developing parking lots was also center to urban planning. Parking lots were recognized as public facilities in the Urban Planning Act of 1962. With the rapid increase in the number of cars, a revised Parking Lot Act was enacted and promulgated in 1979. This introduced new policies such as the ‘resident prior parking,’ in order to handle parking shortages. The parking capacity quickly increased by twenty-six folds from 73,866 lots in 1981 to 1,927,313 lots in 2001, responding to 75.6 percent of the demand.

<Figure 2-6> Trend of Parking Lots



Source: Seoul Metropolitan Government, Seoul Statistical Yearbook

### 3. Bus System Reform

Prior to the bus system reform, buses were unable to compete with other modes of transportation. In 2000, the bus reform plans came underway. The objectives of the reform were to redesign the provision of bus transport services within the Seoul Metropolitan area in light of environmental concerns, increased satisfaction of passengers' needs and achieving the industry financial sustainability.

The determinants of change can be divided into two perspectives: external and internal. The external factors are related to socioeconomic and political aspects. The Internal factors, on the other hand, are associated with the lack of standards and inefficient operators. Addressing these factors was crucial for the viability of the bus system.

## **3.1 Main Determinants of Reform**

### **3.1.1 External Factors**

#### **Socioeconomic Factor**

Improvement in the standard living during the last several decades required increase in the quality of public transportation service, mobility, and accessibility. In order to achieve social equity and social inclusion, the provision of high-quality transportation service for all citizens has become the recent social consensus. Through providing appropriate transportation service to the people who had been transportation-disadvantaged it is intended to diminish the social exclusion. However the government policies for the transportation system up to now had been more favorable toward passenger vehicles other than public transportation.

At the time of the Korean economic crisis in 1997, the ridership of public transportation had temporarily increased until 1999 when the Korean economy showed some signs of recovery. Since then, the number of private vehicle users has continuously increased along with the decrease in public transportation ridership.

#### **Transport Policy**

Paradigms of Seoul's transportation system have shifted from vehicle to people, private vehicle to public transportation, and from new construction to management of existing transportation infrastructure. In order to establish the foundation of sustainable transportation

system, Seoul Metropolitan Government focused on transportation-oriented development (TOD) that is coordinated with land-use and environmental plans. The introduction of low-floor buses, CNG buses and installation of escalators in subway stations are the signs of the recent conversions of paradigms. Also, to restrain the use of private vehicles, the transportation demand management (TDM) has been reinforced through policies such as the implementation of congestion pricing and rising of parking fee in CBD area and by encouraging green transportation. Eventually, Seoul Metropolitan Government started to prepare the simultaneous renovation of bus system in 2003.

### **Road Network**

The absence of bus priority system had lowered the bus travel speed to 19 km/h which is slightly slower than private vehicle's travel speed of 20 km/h. In order to increase the bus speed, the curbside exclusive bus lanes were installed on 212 km sections of major arterials in Seoul, but the improvement was not significant. The shortage of bus depots was another drawback to efficient bus operation system.

### **Environment**

At the present time, there are 3,391 CNG buses and buses with DPF(Diesel Particulate Filter) leaving 58% of buses still using diesel. Diesel vehicles including buses and commercial trucks are emitting 78% of the air pollutants of Seoul such as CO, NO<sub>x</sub>, and HC. The noise and vibration caused by buses are regarded as other threats to

public health. Due to these reasons, the environment-friendly bus system has received great attention.

### **Bus Industry**

The declined bus ridership since 1974 when the subway started its operation was accelerated by the expansion of subway system to the entire Seoul metropolitan area. Consequently, the revenue of bus companies declined causing the deficit in operation and the service quality was sacrificed for the saving in operating cost. The deterioration of service quality was directly related to cause another decrease in the bus ridership and this vicious circle eventually led to the bankruptcy of bus companies.

### **3.1.2 Internal Factors**

#### **Bus Ridership**

The popularization of cars supported by the elevation of income levels from the 1980s had changed the trip patterns of Seoul. The modal split of cars increased from 25% in 1996 to 27% in 2002. However the modal split of bus was dropped from 30% to 26% whereas subway ridership increased from 29% to 35% during the same time span.

#### **Bus Service Quality**

The decrease in bus ridership was partially related to the excessively long routes (80 km in round-trip), overlapping routes, and poor accessibility. Traffic congestion in Seoul lowered the average bus

travel speed to 22 km/h and 18 km/h on the arterial and CBD area, respectively. These problems increased passenger's trip time, and adversely influenced the bus ridership.

Other resistances were the antiquated buses, bus driver's unkindness, accidents, inconvenient transfer, and limited service hour (absence of service after midnight). In addition to these problems, inefficient scheduling and irregular allocation of the bus operation deteriorated bus's punctuality and speed, which discouraged bus passengers due to the difficulty in coordinating their trip.

### **Bus Operation Management**

Before the reform, there were 368 bus routes owned by private bus companies. The large variation of the revenue between routes extended into a considerable disparity in the company's profit. Especially some companies with non-profitable routes were running at a loss. During the last five years, 20 private bus

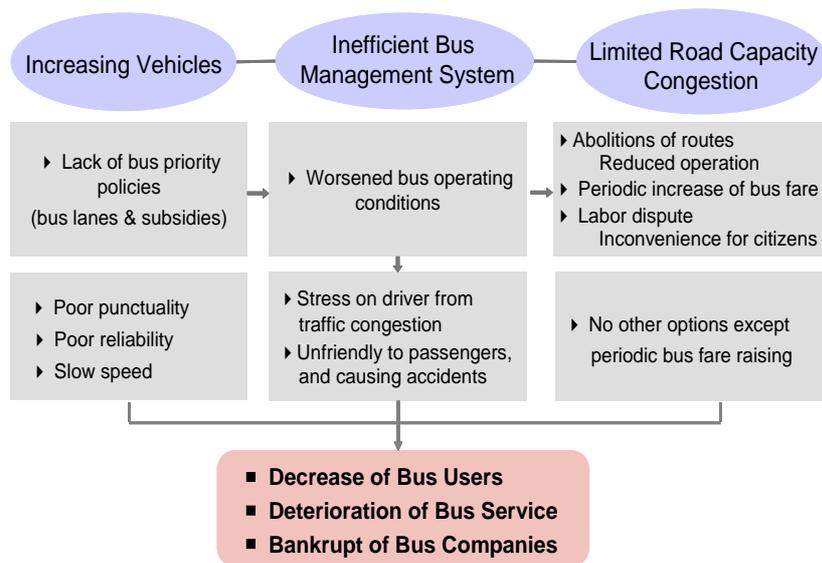
companies have been bankrupted or merged. Private owning of the bus routes eventually aggravated the publicity of transport service.

As private bus companies were focused on maximum short-term profits the publicity was sacrificed for their own interest. A number of companies' owning same routes were competing with each other, which induced aggressive driving such as abrupt acceleration, abrupt stops, illegal weaving, and even illegal bus stop skipping. Seoul Metropolitan Government gradually realized that for a number of reasons, the bus system should not be an entire private industry and had to be regulated by the government in certain ways.

## Bus Companies

Though part of the bus companies had efficient organization and sound financial structure, some companies with weak financial capability ended up insolvent. This deficit of bus companies had increased the government subsidy. The total amount of subsidy toward bus companies was 97.2 billion won in 2003 and has continuously increased.

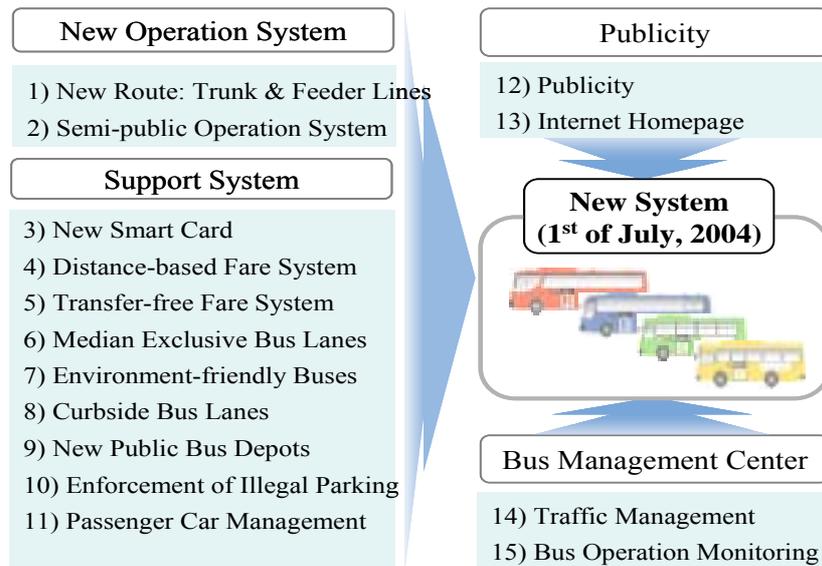
<Figure 3-1> Problems in Seoul Bus System



### **3.2 Main Targets of the Bus Reform**

Seoul's bus renovation project was planned in response to consumers' needs and expectations in terms of urban mobility, rapid urbanization of the metropolitan area, and environmental concerns. The key to solving traffic congestion and maintaining a sustainable transportation system is simultaneously improving public transportation and restricting use of private passenger cars. The aim of Seoul's bus renovation project is to revitalize the bus system through improving regulation and operation of bus services. Reform introduced new forms of governance in the bus transport industry. Additionally, the reform also introduced new monitoring methods, reorganized route networks, created median lanes, improved the quality of business, and introduced a new incentives framework for bus drivers and operators. To achieve this aim, several projects were prepared and implemented. All these projects were integrated and implemented as packages of projects in order to effectively address the complex issues faced by the bus transport industry in Seoul. They are discussed at following sections.

<Figure 3-2> Scheme of Seoul Public Transport Reform



### 3.2.1 New Governance Structure

Prior to the reform, the Seoul Metropolitan Government had experienced difficulties restructuring bus routes. Routes were operated in an inefficient and uncoordinated manner. The lack of coordination in the assignment of bus routes led to ineffective competition among bus companies and to a rapid deterioration of the quality of service offered to consumers. To address these shortcomings, the Seoul Metropolitan Government decided to regain control over the assignment of bus routes, the determination of bus schedules, and the evolution of fares. The Seoul Metropolitan Government established a 'semi-public operation system' to manage and assign bus routes, and

determine the bus schedules. The reform rolled back the delegation previously granted to bus operators with respect to routes to be served or bus schedules.

<Table 3-1> Participants of BSRCC

Government	Seoul Metropolitan Government	<b>1</b>
	Seoul Police Agency	<b>1</b>
	Seoul Metropolitan Council	<b>2</b>
Citizen Groups	Network for Green Transport	<b>1</b>
	YMCA	<b>1</b>
	Green Consumers Network in Korea	<b>1</b>
	Citizens' Coalition for Economic Justice	<b>1</b>
Bus Industries	Seoul Bus Transport Association	<b>2</b>
	Seoul Community Bus Transport Association	<b>1</b>
	Seoul Bus Transport Trade Union	<b>1</b>
Professionals	Transport Professionals	<b>6</b>
	Accountant	<b>1</b>
	Lawyer	<b>1</b>

The Seoul Metropolitan Government created several agencies to oversee and regulate the bus system. Notably the Bus System Reform Citizen Committee (BSRCC) was established in August 2003. BSRCC consists of stakeholders of the bus system such as: Seoul Department of Transportation, Municipal Council, and Association of Bus Company, Transportation Professional, and Lawyer etc. BSRCC debates and decides on various issues such as bus routes, bus fares, and bus operating system.

### 3.2.2 New Fare System

The new system unified and coordinated the fare structure to integrate both bus and rail services. The previous fare system resulted in shorter distance bus riders paying more because buses charged a single fare. The new fare system varies by mode of transportation and total distance traveled. For passengers transferring out of Seoul, the fare is charged based only on the total distance traveled and not on the transportation mode used. Within Seoul, the single fare for bus service start at 800 Korean Won for the first 10 km and increases by 100 Korean Won for increments of 5 km. The base fare also includes free-transfer up to 4 times applicable to both bus and subway. Users have an option of paying with their smart card or with cash, but cash paying users do not have free-transfer privileges and must also pay a surcharge of 100 won regardless of transportation mode.

The distance-based fare system replaced the flat-fare system, including free transfer within 30 minutes. The effectiveness of free transfers between buses and subway modes substantially increased bus ridership. Table 3-2 shows a comparison of fare structure and fare level before and after the reform. The introduction of the smart card eased payment methods and also attracted users by its multiple benefits. Transportation expenses generally decreased because of reduced costs for each trip (\$0.674→\$0.632) and popularization of ‘subway monthly commuting ticket.’ The new fare system made large contributions to increase services and ridership.

<Table 3-2> Bus Fare Structure

		2003. 7 (before)	2004. 7 (after)
Structure	Bus Only	Flat fare	Flat fare
	Transfer	50 won discount	Free (distance-based)
Fare	Card	650 won	800 won
	Cash	700 won	900 won

### 3.2.3 Infrastructure

Two major bus related infrastructures were created and improved; bus route network and exclusive median bus lanes.

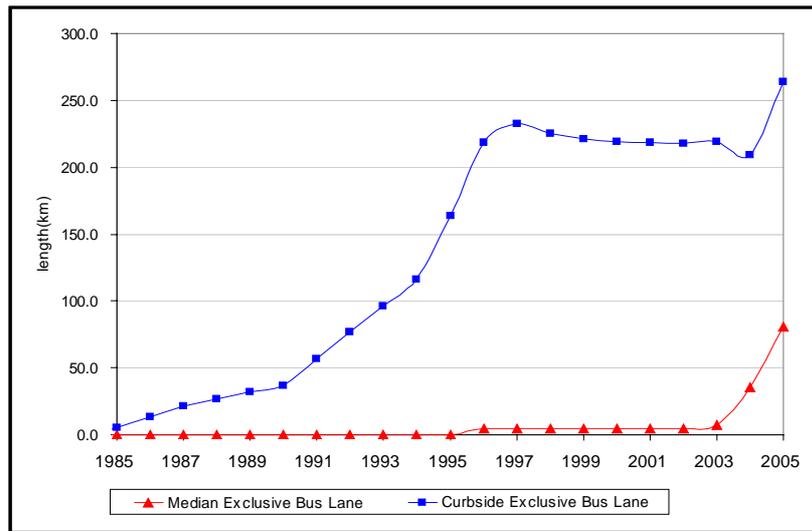
#### Bus Route Network

The bus route network was entirely re-designed to integrate all bus routes in the metropolitan area. All bus services are now grouped into four types and color-coded making them easily distinguishable. The red long-distance intercity buses connect outlying suburbs with each other and the city center. The blue trunk buses operate between sub-cores and along major arterial corridors in Seoul. The green feeder buses including community buses provide local services to feed subway stations and express bus stops and the yellow circular buses provide local services within the city's center. The route number was also reconstructed in order to provide passengers with easy identification of the buses' start and end zone.

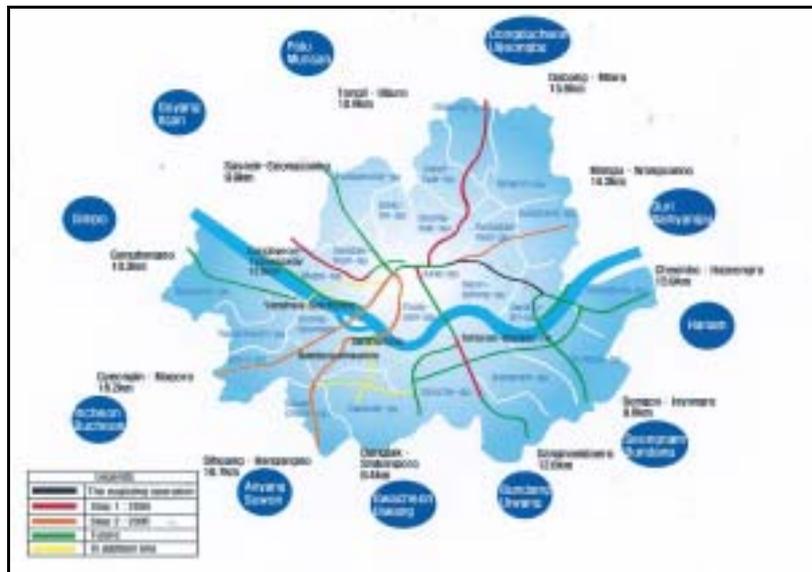
### **Exclusive Median Bus Lanes**

Previously, exclusive bus lanes were installed along the curb side. This had insignificant improvement in traffic congestion, especially at intersections where turning cars continued to interfere with traffic. Instead, median bus lanes replaced former curb side lanes. Much effort was invested to expand and upgrade these lanes from 219 km to 294 km. Exclusive median bus lanes run throughout 3 major corridors (27 km), and will be expanded to 6 corridors (58km) by 2006. The development of a Bus Rapid Transit (BRT) network, high-quality median bus stops, priority traffic signals at intersections, real-time information for passengers and system operators, and new, state-of-the-art buses are all significant for the success of median exclusive bus lanes. Substantial improvements were seen in the overall average bus speed increasing up to 20%. By early 2005, there were already 86 km of such median exclusive bus lanes over 6 different corridors which continue to expand rapidly.

<Figure 3-3> Length of Exclusive Bus Lanes in Seoul



<Figure 3-4> Exclusive Bus Lanes in Seoul



\* existing and planned : 16 routes, 191.2km

### **3.2.4 Technological Innovation**

The new smart card and BMS(Bus Management System) are the key technical innovation of the bus reform project.

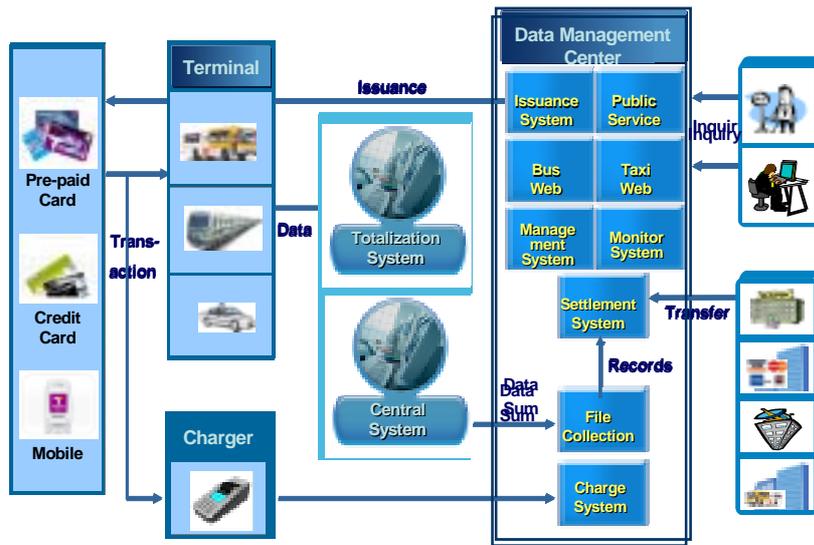
#### **New Smart Card System**

A new smart card was introduced to facilitate intermodal ridership. The new smart card system is a stored-value smart card (T-Money), that was developed with many purposes in mind. Smart cards have had advantages for both passengers and bus companies. Passengers can use their smart card on bus and rail travel, get transfer-fare discounts, and choose between pre-paid and credit card-linked options. For bus companies, fare revenue can be accounted more accurately with the new smart card system.

Seoul has been one of the first cities to use a Radio Frequency Identification card system (Mifare card from Philips) for fare collection since 1997. Though, after 6 years of implementation, the limited capacity of memory, transaction speed and security problems weakened the system. Thus, a new card system using an IC (Intergrated Circuit) chip was developed.

The new smart card satisfies international standards, has increased capacity by adopting EMV (Europay, Mastercard, Visa, the global standard that is helping ensure smart cards, terminals and other systems can interoperate) which allows it to provide multi-function, supports scientific management of bus scheduling, and increases transparent management of bus fare revenues. The smart card is also planned to extend services to taxi use and high street shopping.

<Figure 3-5> Architecture of New Smart Card System



<Figure 3-6> T-money Designs

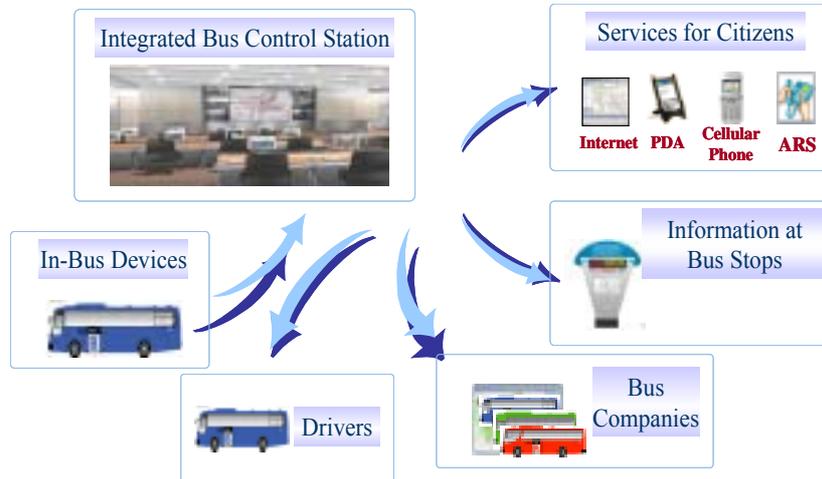


\* (1) Watch Type T-money (2) Card Type T-money (3) Mobile Phone Type T-money  
 (4) Mobile Phone Accessory Type T-money

### **BMS (Bus Management System)**

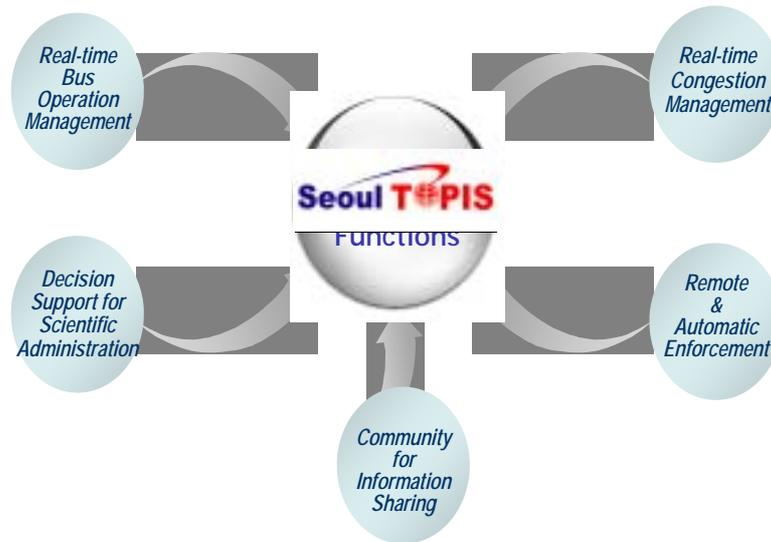
To increase efficient management of bus operations a bus management system (BMS) was developed.

<Figure 3-7> BMS (Bus Management System)



This integrated the Transport Operation and Information Service (TOPIS) which provides data on traffic information that can be uploaded to various transportation agencies in the metropolitan areas. This combined ITS (Intelligent Transport System) and GPS (Global Positioning System) technology to assess buses' position, and control scheduling, and provides bus information to passenger via internet, mobile phone, and PDA. Such information also supports research and assists in decision making processes.

<Figure 3-8> Functions of Seoul TOPIS



### 3.2.5 Consumer and Environmental Concerns

The previous bus system failed to provide quality to riders and was not the environment-friendly. Among the new features integrated to enhance passengers' comfort were: improvement of the design of bus stops, increase in the number of available seats on buses, and ensure the cleanness of vehicle's interior. To improve quality, low-floor buses, articulated buses, and CNG buses were introduced and DPF (Diesel Particulate Filter) was installed in most buses. The Seoul Metropolitan Government also installed a bus information system (BIS) to provide information on buses' position to passengers waiting for buses at bus stops.

<Figure 3-9> Articulated Bus Introduced in Seoul



The Seoul Metropolitan Government plans to operate 300 low-floor buses running on CNG by early 2006. Eventually, all blue and red express buses are planned to be CNG and low-floor buses, and all red buses will be articulated buses. In addition, installation of loading platforms at bus stops will allow getting on and off the express buses easier, faster, and safer. The government now views the BRT expansion as a more cost effective and faster method to provide express public transport service: compared to metro expansion which require much more time and capital investment.

#### **4. Achievements of the Bus System Reform**

The bus system reform enhanced operation and regulation capabilities of public transportation services in Korea. Seoul Metropolitan

Government forcefully targeted the critical concerns during the 1980s when transportation patterns were shifting and bus services failed to provide an alternative option. The leadership of Seoul Metropolitan Government in taking the necessary steps to reform the institutional framework of public transport operation made a major step towards sustaining success over the long term.

The reform fosters integration and coordination which enhances improvements in operation and regulation. All of these achievements confirm the willingness of Seoul Metropolitan Government to improve mobility and the urban environment in Seoul. This solely came about as a result of participative initiatives and consensus building forum involving Seoul Metropolitan Government, bus operators, transport and city professionals, and the citizens.

<Table 4-1> Differences before and after the Bus Reform

	2003(before)	2004(after)
Daily bus passenger (thousand)	4,869	5,350
Daily transit passenger (thousand)	9,307	9,888
Frequency (minutes)	5-15	5-15
Bus speed (km/h)	13 km/h	17.3 km/h
Comfort (low-floor bus)	-	78 buses
Convenience (red zone)	-	142 spots
*Punctuality	0.537	0.493

\* Difference of the permitted headway and actual operation headway

Targets that were implemented to improve the transport system achieved increasing mobility, efficiency, ridership, information dissemination, and mitigated negative impacts such as road safety, traffic conditions, and pollutant emissions and energy consumption. Table 4-2, Table 4-3, Table 4-5 summarizes improvements in the transport system.

<Table 4-2> Increased Number of Passengers for Subway and Bus (thousands/day)

	2003(before)		2004(after)		Increasing Rate
	July	August	July	August	
Bus	3,793	3,744	4,142	4,140	9.9 % ↑
Subway	2,699	2,557	3,055	2,867	12.6 % ↑
Total	6,492	6,301	7,197	7,007	11.0 % ↑

<Table 4-3> Changes of Number of Passengers after the Reform (thousands/day)

Category	Public transport (a+b)	Subway (a)	Bus (b=c+d)	Trunk lines(c)	Feeder lines(d)
July 04- May 05 Average	9,765	4,545	5,220	4,068	1,152
July 03- May 04 Average	9,282	4,497	4,785	3,863	922
Changes	483	48	435	205	230
Rate(%)	5.2 % ↑	1.1 % ↑	9.1 % ↑	5.3 % ↑	24.9 % ↑

\*The data of July 1<sup>st</sup>, 2004 and January 11<sup>th</sup>, 2005 were eliminated due to the card terminal errors

## 4.1 New Governance

During the planning and implementation phase, Seoul Metropolitan Government established a special task team dedicated to bus reform, the Bus System Reform Citizen Committee (BSRCC) that would work closely with Seoul Metropolitan Government, urban government and think tanks. While, the Seoul Metropolitan Government took an administrative role, and the Seoul Development Institute think tank collected, analyzed and disseminated information, BSRCC's roles and strategies helped to form cooperation and consensus building among various stakeholders in the preparation stage, and was a channel that allowed stakeholders to participate in the decision making process.

The main tasks of BSRCC were to discuss reform issues with wide variety such as the bus routes, introduction of articulated buses, etc. They analyzed bus passengers' needs and demands on bus fare, routes and operation system etc, through public hearings and workshops. They also reviewed and suggested the programs of the bus system reform and menus about the welfare of bus drivers, exclusive bus lanes, tendering system, and monitoring related programs.

The committee played a key role of networking stakeholders and related parties as an arbitrator and coordinator to encourage collaboration and compromise among stakeholders. The committee also focused on consensus building from conflicting agendas and specified the bus reform issues and agendas through various social

networks using formal and informal networking. Finally, the committee mediated many disputes and conflicts among stakeholders by organizing sub-committees to solve the conflicting problems and complaints. Its main strategy was to initiate win-win options for benefits of all parties and stakeholders.

## **4.2 Infrastructure**

Transportation infrastructure improved bus services through the creation of transfer facilities, red zones, exclusive median bus lanes and reorganized bus routes. More bus depots improved user convenience by shortening transfer distance. Installation of red zones at bus stops, for 142 stops covering 13 routes, improved passenger transfer time and prevented slipping with special paving. Colored paved surface covers, planned for 315 stops covering 26 routes, made bus stops easily identifiable. The use of exclusive median bus lanes has proven to increase average bus speed by at least 33 percent in three major corridors as well as increase passenger mobility by at least 6 times. Reduced interference among buses and cars has also increased speed of car travel in the adjacent lanes. The plan for exclusive lanes, included construction of exclusive median bus lanes in 4 areas totaling 46.1km, and the expansions of existing exclusive curb-side bus lanes for 11 routes totaling 312km.

<Figure 4-1> Median Exclusive Bus Lanes in Seoul



<Table 4-4> Vehicle Speed in Major Corridors

Major Corridors	Length(km)	Car Speed(km/h) (4, June, 2004)	Bus Speed(km/h) (4, Dec, 2004)	Percentage Change
Dobong-Mia	15.8	11.0	22.0	100% ↑
Susak-Songsan	6.8	13.1	21.5	64.12% ↑
Kangnamdero	5.9	13.0	17.3	33% ↑

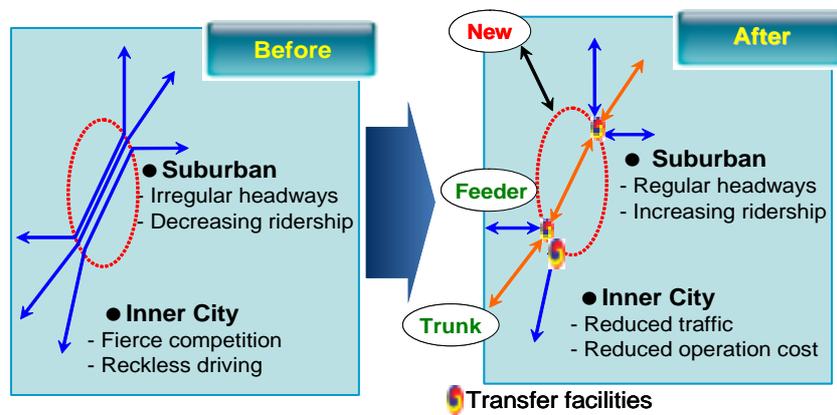
<Table 4-5> Speeds of Roads with Median Exclusive Bus Lanes

Description		Before (June, 2004)	After (August, 2004)	Percentage Change
Road A	Bus (exclusive lane)	11	20.3	85% ↑
	Car (other lane)	18.5	19.9	7.6% ↑
Road B	Bus (exclusive lane)	13.1	22.5	72% ↑
	Car (other lane)	20.3	21.0	3.4% ↑
Road C	Bus (exclusive lane)	13.0	17.2	32% ↑
	Car (other lane)	18.0	19.1	6.1% ↑

The reorganization of the bus network and additional bus routes increased travel and management efficiency. Since the implementation of the reform, number of bus routes increased to 462 routes with 8,306 buses, which previously, only 368 routes with 8,146 buses operated. The increase is mainly caused by the new classification of bus routes that requires more routes and buses in certain areas. Expanding coverage, added 94 new routes and 160 new buses, which accounts for 25% of the increase. The total route length increased to 7,567km from 7,487km, solely because coverage expanded into previously no-public transportation service areas.

Whereas, the average route length decreased from 20.3km to 18.5km, by correcting for previously winding routes and overlapping routes. Long distance redundant routes were transferred into a new ‘route linkage oriented bus system’ by the trunk lines serving as the main arteries of the transportation flow connected by the feeder lines spreading out to the required routes throughout the city.

<Figure 4-2> Demand Responsive Reorganization of Route System



<Figure 4-3> Cheongnyangni Transfer Center / Yeoido Transfer Center



<Table 4-6> Categorization of Bus Routes

**Before the Bus Reform**

Category	Number of bus routes
Urban style	253
High-class	37
Express	12
Circulation	66
Total	368

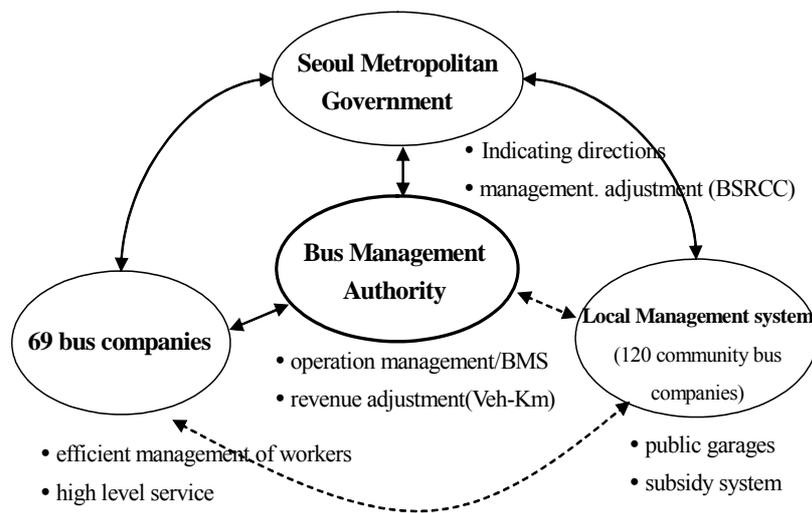
**After the Bus Reform**

Category	Function	Number of routes
Trunk (Blue)	Connecting suburbs-downtown	90
Feeder (Green)	Connecting trunk-subway stations	328
Wide-area (Red)	Connecting metropolitan area-downtown	39
Downtown circulation (Yellow)	Circulating in the downtown	5
Total		462

### 4.3 Technological Innovation

The bus management system (BMS) set up on the 1<sup>st</sup> of July, 2004 utilized advanced technologies such as: GPS, ITS, and RFI to monitor bus travel. Information gathering systems are installed on buses which provide real-time and dynamic bus information (BIS) to passengers. Availability and accessibility of information allow passengers to optimize bus travel time and distance. The management administration also found this information useful to identify aggressive driving, over-speeding and to develop emergency plans. Such data is also useful for analytical studies having policy implications.

<Figure 4-4> New Bus Management System



## 4.4 Consumer Orientation

### 4.4.1 People-oriented, Environment-friendly Public Transport

The reform placed an emphasis on introducing passenger-friendly and environmentally conscious services and buses that would mitigate negative impacts. Quality was achieved through three main initiatives: improving road safety, decreasing pollutant and energy consumption and reaching consumer standards. Road safety profoundly increased when a mandatory bus driver quality certification was required. A competitive education program stressed driving-safety behaviors and understanding of the use of smart card, BMS, and GPS technologies. Driver education is only partly attributed to the significant decrease in bus related traffic accidents (Table 4-7); it should also be complimented with the reorganization of bus routes that have improved scheduling and timeliness of bus travel; thus reducing any unnecessary reckless driving.

<Table 4-7> Bus Related Traffic Accidents and Casualties

Year	Number of accidents	Number of the injured			
		Lightly injured	Heavily injured	Death	Total
2003	654	916	49	6	971
2004	478	704	36	0	740
Rate(%)	26.9%↓	23.1%↓	26.5%↓	100%↓	23.8%↓

Environment-friendly buses were also in the center of the reform planning process. The number of CNG buses increased from 1,504 to 2,100, and simultaneously DPF (diesel particulate filter) were also being adopted. The use of CNG, and DPF energy products significantly reduced air pollution substances such as: CO, NOX, HC, and PM. Only CNG buses and DPF installed buses are operated through exclusive median bus lanes which is required through legislation of Seoul Metropolitan Government.

<Table 4-8> Energy Pollutants and Consumption

	2003(before)	2004(after)
Safety (traffic accident)	3,949	3,094
Accident per day	21.9	17.2
Air pollution (CO: ton)	1,798.8	1,526.4
Air pollution (NOx: ton)	6,889.8	5,846.2
Air pollution (HC: ton)	390.5	331.4
Air pollution (PM: ton)	302.2	245.6
Energy consumption (CNG: 1000m <sup>3</sup> )	147,064	126,485
Energy consumption (Diesel: 1000m <sup>3</sup> )	34,413	41,731

Quality standards for buses such as: cleanliness of interior, comfort, and accessibility for users has been greatly improved. Such standards stretch to service providers such as engineers who are regularly educated about maintenance of buses, smart card systems, BMS and GPS technologies. Effectiveness of service providers can be tracked through complaint resolution.

<Table 4-9> Number of Public Complaints after the Reform

Type of Complaint	04/2004	12/2004	05/2005
Transport card and fare	59,871	4,820	640
Service routes	1,216	44	15
Service schedules	1,638	141	29
Bus stops, route maps	561	24	4
Service of bus driver	392	40	30
Publicity of route and fare	331	19	1
Etc (suggestions, transfer)	981	48	34
Total	64,990	5,136	753

#### 4.4.2 Passenger Car Reduction Policy

##### The Opening of Seoul City Hall Plaza

Seoul City Hall plaza was opened on the 1<sup>st</sup> of May, 2004. The area which used to be always jammed by traffic, exhaust, and noises was returned to the citizens transformed into a big town square park with a large grass lawn. It has defiantly succeeded in restraining the traffic flow in this area and securing space for pedestrians.

<Figure 4-5> Reform of Seoul City Hall Plaza (before and after)



### **The Restoration of Cheong Gye Cheon**

Cheong Gye Cheon, which was a historical stream running through Seoul was covered up with roads and highways since 1937 where the flowing daily traffic volume amounted to 190,000 vehicles. The restoration of this 6 kilometers stream has made a great contribution to the idea of people-oriented, environment-friendly policies and sustainable transport. To relieve the huge traffic, public transportation was encouraged and the bus reform has greatly contributed to decreasing the car traffic volume by 125,000 vehicles per day.

<Figure 4-6> Restoration of Cheong Gye Cheon (before and after)



## **5. Lessons Learned and Conclusion**

Over the last 40 years, Seoul Metropolitan Government has attempted to reform the bus operating system several times but had continuously failed. The failures were caused by the strong oppositions of the bus industries and bus users as well as the government's top-down, vertical approaches which had weak decision making leadership. This is

prominent in the failures of the Seoul bus reform in 1996 and 1997. However, the 2004 bus system reform had support of citizens, and organizations which urged SMG to establish the BSRCC.

Planning and implementing such a huge project could have not been possible without the leadership of decision makers. The entire transport reform could be implemented successfully under the Mayor of Seoul, Lee Myung Bak. Pushing his main projects forward, he made every effort to manage and minimize the various conflicts by consultation and discussions with citizens and stakeholders. It is meaningful that the concept of 'New Governance' had been substantially introduced as a new direction of administration through the public transportation reform. The previous top-down approaches by the central government and Seoul Metropolitan Government has been changed into a process led by a committee supported by citizen groups and collaborative organizations.

As Mr. Lee Myung Bak became the mayor of Seoul in 2002, he has challenged to change Seoul into an environment-friendly, people-oriented space from a city where only development had more priority than people and environment. The Public Transportation Reform, with other main projects such as the Cheong Gye Cheon restoration project, creation of Seoul City Hall Plaza and Seoul Forest, etc has dramatically changed Seoul. In spite of the conflicts and debates, now many citizens are satisfied with the projects and the associations such as BSRCC have encouraged people to change their ideas. They have

began to realize that people and environment should have most priority to any other things such as development or cars and that Seoul can be a more pleasant place to live in.

The Reform is the result of a participative approach based on a consensus building process involving Seoul Metropolitan Government, bus operators, transport and city professionals, and the citizens. The leadership of Seoul Metropolitan Government took the necessary steps of reforming the institutional framework of public transport operation in order to increase efficiency and rationalise costs. In this respect, public transport operators benefited from the support of Seoul Metropolitan Government which helped them to modernise their fleet and adopt innovative technologies. After a phase of stabilisation of this framework, it is expected to increase responsibility and entrepreneurship of public transport operators by encouraging them to adopt a service-oriented approach.

Identifying alternative financing sources is a concern of all public transport organisations worldwide. In Seoul, the subsidy ratio of public transport operation is far lower than in the majority of networks in the world, and it is improving. However, due to the scarcity of public funds, it seems important to consider other sources such as value capture from property development, road use pricing, congestion charging, parking revenues, etc in order to progressively reduce the expenses of Seoul Metropolitan Government.

The challenge for Seoul Metropolitan Government in the coming years will be to continue the Reform and sustain the results over time. To this end, after the initiation and development phase carried out by Seoul Metropolitan Government, it is important to set up a dedicated body which will have the objective of administrating and organising public transport in Seoul in close collaboration with other bodies dealing with mobility-related issues.

In conclusion, the bus system reform is agreeably successful in addressing the needs of Seoul. The reform outcomes and methods have been receiving attention both from home and abroad, leading Seoul to be awarded the Metropolis Award in May, 2005 and other world recognitions for the effort to improve city's public transportation, such as from the International Union of Public Transport(UITP) and the Association of Transport in Japan.

Seoul Metropolitan Government hosted an 'International Forum on the Public Transportation Reform' in July, 2005 to share the experiences and achievements of the Seoul reform and to also gather reviews from specialists of UITP and other cities around the world. Furthermore, many cities across the globe have visited Seoul to benchmark the city's mass transportation reform and notably authorities from Beijing, China and Istanbul, Turkey has reached agreements with Seoul Metropolitan Government to share advancements in public transportation operations.

Recently, Seoul has also been named as the winner of 2005 World Technology Network (WTN) for Environment and is about to be presented the Sustainable Transport Award from ITDP, Environmental Defense and TRB in January, 2006.

There is much for the international area and Korea's government to take away from Seoul's experience. Such success from this experience not only speaks for the reform of the bus system but for reforms of other areas as well.

## **Appendix**

### **□ Review Report of UITP**

Following the request of Seoul Metropolitan Government, the International Association of Public Transport (UITP) delegated a Peer Review Team of public transport professionals who visited Seoul, Korea, from 6 to 8 July 2005. The Team was composed of:

- Hans RAT, Secretary General, UITP, Belgium
- Hup Foi TAN, Deputy President, SMRT Corporation, Singapore
- Oscar SBERT LOZANO, Director Engineering & New Development, TMB Barcelona, Spain
- Mark O'DONOVAN, Head of Contracts, London Bus Services, United Kingdom

With the support of Mohamed MEZGHANI, Director Knowledge and Membership Services, UITP, Belgium

The objective of the Team was to review and assess the Public Transport Reform implemented by Seoul Metropolitan Government since July 2004. To this end, the Team held a number of meetings with officials and representatives of the organisations involved in the definition and implementation of the Public Transport Reform, and had site visits of the public transport system in Seoul. The Team appreciated the availability of all officials and representatives and their readiness to provide information and to support the Team's mission.

Following this mission, UITP Peer Review Team has formulated the following conclusion:

1. There is a clear and strong will of Seoul Metropolitan Government to improve quality of life in this major metropolis under the guidance of the Mayor. The Review Team was impressed by the number of ambitious projects which have been carried out or are being implemented to move Seoul forward to become a sustainable metropolitan world city. UITP Team recognises the vision, political commitment and courage of Seoul Metropolitan Government.
2. The Review Team visited the Cheong Gye Cheon restoration project, the Seoul Plaza renovation and the Public Transportation Reform related facilities and infrastructures. All these achievements confirm the willingness of Seoul Metropolitan Government to improve mobility and the urban environment in Seoul in order to cope with the increase of travel demand and the deterioration of traffic conditions and their negative impacts. These initiatives led to a number of benefits for the citizen and the community: reduction of car traffic in some areas, improvement of traffic conditions, decrease of pollutant emissions and energy consumption, improved road safety, etc. While recognising the important results already achieved, the Review Team calls on Seoul Metropolitan Government to continue the initiated efforts over the coming years in order to sustain the benefits in the long term.
3. The Public Transportation Reform is a major step towards sustainable mobility. The key of its success lies in its integrated approach combining organisational measures, innovative technology, infrastructure development, and transport operation. Seoul is one of the rare cities to have implemented such a comprehensive reform in such a short period of time and simultaneously at different levels: construction of median exclusive bus lanes, reorganisation of the bus network (hierarchisation of bus lines: express lines,

trunk lines, feeder lines, local lines), reform of the institutional framework (contractualisation of bus operators and semi-public operation system), integrated multimodal electronic fare system (T-Money), integrated transport operation and information service (TOPIS), clean buses (CNG), car traffic management and enforcement of illegal parking, etc. The Review Team recognises numerous benefits generated by this reform: better efficiency of operation by improved adequation between transport capacities and demand, growing number of passengers which led to an increase of revenues following the launch of the integrated fare system and therefore a decrease of overall public transport deficiency and government subsidy, improved traffic conditions for buses mainly in the median bus lanes, better decision-making process and more transparency as far as the relationships between operators and Seoul Metropolitan Government are concerned, etc.

4. The Reform is the result of a participative approach based on a consensus building process involving Seoul Metropolitan Government, bus operators, transport and city professionals, and the citizens. The Review Team welcomes the establishment of the Bus Reform Citizen Committee and the transparent approach aiming at involving all stakeholders.
5. The leadership of Seoul Metropolitan Government took the necessary steps of reforming the institutional framework of public transport operation in order to increase efficiency and rationalise costs. In this respect, public transport operators are benefiting from the support of Seoul Metropolitan Government which is helping them to modernise their fleet and adopt innovative technologies. After a phase of stabilisation of this framework, it is expected to increase responsibility and entrepreneurship of public transport

- operators by encouraging them to adopt a service-oriented approach. Quality incentives could be part of this approach.
6. Besides, investigations should be launched to assess the opportunity to replace existing buses by larger capacity buses to optimise operational costs and road space occupancy. The data provided by TOPIS could support this research and help in the decision-making process. Last, TOPIS could also be a tool which supports buses and passengers in getting priorities at traffic lights in order to accelerate the service.
  7. As mentioned above, the Reform fosters integration and coordination between public transport modes. In this respect, the Review Team welcomes the project to integrate taxis in the overall mobility scheme (and payment system through T-Money) and calls to strengthen integration of public transport with car traffic and parking policy (including Park & Ride schemes) and between buses and metro lines in order to avoid duplication and competition between public transport modes. It is also recommended to ensure coordination with public transport lines serving the suburban areas.
  8. Identifying alternative financing sources is a concern of all public transport organisations worldwide. In Seoul, the subsidy ratio of public transport operation is far lower than in the majority of networks in the world, and it is improving. However, due to the scarcity of public funds, the Review Team recommends to consider other sources such as value capture from property development, road use pricing, congestion charging, parking revenues, etc in order to progressively reduce the expenses of Seoul Metropolitan Government.
  9. The challenge for Seoul Metropolitan Government in the coming years will be to continue the Reform and sustain the results over time. To this end, after the initiation and

development phase carried out by Seoul Metropolitan Government, it is important to set up a dedicated body which will have the objective of administrating and organising public transport in Seoul in close collaboration with other bodies dealing with mobility-related issues. This Public Transport Authority could take over the tasks related to the definition of public transport strategy and services and control public transport operation.

10. Last, but not least, citizens and customers are in the centre of preoccupations of authorities and operators. They use the transport system and expect a service which answers their expectations which are permanently evolving. In this context, it is essential to follow the development of their life style and behaviours and implement appropriate marketing strategies to improve public transport image.

In conclusion, on behalf of UITP, the Peer Review Team supports the Public Transport Reform and recognises that Seoul Metropolitan Government is successfully implementing a Public Transportation Reform which is a fundamental step towards sustainable urban mobility. In order to achieve the later objective, UITP Peer Review Team calls for the continuation and strengthening of the Public Transport Reform accordingly with the above-listed conclusions.

Seoul, on 8 July 2005

On behalf of UITP Peer Review Team

Hans RAT	Hup Foi TAN	Oscar SBET LOZANO	Mark O'DONOVAN
Secretary General	Deputy President	Director Engineering &	Head of Contracts
UITP	SMRT Corporation	New Development	London Bus services
	Singapore	TMB Barcelona	United Kingdom
		Spain	

## □ Review from Pretoria, South Africa

Ibrahim Seedat  
Director, Public Transport Strategy  
National Department of Transport  
South Africa

### **1. What's the most important issues in Republic of South Africa(Cape Town, Johannesburg, etc)'s transportation management policies?**

The big challenges facing the 6 metropolitan cities in South Africa are how to manage car use (especially in our suburban areas where over 90% of people drive car to work) and how to develop integrated public transport networks (currently public transport is mostly provided by mini-vans that carry 15 passengers and these are essentially run by route associations of operators. In the big cities about 40% of workers use cars and 51% use public transport and 9% walk to work.

Given the income disparities South African cities are faced with the twin challenges of high suburban car ownership that is concentrated in a small area as well as the lack of an integrated, high quality public transport system for the 60% of urban households without access to a car. The challenge is to establish the right political will and planning and management capacity at the city level in order for the city to start to plan, manage and regulate public transport routes and services in a similar fashion to the Seoul Metropolitan Government.

**2. What was your most surprising discovery about public transportation reform in Seoul?**

I was impressed with the fact that Seoul decided to prioritise dedicated bus lanes and the development of an integrated system using smartcards and free transfers as opposed to spending a lot of money on expanding the metro network. In South Africa the civil engineers are mostly interested in build large highways for cars or with expensive plans to develop a fast train between the cities of Johannesburg and the capital Pretoria which are 60km. It is much more cost effective to develop Busway Rapid Transit system with good public facilities and spaces.

**3. Do you believe there's some idea to borrow from them for your city? If you have, what part do you think so?**

Definitely. South Africa has been wanting to introduce a smartcard system for some time. We feel that we can explore a partnership with the Seoul Metropolitan Government and the Seoul Development Institute to assist us in this regard given that Seoul has develop considerable expertise in this regard. There are also a range of other public transport and passenger car measures that we could borrow from Seoul. We have been awarded the 2010 FIFA World Cup and in this regard there is room for co-operation with Seoul which has had experience with the 1988 Olympics and the 2002 World Cup. We are awaiting approvals from our Department before proceeding to explore the possibilities of a co-operation agreement with Seoul.

**□ Support Notes for the Seoul Nomination of the 2005  
World Technology Network Award for Environment**

I fully support the nomination of Seoul for the 2005 Environment Prize for at least two reasons.

First, Seoul shows that things are moving, and moving in a sustainable direction, more rapidly in Asia than in Europe, where stagnation depresses the best will, or North America, where the unsustainable way of life seems intangible. Second, the leadership of Mayor Lee Myung-Bak is evidence that errors of the past can be corrected, and that the equation progress equals environmentally unfriendly development is not ineluctable, so that many paths can lead to Reconcile Outlasting Mankind with the Earth (ROME).

Best regards,

Francis Papon  
Département Économie et Sociologie des Transports  
Institut National De Recherche Sur Les Transports Et Leur Securite  
F-94114 Arcueil France

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I would like to support your nomination of Seoul's Mayor for the prize this year, for most effective and innovative Transportation based policies. Your description makes it sound almost unbelievable. I have never heard before of any city which has actually dismantled an expressway, and certainly never to restore a waterway. That IS remarkable in itself. All the other things you mention – the Busways, the GPS equipment,

the new busses. All must have required tremendous political push, and in a capital city it must have required enormous financial muscle collected for the purpose. I certainly support your nomination.

With kind regards,

Prof J G Krishnayya  
Director, Systems Research Institute  
17-A Gultekdi, Pune 411037 India

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This is actually the biggest waterway restoration project I've known of in a developing country. As pointed out in your description, waterways are one of the key reasons for which most cities are chosen as major travel, commerce or political "hubs" for a city. Cities (and citizens) should remember that they live in a place that can't forget its history or its future, in terms of economic, environmental and social sustainability.

I sincerely hope (and predict) that Seoul's life quality will continue to improve immensely if it continues to have these wonderful ideas. These are the kind of cities that others should look up to. In short, I fully support this nomination and expect mayor Lee Myung-Bak to keep up the good work.

Best regards,

Carlos F. Pardo  
Project Coordinator  
GTZ Sustainable Urban Transport Project (SUTP)  
Bangkok 10200, Thailand

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For those of us who work on helping to create more sustainable cities, there are few times when events make us stop with great surprise and joy. For the most part, the inevitable march towards motorisation has simply meant trying to develop a few small demonstrations within an otherwise exploding car market. China and other Asian countries are quickly moving towards full car-dependency.

Thus, the dramatic events in Seoul over the past three years are difficult to comprehend. The demolition of a city-centre elevated roadway is unusual in any circumstances. To do so in the burgeoning auto market of Asia is seemingly miraculous.

As a professional working on transport and environment issues in the developing world, I would like to give my strongest support to the nomination of Mayor Lee Myung Bak and the municipality of Seoul. Mayor Lee and his team have redefined what is possible with our urban environment. Demolishing elevated expressways, revamping the public transport system, and transforming waste sites into vibrant communities is a powerful combination of accomplishments.

Undoubtedly, over the next few years there will be many mayors and other municipal officials from the world over making a visit to Seoul in order to see first hand the transformation of the city. The best indication of Seoul's revival, though, is the steady stream of citizens who now make their way to the Cheonggyecheon River instead of the Cheonggyecheon Expressway. Amongst the crowds and children, it is

difficult to imagine that this oasis of water and green space was layers of concrete just a few months back.

So many cities today talk about "sustainability" but few achieve anything that really even begins to reverse the ravages of unrestrained motorisation. Seoul has shown that local governments and a concerned citizenry can indeed reclaim their city. Without reservation, I encourage you to give Mayor Lee Myung-Bak and the Seoul municipality the highest consideration with your 2005 awards.

Sincerely,

Lloyd Wright  
Gakushin Fellow, Osaka University, Japan

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I fully support the nomination of the Mayor of Seoul Mr. Lee Myung-Bak for a World Technology Award. His efforts on the transport works are very significant. I was pleased to have an opportunity to see the results of these efforts during the study tour, organized by Seoul Metropolitan Government in July 2005.

With Best Regards,  
Mr. Oleg Kononov  
Head of the regional and international relations department  
MOSGORTANS

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## Toward Better Public Transport Experiences and Achievements of Seoul

First published: Dec, 2005

Published by Man Soo Kang

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