Application for Outstanding Transportation Project Award (OTPA)

The Seoul Bus System Reform Project

Contents of the Application

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1. Background

Seoul was first established as the capital by the Cho-Sun dynasty 610 years ago. In perspective geographically, Seoul's transportation was born to be inconvenient because it is surrounded by mountains that provide natural protection from outsider attacks. In the early 1900s, when Korea was under Japanese Colonialism, the Japanese government first in Korean history laid a railroad network and introduced electric trains to the city. The electric trains running in radial directions was the main form of public transportation in downtown Seoul until the 1960s. Since the 1960s was the period of economic revival, a huge number of national population converged on Seoul by over 300,000 people per year. In order to transport a large number of people, the electric trains were replaced by buses handling up to 85% of Seoul's population. Later on, the subway, which has a larger capacity, was built from the 1970s onward. By the year 2000, 8 subway lines were constructed with a total length of 287km.

In spite of completing stage two of the subway such as lines 5 through 8, the mode share of the subway has only increased from 29.4 % in 1996 to 34.6% in 2002. The number of passengers on subway lines 1 through 4 actually decreased, and most of the passengers of the new subway lines 5 through 8 were previously bus users. As a result, buses were losing passengers and revenue. This resulted in the contraction of bus routes and companies going bankrupt, which caused the decrease in the number of passengers and service quality. This vicious cycle continued to make citizens no longer favor the use of buses. In contrast, the number of passenger cars continuously increased with the current number being over 2 million. Particularly, there has been a significant increase in traffic between the metropolitan area and Seoul. But due to huge road construction costs being required, environmental damage concerns and objections from citizen groups, road supply has reached its limit.

While citizens complained about high gasoline prices, air pollution from traffic, car accidents and inconveniences caused by traffic congestion, the transportation problems in Seoul worsened day after day. We have come to a point where a fundamental solution to these traffic problems is

required. By renovating public transportation, we are trying to persuade citizens to use public transportation rather than private. This is now a critical subject that cannot be avoided.

2. The Objectives

The objective of the project was to construct an integrated network and to enhance the level of public transportation service. The old system that evoked competition between the subway and buses has been converted to a mutually beneficial supplementary linking system.

First, a full scale reorganization of the bus routes was put into practice. Bus routes have been grouped into 4 lines including trunk, feeder, circulation and wide-area lines. There are now 106 trunk lines, 259 feeder lines, 5 circulation lines and 21 wide-area lines after the adjustment of the previous 368 long, redundant and curved routes.

Second, bus colors are divided function wise; blue for trunk lines, green for feeder lines, yellow for circular lines and red for metropolitan express lines.

Third, the bus number system indicating the operating area is implemented. Seoul is divided into 7 sections and assigning them numbers from 0 to 7 according to the section. The bus number is configured using the starting point section number following the arrival point section number and the bus series number.

Fourth, the route operating responsibilities is converted from the previous private bus company ownership to a public based system. Combined management of revenue and supplying the expenses according to operation records is introduced.

Fifth, a bus management center is built to provide a scientific bus operation management. Bus fleet operations are managed at the center using real time bus operation information from GPS systems installed on every bus.

Sixth, the new smart transportation card system is created. The new card system implements the international standard, expanding capacity and accommodating the distance-based fare system.

Seventh, a unified fare system for every public transportation is introduced. It significantly decreases the fare and even makes it free of charge when transferring between the subway and buses or between buses.

Finally, the exclusive median bus lane on major trunk lines are created. 7 routes amounting to 57.1km have been installed and are currently in operation. A total of 12 routes amounting to 117.6km will be created step by step by 2009.

3. Output

Due to the implementation of the Seoul Bus system reform, the output in terms of revenue and public transportation users have increased significantly. Public transportation has become much more efficient overall. The system itself combined with newly installed median bus lanes, Bus Management Systems and Global Positioning Systems have helped produce favorable results.

Increase in Public Transportation Users

In comparison to daily number of public transportation users in the second half of 2004, an increase of 897,000 (9.6%) users per day for public transportation overall and an increase of 672,000 (18%) users per day for bus users.

Increase in Public Transportation Transfers

In comparison to daily number of public transportation transfers in the second half of 2004, an increase of 1,088,000 (103%) users per day for public transportation transfers overall and an increase of 655,000 (128%) users per day for bus transfers.

Increase in Public Transportation Revenue

In comparison to daily public transportation revenue in the second half of 2004, an increase of 572 million Korean won (10%) per day for public transportation overall and an increase of 179 million Korean won (6.9%) per day for bus revenues.

Increase in Transportation Card Usage

In comparison to daily public transportation card usage in the second half of 2004, an increase of 74% (9%) for the subway and an increase of 92% (15%) for buses.

Increase in Bus Speed Due to the Median Bus Lane

In comparison to the speed of buses before the implementation of the median bus lane and after, there has been an increase of 20km/h (81.8%) on the Dobong-Miaro lane.

Decrease in the Number of Bus Accidents

In comparison to the monthly number of bus accidents before the implementation of the median bus lane, accidents have decreased by 144 incidents (22.2%) and a decrease of seriously injured persons by 73 (11.1%).

4. Social impacts

The implementation of the Seoul Bus system reform project has had a positive impact on our society especially with the introduction of the median bus lane. The formation of this lane has divided the roads into two sections and has been increasing traffic flow significantly for both buses and private cars. An overall 17% increase in public transportation use has shown us that the use of private cars have decreased significantly. Due to the change in bus route responsibilities from the previous situation of private ownership to a public based system, service level of bus operation has greatly improved. Seoul Metropolitan Government is able to give incentives to bus companies accordingly from bus operation performances monitored by the Bus Management System.

5. Urban impacts

The Seoul Bus system reform project has affected our urban environment positively. Because of the introduction of the median bus lane and the reorganization of the bus route system, the number of bus passengers has increased significantly. Interestingly, the number of subway users have increased as well. Overall, the total number of public transportation users have increased 17% in comparison to public transportation users before the implementation of the Seoul Bus

system reform. This is environmentally significant because the increase in public transportation use has a direct correlation to the number of private transportation users which results in a decrease in air pollution caused by motor vehicles. Also, user-friendly low-floor buses have been introduced. To reduce air pollution, 3,846 CNG buses are currently in operation and later on every diesel bus in Seoul will be replaced by CNG buses.

The introduction of the new median bus lane at three main corridors has increased the average speed of buses in bus lanes overall. The speed of automobiles in adjacent traffic lanes have also increased reducing conflict among buses and automobiles. The median bus lane carries about 6 times more passengers than the other lanes. Resulting in bus travel times in median bus lanes consuming only 1.5 of the needed in other bus lanes.

6. Economic impacts

One of the greatest improvements the Seoul Bus system reform has made is changing the previous fare system into a new distance-based transfer-free fare system. This system consists of a free-of-charge fare system for transfers and distance-based fare collection. Basically, users pay a fare based on their travel distance. For a single trip, the fare will be charged by mode types (subway and bus). The single fare for buses and the subway is 900 Korean won (~0.96 US Dollars) within Seoul. For transferring passengers outside of the Seoul, the fare will be charged based on the accumulated distance traveled whatever the mode.

The base fare of 900 Korean won is charged for up to 10km traveled, with an extra charge of 100 Korean won for every additional 5km traveled within 10~40km. For passengers travel more than 40km, extra 100 Korean won will be charged for every additional 10km traveled. It is enabled by a new smart card system along with a GPS module, which will be expanded in the next phase. However, for cash paying users, a surcharge of 100 Korean won is applied for every mode type and those passengers cannot receive transfer benefits. It was planned and decided to encourage passengers to use the new smart card.

7. Transferability

The Seoul Bus system reform's implementation significantly increased the transferability for users. The median bus lane is one of them. The introduction of the median bus lane brought about the installation of the Bus Management System (BMS) which manages and controls buses for a more efficient bus operation. Global Positioning Systems (GPS) were installed on every bus helping the BMS identify each bus' position in order to control its scheduling. Information from the BMS such as expected arrival time and travel time is now available on the internet and via telephone. The performance of bus operations will be monitored by the BMS which will help the Seoul Metropolitan Government give incentives and penalties to bus companies accordingly.

Another big part of the reform is the introduction of the new smart card system. Seoul city is one of the pioneers in introducing the RF (Radio Frequency) contactless card system for fare collection. Previously, two different card types were used. The prepaid card(e.g. T-money)and the deferred payment card (e.g. credit card). But due to problems in the system such a limited capacity, slow transaction speeds and security problems, a new fare card system based on an IC chip was developed. The new smart card satisfies international standards, has more capacity and enables multi-functional services. It plays a key role in the new distance-based transfer-free fare system. From September 1, 2007, integrated transfer fare system will be expanded to Gyeonggi province adjacent to Seoul metropolitan area, resulting in the wider use of smart card for paying the fares of buses and subways within the metropolitan area. It is expected that the usage of smart card will be considerably broadened even to the payment of taxi fares.

What are the future plans of your project?

The exclusive median bus lane will be expanded for use in Songpadaero, Yanghwaro, and Sinchonno within 2007. Three more areas are planned to use the exclusive median bus lane by 2009.

In this year, Seoul Metropolitan Government will implement BRT project which connect Seoul~Hanam, Hwagok ~ Cheongna in cooperation with the Traffic Construction Department. Along with this project, automobiles will be blocked from entering the Seoul metropolitan area and for easy public transportation transfers, outer area transportation centers will be installed.

These steps will help expand the reformed bus system throughout the whole metropolitan area unifying transportation.

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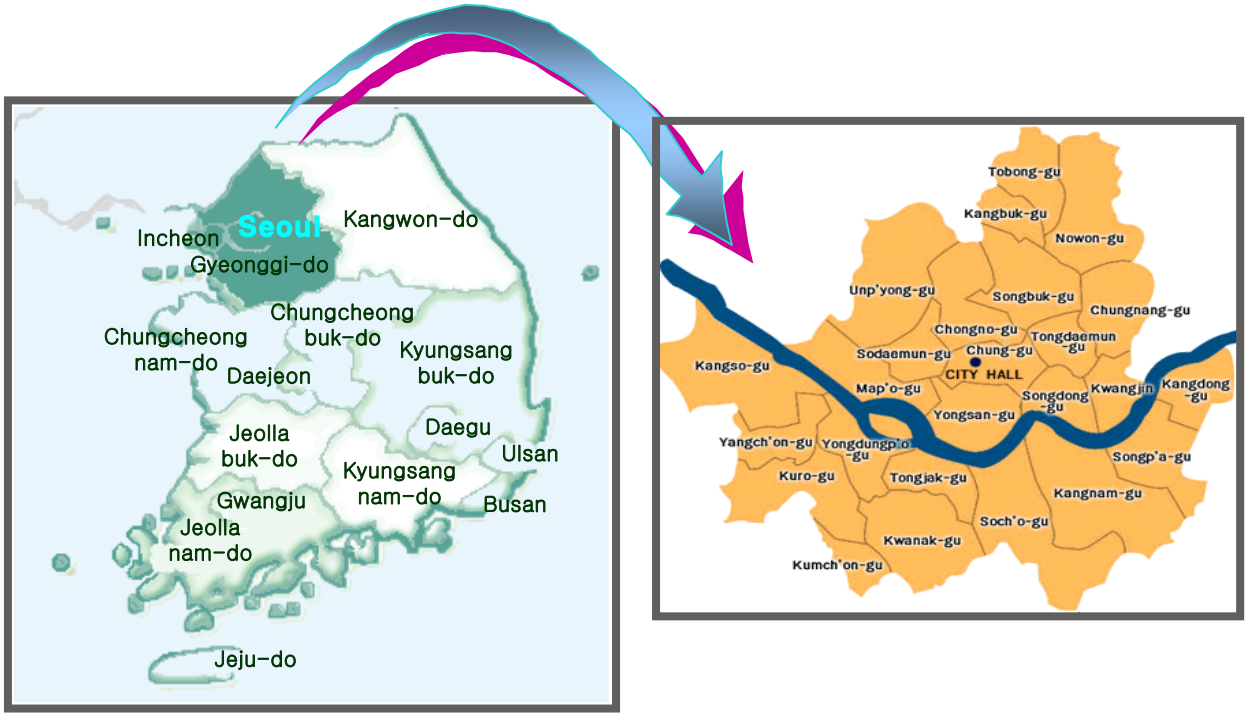
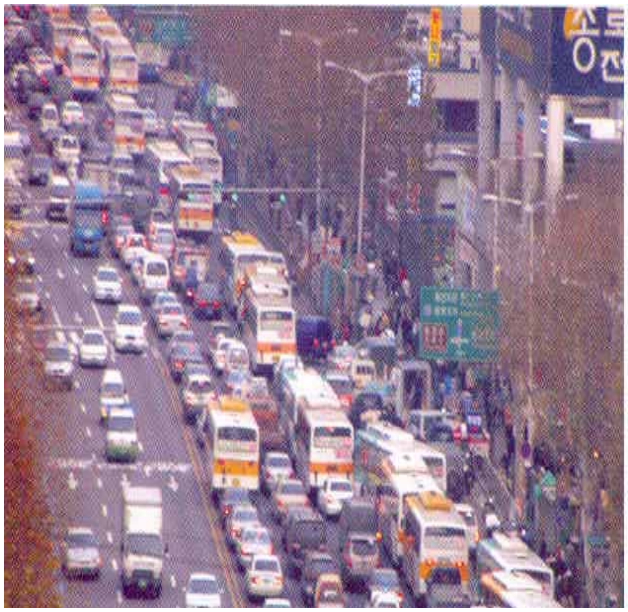
1. Seoul's Location



2. Exclusive Median Bus Lanes



Old

New

Old

New

Newly constructed Exclusive Median Bus Lanes

3. Changed Function Wise Bus Colors

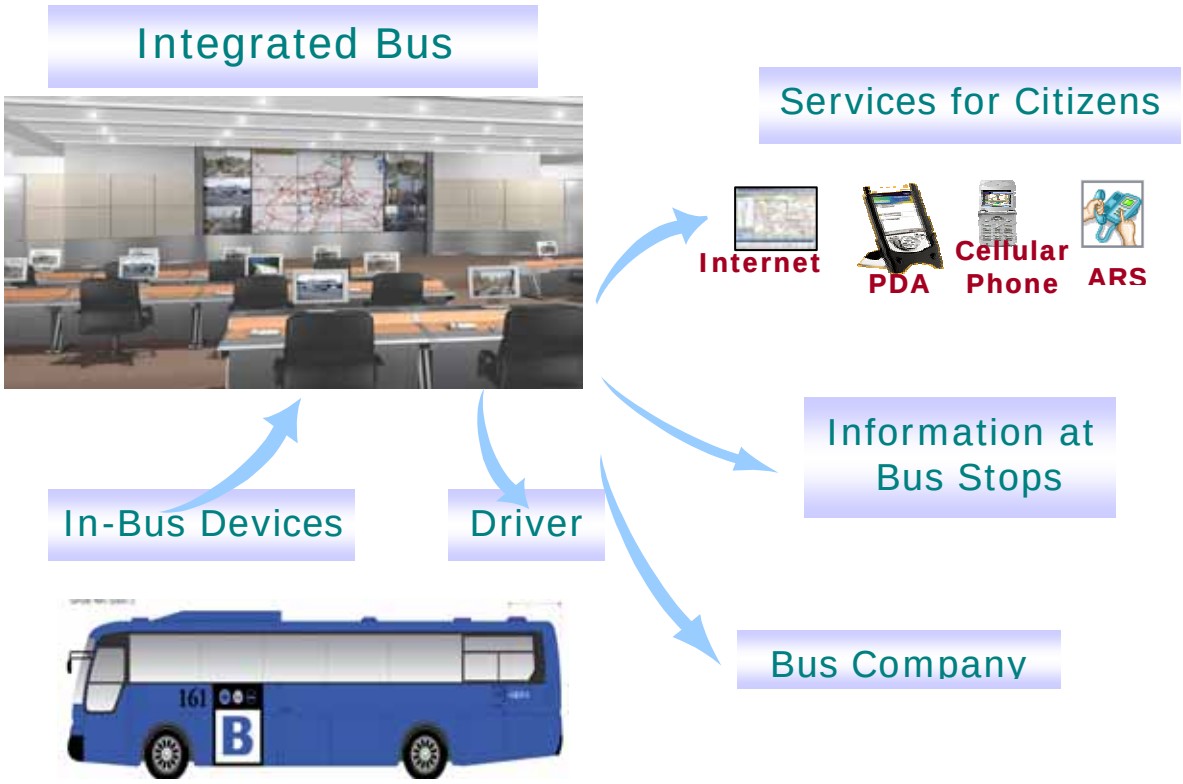
간선버스/Blue Bus

광역버스/Red Bus

지선버스/Green Bus

순환버스/Yellow Bus

4. Transportation Card System & Bus Management System



5. Low-floor Buses and Articulated Buses

6. Bus Stop Shelter and Signs

Dear Sirs / Madams,

I am pleased to apply for the Outstanding Transportation Project Award with our new bus system. The Seoul Bus system reform was implemented in order to construct an integrated network and to enhance the level of public transportation service. The old system that evoked competition between the subway and buses has been converted to a mutually beneficial supplementary linking system.

When the Seoul Bus system reform was first implemented on the 1st of July, 2004, there were many unexpected problems such as errors in transportation cards and confusion of bus routes. By working day and night discussing and analyzing the problems, we were able to fix the problems within the few months following the implementation. Now that 3 years have passed, the Seoul public transportation reform has overcome difficulties of its early stage and has become stabilized. Positive indicators and changes are now appearing.

In comparison to the second half of 2004, the number of public transportation users has increased by 900,000 users per day and by 1,080,000 users per day for transferring customers. The use of the exclusive median bus lane has increased average bus speeds by 20km/h. The waiting time for customers have also become very reliable by decreasing to 2 minutes on average. These positive effects from the implementation of the Seoul Bus system reform result from the change in the previous route-based system to the new network-based system. By combining the subway with buses, it has become a unified system where you can travel anywhere you wish more conveniently and with ease. For those who have wanted to travel directly to their destination can save time and money by using the new transfer system.

The base of the Seoul Bus system reform is our reknown IT technology. With this technology we pioneered the first ever Radio Frequency contactless card system for fare collection. A new fare card system based on an IC chip was developed and introduced satisfying international standards. This card has more capacity and enables multi-functional services which plays a key role in the new distance-based integrated transfer fare system. Also, the use of the exclusive median bus lane has brought about the installation of the Bus Management System (BMS) which manages and controls buses for a more efficient bus operation. Global Positioning Systems (GPS) were installed on every bus helping the BMS identify each bus' position in order to control its scheduling.

Information from the BMS such as expected arrival time and travel time is now available on the Internet and via telephone. This technology makes it possible for the performance of bus operations to be monitored by the BMS which will help improve inefficiencies in the system.

From September 1, 2007, integrated transfer fare system will be expanded to Gyeonggi province adjacent to Seoul metropolitan area, resulting in the wider use of smart card for paying the fares of buses and subways within the metropolitan area. The exclusive median bus lane will be expanded for use in Songpadaero, Yanghwaro, and Sinchonno within 2007. Three more areas are planned to use the exclusive median bus lane by 2009. Also in this year, we will implement BRT project which connect Seoul~Hanam, Hwagok ~ Cheongna in cooperation with the Traffic Construction Department. Along with this project, automobiles will be blocked from entering the Seoul metropolitan area and for easy public transportation transfers, outer area transportation centers will be installed. These steps will help expand the reformed bus system throughout the whole metropolitan area unifying transportation.

We are continuously planning improvements and expansions in order to provide better ways for a more safe, convenient and efficient way for citizens to travel around Seoul.

Sincerely yours,

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Seoul Metropolitan Government

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