

## **"Owl Bus" Based on Big Data Technology**

### **Policy Overview**

The Seoul Night Bus, also known as the "Owl Bus," is the brand name of the city's intra-city buses that run nine routes exclusively from midnight to 5:00 a.m. Like an owl, animated in the dark with its yellow-glowing eyes, the "Owl Bus" was born to make Seoul's public transportation service ceaseless, carrying the city's late night commuters.

### **Background Information**

#### **Insufficient mobility rights for the socially and economically disadvantaged**

From when subway line No. 1 opened in 1974 through to the transformation reform carried out in 2004, the Seoul Metropolitan Government has steadily introduced measures to ensure greater convenience and better mobility of the citizens. However, students and workers such as sanitary workers or small business owners, who return home late night, found it hard to benefit from the pre-existing systems. Most of them suffer from the poor working conditions and low salaries, yet they still had to pay the late-night extra charge when taking taxis to return home.

#### **Growing inconvenience due to late-night taxis' refusal of passengers and illegal operation**

During late night and dawn hours, there are far less available taxis than people who are trying to hail a cab. Thus, illegal operations are prevalent by taxi drivers demanding extra fares, causing serious inconvenience to citizens. Additionally, there are practical limitations in controlling such irregularities. Firstly, there is a shortage of police officers responsible for preventing such violations, and even if the police catch an offender red-handed, it is difficult to obtain evidence to prove the driver's act of refusing passengers or demanding illegal excess fares.

#### **Public-private consensus on the need for new means of transportation to support urban dwellers' economic activities**

Seoul, transformed into a global city within just 50 years, is emerging as a prime location of the global economy. As the city's industrial, economic and cultural activities expand in size and scope, the citizens reached a consensus on the need for a bus service that operates from midnight to dawn. It was

also considered that advanced nations such as Germany and the U.K. have already run such services to promote the safety of the citizens and their rights to mobility.

### **Goals and Objectives**

- ☞ Improve convenience for those who take public transportation post-midnight.
- ☞ Lessen financial burdens on the economically disadvantaged, such as self-employed small business owners.
- ☞ Address citizens' everyday life concerns by customizing policy measures, using big data technology.

### **Resources**

#### -Budget

To finance the operation of the "Owl Bus," budget provision was needed to pay for the labor costs and the installation of safety facilities such as protective walls for drivers and a speeding prevention system. However, these expenses were covered by the joint management funds for the shift from private to quasi-public bus operation.<sup>1</sup> Consequently, additional costs were not incurred.

#### Technology

Information systems connected inside the vehicles such as the Bus Management System, the Bus Information Unit and Bus Information Tool enable comprehensive control of the bus operations, and efficient adjustment of intervals while providing users and drivers with real time operation information.

#### Human resources

The "Owl Bus" was introduced without incurring additional costs, and increased operation revenues too. The allocated resources are 45 vehicles and a total of 54 workers; 36 for driving and 18 for management.

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<sup>1</sup> Private bus companies' selective operation on profitable routes was a long-running concern for SMG. Thus, it shifted from private to quasi-public bus operation system. In the new system, Seoul manages the bus routes and revenues while the private companies operate buses.

## Implementation and Expertise

### Test Operation of Night Bus at the Request of the Citizens

Since 2012, the Seoul Metropolitan Government has operated the 120 Dasan Call Center and the official blog to better listen to the voices of the citizens, and developed various policy measures based on the information collected through these channels. Along the way, an opinion was received that the late night taxi service is not only difficult to use but also imposes heavy financial burdens on users.

An on-site survey conducted for about six months from October 2012 found it necessary to operate a late-night bus service. As a result, starting from April 19, 2013, the city government began operating two pilot routes exclusively for an after-midnight service.



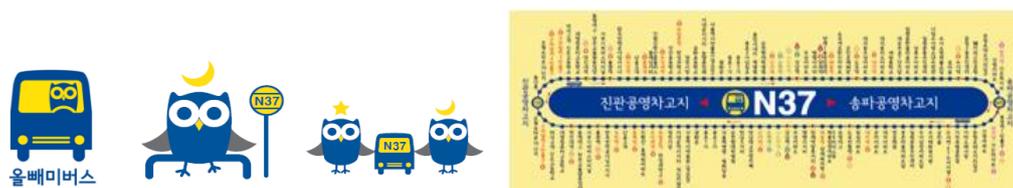
### Expanding "Owl Bus" routes by up to nine, indebted to communication with the citizens and cooperation from the private sector

For three months following the launch of the test operation, the service was extremely well-received by 220,000 people, making it justifiable to raise the number of service routes. The seven new lines were determined by taking into consideration the heavy concentration of people on the move during late night hours. Accordingly, the SMG conducted on-site research and analyzed late-night mobile phone call volumes collected by the Korea Telecommunication to construct a radial-shape network linking outer districts of the city with the hub areas such as Jongno and Gwanghwamun. Also, the brand name "Owl Bus" was chosen by the government through a public contest held in June. With the letter "N" in the bus number, the service began its full operation on September 16, 2014.



**Citizen’s voluntary participation in selecting the brand name, the initial ‘N’ and the character image**

With news regarding the Late Bus spreading over SNS channels, citizens voluntarily suggested to name the late-night bus. Thus, the city government invited public ideas for the naming of the service and, as a result, the brand name "Owl Bus" and "N (Late Night)," and the character that portrays an owl operating a bus were selected. These symbols have been used to mark bus stop signs, bus route map and numbers and distinguish the late-night buses from ordinary ones.



**Greater safety and enhanced convenience for citizens**

The LED lighting panel attached to the front and sides of the bust help passengers to easily recognize even in the dark from a distance. Also, every vehicle is fitted with a device to prevent it from exceeding 70km/h. Partitions protect drivers from possible attacks of drunken or aggressive passengers. Additionally, the network of emergency contacts was established with nearby police stations to swiftly respond in case of emergency.

### **Conflict Management: Mediation and Resolution**

As the service is the first of its kind in Korea, policymakers struggled to shape action plans in detail. Particularly, the biggest task was to address issues such as selection of the routes, ensuring efficient operation and passengers' safety and convenience.

#### ☞ Selection of bus routes: Big data analysis of the KT call volume during late night hours

During the initial stages of mapping out how to operate the Seoul Night Bus, the issue of selecting bus routes emerged. The municipal government color-coded regions by call volume based on the data provided by a private communication service provider, KT. Then, it analyzed the number of passengers who get on and off at each bus stop in the heavy-call volume regions and connected the dots to lead to the most pertinent routes.

#### ☞ Efficient operation: Measures to optimize the operation interval

As the intervals between buses grew longer in the longer distance routes, the SMG introduced the simultaneous dispatching system in which vehicles depart simultaneously from both ends of the bus line, thereby minimizing the gap in the intervals between different directions. Passengers can also easily transfer at the major intersections of different routes and the interval was optimized to 30 to 40 minutes in consideration of the demand and frequency.

#### ☞ Convenience and safety of passengers: real-time operation information

The service provides citizens with real-time operation information. Anyone who wants to take the "Owl Bus" can check the arrival time and location of the bus stop in advance through the website or smartphone apps. Meantime, given that the service operates late night, safety measures were critical to protect citizens. Besides the protective partition and speeding prevention device, it was made mandatory to inspect the vehicle before driving. The drivers with proven qualifications are also well remunerated so that they do not have to take on other vocational activities during the daytime hours and can fully concentrate during night time driving.

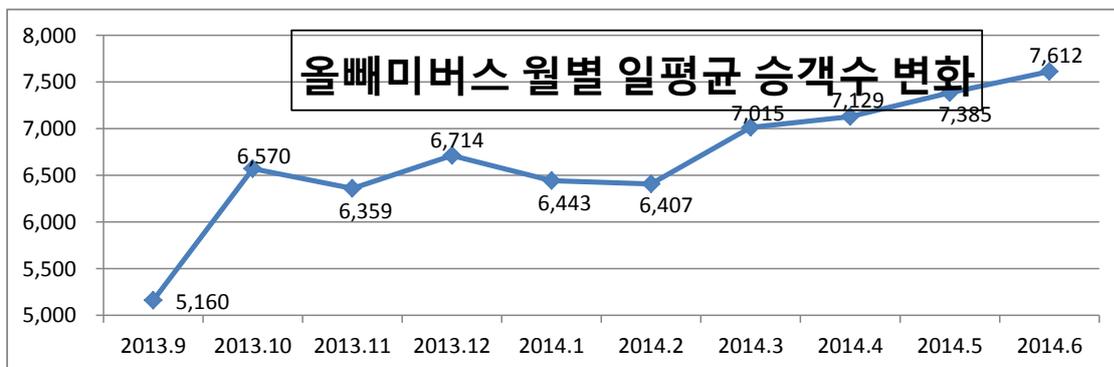
## Results and Evaluation (Cause of Success and Failure)

### Safe and Affordable Means of Transportation for Citizens

The numbers of "Owl Bus" passengers are on the constant rise. A total of 1,735,000 people have taken the buses from September 2009 to June 2013, making the daily average passengers stand at around 7,000. As for economic aspects, passengers are expected to save approximately KRW 6,000 as the "Owl Bus" charges KRW 1,850 per trip while the average taxi fare in the same timeframe costs KRW 8,000. Given that the most of the passengers are students, self-employed small business owners or workers, the service is expected to help stabilize their household finances.

Meantime, most passengers are concentrated in the timeframe from midnight to 03:00, when students and workers return home completing their after-school self-study and night duties. As the unfrequented time tends to leave them more vulnerable, the "Owl Bus" is considered to help them move more safely. Notably, the "Safe returning-home service" provided in cooperation with the nearby police stations reinforce the safety.

< Average number of passengers per day >



<Average number of passengers by hour >

	Midnight	01:00	02:00	03:00	04:00	05:00	Sum
Daily average number of passengers	1,056	2,047	2,008	1,621	770	111	7,612
Proportion	13.8%	26.9%	26.4%	21.3%	10.1%	1.5%	100%

### **Income redistribution for the economically disadvantaged**

Before the operation of the "Owl Bus," one had to pay up to tens of thousands of won to move from the city center to a residential district outside the city. However, they now can complete their journey with just 1,850 won. As the savings will lead to higher disposable incomes, income redistribution effects are expected, too. As of 2013, the SMG estimates nearly KRW 14.1 billion worth of economic benefits have been redistributed.

### **Applicability (Implications)**

#### **Expansion of new IT markets in related areas**

The Seoul Night Bus has helped invigorate culture and IT technologies. The growing post-midnight mobility has vitalized late-night activities such as movies, city tours and shopping. With the Wi-Fi network installed in the vehicles, the communication industry is expected to grow further and the ability to process various transactions on the move e.g. financial ones, has improved the quality of urban life.

#### **Distribution of the manual for other local governments to benchmark**

As residents of other cities express their interest in the "Owl Bus," through SNS channels, local governments and research institutes have inquired about the process in the run-up to the introduction and requested lectures on the "Owl Bus." With many metropolitan governments expressing their interest, the Busan Metropolitan Government has already begun operating the late night service by extending the operation hours of existing intra-city buses and other cities such as Ulsan and Daejeon consider introducing it, too.

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