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## 8. Weekly No-Driving Day: A Voluntary Program to Reduce Traffic Volume in Seoul

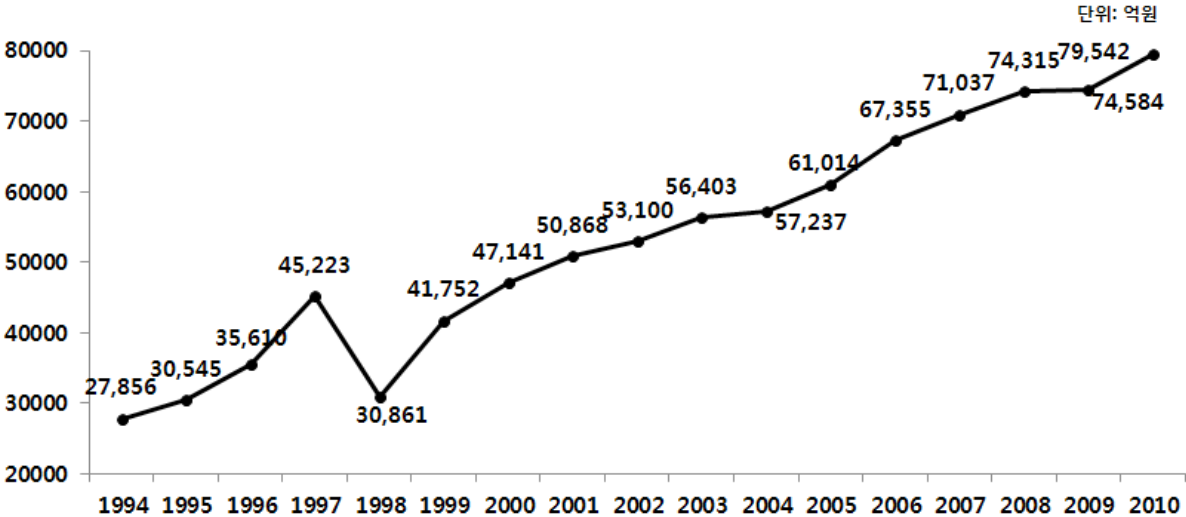
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Policy Area: Transportation

# Background to the Weekly No-Driving Day Program

In South Korea, per-capita petrol consumption is 16.2 barrels as of 2006 – the 5th largest in the world, after Saudi Arabia, USA, Canada, etc. National oil consumption is 2.2 million barrels a day, ranking 9th in the world and making the nation one of the largest energy guzzlers (IEA, 2006). As of 2008, transportation ranked second after non-industry (household) in terms of energy consumption in all of Seoul; in transportation, 80% or more was used to fuel individual passenger cars. The number of cars owned in Seoul rose from 200,000 in the 1980s to nearly 3 million in 2010 – about 15 times larger in only 30 years, approximately a car to each household. This unmanaged growth of passenger car use has driven the city’s congestion-related costs up to KRW 8 trillion, a phenomenal loss in money and energy.

Figure 1 - Estimated Costs from Traffic Congestion in Seoul



Source: the Korea Transport Institute (2010)

As more individuals drive and depend on their cars more heavily than before, concerns are rising over air quality, fuel consumption, traffic congestion, and the increase in overall social costs. To address this worrying situation, the City of Seoul has introduced various policies to provide transportation facilities and ease congestion. However, these policies are now faced with numerous difficulties – lack of space, environmental regulations, financing issues, and civil complaints regarding the protection of property rights. The city responded by adopting transportation demand management policies (e.g., congestion charges, bus-only lanes, the congestion impact fee); in 2003, it introduced the Weekly No-Driving Day program, which encourages citizens to choose one day from Monday to Friday to leave the car at home, thereby saving energy, helping to ease traffic congestion and reducing air pollution.

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## Program Implementation

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As of 2003, the total number of registered vehicles in Seoul exceeded 3 million; of these, more than 2 million were passenger cars. The increasing number of vehicles further aggravates the traffic in the city, and pollutants produced on the road account for 78.2% of the total air pollutant emissions in Seoul. The voluntary Weekly No-Driving Day program in July 2003 was one of the plans the city came up with to manage transportation demand and relieve congestion, borne out of the high public participation in the odd-even road rationing program during World Cup 2002. This program encouraged residents not to drive one out of five weekdays. Under existing road rationing systems (e.g., 5-day rationing), car owners are asked not to drive their cars with license plates ending with a certain number on a corresponding day, regardless of the owner's schedule or circumstances. With the Weekly No-Driving Day program, drivers can choose this day. This transportation demand management policy is more people-oriented, allowing people to adjust the off day according to their individual needs and lifestyle patterns.

When the Weekly No-Driving Day program was in its infancy in 2003, the City of Seoul decided to provide a discount on the congestion impact fee for those companies participating in the program. Based on the “causer-pays” approach, the congestion impact fee was levied on facilities negatively impacting traffic congestion. Buildings that participated in the Weekly No-Driving Day program received a 30% discount on the congestion impact fee. People who participated in the program were given a 20% discount on fees at public parking lots, while from 2004, drivers participating in the program paid only 50% of the congestion charge when using Namsan Tunnel 1 and 3. From 2005, participating vehicles were conditionally exempt from the car tax, based on the number of compliance days for a year. In 2010, the city signed a business agreement with 13 insurance companies, who in turn offered an 8.7% discount on car insurance premiums for participating drivers to encourage more vehicle owners to take part.

The most important change since the implementation of the Weekly No-Driving Day program was the launch of an RFID<sup>2</sup>-based operating system for the first time in the world. RFID readers installed throughout Seoul read RFID tags placed on vehicles by program participants to verify participation in the program. In 2007, paper stickers were abandoned and replaced with RFID tags to identify participants. However, the number of citizens who did not use the tags increased as they wanted to drive their cars on the designated “rest” day. In 2012, the city implemented the Electronic Tag Compliance system, which was designed to stop tax cuts and other participation benefits for participants caught 3 or more times a year for non-compliance.

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2. RFID (Radio-Frequency Identification): Technology that identifies data via radio frequency from a long distance.

**Table 1 - History of the Weekly No-Driving Day Program**

| Year | Month     | Description  |
|------|-----------|--|
| 2003 | July      | Launched as "Voluntary 7-day Road Rationing"   |
|      | September | Discount on congestion impact fee (30% for facilities that adopt the program)                  |
|      | October   | Mandatory introduction to parking lots at public institutions under City of Seoul jurisdiction |
|      | November  | 20% discount on parking at public parking lots in Seoul  |
| 2004 | July      | 50% discount on congestion charge (Namsan Tunnel 1 and 3)                                      |
| 2005 | June      | Conditional discount on car tax (Ministry of Government Administration & Home Affairs)         |
| 2006 | January   | RFID system launch (Electronic tags to be attached for the Weekly No-Driving Day program)      |
|      |           | 5% discount on car tax   |
|      |           | Discount car insurance program launched (Meritz Fire & Marine Insurance)                       |
|      | June      | Program mandatory for all public institutions in Korea (Ministry of Trade, Industry & Energy)  |
|      | December  | Phase 2 RFID system built (14 locations)   |
| 2007 | July      | Paper stickers abandoned, electronic tag introduced for all                                    |
| 2008 | October   | Weekly No-Driving Day program card launched  |
| 2010 | May       | Agreement with 13 insurance companies (discount of 8.7% on premiums)                           |
| 2012 | July      | Electronic Tag Compliance system launched  |

Source: Seoul Metropolitan Government (2014).

## Program Summary

### Participation Incentives

To encourage more people to take part in and comply with the Weekly No-Driving Day program, the City of Seoul decided to offer various benefits such as parking fee discounts at public parking facilities. Those who comply faithfully with the off day receive a 5% discount on car tax. These incentives can be divided into public and private sector as shown in Table 2. The benefits provided by the public sector include toll discounts and those by the private sector include discounts on petrol, carwashes, and car maintenance. Each year, the city spends KRW 10 billion to offer such incentives.

**Table 2** - Incentives for the Weekly No-Driving Day Program

|                        |                                 | Description   |
|------------------------|---------------------------------|---|
| Public (City of Seoul) | Congestion Charge               | 50% discount (KRW 2,000 → KRW 1,000)  |
|                        | Public Parking Lots             | 20~30% discount on parking fees   |
|                        | Resident-Priority Parking Zones | Bonus points upon selection   |
|                        | Congestion Impact Fee           | 20% discount  |
|                        | Car Tax                         | 5% discount   |
| Private                | Fuel                            | KRW 10 – 40 discount per liter  |
|                        | Carwash                         | Maximum 10% discount  |
|                        | Car Servicing                   | Maximum 10% discount  |
|                        | Car Insurance Premiums          | 8.7% discount for attaching a device that allows verification of participation with program |

Source: Seoul Metropolitan Government website.

**Table 3** - Cost of Incentives for the Weekly No-Driving Day Program

(Unit: KRW 1 million)

| Year | Car Tax<br>5% Discount | Tolls for Namsan<br>Tunnel 1 & 3<br>50% discount | Public Parking Lot<br>30% discount on<br>fees | Total  |
|------|------------------------|--|---|--------|
| 2009 | 7,338                  | 925  | 2   | 8,265  |
| 2010 | 10,050                 | 846  | 146   | 11,042 |
| 2011 | 9,744                  | 730  | 159   | 10,633 |
| 2012 | 9,110                  | 693  | 173   | 9,976  |

Source: Seoul Metropolitan Government (2014).

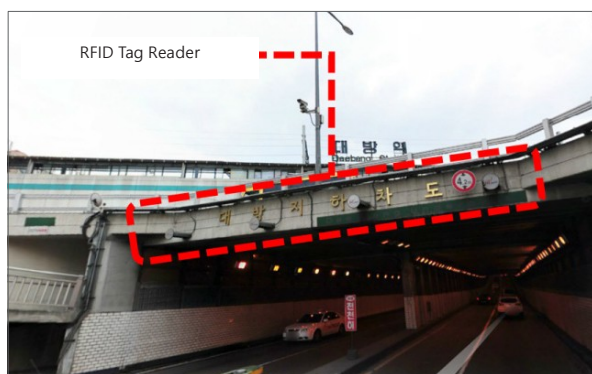
## Verifying Participation via RFID (Radio Frequency IDentification)

The City of Seoul introduced the RFID wireless system to prevent paying incentives to those who do not actually comply with the off day requirement. RFID technology is similar to a barcode: it is a contactless identification of data stored in the IC chip on the electronic tag via radio frequency. Program participants are required to attach the RFID tags that carry their identification number and their car's chosen off day on the front window. The data is recognized by RFID tag readers (19 locations, 52 readers) installed throughout the city. When the system was first introduced, there were concerns over privacy violations, but the tags only contain the off day code and that the vehicle is owned by a program participant. The RFID system only confirms that the vehicle is in compliance with the off day requirement; it cannot track the car's route or history. It does not contain the license plate number or personal history, and therefore does not constitute a violation of privacy.

**Figure 2** - Electronic Tags for the Weekly No-Driving Day Program



**Figure 3** - RFID Tag Reader at the Underground Pass near Daebang Station



Source: Street view, Naver.

**Table 4** - Vehicle with an RFID Tag



Source: The Weekly No-Driving Day Program Page, Seoul Metropolitan Government Website.

**Compliance System to Ensure the Attachment of Electronic Tags**

Because the Weekly No-Driving Day program is voluntary in nature, the city cannot guarantee that all participants abide by the rules. It was found that some participants do not attach the tags properly or at all and still drive. When the city issues the tags, participants need to attach them to the vehicle, take a photograph, and have it verified through the website or smart phone application. The system was modified to give benefits only to those who have had their tags verified by a photograph.

**Program Information on the Website & Smart Phone Application**

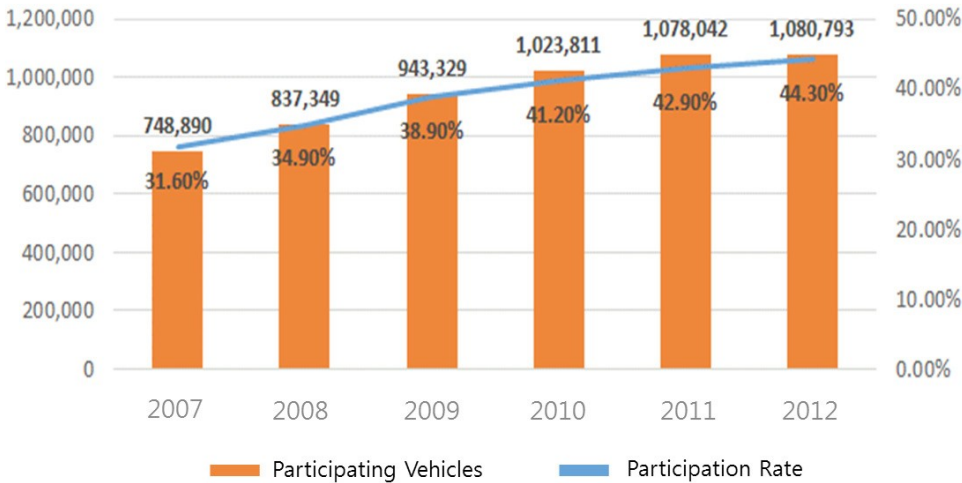
The City of Seoul created a program website and smart phone application to allow participants easy access to information on the program and its incentives. This has made it easier to participate in the program, verify to the city that the tag has been attached, locate affiliated businesses on maps, and calculate the potential benefits should someone choose to participate in the program.

**Major Achievements**

**Steady Increase in the Number of Program Participants**

Launched in 2003, the Weekly No-Driving Day program was welcomed by citizens from the beginning. Thanks to the city's encouragement and incentives, participation grew steadily until 2012. As of 2012, the rate was 44.3% - nearly half of all passenger cars in Seoul are in the program.

**Figure 5 - Participation in the Weekly No-Driving Day Program**



Source: Seoul Metropolitan Government (2014).

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## Reduced Traffic Volume & Cleaner Air

According to research by the City of Seoul in 2014, the Weekly No-Driving Day program has helped reduce Seoul's traffic volume by 1.1%. This number refers to the actual volume of reduction caused by the program, based on participation rate, compliance rate, and car use patterns. While 1.1% is lower than expected, it is not small considering the cost-effectiveness of running this program.

This 1.1% reduction can be translated into some 180 million fewer kilometers traveled by passenger cars a year, and an annual reduction of 36,000 tons of CO<sub>2</sub> emissions (accounting for 0.36% of total emissions by the transportation sector in all of Seoul). The program is also considered responsible for the annual reduction of 295.8 tons of CO, 108.4 tons of NO<sub>x</sub>, and 35.2 tons of HC. In financial terms, reduced travel and enhanced air quality are worth KRW 144.4 billion per year.

## Limitations & Needed Improvements

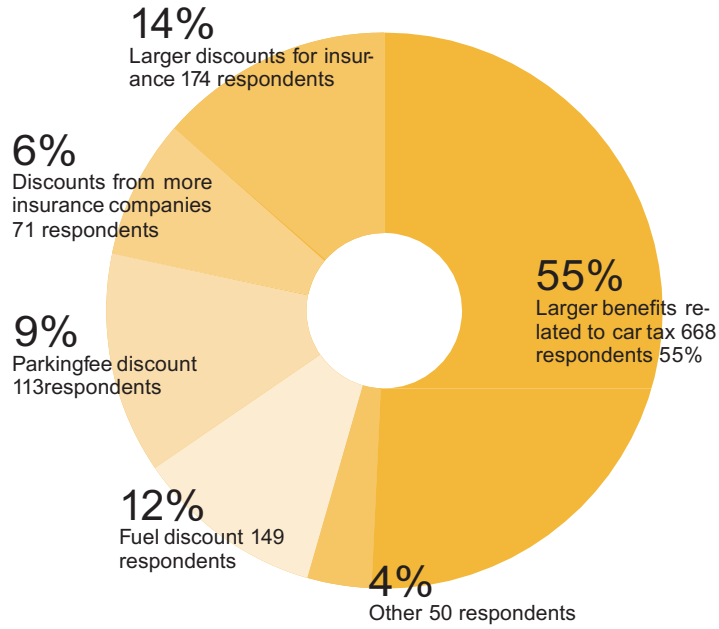
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While the Weekly No-Driving Day program is significant in that it is voluntary, this voluntary nature is what has caused some of the problems. As of 2012, some 1.1 million of the 2.5 million registered passenger cars in Seoul are in the program – a participation rate of 44%. However, traffic volume has been reduced a rather measly 1.1%. One of the reasons for this is that only 45.7% of the participants attach the tags, while only 57.1% of the participants comply with the off day. Such poor rates of actual participation and compliance are what prevent the program from progressing further. Research must be conducted to find a viable way of encouraging more real participation voluntarily.

A survey by Seoul on 1,200 residents in 2014 found that a majority of respondents thought “more incentives” were needed to improve effectiveness of the program. This indicates that the current program incentives (car tax cuts, insurance discounts, etc.) are not sufficient in the minds of individuals. Another complaint was the lack of flexibility – once the off day is set, the participant cannot drive on that day no matter what. This rigidity is something that needs to be addressed as well.



**Table 5 - Citizen Survey: Program Benefits Needing Improvement**



Source: Seoul Metropolitan Government (2014).

## References

- International Energy Agency (IEA), 2006, "World Energy Outlook 2006"
- Seoul Metropolitan Government, 2007, "Study on Effect & Future Development of Seoul's Weekly No-Driving Day Program"
- The Korea Transport Institute, 2010, "2010: Estimated Costs from Traffic Congestion & Analysis of Trends in South Korea"
- Seoul Metropolitan Government, 2014, "Effects of the Weekly No-Driving Day Program & Development of Long-term Strategies"