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# CONFLICT CASES OF NATIONAL PROJECTS IN KOREA

: ANALYSIS AND IMPLICATIONS

Edited by GDPC

# Contents

## Conflict Cases of National Projects in Korea : Analysis and Implications

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edited by GDPC.

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<b>Chapter 1. Conflicts Over National Projects and the Path to National Development</b>	<b>11</b>
1 Context for Reviewing Conflict Cases of National Projects	12
2 Major National Projects that Overcame Conflicts to Become a Driving Force for National Development	15
3 Analytical Framework for Conflict Cases of National Projects	20
<b>Chapter 2. Review of Conflict Cases of Major SOC Projects</b>	<b>23</b>
1 Gyeongbu Expressway Construction Project	24
2 Gyeongbu High-Speed Railway Construction Project	46
3 Incheon International Airport Construction Project	70
4 Lake Sihwa Reclamation Project	94
5 Saemangeum (Development) Project	111
6 Seoul Ring Expressway Construction Project	140
7 Seoul Cheonggye Stream Restoration Project	160
8 Seoul Exclusive Median Bus Lane Project	180
<b>Chapter 3. Synthesis of Conflict Incidences of National Projects and Policy Implications</b>	<b>193</b>
1 Changes of Conflicts over National Projects	194
2 Characteristics of Conflicts in Each Era	197
3 Synthesis of Conflict Incidences of Eight Major Projects	197
4 Policy Implications	209

# Tables

Table 1-1	Schedule for Eight Major National Projects	20	Table 2-4-7	Classification of Identified Issues by Subcommittee	104
Table 2-1-1	Progress of the Gyeongbu Expressway Construction Project	28	Table 2-4-8	Road Map for Special Water Quality Improvement Measures	107
Table 2-1-2	Comparison of the Initial Budget and the Revised Budget	30	Table 2-4-9	Agreements on the Land Use of Sihwa MTV	109
Table 2-1-3	Construction Funding Plan for Gyeongbu Expressway (February 1968)	30	Table 2-4-10	Economic Ripple Effects : Investment Effect (Construction Effect)	109
Table 2-1-4	Investment Breakdown for Gyeongbu Expressway	31	Table 2-5-1	Saemangeum Project Outline	115
Table 2-2-1	Capacity Status of Gyeongbu Railway (1997)	48	Table 2-5-2	Saemangeum Project Progress	116
Table 2-2-2	Gyeongbu High-Speed Railway's Project Content by Phase	49	Table 2-5-3	Lawsuits against the Saemangeum Project	120
Table 2-2-3	Progress of the Gyeongbu High-Speed Railway Construction Project	51	Table 2-5-4	Issues of the Saemangeum Project's Economic Feasibility	125
Table 2-2-4	Transport Efficiency Comparison of High-Speed Rail and Expressway	56	Table 2-5-5	Value of Saemangeum Tidal Flats vs. Value of Rice Fields	126
Table 2-2-5	Cases of High-speed Railway Promotion Programs	63	Table 2-5-6	Major Issues and Arguments of Proponents and Opponents over Saemangeum Project	130
Table 2-2-6	Travel Time Reduction Effect of the Gyeongbu High-Speed Railway	68	Table 2-5-7	The Cost of Construction Suspension of Saemangeum Project	133
Table 2-3-1	Project Content of Incheon International Airport by Phase	72	Table 2-6-1	Current Status of Each Section of the Seoul Ring Expressway	143
Table 2-3-2	Incheon International Airport Construction Project Progress	75	Table 2-6-2	Progress of Seoul Ring Expressway Construction Project	144
Table 2-3-3	Size of Major International Airports	77	Table 2-6-3	Initial Construction Plan vs. Alternative Bypass Routes	147
Table 2-3-4	Major International Airports' Distance to a Nearby Downtown	80	Table 2-6-4	Traffic Situation in Surrounding Areas	149
Table 2-3-5	International Airports' Average Number of Foggy Days Per Year	82	Table 2-6-5	Polls showed that the Majority of Respondents Expressed Support	149
Table 2-3-6	Aircraft Noise Level Measurement Results (2010)	87	Table 2-6-6	Monitoring Results of Crypsinus Hastatus Community in Anmal Area of Mt. Sapae	156
Table 2-3-7	Main Award Records of Incheon International Airport	89	Table 2-6-7	Noise Measurement Results of Hoeryong Temple in Mt. Sapae	156
Table 2-3-8	Incheon International Airport's Rank and Score (maximum five-point scale)	89	Table 2-7-1	Project Content	164
Table 2-3-9	Operation Performance of Incheon International Airport	90	Table 2-7-2	Project Progress of Seoul Cheonggye Stream Restoration Project	166
Table 2-3-10	Incheon International Airport's Status of Facilities	92	Table 2-7-3	Committees regarding Seoul Cheonggye Stream Restoration Project and Characteristics of the Committees	171
Table 2-4-1	Water Quality Improvement Measures for Sihwa Lake	96	Table 2-7-4	Dates of Policy Council and Negotiation Issues	173
Table 2-4-2	Usage Plan for Lake Sihwa's Basin	98	Table 2-7-5	Dates and Main Contents of Council for Merchants	174
Table 2-4-3	Progress of Sihwa Tideland Development Project	99			
Table 2-4-4	Water Quality of Lake Sihwa	100			
Table 2-4-5	Opinions on Environmental Improvement Measures	102			
Table 2-4-6	Opinions on the Size of Sihwa MTV	103			

# Figures

Figure 1-1	International Comparison of Social Conflicts Index	13
Figure 1-2	Location of Eight Major National Projects	16
Figure 1-3	Comprehensive Framework for Empirical Analysis on Conflict Cases of National Projects	21
Figure 2-1-1	Transportation Index Trend After the Opening of Gyeongbu Expressway	36
Figure 2-1-2	Comparison of Major Indicators (1961-1979)	38
Figure 2-1-3	GDP Spillover Effect of Gyeongbu Expressway	40
Figure 2-1-4	Gyeongbu Expressway's Effects on Industrial Production	40
Figure 2-1-5	1970s Overseas Construction Trend (1968-1980)	41
Figure 2-1-6	Comparison of Major Indicators (1970-2009)	44
Figure 2-4-1	Effect of Environmental Improvement Measures	108
Figure 2-5-1	Land Development and Infrastructure under the Master Plan (March 16th, 2011)	114
Figure 2-5-2	T-P Concentration in Korea's Freshwater Lakes	124
Figure 2-5-3	Parties in Conflict and Arguments	128
Figure 2-6-1	Seoul Ring Expressway Route Map	141
Figure 2-7-1	Background of Seoul Cheonggye Stream Restoration Project	162
Figure 2-7-2	Basic Plan for Seoul Cheonggye Stream Restoration Project	164
Figure 2-7-3	Implementation Framework of Seoul Cheonggye Stream Restoration Project	165
Figure 2-7-4	Accomplishments of Cheonggye Stream Restoration Project	178
Figure 2-8-1	Exclusive Median Bus Lane Installation Plan	182
Figure 2-8-2	Example of Seoul Exclusive Median Bus Lane	183
Figure 3-1	Changes of Conflicts over Public Policy	194

# Abbreviations and Acronyms

ACI	Airport Council International
ASQ	Airport Service Quality
BOD	Biological Oxygen Demand
BTO	Build-Transfer-Operate
FAO	Food and Agricultural Organization
FKI	Federation of Korean Industries
GDP	Gross Domestic Product
GNP	Gross National Product
ICCE	Identity, Conflict, Cost, Evaluation
IIAC	Incheon International Airport Corporation
KORAIL	Korea Railroad
KRNA	Korea Rail Network Authority
KTX	Korea Train eXpress
K-Water	Korea Water Resource Corporation
KSCE	Korea Society of Civil Engineers
MOLTA	Ministry of Land, Transport, and Maritime Affairs
MTV	Multi Techno Valley
OECD	Organization for Economic Cooperation and Development
ROI	Return On Investment
SOC	Social Overhead Capital
SSDC	Sihwa Sustainable Development Council
WJE	Wiss, Janney, Elstner Associates

## Preface

Many of us would say that rapid economic growth in Korea is one of the astonishing and successful cases of Korea's SOC. In the meanwhile, a few or more among us would argue that such a success came from a certain amount of sacrifice and pain.

From the early 1960s to the late 1980s, the Korean government had been a powerful planning state, so that the central government's planning dominated the market, civil society and local governments. Yet, as time went by, in particular after the late 1980s, as the country became more democratized, the hitherto dominated private sectors, and local entities geared up to raise their suppressed voices. There have been uprising issues for the self-interests of social classes and regional/local communities, which then in turn caused social conflicts on national scale development projects and the authoritarian planning decisions.

In such a retrospect, this intensive reading can be regarded as a self-reflection of the Korean territorial policy and planning, of which concerns are on what we have missed and what we have mistaken. Again, Korea has been faced with various types of social conflicts in the process of "compressed growth".

Maybe we have been reluctant to talk about our undeniable civil strifes. The consenting readers of this reading would be able to find that the level of Korea's social conflicts is much higher than that of other countries. Yet, against all the odds which are there to beat, we Koreans are still trying to go another mile for more desirable future. Our pride would not be laid on what we have achieved, rather on what we are trying to head toward.

Publishing this intensive reading on the Korean social conflicts, I would like to express a deep appreciation to the contributors to this book. First, this publication cannot be possible without generosity of Ministry of Land, Infrastructure and Transport, which owns the original copyright of the Korean version of this book. Also, a similar amount of gratitude should be sent to Dr. Wonbae Kim, the chief editor, and to the editorial board members Mr. Soonup Park, Ms. Hyuna Lee, Ms. Hyojung Yun, and Ms. Minkyung Pyo.

Yet, most importantly, the bigger and deeper appreciation and gratitude will be shouted out for somebody else. As you can notice, I mean all the parties involved in the middle of the conflict presented in this book, the "people." Without their tears, pain and sacrifice, there would not have been any conflicts and, in turn, conflict resolution and social progress. Then we would have nothing to learn, and nothing to share with our global friends. A thousand thanks to all.

December 2013

Jeong Ho Moon  
Director, GDPC, KRIHS

Chapter

01

## Conflicts Over National Projects and the Path to National Development

1	Context for Reviewing Conflict Cases of National Projects	12
2	Major National Projects that Overcame Conflicts to Become a Driving Force for National Development	15
3	Analytical Framework for Conflict Cases of National Projects	20

# 1 Conflicts Over National Projects and the Path to National Development

## 1. Context for Reviewing Conflict Cases of National Projects

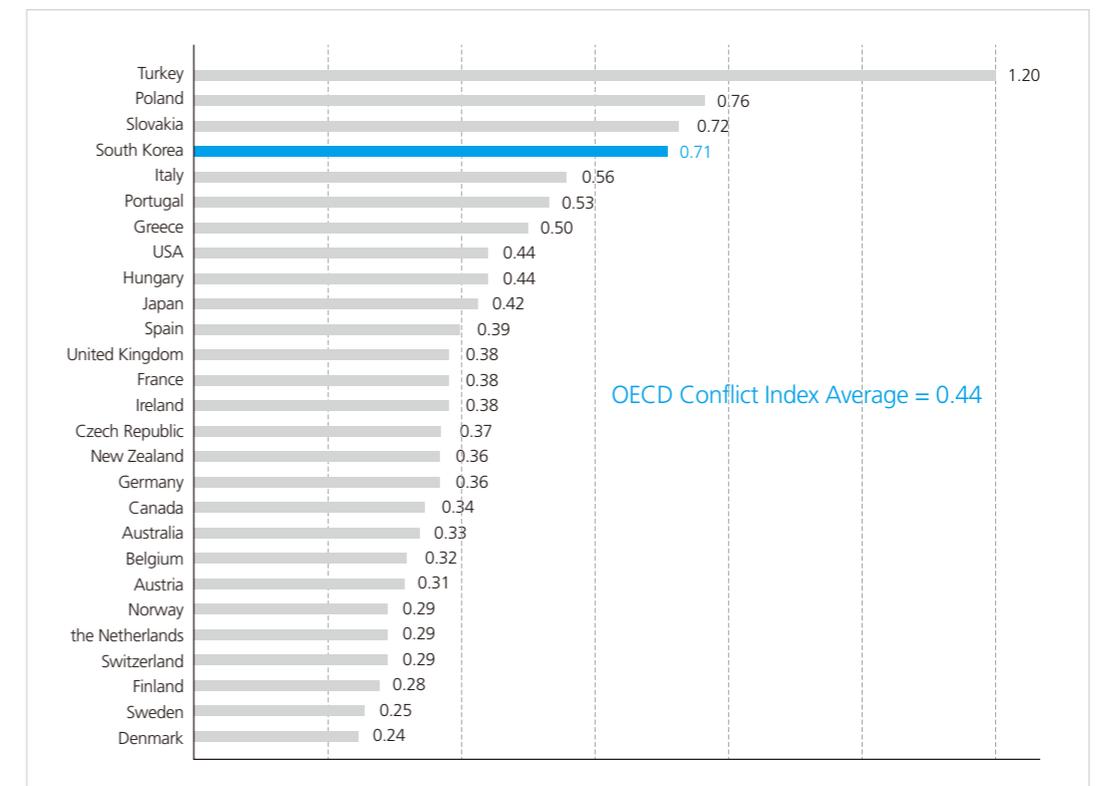
### 1) Current Status of Social Conflicts in Korea

The Republic of Korea (Korea hereafter) achieved both industrialization and democratization in a short span of time and is the only country to transform itself from an aid recipient to an aid donor. Thanks to such strength, Korea hosted the G20 Seoul Summit in November 2010 and led the collective initiative to adopt the “Seoul Development Consensus for Shared Growth.” As such, Korea is well on its way to join the ranks of advanced countries in the globalization era. In this journey, however, Korea faced several obstacles, one of which is the issue of mediating social conflicts that are being expressed in various ways in all parts of society. For Korea to become an advanced country, it is necessary to wisely resolve social conflicts and achieve social integration by reducing the causes of conflicts.

In retrospect, Korea has been faced with various types of social conflicts during the so-called “compressed growth and development” era, which began in the 1960s. Going through the development dictatorship era and up until the mid-1980s, conflicts over political democratization took up the largest share of social conflicts. Following political democratization in 1987, a variety of social conflicts erupted and spread throughout the society, incurring immense social costs. At the same time, however, they also presented social learning experience and lessons for Korea. So far, Korea experienced the era of compressed conflicts, where the strife between public agencies and civil groups, and between regions, classes, generations, and ideologies simultaneously emerged in a complex manner over issues, such as land development and environmental conservation, wealth distribution among classes, ideologies and values. Even today, social conflicts over different interests and values still arise in various sectors of society.

The level of Korea’s social conflicts is much higher than that of other countries’. Following Turkey, Poland, and Slovakia, Korea ranked fourth in terms of the severity of social conflicts among the Organization for Economic Cooperation and Development (OECD) member nations. Korea’s conflict index (0.71) is 61 percent higher than that of the OECD average (0.44). Unfortunately, Korea’s overall capacity for conflict management is weak compared to that of other OECD member countries.<sup>1)</sup>

Figure1-1 International Comparison of Social Conflicts Index



Source : Park Jun and others. “Korea’s Social Conflicts and Economic Costs.” Samsung Economic Research Institute, 2009. p7.

### 2) Social and Economic Costs of Conflict

Every year, Korea had to pay high costs for conflicts emerged in various sectors of society. From 1990 to 2008, a total of 624 cases of conflicts occurred, averaging about 33 cases per year. Over 90 percent of the cases involved conflicts of interest. Specifically, labor conflicts took up the largest share (30 percent), followed by regional conflicts (19 percent). Regional conflicts were mainly triggered by location selections for preferred or unpleasant facilities. PIMFY (Please in My Front Yard) phenomenon

1) Park Jun and others. “Korea’s Social Conflicts and Economic Costs.” Samsung Economic Research Institute, 2009. 7.

occurred when residents tried to promote preferred facilities that benefited their region and NIMBY (Not in My Back Yard), when they opposed controversial facilities from being built in their neighborhoods. Class conflicts over redevelopment projects accounted for 18 percent of the total, and environmental conflicts due to conflicting values in land development and conservation took up 14 percent. Public conflicts lasted for 829 days on average and approximately 20,000 people were involved in each conflict. In particular, environmental conflicts lasted the longest with 829 days on average and regional conflicts continued for about 530 days.<sup>2)</sup>

According to the analysis of the Samsung Economic Research Institute<sup>3)</sup>, a 10 percent decrease in the social conflict index has an effect of increasing the Gross Domestic Product (GDP) per capita by 7.1 percent. Thus, lowering Korea's social conflict index to the OECD average can raise the nation's GDP per capita by 27 percent, or by more than 5,000 dollars than the current level.

### 3) Path to National Development Found in Conflict Experiences and Lessons of National Projects

Among the issues of social conflicts in Korea, major national land development projects for the purpose of constructing Social Overhead Capital (SOC) are the most deep-seated and thorniest. In retrospect, most of these projects turned out to be a success. However, some experienced setbacks and others instigated controversial debates on overinvestment. Many of the successful projects entailed far-sighted insight and great leadership. The prime examples are the Gyeongbu Expressway Construction Project at the early stage of economic development and the Incheon International Airport Construction Project of late. These projects were successful, owing to the leaders' far-sighted insight and strong commitment to boost national development and competitiveness. On the other hand, there were other major national projects that suffered from conflicts in the beginning but eventually succeeded and thus contributed to economic growth and national development as well as secured Korea's global competitiveness.

The following is the list of some of the conflict issues regarding national projects in the past: Concerns over environmental damages triggered by large-scale development projects; arguments on the lack of economic feasibility and the inability to secure financial resources; conflict of interests between regions; objections on grounds of balanced regional development and social equity; concerns over high technological dependence on foreign countries; objections by political interests. Amid such conflicts, some projects were reasonably carried out by embracing the opposition's opinion. On the contrary, there had been numerous cases where projects were stalled and public opinion was split because people were merely opposing for the sake of opposition or were raising irrational demands.

2) Presidential Committee on Social Cohesion. April 6th, 2011. Web. <<http://www.harmonykorea.go.kr/>>

3) Park Jun and others. "Korea's Social Conflicts and Economic Costs." Samsung Economic Research Institute, 2009. 11.

Perhaps time is ripe now to learn from the past experiences and derive lessons for future national development. More specifically, the Korean government needs to establish a conflict prevention and resolution system that helps avoid the waste of national energy and the division of public opinion. In addition, it is necessary to form a social environment where members take responsibility for their own assertions and action even after the project is completed. Such a mature society will be essential for Korea to become an advanced country. Moreover, it is crucial that the national government takes an open stance on national projects by accommodating the issues raised or alternatives suggested by the opponents. Project success depends greatly on how the government takes in opposing views and solidifies them into the project implementation plan.

Over the past five decades, some national projects were successful, whereas others were stalled or failed. This white paper selected the most representative national projects that were controversial at first but turned out to be a success. The purpose is to extract lessons and policy implications from these projects and seek the desirable path to national development by objectively assessing them. Publishing a white paper that includes the lessons and policy implications from failed national projects will be left as a follow-up task.

## 2. Major National Projects that Overcame Conflicts to Become a Driving Force for National Development

Among the major SOC projects and local governments' projects that were pursued in line with strategies to accelerate economic growth and land development after the 1960s, this white paper selected and analyzed eight national projects that overcame conflicts and became successful, thereby serving as growth engines for national development or are expected to do so in the future. They are Gyeongbu Expressway Construction Project, Gyeongbu High-Speed Railway Construction Project, Incheon International Airport Construction Project, Lake Sihwa Reclamation Project, Saemangeum Development Project, Seoul Ring Expressway Construction Project, Seoul Cheonggye Stream Restoration Project, and Seoul Exclusive Median Bus Lane Project.

### 1) Gyeongbu Expressway Construction Project

The Gyeongbu Expressway Construction Project (February 1968-July 1970) was launched during the early economic development phase when development conditions were poor. Recognizing Korea's SOC such as roads and ports as the linchpin of economic advancement, the Korean government embarked the project with the aim of pushing economic development and bridging regional gaps by building a transportation network connecting Seoul, Daejeon, Daegu, and Busan, which was then the

major axis of Korea. It only took two years and five months to complete the Gyeongbu Expressway, which runs 428km from Seoul to Busan. The project required 42.9 billion won in investment and made the best use of Korea's poor civil engineering skills at that time. It was natural back then that many people had negative perceptions about constructing the expressway, which required heavy costs but doubtful benefits. Accordingly, in the early stages, the project had to face heavy criticisms and oppositions from the political circle and the media. Key issues were low project feasibility and project priority, regional imbalance effects, difficulties in securing financial resources, to name a few. Despite such obstacles, the project was launched and successfully completed by the strongly committed government. In result, the project contributed to the rapid development of Korea's economy, inter-regional transportation, and automobile culture.

Figure1-2 Location of Eight Major National Projects



## 2) Gyeongbu High-Speed Railway Construction Project

The Gyeongbu High-Speed Railway Construction Project (1992-2014) was implemented because it was impossible to expand the operation of the railway system as the capacity of the Suwon-Daejeon section (125km) reached its limit in the early 1990s. In terms of economic feasibility, high-speed railway was adopted as the best alternative for a long-distance transport network because, first, high-speed railway's required area per unit transport capacity only accounts for 29 percent of a four-lane expressway and, second, high-speed railway provides a remarkably higher level of safety and punctuality compared to other means. The first phase of the project, which took an investment of 12.7377 trillion won, was completed in 2004 and the second phase was completed in 2010 with an investment of 7.9905 trillion won. During the process, the project drew fierce criticism regarding the shortage of financial resources, return on investment (ROI), environmental degradation, lack of technological skills, and Korea's high dependency on foreign technology. However, the project eventually overcame various difficulties and contributed to the improvement of traffic and transportation conditions between regions by making travel within the country possible in just half a day.

## 3) Incheon International Airport Construction Project

The Incheon International Airport Construction Project (November 1992-June 2008) was carried out in order to construct a new airport in the metropolitan area that can resolve Seoul's noise pollution caused by aircraft and meet the surging demand of air transportation in the late 1980s. After a new runway was built in Gimpo International Airport in April 1987, noise pollution in the area rose as a social problem. Korea experienced rapid economic development and rising people's living standards in the 1980s, hosted the Seoul Summer Olympics in 1988, and freed up overseas travel regulations in 1989. Because of these factors, the annual average number of international passengers in Korea rose by more than 13 percent and domestic passengers by more than 30 percent, showing the highest growth rate of air transport demand in the world. Due to these conditions and changes in demand, a project for building a world-class airport in Yeongjong Island with a capacity of 44 million passengers per year and an annual cargo capacity of 4.5 million tons began. In the early stages, this project also faced harsh criticism over issues such as excessive scales of development and demand forecast, unfavorable accessibility, environmental destruction, land subsidence, and fog. However, by overcoming these difficulties, Incheon International Airport was able to emerge as a hub airport of Northeast Asia as it ranked top in the service category for six consecutive years.

#### 4) Lake Sihwa Reclamation Project

Lake Sihwa Reclamation Project (2002-2016) is a project for building a cutting-edge green composite city. The purpose is to supply high-tech industrial land to the metropolitan area by reorganizing the tideland that was formed during the Sihwa Seawall Project (1987-1994), which was embroiled in fierce controversy at the time. In addition, the project aims to improve the water quality of Lake Sihwa and the air quality of the Sihwa and Banwol Industrial Complex and expand support functions. A total of 3.5221 trillion won will be invested in the reclamation project and the size of the development area accounts for 9.26 square km. Environmental pollution has been the key issue of this project for years. Fortunately, the Sihwa Multi Techno Valley Development Project smoothly took off by weathering difficulties and reaching a consensus on the development plan through a consultative body composed of various stakeholders.

#### 5) Saemangeum Development Project

The Saemangeum Development Project (1991-2020) was contemplated in order to boost food security as Korea had to import rice due to continuous droughts, food crises, and cold weather from the 1960s to the 1980s. In particular, this project was carried out in order to secure prime farmlands that would resolve food problems, to prevent repeated flood damages in the lowland rice paddies in the Mangyeong and Dongjin River basins, and to stimulate the regional economy by cutting the travel distance and forming a comprehensive eco-tourism belt. The Saemangeum Seawall, which runs 33.9 km, is the world's longest seawall. The government plans to transform the Saemangeum region into Northeast Asia's economic center by forming 283 square km of land and a freshwater lake that is 118 square km in size, within the total area of 401 square km created by seawall. This area is also on its way to becoming a green growth hub of Northeast Asia by completing the construction of the seawall and overcoming conflicts regarding the issues of ecosystem destruction, the need to secure farmlands, water pollution, and economic feasibility.

#### 6) Seoul Ring Expressway Construction Project

The Seoul Ring Expressway Construction Project (1988-2006) was initiated to meet the rapidly increasing transportation demand in the Seoul metropolitan area, wherein satellite cities expanded outward. The project entails a 127-kilometer eight-lane circular beltway that connects Toegyewon, Pangyo, Anyang, and Ilsan. This project was crucial in dispersing and detouring the traffic generated at the metropolitan periphery, so that it would not pass through the already crowded city center. However, the project was subject to strong criticisms and oppositions over issues such as the ecological disturbance of wild plants and animals, the violation of the environmental impact assessment process,

route changes, and burden on traffic congestion. Through lengthy processes of consultation and mediation, the project successfully overcame these conflicts and created an eco-friendly expressway.

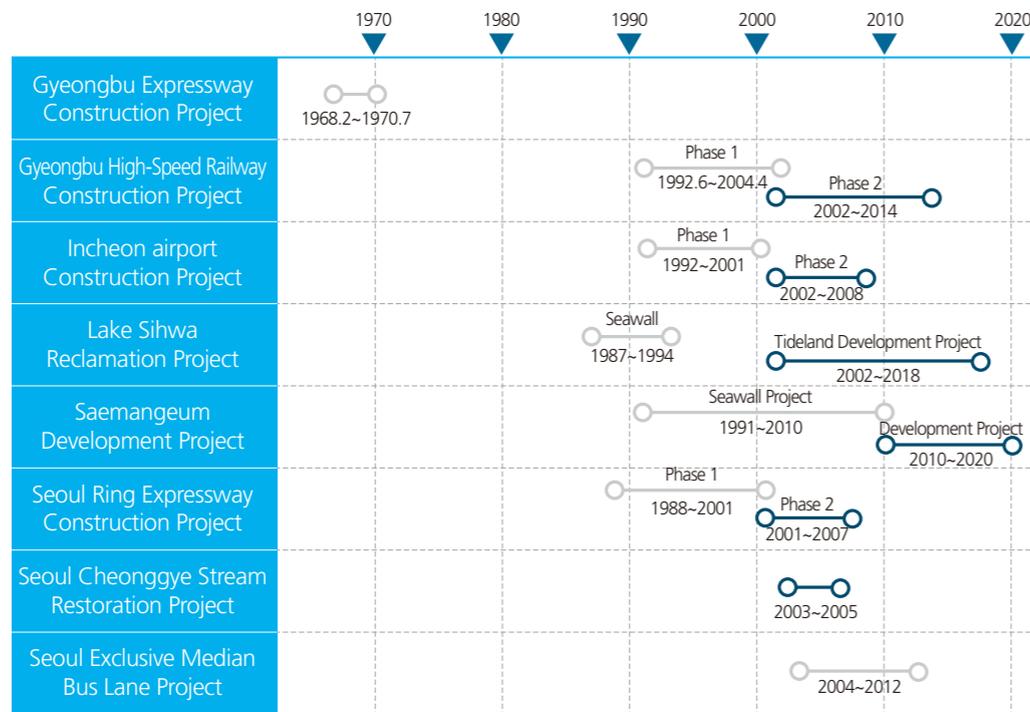
#### 7) Seoul Cheonggye Stream Restoration Project

The Seoul Cheonggye Stream Restoration Project (2003-2005) can be regarded as an inevitable transition process for the urban development paradigm to resolve downtown development issues that were brought up during the industrialization period. Not only did the project remove the covered structures and restore the stream, but also invigorated the downtown economy by inducing redevelopment in neighboring areas. As the project started to gain a momentum, it provoked controversy and conflict among stakeholders. In particular, the confrontation was mainly centered on traffic jam caused by the restoration project, business losses of the merchants, and the direction of cultural asset restoration. However, the Seoul Metropolitan Government was able to successfully run the project and turn Cheonggye Stream into Seoul's landmark that attracts citizens and tourists. By utilizing various conflict management tools, the city government helped resolve complaints and attain policy compliance.

#### 8) Seoul Exclusive Median Bus Lane Project

The Seoul Exclusive Median Bus Lane Project (2004-2012) aimed at setting up an exclusive median lane in the major radial and arterial roads in Seoul so that buses, the most representative public transportation means, can arrive on time and enhance users' convenience. Seoul city thus far secured 107.7km of the exclusive median bus lane in 14 roads by 2010 and plans to operate a total of 214.7 km in 19 roads by 2012. Other metropolitan municipalities are also actively introducing the Exclusive Median Bus Lane Project. However, this project also experienced conflicts surrounding the issues of its effectiveness, opposition of merchants located nearby bus stops, and difficulties in mediating the interests among bus companies. Nonetheless, the project eventually provided a breakthrough for bus rapid transit servicing citizens better.

Table1-1 Schedule for Eight Major National Projects



### 3. Analytical Framework for Conflict Cases of National Projects

This white paper used Otto Hieronymi’s “ICCE Approach” in order to empirically analyze the conflict cases of eight major national projects.<sup>4)</sup> As shown in the diagram below, I (Identity) stands for the selection process of the national projects for analysis, C (Conflict) refers to the analysis of the opponents’ arguments and grounds. Another C (Cost) is the analysis over economic and social costs incurred by conflicts. E (Evaluation) is the process of evaluating the project overall, verifying proponents’ and opponents’ arguments, and drawing policy implications.

In accordance with the ICCE approach, this white paper draws policy implications by synthesizing the results of the empirical analysis on the aforementioned eight national projects from the three aspects: the opponents’ logic; persuasion strategies to it; and the verification of the proponents’ and opponents’ logic, thereby drawing a conclusion of policy implications.

Regarding the opponents’ logic, this paper grouped their logical basis into three issues of environmental feasibility, economic feasibility, and equity, and then reviewed the main characteristics of the opponents’

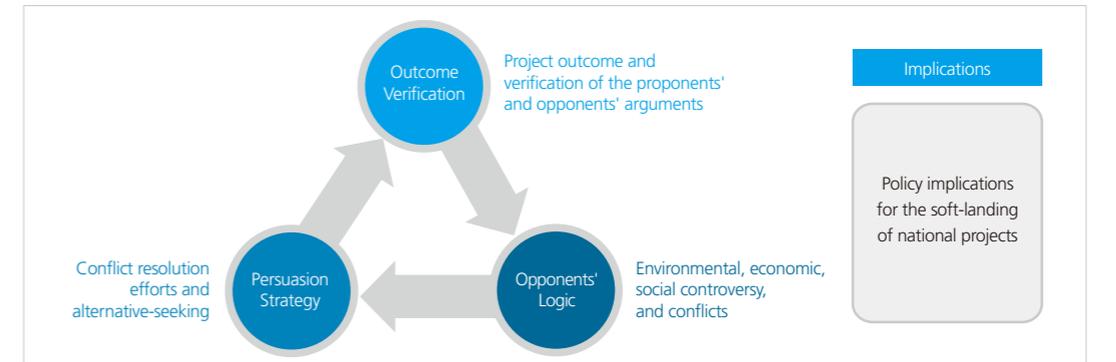
4) Otto Hieronymi. “Policy Decisions for SOC Investment : Environmental and Planning Issues.” OECD International Futures Programme, 1993. OECD. “Infrastructure in the 1990s: An Overview of Trends and Policy Issues.” OECD Forum for the Future, 1993.

logic on each issue. With respect to persuasion strategies, this paper, firstly, attempted to suggest evidence necessary for resolving conflicts and seeking alternatives and, secondly, discussed the response measures that have been used by project agencies to persuade the opposition by classifying them into several types such as dialogue with the opponents, consensus building through participation, promotion, and education.

Utilizing the “ICCE Approach” in order to Empirically Analyze National Projects’ Conflict Cases and its Verifications

- **I (Identify)** : Selection of the national projects subject to analysis
- **C (Conflict)** : Analysis of the proponents’ and opponents’ arguments and their logical grounds
- **C (Cost)** : Analysis of social and economic costs incurred by conflicts
- **E (Evaluation)** : Overall outcome, verification of the proponents’ and opponents’ arguments, and policy implications

Figure1-3 Comprehensive Framework for Empirical Analysis on Conflict Cases of National Projects



Meanwhile, regarding specific outcomes of the national projects and the validity of the proponents’ and opponents’ arguments, this paper used an ex post facto verification method by tapping into existing empirical data on analyzing economic and social effects, along with various statistics that have been provided after the projects were completed.

Lastly, based on the results of empirical analysis on the implementation process of the projects, this white paper put forward policy implications that can be used for the government to introduce future national projects with less resistance in the initial phase. In order to verify the content and validity of the opponents’ logic, the authors of this paper investigated and utilized various data from books, newspapers on national projects published by government agencies, research institutes, public organizations as well as websites of relevant agencies.

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Chapter

02

## Review of Conflict Cases of Major SOC Projects

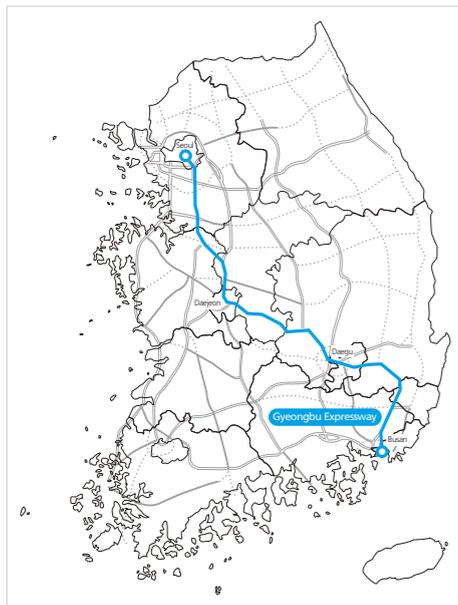
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# 2 Review of Conflict Cases of Major SOC Projects

## 1 Gyeongbu Expressway Construction Project

### 1. Project Outline

Project Volume	Total length 428km (Southern end of Hannam Bridge, Seocho-gu, Seoul - Geumjeong-gu, Busan)
Construction Duration	February 1st, 1968~July 7th, 1970 (2 years and 5 months, 888 days)
Investment Amount	42.97 billion won in total (Approximately 100 million won/km)
Major Specification	643 bridges, 6 tunnels, 19 interchanges Passes major cities such as Seoul, Daejeon, Daegu, Busan



The Park Chung-Hee administration began to contemplate the construction of expressways to resolve the difficulties of transporting increasing passengers and cargos as a result of the success of the First Five-year Economic Development Plan. Even though the construction of the Gyeongin Expressway, which runs from Seoul to Incheon, began in 1967, constructing a nationwide expressway network was practically impossible, considering the social and economic conditions at the time. However, in 1967, the project began to take shape as President Park pledged to build the Gyeongbu Expressway during his election campaign.

The purpose of building the Gyeongbu Expressway was to support economic growth by linking the transportation network for major cities such as Seoul, Daejeon, Daegu, and Busan, and to promote economic revitalization by bridging regional gaps. The project took two years and five months starting from February 1968 and required a total of 42.9 billion won to build a four-lane expressway that runs 428km, equipped with 634 bridges, six tunnels, and 19 interchanges.

At the time, many people opposed the construction of the highway. The political circle, media, academia, and the business community raised doubts about the feasibility of the project and stressed that Korea was not yet prepared. Instead, they insisted that the government invest the funding in stabilizing the agriculture and fisheries industry and fostering small and medium-sized enterprises. Moreover, they were concerned that the country would have to sacrifice the construction of public roads, since the expressway would require an immense amount of investment in a short period of time. Furthermore, the opposition criticized that the highway would not only trigger regional imbalance, as production and service facilities concentrate in major cities, but also likely become an exclusive road for the rich who could own a car.

Nevertheless, as the nation's core infrastructure, the Gyeongbu Expressway has been praised for heralding the "automobile era" by remarkably cutting the transport time and laying the cornerstone for Korea's economic development, dubbed as the "Miracle on the Han River." Moreover, the Gyeongbu Expressway triggered the construction boom for other highways, such as the Yeongdong Expressway.

Currently, the direct economic impact of the expressway network on the national economy reaches 305.7 trillion won annually (33.6 percent of the GDP, as of 2006) and the expressway network is known to contribute to balanced regional development by reducing regional inequalities. Above all, the success of a national project that overcame a host of difficulties delivered pride and "can-do spirit" to the people, which is the most invaluable social asset.

## 2. Project Background and Purpose

### 1) Project Background

The Korean government began to take interest in building expressways, right after when Korea's road technology officials had an inspection tour of the road system in the United States in the mid-1950s. At that time, Korea, however, could not afford to build highways, as it was preoccupied with recovering from the damages of the Korean war.

Soon after, Japan completed the Meishin Expressway in 1958 and the Korean government found out that Japan was on its way to add two more expressways during the 1960s. As the success of the First Five-year Economic Development Plan brought transportation problems to the surface, the Korean government began to have in-depth discussions about highway construction. With the construction of the Gyeongin Expressway that links Seoul and Incheon in May 1967, Korea opened an "expressway era." However, it was natural that few could conceive the idea of building a nationwide expressway at the time given the country's poor social and economic conditions.

On April 29th, 1967, Park Chung-Hee, who was a candidate at the sixth presidential election, pledged to construct an expressway during the Second Five-year Economic Development Plan (1967-1971). The project emerged at a press conference on May 2nd, 1967, when he announced to build a main expressway network connecting Seoul, Incheon, Gangneung, Busan, and Mokpo.

### 2) Project Purpose

The Gyeongbu Expressway was carried out for the purpose of supporting Korea's economic growth by establishing a transportation network that links Seoul, Daejeon, Daegu, Busan and boosting the national economy by closing regional gaps.

### 3) Project Content

A total of 42.9 billion won was invested in constructing the 428-kilometer-long expressway that runs from the southern end of Hannam Bridge located in Seocho-gu, Seoul to Geumjeong-gu, Busan.

It took approximately about 100 million won per kilometer at the price of that time .

The construction started on February 1st, 1968 and was completed on July 7th, 1970, taking 888 days. The Seoul-Suwon-Osong section was opened at the end of 1968, the Osan-Cheonan-Daejeon and Daegu-Busan section was completed in late 1969, and with the opening of the Daejeon-Daegu section in July 1970, the expressway was completed.

At the time, the expressway was equipped with 634 bridges, six tunnels, 19 interchanges, and its width was 22.4 meters in all sections of the four-lane expressway. The asphalt-covered road required

6.8 million concrete blocks, 473,000 drums of asphalt, 49,900 tons of steel, 19,000 tons of structured steel, 8.928 million man-days, and 1.65 million units of equipment.

### 4) Project Agency

The Park Chung-Hee administration launched the National Expressway Construction Planning Investigation Group (hereinafter "Investigation Group") on December 15th, 1967. The Investigation Group was in charge of planning and investigating for the project committee's matters of consideration. To entrust authority to the Investigation Group with its important mission, the president directly appointed the members of the Group through a procedure equivalent to naming state ministers. The Group continued to perform a vast number of feasibility studies as well as planning and investigation activities for the expressway, right up until the ground breaking ceremony on February 1st, 1968.

The government disbanded the group on January 29th, 1968 and launched the Seoul-Busan Expressway Construction Office, an implementation body for construction works, according to Ordinance No.48 of the Ministry of Construction.

### 5) Project Progress

The following is the progress of the expressway since its construction became a campaign pledge in April 1967, until the opening of all sections in July 1970.

Table2-1-1 Progress of the Gyeongbu Expressway Construction Project

Date	Content
April 29th, 1967	The plan to construct the expressway during the Second Five-year Economic Development Plan (1967-1971) was announced as a campaign pledge
November 20th, 1967	Six organizations submitted the estimated cost of construction to the Blue House
November 23rd, 1967	A working group was formed at the Presidential Office to compare and review each plans.
November 24th, 1967	Setting up of the Blue House Working Group (4 members, about 20 days) - Ordered by the president to review the approximate construction costs, draw a route map, purchase sites, organize data, complete standard cross-section model, and investigate planned routes
December 13th, 1967	Establishing the National Expressway Construction Project Committee - A policy organization that appointed the prime minister as the chairman of the committee to coordinate relevant ministries, establish a close-knit cooperation system, and use strong administrative power, and named the Minister of the Economic Planning Board and the Ministry of Construction as vice chairs. - First Meeting (December 19th, 1967) : Decision on the basic direction for the investigation group - Second Meeting (January 24th, 1968) : Review on the basic construction plan for the Gyeongbu Expressway in the run up to the ground breaking ceremony on February 1st. - Dissolution on November 23rd, 1968 : Lost its reason of existence as President Park directly controlled the investigation group and the subsequent construction office.
December 15th, 1967	The launch of the National Expressway Construction Planning Investigation Group - In name, the group was in charge of planning and investigating the project committee's matter of consideration. However, to entrust authority to the group with its important mission the president directly appointed the members in a procedure equivalent to naming state ministers. - Performed feasibility studies as well as planning and investigation activities for the expressway up to January 29th, 1968, the day before the ground breaking ceremony (February 1st, 1968)
January 29th, 1968	Launched the Seoul-Busan Expressway Construction Office, an enforcement body for construction works (Ordinance No. 48 of the Ministry of Construction)
Confirmed Routes	Seoul-Daejeon (January 12th, 1968), Daejeon-Gimcheon (October 17th, 1968), Gimcheon-Daegu (October 17th, 1968), Daegu-Busan (April 25th, 1968)
February 1st, 1968 - July 7th, 1970	Construction under way

### 6) Project Funding<sup>5)</sup>

In 1967, after the construction plan of the Gyeongbu Expressway was materialized, the main issue that created a stir about the feasibility of the expressway was funding. The only experience of constructing an expressway Korea had at the time was the Gyeongin Expressway. However, the Gyeongin Expressway paled in comparison to the Gyeongbu Expressway, which was a mega national project.

The construction of the Gyeongin Expressway, which was a test bed for constructing the Gyeongbu Expressway, began on March 24th, 1967 and saw the completion of the 23.5km-long Seoul-Gajwa section on December 21st, 1968. Soon after, the 29.5km-long section between Seoul and Incheon was entirely opened as the 6km-long Gajwa-Yonghyeondong, Incheon section of which the paving had been delayed, was complete on July 21st, 1969. The total cost of construction reached 3.15 billion won, which means a unit cost 105 million won per kilometer.

Thus the construction of the Gyeongbu Expressway which required massive financial resources and workforce owing to many tough sections compared to the Gyeongin Expressway was indeed the first major national project. That is why it was dubbed as "the largest civil engineering project in the history of Korea."

The initial cost of construction proposed by the investigation group was 38.4 billion won. This, however, was adjusted to 33 billion won after the review of economic vice-ministerial meeting. In the early stages of planning, organizations and companies that were taking orders from the president reported completely different estimated costs. For instance, the Ministry of Construction estimated 65 billion won, which was later revised to 45 billion won, the Ministry of Finance 33 billion won, the Economic Planning Board giving up cost estimation, the Seoul Metropolitan Government 18 billion won, the Army Corps of Engineers 49 billion won, and Hyundai Engineering and Construction 28 billion won. Whether for the government agency or a private company, it was impossible to correctly estimate the construction costs.

In this regard, it was no surprise that the actual costs incurred during construction showed a huge gap with the estimated costs. The price tag of construction had to be revised due to unexpected costs incurred during the construction of sections in Seoul-Osan, Osan-Daejeon, Daegu-Busan, and additional costs. Eventually, in March 1969, the Ministry of Construction had to ask for a total of 42.97 billion won, which was 9.97 billion won higher than the initial budget of 33 billion won.

5) National Archives of Korea. "Constructing the Nation's Artery: Gyeongbu Expressway" <<http://theme.archives.go.kr/next/gyeongbu/road-Statistics02.do>>

Table2-1-2 Comparison of the Initial Budget and the Revised Budget

(Unit: 100 million won)

Item	Initial Budget	Revised Budget	Increased Amount
Construction Cost	282.9	373.9	91.0
Equipment Cost	-	4.9	4.9
Land Compensation Cost	12.4	19.6	7.2
Investigation & Design Cost	5.0	4.7	-0.3
Loan Supply Cost	21.9	18.9	-3.0
Foreign Labor Outsourcing Cost	1.1	0.9	-0.2
Test Equipment Cost	0.5	0.4	-0.1
Office Operation Cost	1.2	1.2	-0.02
Extra Cost	4.9	5.3	0.4
Total	330.0	429.7	99.7

Source : "Seoul-Busan Expressway Construction Form (C11M24673)." 1974. 250

In order to build the expressway, the Korean government requested 3.3 million dollars of loan to the International Bank for Reconstruction and Development, which turned it down. Hence, President Park decided to source the construction funding exclusively from domestic capital. As a means to secure financial resources, various ways were proposed, such as introducing foreign capital in the form of equipment and grain loans, and securing domestic financial resources, such as raising oil tax, issuing government bond, collecting transit tax and toll fees, and receiving military support. The financial resources procurement plan for the Gyeongbu Expressway, which was mapped out in February 1968, is shown in Table 2-1-4. However, local financial resources accounted for a staggering 95.6 percent of the construction costs as the grain-loan claim funds from Japan stood at a mere 1.89 billion won, which indicates the difficulties in hosting foreign capital and related political decisions to suspend the loans.

Table2-1-3 Construction Funding Plan for Gyeongbu Expressway (February 1968)

Financial Resources	Amount (100 million won)
Gasoline Tax Revenue	139
Transit Tax Profit	60
Grain Loan Sales Revenue	84
Grain-loan Claim Fund	27
Toll Fee Revenue	15
Economic Development Special Account Budget	6
Total	331

Source : Economic Planning Board. "A White Paper on Reparation Fund." 1976.

Table2-1-4 Investment Breakdown for Gyeongbu Expressway

(Unit: 100 million won)

Fund	Year			Total	Ratio (%)
	1968	1969	1970		
Claim Fund	8.2	10.7	-	18.9	4.4
Local Fund	67.4	243.7	99.7	410.8	95.6
Total	75.6	254.4	99.7	429.7	100.0

Source : Economic Planning Board. "A White Paper on Reparation Fund." 1976. 279

### 3. Arguments and Grounds of Proponents and Opponents

#### 1) Issues and Logic of Proponents and Opponents

The Gyeongbu Expressway Construction Project revealed conflicts from the early stages of discussion. The feasibility of the expressway construction, an issue of giving priority to the Seoul-Busan section, imbalanced regional growth, and damages to tradition and customs are among such issues. The arguments and grounds of the proponents and opponents are as follows.

##### (1) Feasibility of the Expressway Construction

- Arguments and Grounds of Opponents

The opponents of the Gyeongbu Expressway were concerned that other roads would lack investment as an immense amount of funding would be poured into the Gyeongbu Expressway in a short period of time. Given Korea's economic conditions at the time, the opposition party and American officials stressed that the Korean government should invest in stabilizing the prices of agricultural products and fostering small and medium-size enterprises, rather than constructing the highway.

- Arguments and Grounds of Proponents

The proponents argued the need to build the Gyeongbu Expressway since it would provide favorable conditions in developing industries, promoting regional development, and expanding the spheres of daily life. That is because roads had a higher investment efficiency and a higher possibility of resolving transport issues with a limited amount of funding, compared to railways and ports.

The review of the IBRD's research group, from November 1965 to June 1966, stating that Korea's railway, marine, and airway conditions were reaching their limits and in particular, the Gyeongbu Line was expected to become saturated in the near future, providing ammunition for the proponents' argument of constructing the Gyeongbu Expressway. During the First Five-year Economic Development Plan, Korea saw an annual economic growth rate of 8.3 percent, while experiencing a 13.5 percent annual increase rate of transportation and a 40 percent rise of Gyeongbu rail cargos.

### (2) Issue of Project Priority to Seoul-Busan Section

- Arguments and Grounds of Opponents

The political circle, the media, the academia, and the business community opposed the construction of the Gyeongbu Expressway arguing that it was premature for Korea. In addition, the decision to give priority to the Seoul-Busan section triggered objections that the government gave poor treatment to the Honam area, or Jeolla Province.

- Arguments and Grounds of Proponents

The proponents stressed that the Seoul-Busan section should be constructed first because the Gyeongbu axis connecting Seoul, Daejeon, Daegu, and Busan, accounted for 80 percent of the total transportation volume, and Busan and Incheon port took up 40 and 20 percent of marine exports, respectively. In addition, they emphasized the fact the Seoul metropolitan region could make a full use of both the Gyeongbu Expressway and the Gyeongin Expressway. In particular, they underscored that the Gyeongbu Expressway had the highest profitability, so the toll revenue could be used to build other highways or repay the principal. The fact that regions adjacent to the Gyeongbu axis accounted for 45 percent of the nation's land, 44 percent of the national population, 46 percent of Gross National Product (GNP), and 81 percent of corporate production, served as evidence to the proponents' arguments.

### (3) Imbalanced Regional Growth and Damages to Traditional Custom

- Arguments and Grounds of Opponents

The opponents argued that the economy of small and medium-sized cities could be undermined, once the production and service facilities were concentrated in major cities. On top of that, the active exchanges between cities and rural areas based on the fast mobility of the expressways could lead to an excessive urbanization of consumption behavior in rural areas and hindrance to preserving local folk cultures.

- Arguments and Grounds of Proponents

The proponents claimed that the Gyeongbu Expressway could bring positive effects, such as preventing the concentration of population and industries in major cities and promoting balanced development of small and medium-sized cities and joint development of agriculture and industry. They also mentioned benefits incurred by the Expressway such as increased income for farming and fishing communities that could arise from shortened distribution processes and the stimulation of tourism industry.

### 2) Persuasion Strategy

In order to alleviate the conflicts surrounding the construction of the Gyeongbu Expressway, the government used persuasion strategies such as forming public opinion and proposing objective grounds through economic feasibility studies.

#### (1) Forming Public Opinion

The government aimed to resolve the lack of public awareness on the expressway by forming public opinion. Above all, it concentrated on stressing the need to construct an expressway. For instance, on December 5th 1967, the government distributed to media the Thesis on the Validity of the Seoul-Busan Expressway Construction Project. According to the thesis, the construction funding of the expressway would be gathered from user charges, and thus construction and maintenance costs would be self supported from the toll revenue for 20 years. Furthermore, the February issue of Generation in 1968 listed four reasons why the expressway should be built. The reasons are as follows.

- Characteristic of the expressway : Emphasis on highway safety
- Reasons why expressway construction should precede railway construction : Emphasis on the convenience of roads over railways
- Reasons why the construction of an expressway that connects north and south is crucial : Construction and maintenance of the Gyeongbu Expressway will be supported from the toll revenue for 20 years
- Proposition on the maximization of defense benefits and effects

#### (2) Economic Feasibility Study

Apart from forming public opinion, the government recognized the need for providing convincing arguments. Hence, to show the feasibility of constructing the expressway in quantitative terms, the government announced "the Outline of National Expressway Construction Plan", which included a study of Gyeongbu Expressway's economic feasibility carried out by the investigation group.

First, in terms of economic growth, constructing a national expressway is a crucial long-term

national project as it is the best way to solve transport problems brought by rapid economic growth. Korea's average annual economic growth rate from 1962 to 1968 was approximately 8.3 percent, whereas transportation growth rate was 13.5 percent. Currently, the transportation capacity of railways, roads, and shipping is low, and the transport share of automobiles is too small. It will be hard to achieve economic growth without road development, and over one billion won worth of losses per year will be incurred due to the lack of paved roads. Furthermore, it is predicted that the capacity of Gyeongbu railway, the main railway line, will reach saturation in the foreseeable future.

Second, it is valid to begin with the Seoul-Busan expressway since high traffic volume gives it higher profitability compared to the Daejeon-Mokpo or Seoul-Gangneung expressway. The areas adjacent to the Gyeongbu Expressway account for almost half of the entire Korean population and GNP, while taking up 61 percent of industrial production. It is also the main artery that connects Busan and Incheon port, which makes up roughly two-thirds of Korea's total export and import cargos. Because of these reasons, it is possible to recover construction funds from user charges. The Gyeongbu expressway, after completion, can also provide increased revenue from related taxes, which can be used as a means to secure financial resources for constructing other expressways. In terms of strengthening transport capacity, the Gyeongbu Expressway is the best alternative compared to other transport modes and general national roads. Unlike railways, which can only transport special cargos between points, expressways enable items to be delivered door to door. Even if the government invests 10 billion won in improving national roads, it is still a mere 20 percent of passenger capacity and 30 percent of cargo capacity of expressways. Moreover, national roads are far less effective in improving safety, such as lowering accident rates, since it is impossible to remove mixed traffic and surface crossings. Travel time by national roads also takes 1.5 times longer than expressways.

Third, the Gyeongbu Expressway will bring direct benefits to the citizens' life. Whereas road functions lag behind the advancement of car performance, a modernized expressway can contribute to price stability of essential commodities through its fast speed, low price, and safety. Speedy road transport remarkably drops inventory investment—30 percent of production investment—which increases capital ratio, promotes the export industry, reduces cargo damages, and saves packaging costs. Transport costs can also be reduced by improving transport equipments; improving car performance, using trailers and containers. In addition, the Gyeongbu Expressway provides the estimated direct gains of 17 billion won for the first five years and 90 billion won for the 15 years after completion from saving operating costs (fuel, tire wear) and transport costs inclusive of maintenance and repair, time saved, accident reduction.

Fourth, the expressway can contribute to developing farming and fishing communities and bridging regional gaps. It also prevents population and industries from concentrating in major cities, stimulates balanced development of small and medium-sized cities, promotes joint growth for agriculture and

industries, expands urban areas, and increases income for farmers and fishermen, thanks to the accelerated distribution process. As of 1966, the population growth rate of three major cities was over six percent and a mere two percent for small and medium-sized cities, when the nation's overall population growth rate was 2.5 percent. Thus, regional differentials were wide. The construction of the expressway can bring many benefits: it expedites the dispersion of factories into other provinces and the creation of firms; develops the dairy industry, promotes high-grade vegetable farming and fishing industry due to the ease of door-to-door transport; advances the processing industry; increases the usage of cultural facilities; and promotes the tourism industry.

Fifth, the construction project brings huge benefits such as employment increase and industrial development through the mass-production of construction materials. During the construction process, it can lead to increased job opportunities and mass-production of construction materials, the promotion of automobile and machinery industry, and the modernization of industrial composition. More specifically, the project can create 60 billion won in increased production, as it has an employment effect of 21 million man-days, provides over 15 billion won in wages, and promotes six billion won in construction material production and automobile industry development.

Sixth, the project adds to national defense benefits, such as strengthening national defense power through the enhancement of military mobility. Moreover, the expressway can resolve the rising transport volume by doubling the transportation capacity, making civil links easier, and enabling the mass use of large modern weapons. Another merit is that highways can be used as a runway in emergencies.

#### 4. Economic and Social Costs From Conflicts

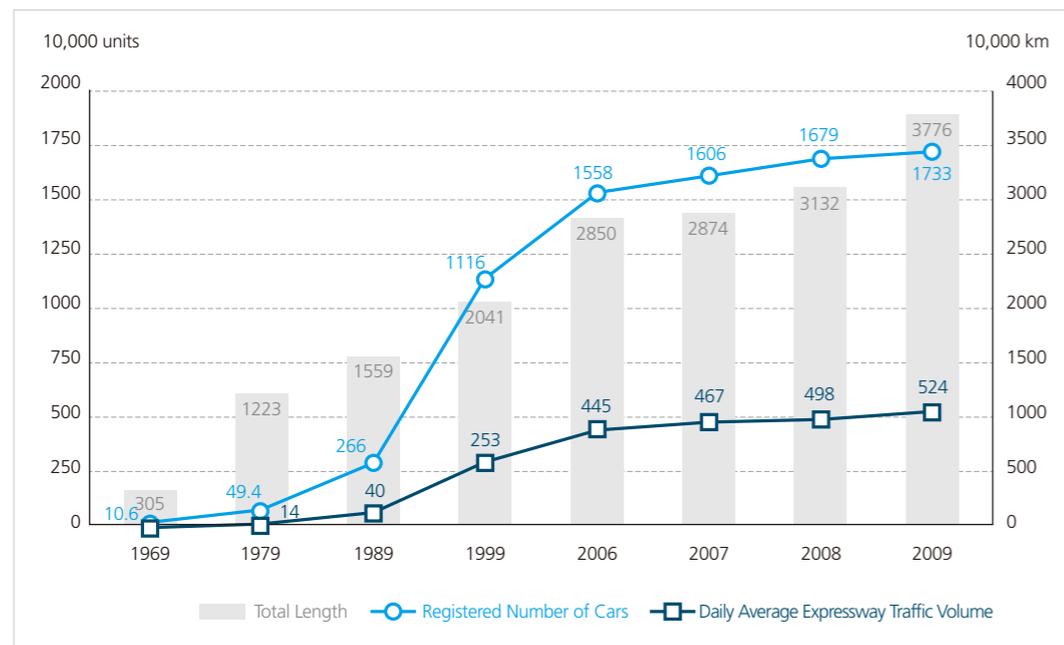
Against all odds, the construction of the Gyeongbu Expressway Seoul-Busan section was completed in only two years and five months, which was unprecedentedly short time, under the strong will and action of the country's leader. Thus, the Gyeongbu Expressway suggests no need for analyzing economic and social costs from conflicts.

## 5. Verification and Evaluation of Proponents' and Opponents' Arguments

### 1) Expressway Construction Feasibility

The Gyeongbu Expressway that enabled faster travel time opened the automobile era and laid the cornerstone for Korea's economic development, dubbed as the "Miracle on the Han River." As a result, the direct effect that the expressway network had on the nation's economy as of 2006, was estimated to reach 305.7 trillion won (33.6 percent of the GDP) annually. Moreover, the increase in the number of cars using expressways has provided Korea an opportunity for manufacturing automobiles. The Gyeongbu Expressway also contributed to resolving unemployment issues and increasing national income with an employment effect of approximately 21 million man-days throughout the construction period.

Figure2-1-1 Transportation Index Trend After the Opening of Gyeongbu Expressway



### 2) Issue of Project Priority to Seoul-Busan Section

According to the Korea Research Institute for Human Settlements, which carried out a study on the effects of the expressway in 2006, the Gyeongbu Expressway had the largest benefits among the highways in Korea. Thus, it has been proven that the decision to build the Gyeongbu Expressway first was right in terms of economic feasibility. The report suggested that, among all the expressways

open in 2006, the Gyeongbu Expressway had the largest amount of benefits at 13 trillion won in 1995, 15.9 trillion won in 2000, and 13.6 trillion won in 2005 respectively. The expressway had also contributed to laying the foundation for logistics revolution and economic growth as diverse types of industrial complexes began to be located around the Gyeongbu axis. The fact that 79 percent of national and local industrial complexes were located within 10km of Gyeongbu Expressway is a strong evidence.

### 3) Imbalanced Regional Growth and Damages to Traditional Custom

Despite the concerns of the opposition, it has been proven that the Gyeongbu Expressway promoted industrial development suitable to the region by linking industrial activities with available resources. The expressway also proved to substantially narrow regional gaps by developing both potential demand and supply areas. Modernized expressway contributed to increased farmers' income by enabling high-value vegetables and dairy industries to grow, and boosted the development of farming and fishing communities by directly connecting production sites with consumption sites.

Meanwhile, mobility and accessibility to all parts of the country was remarkably expanded thanks to the capability to travel Korea in a day. Accessibility from one region to another has been greatly improved and in result regional manufacturing, service industries and, in particular, local tourism industries have been invigorated.

## 6. Project Implementation Effects

### 1) Analysis on Project Implementation Effects

The effects of the expressway project can be divided into direct and indirect effects. Direct effects are the benefits directly obtained by highway users, while indirect effects are the gains that users and citizens obtain from the expressway, aside from the direct benefits.

#### (1) Direct Effects

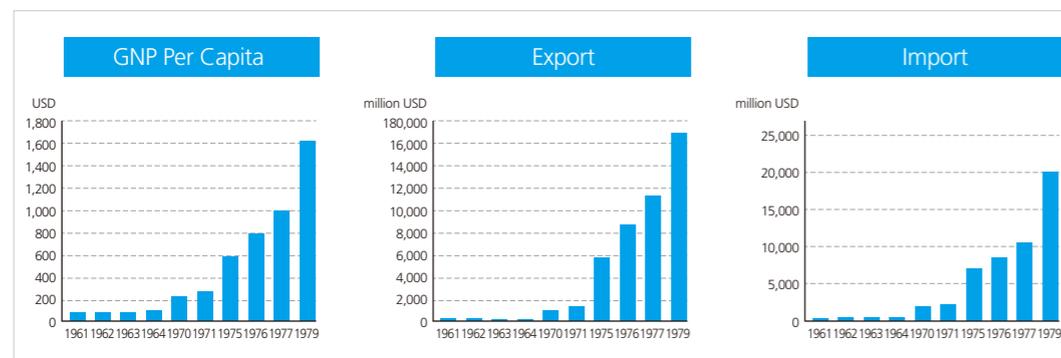
- Survey on the Expressway Project Effects (Korea Research Institute for Human Settlements, 1995)  
The Institute carried out the evaluation with and without the Expressway. Estimated direct effects as of 1994 included reduction of: travel distance by 8.7 percent, travel time by 20.4 percent, gasoline consumption by 18.3 percent, and diesel consumption by 24.9 percent. Converted into monetary costs, the direct benefits amounted to 8.2434 trillion won, or 2.72 percent of the GNP as of 1994.

- Survey on the Expressway Project Effects (Korea Research Institute for Human Settlements, 2006)  
The Institute analyzed the project benefits by comparing the cases where all the highways were in operation as of 1995, 2000, and 2005 with the case where each highway was not in operation. The Gyeongbu Expressway was found out to bring the biggest benefits with 13 trillion won, 15.9 trillion won, and 13.6 trillion won, respectively for the years of 1995, 2000 and 2005.
- Fuel Cost Reduction  
As of 2005, the Gyeongbu Expressway had an effect of saving 607 million liters of gasoline and diesel per year. When converted into monetary values, it amounted to 270.4 billion won a year.
- Travel Time Reduction  
It took more than 15 hours by car to get from Seoul to Busan before the construction of the Gyeongbu Expressway. On the contrary, the same distance now only takes four hours and twenty minutes via the expressway, which means a 71 percent travel time saving.

(2) Indirect Effects

- Employment Expansion and Economic Development<sup>6)</sup>  
In 1967, Korea had a population of 30.13 million, an unemployment rate of 3.2 percent, and an inflation rate of 12 percent. The GNP per capita was 142 dollars, whereas export volume was 320 million dollars and import volume 996 million dollars, with trade deficit of 574 million dollars.

Figure2-1-2 Comparison of Major Indicators (1961-1979)



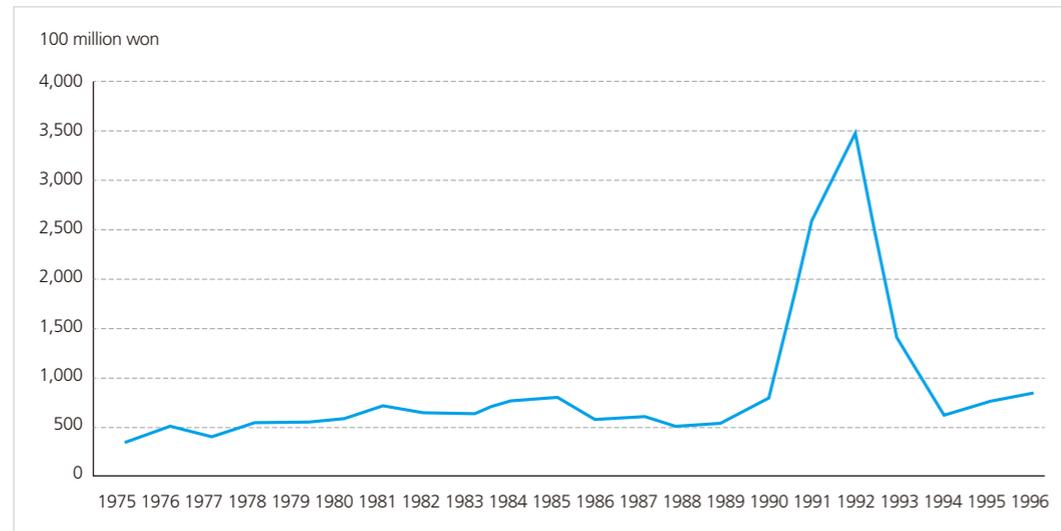
The Gyeongbu Expressway had an employment effect of approximately 21 million man-days. It was an effective means for helping the unemployed, as more than 15.9 billion won went into wages. A mass production system for construction materials was also formed, as the demand for materials surged with the construction of the expressway. Moreover, the project contributed to the rapid development of the machinery industry, including automobiles, as it had a spillover effect of producing approximately 60 billion won worth of cars.

- Contribution to Bridging Regional Gaps and Balanced Regional Development  
In the early stages of economic development, Korea adopted an imbalanced growth policy. The government pursued efficiency by investing minimum amounts in selected areas and then attempted to achieve regional equity by developing low-developed, low-efficiency areas. During the process, the expressway played a big role.  
Korea’s rural population rapidly decreased as the population and industries moved to major cities in the late 1960s. Concerned with the issue of rural depopulation, the government attempted to reduce regional gaps by connecting available resources and industrial activities through the nation’s main artery. In particular, the modernized expressway contributed to increasing farmers’ income by fostering high-value vegetables and the dairy industry and stimulating the development of agriculture and fishing industry by linking production sites in fishing villages with consumption sites in cities.  
Since the 1970s, various economic and social policies induced the population and industries to shift to metropolitan areas and major cities. Nevertheless, the Gyeongbu Expressway was known to have invigorated the regional economy, such as farming and fishing communities.

- GDP Investment Effects  
The results of the GDP investment effects for 21 years between 1975 and 1996 are as shown the diagram below.

6) Korea Expressway Corporation. "The History of Gyeongbu Expressway." 2009.

Figure2-1-3 GDP Spillover Effect of Gyeongbu Expressway

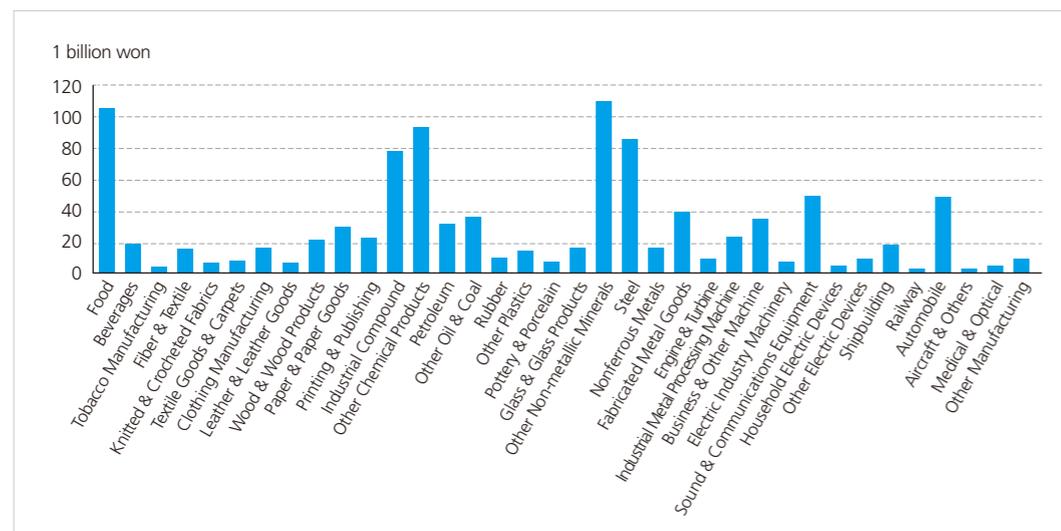


Source : Korea Expressway Corporation, "Analysis on Business Effect by Expressway Lines." 1999.

• Spillover Effects on the Manufacturing Industry

The spillover effects on the manufacturing industry by the construction of the Gyeongbu Expressway from 1968 to 1993 are shown in the Figure 2-1-4.

Figure2-1-4 Gyeongbu Expressway's Effects on Industrial Production

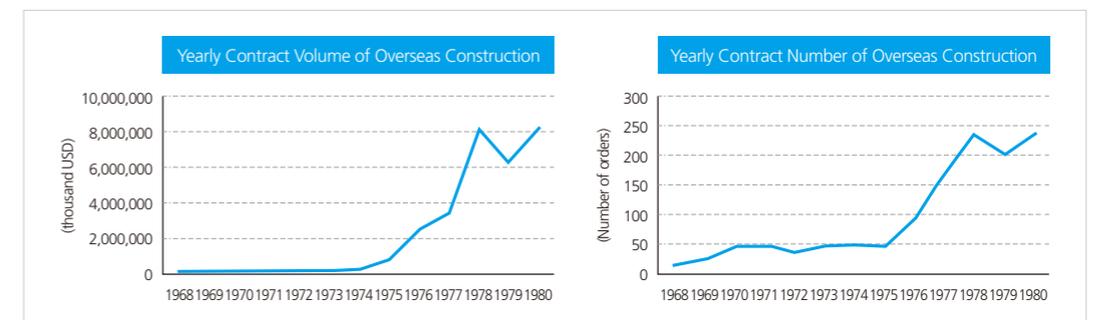


Source : Korea Expressway Corporation, "Analysis on Business Effect by Expressway Lines." 1999.

• Stimulation of Overseas Projects

The Gyeongbu Expressway also contributed to the stimulation of overseas construction projects. The 1970s was the era of expressways that began in earnest with the opening of the Gyeongbu Expressway in 1970, Honam and Namhae Expressway in 1973, and Yeongdong and Donghae Expressway in 1975. The number of construction contracts won overseas grew rapidly with the Overseas Construction Promotion Act and the experience of expressway construction.

Figure2-1-5 1970s Overseas Construction Trend (1968-1980)



Source : International Construction Information Service. <<http://www.icak.or.kr>>

(3) Other Effects

• Increased Daily Average Traffic Volume and Toll Revenue

Toll revenue from the Gyeongbu Expressway rose continuously as the daily average traffic jumped by 6.4 fold over 20 years from 150,000 in 1988 to 975,852 cars in 2007.

2) External Evaluation of Gyeongbu Expressway

(1) National Archives of Korea

The National Archives of Korea stated the construction effects of Gyeongbu Expressway under the theme "Constructing the Nation's Artery: Gyeongbu Expressway."

• Cornerstone of Korea's Economic Development

Together with the acceleration of industrial development, the Gyeongbu Expressway played a key role in making Korea one of the top ten economic powerhouses.

• Contribution to Korea's Balanced Regional Development

The expressway contributed to the smooth circulation of labor and supplies necessary for economic development, reduction of regional inequalities, and balanced regional development.

- Contribution to Korea's Construction Industry  
Thanks to the technological advancement of the construction industry, the Gyeongbu Expressway contributed to the development of the construction industry and strengthened its international competitiveness.
- Contribution to Korea's National Defense  
The Gyeongbu Expressway contributed to strengthening national defense through the mobilization of combat forces in emergencies.
- Contribution to Reform of National Consciousness  
The Gyeongbu Expressway contributed to reaffirming the nation's unlimited potential and inspiring a "can-do" spirit.

### 3) Construction Value of Gyeongbu Expressway

The estimated value of Gyeongbu Expressway amounted to 11.7933 trillion won, including land, road paving, bridges, and tunnels.

Total Value	Land+road paving+bridge+tunnel values = Approximately 11.7933 trillion won
Land Value	Average price of publicly notified individual land price per 1 m <sup>2</sup> (40,126 won)×area(34,655,000m <sup>2</sup> ) = Approximately 1.3906 trillion won
Road Packaging Value	Reacquisition cost per area(m <sup>2</sup> )(807,692 won)×area(9,860,500m <sup>2</sup> ) = Approximately 7.9642 trillion won
Bridge Value	Reacquisition cost per area(m <sup>2</sup> )(2,354,839 won)×area(910,000m <sup>2</sup> ) = Approximately 2.1429 trillion won
Tunnel Value	Reacquisition cost per area(m <sup>2</sup> )(1,556,034 won)×area(190,000m <sup>2</sup> ) = Approximately 295.6 billion won

Annotation1 : Land Value: Estimated according to the appraised land value of the relevant region

Annotation2 : Road paving value, bridge value, tunnel value: Used reacquisition cost

※ Reacquisition cost is the cost (material cost+labor cost+construction cost, etc.) required when building facilities at present.

The government announces the unit area (m<sup>2</sup>) price per facility

Source: Ministry of Strategy and Finance and National Accounting System Review Committee. "SOC Assessment Guide (Draft)." 2010.

### 4) Contribution to Society, Culture, and Education

#### (1) Realization of a Nationwide One-day Life Zone

The opening of Gyeongbu Expressway enabled citizens to travel the country in a single day. Accordingly, lifestyles and living patterns of one region quickly spread throughout the nation. During this process, underdeveloped areas were able to benchmark the cultures of relatively developed areas, and the areas with economic dominance began to take interest in other areas' cultures with traditional lifestyles.

#### (2) Restoration of Traditional Cultures on the Verge of Decline

Cultures that were confined to certain regions, such as the 12 versions of Pansori, loop fight, Gyeonggi folk song, Jeongseon Arirang, traditional lacquer work, and ceramics, were restored. Markets and vitality of traditional cultures and inherited lifestyles were also reinvigorated as exhibition platforms took place in major cities. In addition, shortened travel time made research on historical temples and dinosaur monuments easier including, for example, in-depth studies on tourism and cultural resources of Jeju and other islands, which required at least three days to travel by sea.

#### (3) Diminished Boundaries between Universities in Seoul and the Metropolitan Periphery

After the completion of Gyeongbu Expressway, Dongguk University, Kyunghee University, Dankook University, Yonsei University, Korea University, and Sangmyung University opened satellite campuses in the central region of Korea. Academic exchanges were invigorated between Seoul and other localities, thanks to the easy access through highways.

#### (4) Boom in Observing Traditional Holidays

After the opening of the Gyeongbu Expressway, a car boom swept the country as people aspired to visit their hometowns with family members via expressways. Even though increased demand for cars triggered traffic congestion, the expressway contributed to settling in a filial piety culture that stresses ancestral ritual formalities, where family members and relatives gather for holidays.

### 5) Cornerstone for Korea's "Miraculous History"

#### (1) Driving Force for Economic Development

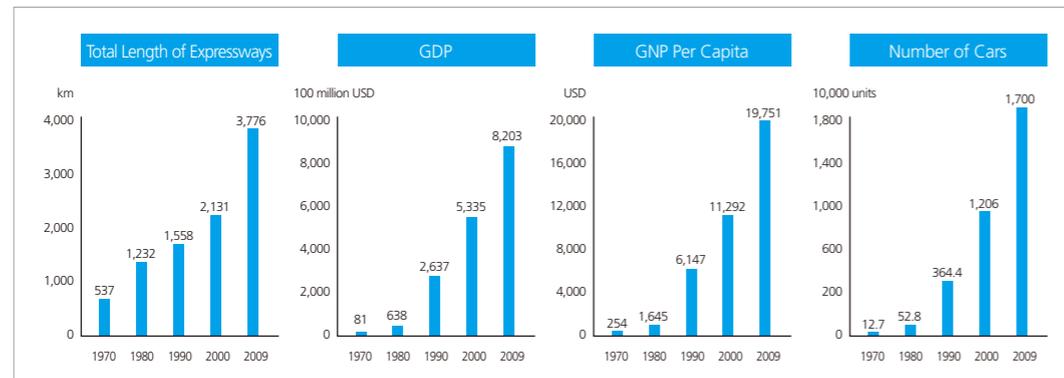
The construction of the Gyeongbu Expressway generated significant economic impacts including 21 million jobs, spill-over effects on industrial production, and the rise of steel, petro-chemical, ship-building, automobiles and electronics industry. In result, Korea's export and domestic market grew rapidly.

(2) Establishment of Economic Foundation

Based on the success of the Gyeongbu Expressway, Korea shifted from an agrarian society to an industrial society in the 1970s. The expressway accelerated region-to-region communication, enabled various exchanges of information and culture, and spread agricultural technologies and Saemaeul Movement, which helped overcome poverty in rural areas.

The expansion of SOC's such as expressways and the development of heavy chemical industry laid the foundation of Korea's advancement. In the 1980s, Korea saw that the number of cars exceeded one million units and export volume reached 60 billion dollars. In the 1990s, the number of cars surpassed ten million units and export volume stood at 100 billion dollars.

Figure2-1-6 Comparison of Major Indicators (1970-2009)



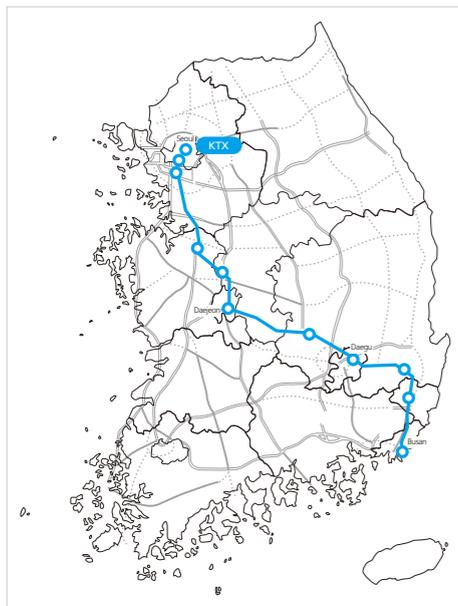
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## 2 Gyeongbu High-Speed Railway Construction Project

### 1. Project Outline

Project Duration	June 30th, 1992~April 1st, 2004 (Phase 1: 11 years and 9 months) June 1st, 2002~December 31st, 2014 (Phase 2 : 12 years and 7 months)
Investment Amount	20.4834 trillion won (Phase 1: 12.7337 trillion won, Phase 2 : 7.497 trillion won)
Project Volume	Total length 417.5km, 6 stations newly built, 4 stations improved
Technical Specifications	Maximum speed : 300 km/h, Passenger capacity : 520,000 passengers/day, Railway Vehicles : 46 units Vehicle Storage Stations : Seoul (Gangmae-dong, Goyang-si), Busan (Danggam-dong, Busanjin-gu)



In the 1970s and the 1980s, infrastructure could not keep up with the rapid speed of economic development. As a result, transport and logistics became major problems in the Gyeongbu axis. Although the majority of expressway and railway sections reached their capacity limits, Korea's transportation infrastructure and plans were inadequate to solve the problems. An introduction of new transport facilities in the Gyeongbu axis was felt inevitable. The high-speed railway was singled out as the best alternative. The objective of the Gyeongbu High-Speed Railway Construction Project was to enhance national competitiveness by resolving the shortage of transport infrastructure associated with rapid economic development and to achieve balanced regional development and social integration by

promoting economic and social exchanges between regions.

The Gyeongbu High-Speed Railway, which connects Seoul-Gwangmyeong-Cheonan-Asan-Osong-Daejeon-Gimcheon (Gumi)-East Daegu-New Gyeongju-Ulsan-Busan, required a total of 20.4834 trillion won for 22 years and six months from June 1992 to December 2014.

In 1974, the IBRD proposed the construction of a new railway on the Gyeongbu axis, and this was reflected in the Korea's Fifth Five-Year Plan(1986-1989), which eventually led to the decision of constructing the Gyeongbu High-Speed Railway in 1989. In 1992, four zones in the pilot section (Cheonan-Daejeon) began construction and in 1993, France's Alstom was chosen as the priority negotiator for the supply of vehicles. In 1996, the High-Speed Railway Construction Promotion Act was enacted and proclaimed. The first phase was opened in 2004 and the Daegu-Busan section of the second phase was completed in 2010.

In April 2004, the opening of the Seoul-East Daegu (248.0km) section, which was the first phase of the project, enabled passengers to travel Seoul-Busan (417.5km) in only two hours and 40 minutes. Later on, the East Daegu-Busan section (127.2km) of the second phase opened on November 1st, 2010. The completion of the construction lowered the travel time to two hours and 18 minutes. As a result, the project generated spillover effects such as balanced regional development, accumulation of related technologies, ability to travel the country in half-a-day and the realization of green growth by minimizing environmental pollution.

From the planning stage, the Gyeongbu High-Speed Railway Construction Project aroused various types of conflicts related to the issues such as balanced regional development, technological dependency, investment efficiency, environment and culture, and, as a consequence, incurred heavy economic and social costs. To alleviate such conflicts, the government and the project agency mobilized scientific means or various persuasion strategies such as forming consultative bodies, running public relations campaign, filing lawsuits and reaching agreements.

### 2. Project Background and Purpose

#### 1) Project Background

Resolving the difficulties of transportation and logistics in the Gyeongbu axis was the main reason for carrying out the Gyeongbu High-Speed Railway Construction Project. As of 1995, 73 percent of the total population and 70 percent of regional production were concentrated in the Gyeongbu axis. In addition, among the inter-regional transportation volume, the axis accounted for 66 percent of passengers and 70 percent of cargos.<sup>7)</sup> It was forecasted that the axis would see 3.6 percent and 4.3

7) Passengers: Nationwide 7.3 million passengers/day, Gyeongbu axis 4.8 million passengers/day; Cargo: Nationwide 1.23 million tons/day, Gyeongbu axis 860,000 tons/day

percent of annual passenger and cargo traffic increase, respectively.

Moreover, thirty eight percent of traffic congestion occurred in the Seoul-Suwon, Cheonan-Daejeon, and Gimcheon-Daegu sections of the Gyeongbu Expressway. As the number of cars jumped 5.9 fold from 2.04 million units in 1988 to 12.06 million units in 2000, the area of congested sections was expected to grow in spite of the expressway extension. In the case of railways, capacity shortage in all sections was pointed out as a major issue. For instance, as of 1997, the Suwon-Daejeon section already reached its limit. Although south of Daejeon did not have many problems, the capacity shortage of the Suwon-Daejeon section made it impossible to run additional operations. It was estimated that the capacity would reach its limit between 2000 and 2003 even if there was a 15 percent increase of capacity through the electrification of original railways.

Regional development focused on the Gyeongbu axis made it difficult to solve the traffic and logistics issues with the existing transportation infrastructure and expansion plans alone. It was thus inevitable to introduce new transport facilities in the axis. The high-speed railway was singled out as the best alternative of all, since it required land, only 29 percent of a four-lane expressway per unit transport capacity, and had high levels of safety and punctuality.

Table2-2-1 Capacity Status of Gyeongbu Railway (1997)

(Unit: times/day)

Classification	Seoul-Cheonan	Cheonan-Daejeon	Daejeon-Daegu	Daegu-Busan
Railway Capacity	138	134	123	134
Operation Status	138	134	94	96
Remaining Capacity	0	0	29	38

Source : Ministry of Land, Transport, and Maritime Affairs. "Overcoming Environmental Conflicts of the Gyeongbu High-Speed Railway Second Phase: Mt. Cheonsung Passageway." 2010. 1.

### 2) Project Purpose

The primary purpose of the Gyeongbu High-Speed Railway was to boost national competitiveness by accelerating efficient industrialization through resolving transport infrastructure shortages caused by economic development. An allied objective was to achieve balanced regional development and social integration by promoting economic and social exchanges among regions through reduced travel time.

### 3) Project Content

The Gyeongbu High-Speed Railway Construction Project connects Seoul-Gwangmyeong-Cheonan-Asan-Osong-Daejeon-Gimcheon (Gumi)-East Daegu-New Gyeongju-Ulsan-Busan. The duration of the project, both phase one and two, would be 22 years and 6 months from June 1992 to December 2014.<sup>8)</sup> Out of total investment amounting to 12.738 trillion won in the first phase, 45 percent was funded from state coffers—contribution 35 percent and loan 10 percent—and 55 percent from the public corporation's own financing. The railway's maximum speed was planned to be 300km/h and daily passenger capacity up to 520,000 passengers per day. The total number of vehicles was planned to be 46 including 12 manufactured overseas and 34 manufactured in Korea. Vehicle storage bases were supposed to be located in Gangmae-dong, Goyang-si and Danggam-dong, Busanjin-gu.

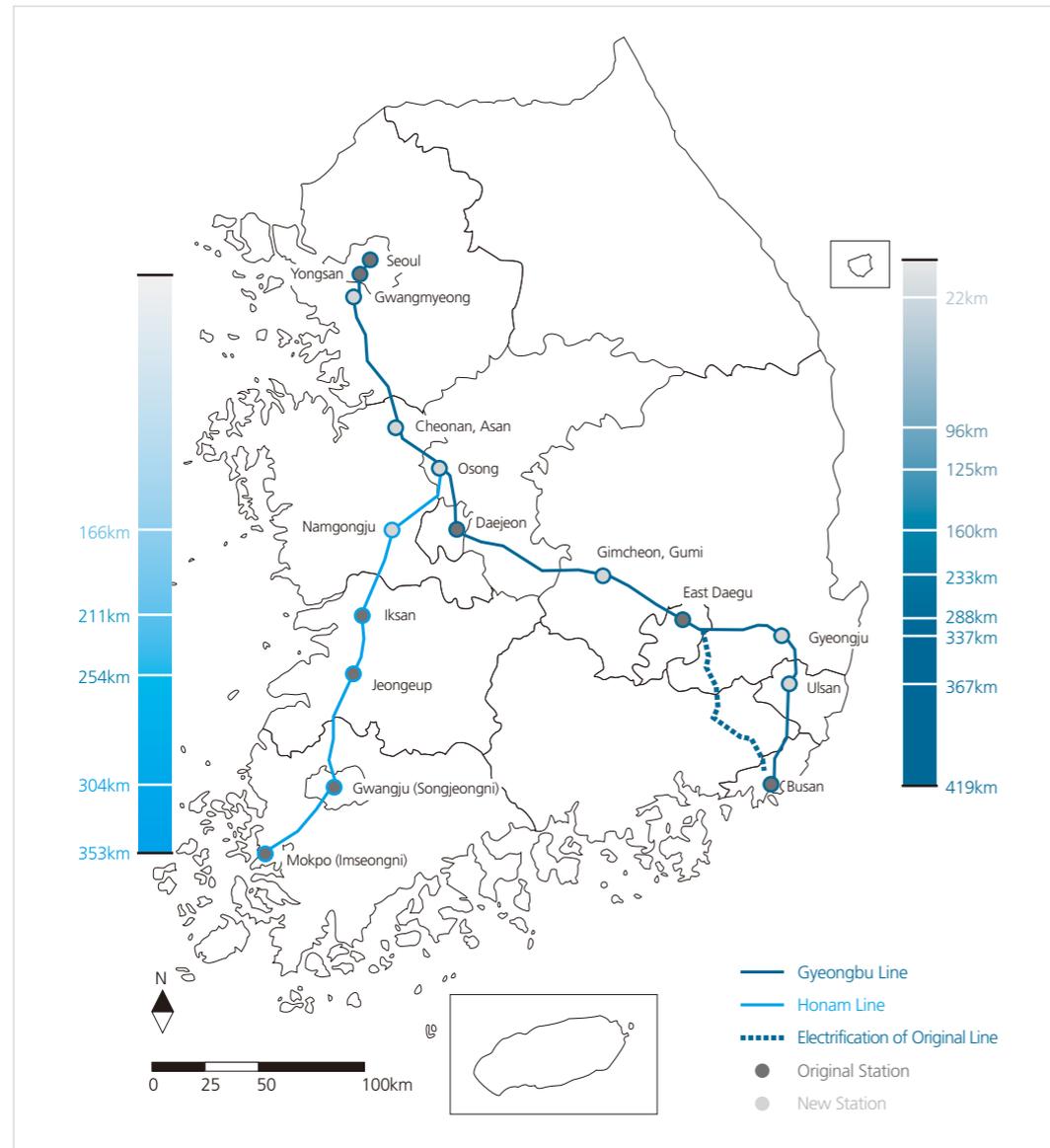
With the opening of the Seoul-East Daegu section (248.0km) in April 2004, it took two hours and forty minutes for the Seoul-Busan section (417.5km). After, the completion of the East Daegu-Busan section (127.2km) on November 1st, 2010, travel time between Seoul and Busan was reduced to two hours and eighteen minutes. The second phase of the project would require 7.991 trillion won, and an additional line will be constructed between downtown Daejeon and Daegu by 2014.

Table2-2-2 Gyeongbu High-Speed Railway's Project Content by Phase

Classification	Phase 1	Phase 2
Project Section	Construction of the Seoul-Daegu section, Electrification of downtown Daejeon and Daegu and the existing Daegu-Busan section	Construction of downtown Daejeon and Daegu and the Daegu-Busan section
Total Cost	12.738 trillion won	7.991 trillion won
Project Duration	1992-2004	2002-2014

Source : "About Phase Two of the Gyeongbu High-Speed Railway Construction Project." Korea Rail Network Authority, Web

8) The East Daegu-Busan Section of the second phase was opened on November 1st, 2010. The new section (40.9km) in downtown Daejeon and Daegu is scheduled to open in 2014.



Source : Ministry of Construction and Transportation. "A Study on Effective Development of High-speed Railways' Neighboring Areas." 2006. 5.

#### 4) Project Agency

In 1989, the High-speed Railway Planning Office was established under the Korea Railroad and was expanded into the High-Speed Railway Project Planning Group in 1991. In 1992, the project began in earnest with the launch of the Korea High-Speed Railway Construction Corporation. In 1996, the High-Speed Railway Construction Planning Group under the Ministry of Construction and Transportation

led the project, and the Korea Rail Network Authority (KRNA) has been promoting the construction projects for the Gyeongbu High-Speed Railway and the Honam High-Speed Railway since 2004.

#### 5) Project Progress

It took 36 years to complete the entire section from the time when the need for the Gyeongbu High-Speed Railway Construction Project was first raised in 1974. The following table summarizes the detailed progress of the project.

Table2-2-3 Progress of the Gyeongbu High-Speed Railway Construction Project

Date	Content
June 1974	Under the request of the IBRD, a French and Japanese Investigation Group proposed the construction of a new railway in the Gyeongbu axis
June 1981	Reflected in the Fifth Five-year Plans of South Korea (1982-1986)
November 1984	Feasibility study on the long-term transportation investment and high-speed railway construction in the Gyeongbu axis
May 1989	Decision on the direction for constructing the Gyeongbu High-Speed Railway
December 1989	Establishment of High-Speed Railway Planning Office under the Korea Railway
June 1990	Final decision on the project plans and routes
February 1991	Expansion of the High-Speed Railway Planning Office into the High-Speed Railway Project Planning Group
March 1992	Establishment of the Korea High-Speed Railway Construction Corporation. Dissolution of the High-Speed Railway Project Planning Group
June 1992	Construction of 4 zones in the pilot section (Cheonan-Daejeon)
August 1993	Selection of the priority negotiator for the railway vehicle (France's Alstom)
November 1996	Establishment of the High-Speed Railway Construction Planning Group under the Ministry of Construction and Transportation
December 1996	Enactment and proclamation of the High-Speed Railroad Construction Promotion Act
July 1999	Designation of the official name of the high-speed railway system (KTX)
November 2000	Completion of the pilot section (57.2km). Test speed : 300km
April 2004	Opening of phase 1 of the Gyeongbu High-Speed Railway
August 2004	Temporary suspension of the Mt. Cheonseong section (Wonhyo Tunnel) construction
October 2010	Completion of phase 2 of the Gyeongbu High-Speed Railway

### 3. Arguments and Grounds of Proponents and Opponents

#### 1) Issues and Logic of Proponents and Opponents

The Gyeongbu High-Speed Railway Construction Project experienced various types of conflicts from the planning stage. The conflicts were categorized into balanced regional development (equity), safety, technology level and dependency (technological feasibility), investment efficiency (economic feasibility), environment and cultural asset (environmental feasibility) issues, and other matters. The arguments and grounds of the proponents and opponents are as follows.

##### (1) Balanced Regional Development (Equity)

###### • Arguments and Grounds of Opponents

The opponents of the Gyeongbu High-Speed Railway argued that industrial development in the country was concentrated in the Gyeongbu axis because of biased development of SOCs such as railways, roads and harbors there. They claimed that, if the high-speed railway was built along the axis, then Korea would be unable to avoid the vicious cycle of overpopulation, over-concentration of industries, and environmental damages. Moreover, the Gyeongbu high-speed railway would bring an over-concentration of population and industries in the Seoul and Busan metropolitan area, choking off the nation's main artery. The opponents stressed that constructing the Gyeongbu high-speed railway, in a situation where other regions were experiencing an absolute shortage of SOCs, would not only accelerate regional imbalance but also make the national economy too dependent on the Seoul metropolitan area and the southeastern area. In addition, they pointed out that the opening of high speed railway would weaken the power of areas in between those two metropolitan areas, just as Japan's Shinkansen further strengthened the role of Tokyo and Osaka regions.

###### • Arguments and Grounds of Proponents

The proponents who supported the Gyeongbu High-Speed Railway argued that the project would invigorate the local economy by accelerating the dispersion of population and the relocation of firms, which in result would contribute to the nation's balanced development. The proponents explained that, in the case of Japan, population of small-and-medium-sized cities, where the Shinkansen Line passes through, increased more than ten percent and the establishment of companies increased more than 30 percent, whereas other cities only experienced five to twenty percent increases. They further suggested that high-speed rail would reduce information gap between regions, as information can spread out from the metropolitan areas to other areas through people-to-people exchanges using the high-speed

rail. They also emphasized that the Gyeongbu High-Speed Railway could contribute to the revitalization of leisure and tourist industries with the increased number of people visiting tourist sites along the Gyeongbu Line.

##### (2) Safety, Technology, and Dependency Issues

###### • Arguments and Grounds of Opponents

At the time, the opponents' main argument was that, once a high-speed railway was built, it would be difficult to make changes, even with the arrival of a new technology. While criticizing the exclusion of the magnetic levitation (maglev) propulsion train option, the next generation technology, for the reasons of Korea's technology level and safety during the policy-making process, the opponents claimed that wheel-type trains would become junks by the time of the project's completion. They also added that the government did not take Korean companies' level of technology into account because it was solely concerned about the speed. In result, the project would be primarily led by foreign companies, in disfavor of Korean companies. Further claims were made that a construction method, which undermines the participation of Korean engineering teams, could make Korea dependent on foreign technologies, and as a result, Korea's machinery industry would lose growth opportunities. Concerns for safety continued to linger even during construction. In fact, the Gyeongbu High-Speed Railway in Cheonan-Daejeon pilot section, and the Seoul-Cheonan section was found to have been poorly constructed according to the safety inspections conducted in 1997 by Wiss, Janney, Elstner Associates (WJE), an American company. Even though the strength of concrete, which is the most important factor in construction, did not have any major problems, safety problems were found in some parts of construction that required high-level technical skills.<sup>9)</sup>

There were conflicts on safety measures regarding the construction. Claims were made that the Mt. Cheonseong region is an active fault area which the tunnel has a high possibility of collapse not only during construction, but also even after construction due to regular and continuous vibration that occurs in the process of train operation. The opponents argued that it was problematic to carry out the tunnel construction rather than to seek alternative routes, given other instances in which routes have been changed due to the risks of the tunnel's collapse. Valleys and wetlands were argued to be destroyed if tunnel construction triggered underground water leaks through the fault zones.

9) Yeonhap News. April 16th, 1997

- Arguments and Grounds of Proponents

The proponents stressed that the Gyeongbu High-Speed Railway would have a great ripple effect throughout Korea's technologies and industries, such as technology transfer, technology development, and advancement of existing technologies, because it would be a comprehensive system that includes cutting edge technologies like civil engineering, machinery, electricity, and electronics. The proponents expected that, through the high-speed railway system technology, there could be improvements in comprehensive design capability of public and mass transit, such as railway, subway, and light rail.

In regard to safety issues of the tunnel construction, the proponents confirmed that there was neither displacement continuously occurring nor active fault zone displaced recently in the construction section. They explained there was not an instance where routes were changed due to risks of the tunnel collapse. The Sangri Tunnel section, of which route was altered in November 1996, was due to concerns over the roadbed's safety caused by cavitation after a mine abandoning. According to a geological survey and a detailed survey on changes in natural environment, which were conducted during designing the original and alternative construction plan for the Mt. Cheongseong Tunnel, the region's bedrocks were found to be solid, strong, and deeply distributed from the surface with excellent water tightness. The proponents further argued that there was not the remotest possibility of underground water leakage through the fault zone, since the Mt. Cheongseong Tunnel runs parallel to the middle section between the Yangsan and Dongrae fault zones, unlike the opponents' argument that the tunnel traverses across.

### (3) Investment Efficiency Issues (Economic Feasibility)

- Arguments and Grounds of Opponents

The opponents also brought up problems related to the project's investment priority and efficiency. At the time, the amount of required investment of SOCs for the next ten years for the whole country was estimated to be 69 trillion won, but only 36 trillion won was available. Accordingly, the Federation of Korean Industries (FKI) officially proposed to reexamine some of the construction projects, such as the Gyeongbu High-Speed Railway and the Seohaean Expressway projects. At the same time, some argued that more time for reexamination was needed to determine which projects were more economical in terms of investment efficiency, since the number of cars would continuously increase regardless of high-speed railway. Thus the FKI recommended that funds be diverted to large-scale road construction projects with immediate results instead of high-speed rail. The opponents also pointed out that, compared to other countries, high-speed railway projects in Korea had low cost efficiency due to

mountainous areas and deep valleys that would drive up construction costs.

Assuming the expected opening date of the project, the uncertain payability of passenger service was also subject to criticism. Railway's payability depends on how far it reaches and how much it carries. Thus, even if taking the growth of national income into consideration, the opponents came to a conclusion that there would be insufficient demand for high-speed rail to operate in the economic scale, given the structure of Korea's traffic network and the spatial structure. Although it was claimed that the direct and indirect economic effects obtained from the reduced traffic congestion of the Gyeongbu axis would be huge, the opponents pointed out that there was no reference to the superiority of high-speed rail in comparison with other modes. In relation to securing funds, the opponents argued that the cost of the Gyeongbu High-speed Railway construction would be astronomical, which, in turn, would place a great burden on the nation's economy.

Criticism was also laid on the effectiveness of transportation. The opponents argued that the high-speed railway's contribution to solving freight transport problems, which should take a top priority for the transportation in the Gyeongbu axis, would only be modest. They suggested that it would be more effective to enhance and expand the existing railways, since traffic congestion would become worse without a large-scale expansion of road network in the Gyeongbu axis. Specific routing suggestions were also made: the Daegu-Miryang-Busan route with a branch line would bring the least environmental degradation instead of the route detouring to Gyeongju without significant losses to passenger volume and the Gyeongju business community.

- Arguments and Grounds of Proponents

The proponents expected large economic benefits of the Gyeongbu High-Speed Railway including increased transport capacity, relieved traffic congestion on the Gyeongbu Expressway, other economic and social benefits, and reduced traffic accidents. They predicted that the Gyeongbu High-Speed Railway would bring about substantial changes in all aspects of life including politics, economy, society, and culture, because travel time between Seoul and Busan would be shortened to two hours, enabling citizens to travel the country in half a day. With the completion of the second phase of the Gyeongbu High-Speed Railway, the proponents expected that Daegu-Busan line's passenger-carrying capacity would increase by four times and the existing Gyeongbu Line's container transport capacity by eight times, since the high-speed railway would be designated for passengers and the existing Gyeongbu railway would mainly carry freight. For example, the number of passengers was predicted to increase from 180,000 to 620,000 per day and the number of containers from 390,000 to three million per year. The conversion of passengers from car to high-speed rail would relieve traffic congestion

on highways. As a consequence, an estimated 1.85 trillion won worth of economic and social benefits would be obtained from reduced time and operation costs, as of 2005.

It was also pointed out that, although the construction cost of high-speed rail is about twice more expensive than four-lane highways or conventional double-track railroads, high-speed rail has two or three times of efficiency than highways or double-track railroads in terms of unit construction cost and per hour transportation. With its huge energy-saving effects,<sup>10)</sup> high-speed rail was expected to contribute to environmental protection due to reduced emission of air contaminants, such as CO<sub>2</sub>. Furthermore, high-speed railway is highly efficient in terms of land use since it requires only 29 percent of a four-lane highway per unit transport capacity. Together with safety and punctuality, high-speed rail was considered to be the best alternative in comparison with other means of transportation.

Table2-2-4 Transport Efficiency Comparison of High-Speed Rail and Expressway

Classification	High-Speed Railway (A)	Expressway (B)	Double-Track Railroad (C)	A/B	A/C
Construction Cost (100 million won/km)	382	262	250	1.46	1.53
Transport Capacity (10,000 persons/day)	52	25	27.5	2.08	1.89
Travel Time (Time: min)	1:56	5:20	3:50	△ 2.70	△ 1.98
Transport Efficiency (based on expressways)	3.93	1.00	1.60	-	-

Annotation : Vehicle expense excluded from construction cost ;

$$\text{Transport Efficiency} = \text{Transport Capacity} / (\text{Travel Time} \times \text{Construction Cost})$$

With respect to the issue of routing, the proponents were reminded that the decision for the current route via Gyeongju was based on various technical surveys over a period of about three years from July 1989 to February 1991. The survey results suggested that although the Daegu-Miryang-Busan route shortened travel time by seven minutes due to a shorter distance by 30km when compared to the Daegu-Gyeongju-Busan route, its economic feasibility would fall short of the latter because of lesser areas to benefit from high-speed rail. Moreover, route changes into Miryang or others would suffer from serious consequences arising from not only civil petitions of the residents in Gyeongju and Ulsan region, but also regional confrontations between the North and South Gyeongsang Provinces.

10) TGV and Shinkansen have energy consumption rate per passenger and per kilometer only 19 to 24 percent of cars or airplanes.

Furthermore, when a new route were to be considered or selected, the construction period would be delayed by seven years and the high-speed railway would be open in 2016. If then, an estimated 18.2 trillion won worth of economic and social benefits would be lost due to increased travel time and operation costs. More specifically, if the railway were to be only operated with the existing line from 2010 to 2016, about 24-million passenger demand would not be met, and the operating revenue for the seven years, which was estimated to be about 3.8 trillion won, would evaporate. In particular, if the Busan New Port opened in 2011, it would become difficult to handle 14 million TEU of cargo volume due to the lack of logistics infrastructure. Concerns were also expressed regarding the incurrence of penalty for breach of contract and sunk cost, which was predicted to be around 130 billion won.

As for the new Daegu-Busan Line, it was concluded that, with a newly-constructed Gyeongju Station, user preference for high-speed rail would increase and, in result, raise the number of passengers by 1.4 times from 200,000 to 280,000 per day. Consequently, an additional annual revenue of 800 billion won from passenger ridership would be secured and thus improve operating balance. Considering the possible increase of cargo volume of the Busan New Port and nearby industrial complexes, passenger transport and cargo volume were expected to increase by 3.6 and 4.3 percent per annum, respectively. And thus the conclusion was made that it was an absolute necessity to build a new Daegu-Busan high-speed rail to meet the demand.

#### (4) Environment and Cultural Asset Issues (Environmental Feasibility)

- Arguments and Grounds of Opponents

Starting in July 2002, Monk Ji-yool, then an affiliated member of the Naewon Temple, and environmental and civic organizations including Environmental Preservation Countermeasure Committee for Mt. Cheonseong, Buddhist Environmental Solidarity, and “Korean Salamanders and Friends” began holding protests against the Mt. Cheonseong Tunnel construction, arguing that the construction would cause damage to the whole alpine wetland area’s natural ecology and disturbance to ascetic practices of the temple. The protest began with 50 Buddhist nuns of the Naewon Temple making a “three steps and one bow” walk, which spread into an all-night sit-in hunger strike of environmental organizations and monks. As a result, political circles, including the Grand National Party and the Democratic Party, promised to review the Mt. Cheonseong tunnel construction as a presidential election pledge at the end of 2002. The government, hence, put the construction on hold, reviewed the route from March to September 2003, reached a conclusion which confirmed that the suggested route was the most adequate option, and resumed the construction. Regarding the Gyeongju section that passes through the city, the opponents went against it on the grounds of damage

to cultural assets, which led to alterations of the section route later on.

As for the legitimacy of environmental impact assessment, the opponents raised questions about not conducting the environmental impact reassessment or carrying out renegotiation procedures even though the construction did not begin within seven years after receiving the environmental impact assessment in November 1994. They argued that there was a need for reassessment, since unforeseen problems, such as designating a Natural Ecology Special Protection Area and Wetland Conservation Area or the discovery of new fault zones, arose after consultations for the environmental impact assessment were made. Questions were raised about the credibility of the environmental impact assessment, which was conducted in November 1994, based on the fact that it lacked descriptions on more than 30 endangered animals and species, and 22 wetlands.

In regard to the contamination and depletion of underground water, the Green Korea United's 2003 survey results showed that the whole area of Jangjae-ri in Baebang-myeon, Asan, South Chungcheong Province, where the Cheonan-Asan Station was built, appeared to have suffered the most. Groundwater was also found to be depleted in Jangjae-ri 2-gu, Mungok-ri in Buyong-myeon, Cheongwon-gun, North Chungcheong Province, where the Biryong Tunnel passes through, and Iljik-dong and Soha-dong in Gwangmyeong, Gyeonggi Province, where the Gwangmyeong Tunnel and the Iljik Tunnel were built.<sup>11)</sup> Also in 2006, residents of Junam-ri in Ungsang-eup, Yangsan, South Gyeongsang Province, filed a civil complaint, saying that the amount of underground water decreased at the Wonhyo Tunnel construction site, Mt. Cheongseong section.

Conflicts surrounding noise occurred frequently. The residents of Seondugu-dong in Geumjeong-gu, Busan, raised voices that they were suffering from train noise ever since the opening of the high-speed railway's second phase section, urging for countermeasures. According to the residents, they were suffering from unbearable noise because high-speed trains passed by the town 74 times both ways on average per day. Furthermore, the residents of Taegi-ri and Bangokha-ri in Eonyang-eup, Ulju-gun reported that they were also suffering from terrible noise incurred by 46 high-speed trains passing by a day.

The protection of cultural assets was another source of conflicts. The opponents argued that the section that runs underground of the Mitaam Temple, which is registered as a traditional Buddhist temple, went against the traditional temple compound's approval procedure under the Act, since it did not get the approval of the temple's representative and the Minister of Culture and Tourism. As for the problems related to the disruption of the temple's ascetic practice environment, the opponents claimed that if the tunneling work were to be

11) Hankyoreh Shinmun. September 2nd, 2003.

proceeded, the landscape, and the peaceful and pleasant environment of the temple would suffer great damage.

- Arguments and Grounds of Proponents

With regards to the legitimacy of environmental impact assessment, the proponents defended that there was no need to reconsider or carry out the evaluation again because there were no particular changes such as route alteration. They also explained that additional detailed surveys were conducted on the changes in natural environment before the construction began. Since the environmental impact assessment for the high-speed railway construction project was specifically conducted on sections that were expected to have direct damages, the proponents pointed out that there was a distinction between the impact assessment and the survey on the entire region of Mt. Cheonseong proposed by Monk Ji-yool.

As for the potential damages to wetlands and surrounding ecosystem, the proponents added that the tunnel line that would pass through Mt. Cheonseong was not a subject of negotiation because it would not directly pass through the Mujechi Wetland or Hwaemom Wetland.

Regarding the complaints of Junam Village residents about the underground water depletion, Yeongnam Regional Headquarters of KRNA explained, "the residents' claims about the underground water depletion has no credibility, since it is currently a low-water season and the stream is an intermittent spring."

On the issue of noise, KRNA argued that the equivalent sound level, which quantifies the noise environment as an average value of sound level for an hour, fell short of the Noise and Vibration Control Act's standard level with a day average sound level at 70 decibels and a night average sound level at 60 decibels. "In some areas of Seondugu-dong, the background noise was measured to be higher than the train's lowest level of noise due to the noise created by cars that pass through the national highway," said a KRNA official. "However, it is difficult to come up with countermeasures, such as building soundproof walls, as of now, because the train's sound level does not exceed the legal standard level."<sup>12)</sup> the official added. In response to the problems related to Ulju-gun, the official said, "Recently, the noise level was measured by an external agency and I was informed that the noise level was lower than the standard level of 63 decibels. However, KRNA will come up with adequate measures based on accurate research findings since the noise level complained by the residents is too high."<sup>13)</sup>

In reference to the claims that the construction violated the Preservation of Traditional Buddhist Temples Act, KRNA argued that the construction did not intrude into the precincts of the traditional temple because the Gyeongbu High-Speed Railway's route lay away from

12) The Busan Ilbo. December 3rd, 2010

13) The Segye Times. November 28th, 2010

the Mitaam Temple by 405 meters of vertical distance and 250 meters of horizontal distance. As for the invasion of the temple's ascetic practice environment, cutting-edge construction methods were applied in designing the tunnel, and the expected vibration level was measured to be 0.027 centimeters per second when blasting the tunnel and 0.0011 centimeters per second when operating the train. Since the vibration levels were far lower than the vibration standard level of 0.2 centimeters per second, which was applied to all sections of cultural assets, it was concluded that the ecosystem and important structures would not be affected by noise and vibration.

#### (5) Other Issues

##### • Conflicts Over Hosting Stations

High-speed railway stations have great economic and social effects on surrounding regions, but they cannot be established as much as regular railway stations can be in terms of efficiency. As a result, there was an acute competition between local governments for hosting a station to their localities, which inevitably led to conflicts. Such conflicts occurred not only during the planning stage, but also during operation. On October 6th, 2010, around the time of the Gyeongbu High-Speed Railway second phase's opening, the Ministry of Land, Transport, and Maritime Affairs (MOLTA) announced that the KTX train would make a stop at Yeongdeungpo Station. Against this announcement, Gwangmyeong City, along with six neighboring cities including Gwacheon, Gunpo, Siheung, Ansan, and Uiwang, formed a civil committee. The committee visited the Korea Railroad Corporation to protest, held sit-in demonstrations, and filed petitions to the Korean Presidential Office, National Assembly, MOLTA, and Korea Railroad Corporation. After the announcement, the Ministry visited Gwangmyeong city to discuss ways to vitalize the Gwangmyeong Station. During the visit, the Ministry declared that KTX train would only make two stops a day at Yeongdeungpo Station and that such plan would go unchanged until 2014. The Ministry added that it would renegotiate the plan after the opening of Honam High-Speed Railway. Gwangmyeong city, however, did not trust the Ministry. In addition, the response of Yeongdeungpo-gu residents was mixed with some welcoming the idea, while others expressing disapproval.

##### • Conflicts Over Station Names

There were disputes about naming of stations. Local governments competed with each other over the naming because adding a name of a railway station to maps and road signs could raise the visibility of the locality and thus a large promotional effect. Conflicts erupted when deciding station names especially for Osong, Gimcheon (Gumi), New Gyeongju, and Ulsan Stations. The residents did not hesitate to act as a group to maintain pride for their cities, but

the Korea Railroad (KORAIL) decided on the name of the stations by forming the Station Naming Review Committee, in which civic groups, local lawmakers, and professors participated. There were even cases where station names were decided only three months prior to the stations' opening due to the collision of interests between different localities. As for Gimcheon (Gumi) Station, Gimcheon city has been in conflict with Gumi city over the course of seven years, but both cities could not reach an agreement. Gimcheon demanded the station to be named after Gimcheon, whereas Gumi wanted to name it as Gimcheon-Gumi Station. Cheongju City and Cheongwon-gun stood against each other as well; Cheongju demanded the name to be Cheongju-Osong Station in consideration of Cheongju and Cheongwon's administrative district integration, whereas Cheongwon demanded the name to be Osong Station since the station is located at Osong-ri, Cheongwon-gun. Cheongju eventually gave in to Cheongwon. Ulsan (Tongdosa) Station was also in disputes because Christian groups resented the fact that the Buddhist temple name of Tongdosa was inserted in the station name.

#### 2) Persuasion Strategy

The government applied various persuasion strategies in order to ease tensions regarding the Gyeongbu High-Speed Railway Construction Project. Such strategies were categorized into scientific method, formation of consultative group, nationwide public relations, and lawsuit and settlement.

##### (1) Scientific Method

In regard to the problems over faulty works, KRNA conducted a detailed safety inspection with WJE on 148 locations, notified the inspection results and repairing methods to the construction company, and monitored the repair work. Moreover, KRNA organized a special task force to prevent all types of failures that were pointed out in the inspection results. As for the sleepers, for which the repair work had in fact been completed, KRNA conducted a verification test to check the safety and conducted another detailed inspection to reaffirm the safety.

Regarding environmental problems, the government requested the Korea Society of Geological Engineering to conduct a detailed survey on changes in natural environment from June 2002 to December 2003 before the actual construction began. This was necessary because some of the animals and plants were listed as protected species, and some of the wetlands were designated as "wetlands protection area" after an environmental impact assessment. In response to potential damages to the wetlands and the ecosystem, an environmental conservation monitoring was outsourced. The objective was to estimate the impact of the tunneling work on wetlands and valleys, to resolve conflicts with environmental organizations, and to construct objective data. According to the results, the tunneling work did not have an impact on the wetland's ecosystem. However, as a

means to prepare for all eventualities, an automatic underground water level measuring system was installed in the course of construction to automatically monitor changes in underground water level.

In reference to the problems related to the disruption of the temple's ascetic practice environment, a detailed inspection was conducted and it confirmed that the tunneling work was not causing any problems. Inspection results suggested that the Naewon Temple did not suffer any damages from noise and vibration since the high-speed railway tunnel's construction section was horizontally located 2,260 meters away from the Naewon Temple. The vibration level that reaches the hermitage was measured to be 0.027 centimeters per second when blasting the tunnel and 0.0011 centimeters per second when operating the train because the construction section's vertical and horizontal distances from the Mitaam was 405 meters and 250 meters, respectively. The measured vibration levels only accounted for 0.5 to 13 percent of the cultural assets' vibration standards, and it was explained that civil complaints were not raised even during construction in regard to noise and vibration damage.

### (2) Formation of Consultative Group

As for the conflicts over Mt. Cheonseong and Mt. Geumjeong, the government exerted efforts to earn public trust on a joint inspection through a fair and transparent inspection. It formed and operated a route review committee in 2003 to reconsider the Mt. Cheonseong Tunnel route so as to resolve conflicts through dialogue and participation, and finally decided on the original route at the National Affairs Coordination Meeting in September 2003. Furthermore, the government agreed to conduct a joint environmental impact assessment with Monk Ji-yool and her associates in February 2005 in order to settle the origin of conflicts. In result, a joint environmental impact assessment team was formed in 2005 and concluded the joint assessment in November 2005.

Each local government also came up with plans to address problems through consultative groups. Daejeon operated the "Private-Public Joint Cooperation! 25-Hours Civic Administration Task Force Team", which was composed of resident and citizen representatives, environment experts, urban and construction specialists, Daejeon Metropolitan City, and KRNA officials, to settle civil complaints in real time regarding the high-speed rail section passing through downtown Daejeon. Daegu also formed a High-Speed Railway Planning Group as a consultation channel with the government, which helped promote the efficiency of government funding, build or improve 16km of service road, 17km of green buffer zone, 20km of soundproof walls, construct or improve 13 multi-level crossing facilities, repair and develop railways' vicinities, and prepare data on how to minimize damages for local residents. Busan was also added to the list in coming up with measures; it formed a private-public consultative group to discuss problems related to Mt. Geumjeong section of the project.

### (3) Nationwide Public Relations

Beginning in 1992, the government produced report materials and visual images, published promotional brochures, established public information centers, ran a promotional website, and held symposiums and discussion forums to collect opinions extensively from experts at home and abroad for the Gyeongbu High-Speed Railway. Moreover, the KRNA promoted the high-speed railway by frequently providing information to journalists from broadcasting companies and newspaper companies (27 companies, 55 journalists), and daily newspaper's cultural and sports section reporters (19 companies, 20 reporters).

Table2-2-5 Cases of High-speed Railway Promotion Programs

Target	Program
Press	Distribute report materials about high-speed railway's opening, hold press interviews, press conferences, and journalist meetings to promote high-speed railway's merits
Customers	Raise awareness of the high-speed railway by holding special events for customers
Local Residents	Hold various activities to resolve conflicts over the level of noise pollution that is causing harm to residents residing near railways and stations, promote high-speed railway's contribution to the development of local communities and tourists
Employees	Publish company newsletters, play in-house broadcasting, provide in-house training, and collect diverse opinions
Information Agencies	Carry out lobbying activities, manage public opinion
Public Organizations and others	Arrange programs that promote effective communication with social and environmental organizations, banks, teachers, students, and agencies

Source : Ministry of Construction and Transportation, "A Study on the Establishment of General Plan for Designing the Intermodal Transportation System for the Gyeongbu High-Speed Railway." 2003.

The government made efforts to broadcast expected changes in citizens' life in the high-speed rail era through television drama by actively utilizing media outlets, such as broadcasting programs, and encouraging special media coverage on the subject. Moreover, the government continuously promoted high-speed railway trial ride events, produced souvenirs, and distributed them as a means of direct nationwide promotion. The high-speed railway's website went through a complete overhaul for strengthened promotion, and banner ads were posted on the Internet.

However, the government was unable to come up with a systematic promotion strategy when carrying out the second phase of the Gyeongbu High-Speed Railway Project. Instead, when important political events came up, it made various promotional pamphlets to distribute to related agencies including community administration centers in a bid to persuade the public. In particular, the government

emphasized the economic feasibility of the railway line's second phase, but when it encountered opposition from civic and religious groups, it shifted its focus to environmental soundness and safety. In April 2003, the Ministry of Construction and Transportation and KRNA published the "Response Letter to Publicly Written Questions from the Opposing Committee of Civic and Religious Groups against the Gyeongbu High-Speed Railway Construction Project: Mt. Geumjeong and Mt. Cheonseong Passageways," in which not only the economic feasibility of the project but also the environmental soundness, safety, future orientedness, and participatory principles were equally emphasized. On January 7th, 2004, after the establishment of KRNA, the government shifted its promotion strategy towards a direction which emphasized the Gyeongbu High-Speed Railway's environmental compatibility, and it continued to hold its accommodating stance of listening to the opinions of environmental organizations. By that time, promotion strategies regarding the soundness of wetlands were conducted meticulously.

#### (4) Lawsuits and Settlements

Since the Gyeongbu High-Speed Railway route was revealed to the public in 1994, the Beomeo Temple and environmental organizations had constantly held rallies and filed civil complaints and lawsuits against the government for about ten years. The Beomeo Temple and the Busan Metropolitan City continuously demanded underground construction of the Geumjeong Tunnel section on the grounds that the high-speed rail, if constructed on the surface, would destroy the landscape and cause noise and vibration. The Ministry of Construction and Transportation was not in a position to accept such demands at the time. However, considering the Beomeo Temple's considerable status in the Buddhist community, the government changed the design by extending one kilometer of the Geumjeong Tunnel section, including the underground construction of a 320 meter-long bridge section of the Beomeo Temple, with an additional construction cost of 23 billion won.<sup>14)</sup> In October 2003, Monk Ji-yool, who staged a hunger strike, applied for a provisional injunction on behalf of the "Korean Salamanders and Friends", but the case was dismissed by the court. After about four years of wrangling, the conclusion was made that the construction had no relationship with the destruction of ecosystem.

With regard to the noise issue, the Environmental Dispute Mediation Committee under the Ministry of Environment ordered the developer called "D" company, KORAIL, and KRNA to compensate 77 million won for causing noise damage to 526 residents of the "S" apartment complex in Dong-gu, Daegu. Apart from compensation for noise damage, the committee also ordered related railway companies to prepare soundproof measures so as to bring the noise level down to under 65 decibels, the standard level for railway noise. As for the conflict over whether to build the high-speed railway line that passes through the downtown Daejeon aboveground or underground, Daejeon city finally agreed in May 2004, after almost 14 years of disputes to build the railway aboveground, under the

14) The Busan Ilbo. July 26th, 2005.

condition that the improvement of poor living conditions around the railway would be accomplished as part of the construction project.<sup>15)</sup> The committee further ordered the construction company to compensate 100 million won for causing death of pigs that were being raised in the pig farm nearby the construction site in Gyeongsan, North Gyeongsang Province.<sup>16)</sup>

## 4. Economic and Social Costs From Conflicts

The Gyeongbu High-Speed Railway Second Phase construction for Mt. Cheonseong and Mt. Geumjeong was halted twice for 189 days as agreed with Monk Ji-yool. However, construction for the cut-and-cover tunnel and the bridge, and engineering works continued during the construction suspension period. The project was completed and opened as scheduled thanks to measures to shorten the delayed construction such as the deployment of additional workforce. In result, there were no additional costs due to the delay. The construction company that built the Wonhyo Tunnel at the time estimated the direct losses to be about 14.5 billion won. However, according to the Ministry of Construction and Transportation and the Korea Chamber of Commerce and Industry's 2005 report, the actual economic and social losses were approximately 2.5 trillion won when the construction got suspended for about a year.

## 5. Verification and Evaluation of Proponents' and Opponents' Arguments

### 1) Aspects of Balanced Regional Development

After the opening of the KTX Line, exchanges between Seoul and other regions increased, but population concentration in the metropolitan area did not occur. The same goes for the Shinkansen in Japan, and it was analyzed that the temporary straw effect in the beginning of the high-speed railway's opening would be offset by regional development in the long term. The station area is currently undergoing development, which is expected to translate into the development of center and subcenter of cities, revitalizing land use of the entire region. The development of Cheonan-Asan Station and Gwangmyeong Station areas is in full swing, and the station area development plan is being promoted in most of the cities which house a station. High-speed railway station areas are

15) If environment improvement projects like building ten meters of road and green buffer zone, along with soundproof wall installation in the 6.5-kilometer section between Panam-dong IC in Dong-gu and Ojeong-dong in Daedeok-gu were to be proceeded, the estimated budget would be about 600 billion won. Thus, if the cost for aboveground construction were to be added, 1.5 trillion won would be sufficient, which was substantially lower than that for the underground construction. Such an agreement was reached, thanks to Dong-gu and Daedeok-gu residents's understanding and willingness to make concessions.

16) YTN. October 31, 2008.

expected to contribute to balanced national development, spreading the population to provincial regions, by functioning as the hub of regional development and the catalyst of regional economy. Such phenomenon was previously seen in other countries' cities adjacent to stations, such as in France and Japan. In particular, short-term regional advancement of the tourist industry is being observed.

## 2) Technological Aspects

Wheel-type trains turned out to be the most adequate for the Gyeongbu High-Speed Railway. If the maglev propulsion train had been chosen, the opening of the high-speed railway would still be impossible. The maglev propulsion train, which is currently undergoing tests in Germany and Japan, is yet to be considered as a reliable technology by industrial and academic circles. It still needs verification tests due to its uncertain economic feasibility.<sup>17)</sup> In terms of transport capacity, the wheel-type train has more merits compared to the maglev propulsion train. So far, even the largest of its kind, the TR-06, can only accommodate 192 passengers maximum per two coaches, whereas the wheel-type can accommodate 800 to 1,000 passengers per vehicle.

## 3) Investment Efficiency

The high-speed railway construction at the time was proven to be a future-oriented investment rather than an over-investment. After the construction began in 1992, the first and second phase of the Gyeongbu High-Speed Railway was completed in April 2004 and October 2011, respectively, leading the green growth era. In retrospect, high-speed railway construction is proven to be a forward looking investment, at least 20 years ahead of time. The government is currently pushing forward a strategy that transforms the national transport system to be centered on the high-speed railway. Furthermore, the high-speed rail is proven to be effective in improving the industrial competitiveness of Korea by making inroads into foreign markets through accumulated technologies. Engineering and construction projects over long time made it possible to create demand through new construction methods and upgraded management capacity, which, in turn, strengthened national competitiveness.

## 4) Environment

The environment monitoring results indicated that the Gyeongbu High-Speed Railway construction did not cause water level fluctuation. Moreover, changes in water levels and flows for the Mujechi Wetland and the Big Daeseong Wetland were found to be highly correlated with seasonal changes and the amount of precipitation. The results showed that the construction did not cause noise or vibration damages because the construction site's horizontal and vertical distances were measured to

<sup>17)</sup> The maglev propulsion trains became commercialized in China (Pudong Airport-Shanghai section, 30.5km) in 2004, but long-distance travelling maglev propulsion trains are still undergoing tests in Japan.

be relatively far from the Buddhist temple. Changes in the ecosystem, such as the wetlands near Mt. Cheonseong, were not found either. A field survey conducted in 2011 found out that the number of Korean salamander eggs has not changed after the construction. On the contrary, it was found out that the high-speed railway service has contributed to green growth nationwide, reducing 4.2 million tons of greenhouse gas emissions in 2009.

## 6. Project Implementation Effect

### 1) The Cornerstone of Balanced National Development

The Gyeongbu High-Speed Railway construction is evaluated to bring the same effect of building four Gyeongbu Expressways. It is expected to increase distribution and transport efficiencies by cutting down travel time between regions, make the efficient use of national land possible, and accelerate balanced regional development. It is also expected to develop underdeveloped areas nearby station areas. Taking this into account, a plan to develop station areas as a hub for regional economy is underway. Moreover, small-and-medium-sized cities and rural areas near stations would become bases for larger living spheres, and easier access to high-speed railways would promote the emergence of polycentric metropolitan areas, which are formed around a few key stations. In this newly-formed areas, city service function such as manufacturing, distribution, education, and culture would be strengthened, and expanded living spheres would increase the interconnectivity with neighboring regions. In the polycentric metropolitan areas, central management functions would be reorganized around small-and-medium-sized cities including cities with high-speed railway stations and nearby industrial, educational, cultural, and commercial cities. As a result, it is expected to decentralize diverse economic, social and cultural activities away from the Seoul metropolitan area to other regions.

### 2) Technology Localization and Export Promotion

Since high-speed railway construction was new to Korea at the time of the first phase construction, Korea had to depend on foreign technical staff including that of France's SYSTRA and INGEROP and Germany's DEC, during the design and construction process in order to resolve technological problems arising from long-span bridge and tunnel construction and the structural problems embedded in high-speed. However, it is not an exaggeration to say that the second-phase construction was completed with domestic technology based on accumulated know-hows during the first-phase construction period. Based on its experience, Korea was able to achieve the localization of high-speed railway technologies and is now exporting the technologies overseas. Thus, contrary to concerns on the

dependency on foreign technologies, it did not occur.

The KTX Sancheon, which was solely built with domestic technologies, boasts world’s best on-time arrival rate, the rate of trains arriving within five minutes of estimated arrival time, of 97.6 percent with a maximum speed of 350km per hour. However, continuous technological development with economic considerations is still needed in order to commercialize technologies such as multi-tiered train operation, signal system for train interval and train control, and turnouts.

### 3) Realization of a Nationwide Half-a-day Life Zone

The length of time for business was extended with reduced travel time. High-speed rail enabled one-day business trips and cut down business expenses. In particular, the extended departure time of the last high-speed train in a day allowed business travelers to have more time to work during business trips. Reduced travel time by KTX removed barriers of time and space in Korea, enabling citizens to travel the country in half a day. Furthermore, travel time reduction for long-distance travel from Seoul to East Daegu and from Seoul to Busan delivered customer satisfaction. Customer preference for KTX recorded high, since train tickets were sold out not only during the peak seasons such as the Lunar New Year’s and Chuseok holidays, but also during the vacation season and weekends. According to a survey, passengers prefer KTX because it is safe, fast, punctual and free of congestion.

The number of daily passengers for KTX increased from 70,000 in 2004 to 102,000 in 2009, an annual total of 37.48 million passengers. In 2009, KTX’s passengers and revenue accounted for 32 percent and 69 percent of the total long-distance travel passengers and revenue, respectively. The construction of KTX enhanced cultural exchanges among regions with reduced time and economic distances and in result contributed to reducing the cultural gap between Seoul and the rest of the country. The expansion of exchanges in cultural, art, and social activities between regions enabled by high-speed railway will broaden mutual understanding, and, in turn, contribute to the sense of emotional unity.

Table2-2-6 Travel Time Reduction Effect of the Gyeongbu High-Speed Railway

Section	2003	2004	2010	Reduced Time
Seoul-Busan	4:10	2:40	2:18	1:52
Seoul-Ulsan	-	3:46	2:01	1:45
Seoul-East Daegu	3:03	1:35	1:38	1:25
Seoul-Daejeon	1:31	0:49	0:49	0:42
Busan-East Daegu	-	1:05	0:39	0:26

Annotation : Calculation was based on the sections with the fastest travel time. Referenced from KORAIL’s train schedule, released reports, and standard for two stations.

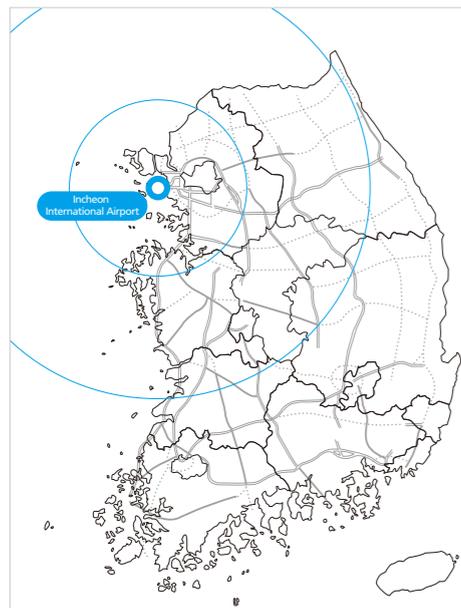
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## 3 Incheon International Airport Construction Project

### 1. Project Outline

Construction Duration	Phase 1 : November 1992~March 2001, Phase 2 : November 2002~June 2008
Total Cost	8.6011 trillion won
Project Volume(as of 2010)	<ul style="list-style-type: none"> <li>• Site Area : 21.292 million m<sup>2</sup></li> <li>- Runways : 3 in total (capable of simultaneous take off and landing of jumbo jets such as A380), 4,000 meter-long runway (1) and 3,750 –meter-long runways (2)</li> <li>- Passenger Terminal (496,000m<sup>2</sup>), Traffic Center (250,000m<sup>2</sup>, stations of Incheon Airport Railroad Express and a maglev propulsion train are located on the premise)</li> <li>- Annual Handling Capacity : 44 million passengers, 4.5 million tons of cargo, 410,000 flights</li> <li>- Mooring Facilities : 2.437 million m<sup>2</sup> for passenger flights, 737,000m<sup>2</sup> for cargo flights</li> <li>- Free Trade Area (opened in March 2006) : 230,000m<sup>2</sup> of cargo terminal, 990,000 m<sup>2</sup> of airport logistics complex</li> </ul>



### 2. Project Background and Purpose

#### 1) Project Background

After the 1980s, economic growth, increased national income, and overseas travel liberalization of Korea increased the number of international and domestic passengers by more than 13 and 30

percent on annual average, respectively, showing the world's highest growth rate for air transport demand. To meet rapidly rising demand, the government added a new runway in the Gimpo International Airport in 1987, which was unable to expand further due to noise pollution in nearby residential areas, topographical constraints, and increasing passengers and cargo traffic. Thus, the government completed the four rounds of feasibility studies in 1990 to select a site to build a new airport in the Seoul metropolitan area. Among 22 candidate sites, Yeongjong Island was chosen to be the most suitable location. Various factors, such as topographic conditions, weather conditions, constraints posed by obstacles, noise, construction costs, and accessibility were integrated in the decision making process. The ultimate goal was to not only meet rising international air transport demand of the 21st century, but also actively respond to changing nature of air transport demand.

#### 2) Project Purpose

The purpose of Incheon International Airport construction project was to respond to the continuously rising air transport demand and maximize the use of Korea's geopolitical position to secure a hub airport in highly competitive Northeast Asia. Incheon Airport construction was a national project that aimed to keep abreast with rapidly changing trend of the airport transport industries by building a new, around-the-clock, all-weather airport of the future in the Seoul metropolitan area in accordance with the global one-day life zone era and to build a cutting-edge hub airport of the future in Northeast Asia.

#### 3) Project Content

##### (1) Airport Construction Project

Incheon Airport construction project was planned to develop a site of 56.1 million square meters on reclaimed tideland, located between Yeongjong Island and Yongyu Island in Unseo-dong, Jung-gu, Incheon. The construction was designed to proceed in four phases from 1992 to 2020. The first phase construction began with a feasibility study and a basic design in 1989, seawall construction in the north and south of the site in November 1992, the construction of key airport facilities in June 2000, and ended the completion of the first phase construction in December 2000 by injecting 5.632 trillion won of total construction costs. Incheon Airport then underwent numerous comprehensive test runs and inspections through virtual training that mobilized passengers, cargos, and jets. And the airport finally opened on March 29th, 2001.

A total construction cost of 2.9 trillion won was invested in the second phase construction, which continued from November 2002 to June 2008. During this period, 8.25 million m<sup>2</sup> of land underwent site construction to build the third runway and expand mooring facilities. The tariff free area of 990,000m<sup>2</sup> and the international free trade area of 165,000m<sup>2</sup> within the airport zone were developed

to attract trading and logistics companies.

Incheon Airport’s initial size during the first phase construction was 11.715 million m<sup>2</sup> of the site and 496,000m<sup>2</sup> of a passenger terminal, but it was changed to 47.428 million m<sup>2</sup> and 1.146 million m<sup>2</sup>, respectively. Thus, Incheon Airport’s goal was to be able to handle 34.98 million passengers and 3.42 million tons of cargo by 2011. The future plan is to transform Incheon Airport into a world-class airport that can handle 100 million passengers and 10 million tons of cargo after 2035.

Incheon Airport went into the second phase of construction in earnest in 2002, a year after its opening, to satisfy air transport demand in a timely manner, which recorded an annual average growth rate of six percent, and to gain an edge for Northeast Asia’s hub airport over competing airports in neighboring countries such as China and Japan.

As part of Incheon Airport’s strategy, a 4,000 meter-long runway was built to accommodate jumbo jets such as A380 and to prepare for global warming. Moreover, the state-of the-art airport infrastructure such as a 88-kilometer express luggage processing system and unmanned automated trains that connect passenger terminals with passenger concourses was installed to meet future air transport demand.

Table2-3-1 Project Content of Incheon Airport by Phase

Classification		Phase 1 & 2 (1992-2008)	Phase 3 (2009-2017)	Accumulated Total	Final Phase
Facility Size	Site Area (m <sup>2</sup> )	21.292 million	1.105 million	22.397 million	47.428 million
	Runway	3	-	3	5
	Passenger Terminal (m <sup>2</sup> )	496,000	350,000	846,000	1.146 million
	Concourse (m <sup>2</sup> )	166,000	-	166,000	166,000
Handling Capacity (per year)	Flight (10,000 times)	41	-	41	74
	Passenger (10,000 persons)	4,400	1,800	6,200	10,000
	Cargo (10,000 tons)	450	130	580	1000

Source : Ministry of Land, Transport, and Maritime Affairs. "Notification No. 2009-416 of the Ministry of Land, Transport and Maritime Affairs." 2009. Publicity Material of Incheon International Airport Corporation

(2) Access Transportation Facilities Projects

The Incheon Airport Expressway, the 40.2 kilometer-long New Airport Highway that directly leads to Incheon Airport, began its construction in 1995 with private capital, underwent foundation work and bridge post construction, and opened on November 21st, 2000 as a six-to-eight lane highway. In

addition, a total project cost of 3.2956 trillion won was injected into the Airport Railroad construction project of a 61-kilometer-long double track railway between Incheon Airport and Seoul with ten stations. The 40.3 kilometer-long Gimpo International Airport Station-Incheon Airport section opened on March 27th, 2007, whereas the Gimpo International Airport Station-Seoul Station section opened in late 2010. Travel time for the entire section takes about 40-minutes.

Meanwhile, the 21.38 kilometer-long Incheon Bridge, which connects Incheon Airport with Songdo Island, opened in October 2009 with an investment of 2.468 trillion won, and the bridge enhanced the accessibility of Seoul and the southern Gyeonggi Province to Incheon Airport. It is also connected with Gyeongin Expressway Two and Three, and Seohaean Expressway, contributing greatly to the improvement of traffic and logistics environment of the Seoul metropolitan area.

(3) Current Status of Key Facilities

Take-off and landing is convenient in Incheon Airport since it has the world’s third largest 100.4 meter-high and 179 square meter-wide control tower, two 3,750 meter-long and 60 meter-wide runways, and a 4,000 meter-long runway. All of the runways are equipped with cutting-edge facilities to ensure the take-off and landing of jumbo jets. In addition, passenger terminals, traffic center, concourse A, and other ancillary buildings have various amenities such as 229 elevators, 231 escalators, 129 moving walkways, and four cart-carrying facilities, as well as commercial facilities like duty free shops, snack corners, and VIP lounges.

4) Project Implementation Agency

Right after Yeongjong Island was designated as the final site in June 1990, the government established the New Airport Construction Planning Group under the Ministry of Construction and Transportation to carry out tasks related to the general plan of the construction. Then, the project kicked off after the New Airport Construction Authority was established in January 1992 under the Korea Airport Corporation. However, with increased workload and the need to reinforce the organization, the Corporation for New Airport Construction in the Seoul Metropolitan Area was established in September 1994. This corporation supervised the new airport construction until the Incheon International Airport Corporation (IIAC) was established in February 1999. After its opening in 2001, the IIAC began recorded profits for the first time in 2004. It continued to achieve surplus for six consecutive years and grew into a public corporation that specializes in global airport management.

## 5) Project Progress

### (1) Planning Process

After Gimpo International Airport was designated as an international airport in January 1958, it continued to expand. However, the need for a fundamental measure came to the fore due to the rapidly growing air transport demand and the operation of jumbo jets in the late 1960s. In order to address such issues, the government conducted the first feasibility study from 1969 to 1970 on a new airport in the Seoul metropolitan area with 220,000 dollars of AID loan. Around 1980, the government began to review a new international airport construction project in earnest to replace the Gimpo International Airport. The government at first considered two different options; an expansion of the Gimpo International Airport or construction of a new airport, with the assumption that the Gimpo International Airport's capacity would reach its limit by the mid-1990s. The option to expand the Gimpo International Airport was dismissed in the early stages for two reasons: first, it had aircraft safety-related issues due to an obstacle—Mt. Gyeyang, 360-meters high—near the airport, and, second, it would cause serious noise problem to the nearby residential area of some 100,000 households. Among the locations that are within the 100-kilometer-radius of the Seoul downtown area that can be reached within an hour, the government began to search for a new airport site that would not incur noise problem to nearby areas. In June 1989, the Ministry of Construction and Transportation conducted a feasibility study to select a new airport site near the Seoul metropolitan area. Three to four candidate sites including Yeongjong Island and Sihwa district were selected. After extensive reviews, the government finally decided on Yeongjong Island as the new airport site based on its high scores on all criteria such as weather conditions, noise level, accessibility, and ease of expansion, and made the official announcement in June 1990.

### (2) Project Progress

The following is the project's main progress from the planning to the launch of its construction.

Table2-3-2 Incheon International Airport Construction Project Progress

Classification	Project Implementation Content
1989	The Ministry of Construction and Transportation reported the urgency of a new airport development in the Seoul metropolitan area
June 1989-April 1990	Conducted a feasibility study to select a new airport site
July 1989	Formed the New Airport Promotion Committee
June 1990	Finalized the new airport site selection at the third New Airport Construction Promotion Committee
November 1990-December 1991	Began designing the basic plan
December 1990	Established the operational rules of New Airport Construction Technical Advisory Committee
May 1991	Proclaimed the New Airport Construction Promotion Act
July 1991	Requested the Ministry of Environment to write an Environmental Impact Report and seek consultation
August 1991	Announced a compensation plan
January 1992	Established the New Airport Construction Headquarters
May 1992	Public Water Reclamation License acquired by the Ministry of Construction and Transportation from Incheon city
	Environmental Impact Assessment Report and consultation completed by the Ministry of Environment
	Announced the confirmed New Airport Basic Plan
November 1992	Held a ground-breaking ceremony, began site construction
November 1995	Announced the altered New Airport Basic Plan
March 1996	Finalized the name of the new airport (Incheon International Airport)
May 1996	Began passenger terminal construction
December 1996	Began runway construction
April 1997	Began traffic center construction
November 1997	Completed site construction for seven sections
June 1998	Began high-level road construction at passenger terminals
August 1998	Decided on a policy for the unification of airport construction and management
April 1999	Began field test for comprehensive information and communication system
June 2000	Completed construction for airport basic facilities
July 2000	Began comprehensive test runs
October 2000	Began test operation
March 2001	Opening of Incheon International Airport

### 3. Arguments and Grounds of Proponents and Opponents

#### 1) Issues and Logic of Proponents and Opponents

##### (1) Investment Cost Issues

- Arguments and Grounds of Opponents

The opponents of Incheon Airport claimed the feasibility study was not conducted correctly and that the Incheon Airport construction project required too much budget. According to a feasibility study for the new airport site conducted in April 1990, the expected total construction cost was calculated to be 2.3 trillion won, but the actual project plan in 1991 reported that the cost jumped to 10 trillion won, and the cost for the first phase construction alone was calculated at 3.4 trillion won.

In the basic planning of 1992, while the first phase construction cost remained the same, the size of the total project was slashed into half; the number of runways was reduced to one from the initial two, the size of the airport terminal site was reduced to 244,200 from 462,000 square meters, and the construction plan for a double-track railway was excluded. Afterwards, the number of runways went back to its original plan to two and the first phase construction cost was adjusted again to 5.7 trillion won. Since about 1.3 trillion won was already invested into the construction in late 1997, it meant that even though the construction continued according to the government's calculation, at least 4.3 trillion won should be additionally injected in order to complete the first phase of the construction. The opponents, however, criticized that the country would go into bankruptcy if the government were to be dragged into the project, since the expected total construction cost would be more than 30 trillion won, not ten trillion won.

- Arguments and Grounds of Proponents

The government and proponents argued that the Yeongjong Island Airport Construction Draft Plan was a national project to expand the nation's airport capacity for the 21st century, since the Gimpo International Airport had reached its limit due to a rapid increase in air transport demand in the 1990s. Although the project requires an immense amount of national budget of more than ten trillion won, the government and proponents argued that, in the long run, it is not only desired but essential investment for Korea to secure a position of hub airport in competition with China and Japan in Northeast Asia.

Two additional points were made : first, large portion of investment can be secured through the inducement of private capital, and second, airport infrastructure investment will generate positive direct and indirect financial spill-over effects. In other words, if the new airport begins

to accommodate Asia-Pacific region's passenger demand, which accounts for ten percent of the world air transport demand, it would bring economic benefits that would more than compensate for the entire investment cost by securing the hub airport position in Northeast Asia.

##### (2) The Issue of New Airport's Size

- Arguments and Grounds of Opponents

The opponents criticized the excessively large size of the Incheon Airport's required site area of 56.1 million square meters, which was twice the size of Chicago O'hare International Airport and five times bigger than London Heathrow Airport and Osaka Kansai International Airport. The project cost over ten trillion won was said to be too much due to extra costs for reclamation and sea dikes, and thus a lesser size of an airport with the 16.5 million m<sup>2</sup>-site would be sufficient to build the world's largest airport. While criticizing the lack of plans how to utilize the excessively vast site of Incheon Airport, the opponents raised strong doubts about the government's plan to build a city with a population of 100,000 on the site considering the lack of transportation and water, weak soil foundation, and noise pollution. They further pointed out the rarity of success examples in other countries with regard to building a city with a population of 100,000 around the airport, which is distant from the mother city.

Table2-3-3 Size of Major International Airports

Classification	Service Frequency (10,000 times)	Number of Passengers (10,000 persons)	Cargo (10,000 tons)	Site Area (10,000 m <sup>2</sup> )
• Domestic Airports				
- Gimpo International Airport		1,386	46	204
- Cheongju New Airport				400
- Yeongjong Island (candidate site)				1,700
• Top 3 Airports in the World				
- Chicago O' Hare International Airport	764,000	5,677		860
- Hartsfield-Jackson Atlanta International Airport	751,000	4,590	71	460
- Los Angeles International Airport	563,000	4,440	96	478
• Top 3 Airports in Europe				
- London Heathrow Airport	330,000	3,751	61	355
- Paris Orly Airport	184,000	2,242	24	464
- London Gatwick Airport	180,000	2,086	19	230
• Top 3 Airports in Asia				
- Tokyo Haneda Airport	168,000	3,221	13	143
- Osaka International Airport	128,000	2,012	38	96
- Narita International Airport	108,000	1,724	120	320

Source : Korea Airports Corporation. "Airports around the Globe." 1990.  
 Noboru Makino. "1990 nendai no Nippon." Mitsubishi Research Institute Inc. 1990.  
 Kim Jeong-uk, Kwon O-hyeok. "The Location of New Airport in Seoul Metropolitan Area." 1993. 56.

- Arguments and Grounds of Proponents

The government explained that the size of 56.1 million square meters was to be developed when the completion of the fourth phase of the new airport construction in 2020. The size of the airport with a site area of 19.8 million m<sup>2</sup> for the second phase construction is explained to be similar to that of other competing airports. The government also stated that the third phase construction project would be carried out after reviewing the airport's development potential to grow into a hub airport from 2008. It emphasized, however, that the future airport should not simply focus on the airport functions, but consider creating high value-added trading centers and securing international and industrial business complexes around the airport. In addition, the government stressed the necessity of securing spaces, which would allow the government to flexibly deal with long-term changes in air transport demand, since it would be impossible to have another airport due to a saturated demand within the Seoul metropolitan area.

### (3) Issues of New Airport's Potential as a Hub Airport and Demand

- Arguments and Grounds of Opponents

The government proposed that Incheon Airport should be able to transport 100 million passengers annually including transit passengers, since the goal was to build East Asia's core airport for next-generation supersonic air transportation, which flies between continents within two to three hours. However, the opponents criticized Incheon Airport because of its size twice bigger than the then largest airport in the world, Chicago O' Hare International Airport. Opponents also pointed out the low possibility for Incheon Airport to become the hub airport of East Asia, referring to professor Robert Simpson of MIT at the Incheon International Airport International Symposium, saying that "a new airport in the Seoul metropolitan area should be considered as a destination airport, not a transit airport." They added that the current trend of world's air transport was not to transfer at a continental core airport, but to directly connect the departing airport with the arriving airport. Furthermore, there is no single airport in the world with a plan to become the continental hub airport, and the expansion projects of key international airports do not indicate any plans to become the continental transfer airport.<sup>18)</sup> The global trend was to build a few international airports, rather than one, in one city for various destinations in order to disperse cargo volume and allow convenient access. Therefore, quoting these airport experts' opinion, opponents criticized that the plan to build a continental hub airport seemed highly unrealistic.

18) London has two airports, Heathrow Airport and Gatwick Airport, and Paris has Orly Airport and Charles de Gaulle Airport. New York has three airports of relatively similar in size to handle air transport. There are two airports in Tokyo, Haneda Airport and Narita International Airport, and in the southern-central region of Japan, the existing Osaka International Airport and the new Kansai International Airport share cargo volumes.

- Arguments and Grounds of Proponents

The proponents argued that the trend of direct connection between airports should be backed by stable demand for air routes, but such demand was low for airports in Southeast Asia or China. Thus, a "Hub and Spoke" strategy of selective concentration still had a successful prospect in Northeast Asia. The proponents explained that countries like Japan, China, and Hong Kong were building new airports or undergoing expansion of the existing airports to compete against each other so as to become hub airports, which was in line with fierce competition for hub airports in Europe and America. In this respect, Yeongjong Island's new airport would be more competitive than any other airport in Northeast Asia in terms of airport location and capacity and therefore had a high possibility of becoming a hub airport of Northeast Asia.

### (4) Problems Related to Site Selection and Accessibility

- Arguments and Grounds of Opponents

The opponents questioned the Incheon Airport's role as a core airport in Korea due to its remote location. Yeongjong Island is located in the northwestern end of Korea with the worst nationwide accessibility, where one must go through traffic-congested Seoul and Incheon. Incheon is the least accessible city in the country and even difficult to reach within the Seoul metropolitan area. Its poor accessibility from Seoul, in turn, would worsen traffic conditions in the western part of Seoul. The opponents also argued that Incheon Airport could not have any competitive edge over Narita International Airport, since Yeongjong Island's distance from Seoul was 54.5km by highway and 60km by the Airport Railway. Therefore, the opponents criticized that even if a new airport expressway was built, it would not guarantee reduction in travel time and distance.

- Arguments and Grounds of Proponents

The proponents explained that Yeongjong Island was selected after conducting numerous feasibility studies on various candidate sites in the Seoul metropolitan area, and argued that areas with better accessibility would cost much more with astronomical compensation costs. In particular, Sihwa District I, which was a potential contender, had higher noise damage level, deeper water level of reclamation area, and worse topographical conditions than those of Yeongjong Island. It was also farther from Seoul, 70km away, and compensation expenses would be astronomical when building the connecting road since it would pass through old sections of cities such as Anyang, Guro, and Ansan. In contrast, Yeongjong Island's accessibility problem, according to the proponents, could be resolved through Incheon Airport Expressway and Airport Railway, and the Island was better located in preparation for the inter-Korean unification era in the future.

Table2-3-4 Major International Airports' Distance to a Nearby Downtown

Major Airports	Distance (km)	Major Airports	Distance (km)
Europe		Asia	
Schiphol, Amsterdam	15	Changi, Singapore	20
Main, Frankfurt	12	Narita, Tokyo	66
Heathrow, London	24	Haneda, Tokyo	16
Charles de Gaulle, Paris	24	Yeongjong Island (candidate site)	54.5
Rome	35		
USA		San Francisco, USA	25
O' Hare, Chicago	36	Toronto, Canada	29
Fort Worth, Dallas	27		
Los Angeles	24		
Kennedy, New York	23		

Source: Kim Jeong-uk, Kwon O-hyeok. "The Location of New Airport in Seoul Metropolitan Area." Haewoo, 1993. 40.

(5) Balanced Regional Development Issues

• Arguments and Grounds of Opponents

The opponents, while pointing out the accessibility problem associated with the remote location of Yeongjong Island, criticized that it would further increase the concentration of key facilities in the Seoul metropolitan area, and thus, pose an obstacle to balanced regional development. Moreover, the opponents claimed that the new airport and the Gimpo International Airport should be located in opposite directions from Seoul to provide more options and increased accessibility, but the overlapping directions would undermine both airports' efficiencies.

Furthermore, it would be difficult to create industrial complexes near the airport because the infrastructure of Seoul-Incheon area was already deteriorated with poor conditions of available large-scale land and environment. An international airport is known to be a prerequisite for developing high-tech industries, and thus building the Incheon Airport in the Seoul metropolitan area would deprive the opportunity of other cities such as Daejeon, Cheongju and Gwangju to develop high-tech industries. Together with its negative effects on balanced regional development, the Incheon Airport is criticized to be disadvantageous for future unified Korea because of its low accessibility from inter-Korean transport network.

• Arguments and Grounds of Proponents

In regard to the balanced regional development, the government explained that one new airport alone could not foster and develop high-tech industries in local areas. Instead, a better solution is to develop local areas by revitalizing local airports through connections with the airports in the Seoul metropolitan area. It was further explained that since the development

and success of a hub airport is primarily concerned with the efficiency principle, it should be differentiated from the balanced regional development stressing the equity principle.

(6) Environmental Impact Issues

• Arguments and Grounds of Opponents

The opponents argued that fog will inhibit the operation of aircraft at Incheon Airport since the number of foggy days in Yeongjong Island was estimated to be 49. Gimpo International Airport where foggy days recorded most among international airports provided an evidence. They also predicted that airplanes and airport facilities located on the west coast of Korea would be damaged and destroyed due to a high risk of tidal waves triggered by climate change.

Yeongjong Island region is also known to be one of four major habitats for migratory birds in Korea, where more than 100,000 migratory birds pass through the region all year long. Potential bird strikes could pose a threat to the safety of aircraft operation. Moreover, since Yeongjong Island is a travel stop for all kinds of migratory birds including snipes, the globally protected species, the new airport construction would destroy the habitat of protected species and in result face criticisms from the international community by violating the Convention on Biological Diversity.

The opponents also warned that Yeongjong Island could possibly lose all of the airport facilities if a dangerous tidal wave from a typhoon or an earthquake in the west coast hit the island. This was because even though the new airport was protected by sea walls from flooding, its ground level was lower than the water level at a full tide. Therefore, rising sea level due to climate change or tidal waves could fatally damage airport facilities since the height of its sea dikes was just between 8.4 and 9.4 meters.

Furthermore, the opponents expressed concerns over the spread of marine pollution caused by the airport construction because the airport site was a tideland, where the low and high tide difference amounted to more than nine meters. The mud flat in this area facilitated self-purification of Han River's waste water and mitigated coastal pollution. The region also boasted well-preserved beautiful natural landscape and coastal resources such as beaches, which were something of rarity in the regions near the metropolitan area.<sup>19)</sup> Thus the opponents argued that the Yeongjong Island and Yongyu Island area was not fit for airport construction in environmental and meteorological terms. Instead, the area deserved preserving as a leisure and resort place for the residents of the metropolitan area.

19) Yeonhap News. July 18th, 1992

• Arguments and Grounds of Proponents

The government explained that all airports had problems related to bird strikes, but most of the damages were minor with almost no human casualties. They went on to explain that such problems could be minimized by creating a new habitat for migratory birds and by preventing birds' habitation in the airport area through the mobilization of manpower and various equipments.

As for the problem related to the number of foggy days, the government explained that it could be resolved through a state-of-the-art flight guidance instrumentation device. An explanation was added that the analysis of about 60 typhoons that arrived onshore in the last 80 years from 1904 to 1985, revealed little damage of typhoons due to their weakened power by the time they reached Yeongjong Island. The government reassured that the seawalls would fully protect the airport against tidal waves because they were one to two meters higher than the bank protections and seawalls in the nearby coastal area.

Table2-3-5 International Airports' Average Number of Foggy Days Per Year

International Airport	Number of Foggy Days	International Airport	Number of Foggy Days
Yeongjong Island (candidate site)	49	Heathrow, London	8
Gimpo	54	Frankfurt	30.1
Sihwa District	50	Kuwait	10.5
Changi, Singapore	17.4	Washington	31.1
Narita, Tokyo	4.2	Chicago	15
Bangkok	16.4	Detroit	20.9
Amman	2.3	Kennedy, New York	30.9
Reykjavik, Iceland	13	Los Angeles	39.2

Source : Kim Jeong-uk. Kwon O-hyeok. "The Location of New Airport in Seoul Metropolitan Area." Haewoo. 1993. 117.

(7) Runway Problems caused by Weak Foundation

• Arguments and Grounds of Opponents

The opponents expressed concerns about the differential settlement of ground at takeoff and landing, since Incheon Airport's site was a reclaimed land of mud flat and its sedimentary layer of the mud flat was 24 meters deep on average. In particular, the reclaimed land, where the airport's runways would be built, was a mud flat, of which deposits piled up in tens of meters. Therefore, the ground was expected to become bumpy due to the differential settlement of the ground, which implied the malfunctioning of the runway.

• Arguments and Grounds of Proponents

The government explained that the differential settlement of ground in Yeongjong Island could occur less than expected, since the airport would be built on a bedrock after reclaiming only 5 meter-deep tideland, whereas the Kansai International Airport reclaimed 20 meter-deep tideland. Furthermore, the airport's foundation could be successfully maintained if the differential settlement of ground was to be minimized by using cutting-edge fill-up construction methods, such as sand compaction pile method, paper drain method, pack drain method, and pre-loading method.

(8) Issues of Political Nature

• Arguments and Grounds of Opponents

Building a new airport on the 'limited readjustment zone' was, according to the opponents, a violation of the Seoul Metropolitan Area Readjustment Planning Act (hereinafter "Metropolitan Area Readjustment Act"). The Metropolitan Area Readjustment Act was enacted in 1982 and was put in force to control the overpopulation of the metropolitan area and to pursue balanced regional development. Since Yeongjong Island and Incheon region belong to the limited readjustment zone, the opponents argued that allowing Incheon Airport, a facility that induces population and industries, in such limited adjustment zone is a violation of Metropolitan Area Readjustment Act. Moreover, such action would cause confusion in the metropolitan area's long-term plan. The opponents also pointed out that certain chaebols, Korea's family-controlled conglomerates, might benefit from Incheon Airport's construction and that the feasibility study carried out by the private contractor was far from satisfactory.

• Arguments and Grounds of Proponents

The government took a different position, arguing that the construction of Incheon Airport should not be viewed as a new facility building that induces population, but as an expansion and a transfer of the existing facility that exceeded its capacity. The government refuted that it is absurd to apply the principle of balanced regional development to the project, if one fully understands the nature of a hub airport, which can only be succeeded by selective concentration, and that Incheon Airport is a national project being carried out as a long-term development plan. The government further refuted the opponents claim of a hasty implementation of the Incheon Airport project because the feasibility study began in 1969.

## 2) Persuasion Strategy

### (1) Emphasizing the Need to Secure a Hub for Northeast Asia's Air Transport

The government reminded the fact that a vast area of land could be acquired from Yeongjong Island and that it had a great potential to become the hub airport of Northeast Asia since 43 cities with a population of more than one million are clustered within a three-hour flight distance. Following the establishment of diplomatic ties with China, the government emphasized the need to secure a hub airport position in Northeast Asia by building the Incheon Airport as soon as possible.

It also reminded that Japan, Hong Kong, and Thailand were planning large-scale expansion projects of their existing airports because the Asia-Pacific region was experiencing rapid demand increase for air transport. More specifically, by mentioning Japan and Hong Kong's plan to complete the construction of Kansai International Airport and Chek Lap Kok International Airport in 1994 and 1997, respectively, the government emphasized that a new airport was the only solution not to fall behind other international airports in Northeast Asia. The government stressed the logic of competition. For example, if the new airport construction project would be delayed by being embroiled in controversy, Korea would lose the chance of becoming a hub airport in Northeast Asia in competition with Japan or Hong Kong, and thereby, it would just remain as a small air transport country.

### (2) Emphasizing the Need to Prepare for Exchanges with China

An emphasis was also laid on the need for an early construction of the new airport, since exchanges of people and goods were expected to rise rapidly after the establishment of diplomatic ties with China. Given its geographical proximity to China, Yeongjong Island was the best location for a new airport. Since the establishment of Korea-China diplomatic ties, global airline companies had begun to compete against each other to secure new flight routes connecting third countries with Seoul and Beijing. Thus, the government called for the urgent need for a new airport to absorb such high air transport demand.

### (3) Emphasizing the Potential Opportunity of Balanced Development

The government actively appealed that the new airport could be used as a base for accelerating the development of the west coast as well as a hub for the Korean peninsula due to its close proximity to North Korea. In addition, it stressed that the airport would substantially contribute to balanced regional development by enhancing links with other local airports such as Pohang, Gimhae, Gwangju, and Ulsan.

### (4) Emphasizing the Need to Prepare for Gimpo International Airport's Capacity Limit

The Gimpo International Airport exceeded the optimum level of capacity in terms of passenger and cargo handling ability even before the mid-1990s. The government called for a new airport to be built as a matter of urgency in order to meet the unsatisfied air transport demand. Since the Gimpo International Airport was causing serious aircraft noise damage to nearby areas, where a large number of residential areas were clustered, it was argued that it would be difficult to increase the number of inbound and outbound flights, which would incur damages to the economy including the tourist industry due to more frequent delays in flight departures and arrivals.

### (5) National Land Expansion and Other Issues

The new airport construction would expand the national land because an additional land had to be created by reclaiming two islands with an area of 56.1 million square meters. An easy access to the airport was noted as another merit due to a straight-line distance of 50km from Seoul. The government added that noise issue would be naturally resolved, as tideland in the shallow waters was to be reclaimed.

## 5. Verification and Evaluation of Proponents' and Opponents' Arguments

### 1) Airport Size and Cost Issues

The second phase facility expansion project was carried out in time to meet an increasing demand, gradually improving the airport's passenger and cargo handling capacity. The increased number of international passengers had helped secured financial resources and thus enabled the third phase construction. Furthermore, contrary to the concerns over low economic feasibility, Incheon Airport is currently operating with surplus. The airport achieved its first surplus in 2004, and its net income reached 266.8 billion won in 2009.

### 2) Overcoming Criticisms on Northeast Asia's Hub Airport

Incheon Airport is serving as a hub airport by ranking eighth in international passenger service and second in international cargo transport, along with steadily increasing number of flights to cities around the world. In particular, Incheon Airport has become the economic center and the global gateway that handles 24 percent of Korea's trade volume worth 164.1 billion dollars as of 2009. In 2009, the airport adjusted flight schedules, which increased the number of connecting flights by 30 percent compared to the previous year, and in turn increased the number of accumulated passengers by 17.6 percent compared to 2008, surpassing the five-million-accumulated-passenger mark.

Incheon Airport is also getting out of the concerns about its overestimated handling capacity of passengers and cargos. The accomplished handling of passengers was 33.48 million persons in 2010, increasing by an average of 8.3 percent a year since 2002. At the end of July 2010, the highest record for daily passenger number was 115,901 (Outbound passengers 61,345 and Inbound passengers 54,556), and cargo handling capacity increased to 2.68 million tons in 2010, recording the world's second largest cargo volume.

### 3) Accessibility Issues

The construction of KORAIL Airport Railroad, Incheon Airport Expressway, and Incheon Bridge allowed the airport to be reached mostly within an hour from the Seoul metropolitan area, resolving the airport's accessibility issues. Traffic problems in the metropolitan area still exist, but Incheon Airport's accessibility has not yet been questioned.

In particular, the construction of the Incheon Bridge is contributing to the enhanced accessibility of the southern part of Incheon, where the initial plan was to build an undersea tunnel. Concerns have been raised regarding the lack of demand for the transportation facilities connected to Incheon Airport because the government has been providing subsidy to private investors due to lower traffic volume than expected. Meanwhile, it is expected that other regions would not experience many difficulties in using the hub airport because the nationwide accessibility to the airport would be improved when the KTX is connected to the Incheon Airport rail.

### 4) Projects Related to the Development of Airport Area

Since the opening of the Free Trade Area in March 2006, which is comprised of airport logistics complex (990,000m<sup>2</sup>) and cargo terminal (1.1 million square meters), Incheon Airport has attracted 67 leading companies from home and abroad and has reached an occupancy rate of 76 percent. The second phase development of Free Trade Area (920,000m<sup>2</sup>) is currently underway in order to timely expand the site and capacity of the airport logistics complex, and to set conditions for handling more cargo volume. In addition, the IIAC is preparing to attract airline companies and facility maintenance companies by building the Aviation Town. To this end, the IIAC consulted with international aircraft and engine manufacturing companies and global facility maintenance companies, concluded partnership agreements to jointly induce foreign investment, and set a foundation for promoting the Aviation Town development project.

On the other hand, the corporation is currently promoting the Dream World Project comprised of six clusters on a 14.45 million m<sup>2</sup> site near Incheon Airport to develop it into the Air City as well as shopping malls, leisure towns, tourist and recreational facilities.

### 5) Airport's Efficient Operation and Safety Issues

Contrary to the concerns raised by the opponents, bird strikes did not cause serious damages to the airport. The IIAC established a regional wild birds and animals management plan to prevent wild birds from approaching the airport area, and is currently operating a wild bird extermination team and a monitoring office. Twenty-one persons are divided into three teams, and each team works two shifts a day. To prevent bird strikes, 17 different devices with a total number of 83 items of equipment are being used, such as sonic bird repellent devices. In addition, two stations were built in order to eliminate wetlands around the airport and monitor birds. Incheon Airport has experienced about 80 bird-strike incidents since its opening, but none of the incidents has affected flight operation.

Flight cancellations due to fogs have been reported less than expected, because Incheon Airport is equipped with a cutting-edge instrumentation system which enables aircraft to take off and land as long as the minimum visibility of 100 meters is secured. Damages related to tidal waves have not yet been reported. Regarding the ground settlement, only 0.86 centimeters of ground has sunk in the past decade, confirming the concern was unfounded.

### 6) Environmental Issues

#### (1) Noise

Damages to habitats for migratory birds and coastal environment have not yet been identified. The IIAC installed ten aircraft noise monitoring stations, which can continuously measure noise levels around the clock, in the areas near the airport.

Despite the increased number of flights, Incheon Airport is maintaining its yearly noise level under the legal standard level by changing air routes and promoting noise reduction measures. As a result, although the number of flights increased by 18 percent in 2007, the average noise level in eastern Jangbong Island, a noise-sensitive area, increased only by a small margin.

Table2-3-6 Aircraft Noise Level Measurement Results (2010)

Classification	Airport Neighboring Area (Standard Value of 75WECPNL)								
	Ganghwa (Hwado)	Ganghwa (Seokmo)	Ganghwa (Yangdo)	Jangbong (West)	Jangbong (East)	Jangbong (Ongam)	Mo Island	Si Island	Sin Island
2010	36.1	41.1	53.8	56.1	64.3	71.9	69.2	53.1	61.3
Classification	Airport Neighboring Area (Standard Value of 75WECPNL)					Airport Region			
	Muui Island	Eulwang-dong	Nambuk-dong	Deokgyo-dong	New City	Standard (1 North)	Standard (1 South)	Standard (3 South)	Standard (3 South)
2010	44.6	63.4	49.9	49.4	42.3	80.6	88.0	85.9	84.5

Annotation1 : Standards for expected aircraft noise damage area and aircraft noise-damaged areas, determined by civil aeronautics law : 75WECPNL

Annotation2 : WECPNL: Standard measurement for noise

Source : 2010 Aircraft Noise Level Measurement Results, <www.airport.kr>

(2) Marine Ecosystem

Surveys on five different sites in the airport region are being conducted, focusing on zooplankton, phytoplankton, fish eggs, maurolicus muelleri, and intertidal marine organisms. The following is the recent survey results.

**Marine Ecosystem Survey Results**

- Phytoplankton: The standing distribution of phytoplanktons in 2010 was 55 in summer (July), 276,744 cells/L on average, and 50 in fall (October), 423,656 cells/l on average
- Zooplankton: The standing distribution of Zooplanktons in 2010 was 13 in summer (July), 3,392 ind/m<sup>3</sup> on average, and 23 in fall (October), 1,244.5 ind/m<sup>3</sup> on average.
- ※ ind/m<sup>3</sup> : Number of zooplanktons per m<sup>3</sup>

Source : Incheon International Airport Corporation. "Post-Environmental Impact Assessment Report." 2010.

(3) Terrestrial Ecosystem

Surveys are being conducted twice a year on flora and fauna on Yeongjong Island, Sangbok Island, Yongyu Island, and Sinbul Island, directly affected by the Incheon Airport construction. The following is the recent survey results.

**Terrestrial Ecosystem Survey Results**

- Flora : The standing distribution of plants in 2010 was 186,728 tons with a net production amount of 43,487 tons.
- Fauna : 6 and 8 mammals were found in the first and second half of 2010, respectively, with 4 amphibians and 6 reptiles. 33 and 55 different kinds of insects were found in the first and second half of 2010, respectively.

Source : Incheon International Airport Corporation. "Post-Environmental Impact Assessment Report." 2010.

(4) Birds

Between 2001 and 2008, the condition of habitat for water birds and the current condition of snipes and plovers, which inhabit the mud flats, came out differently depending on the survey environment, but only insignificant changes were found in terms of the number of species and birds.

**Bird Habitat Survey Results**

- 70 different kinds of birds, 22,446 in number, were observed in spring and autumn, 2010. The most observed birds, in order of frequency, were snipes, plovers, seagulls, and natatorial birds.

Source : Incheon International Airport Corporation. "Post-Environmental Impact Assessment Report." 2010.

6. Project Implementation Effects

1) World Recognition for Incheon International Airport's Excellence

For the past decade, Incheon airport has made great strides of progress, and has emerged as one of the best international airports in the world, serving as an exemplary model for more than 1,000 international airports. Incheon Airport is drawing the world's attention not only for its remarkable quantitative growth, but also for being recognized as the best airport in terms of service quality. The following is Incheon Airport's main award record.

Table2-3-7 Main Award Records of Incheon International Airport

Classification	Awards
2005-2010	Won Best Airport Worldwide at the Airport Service Quality (ASQ) awards for six consecutive years by the Airport Council International (ACI), and listed in the Hall of Fame
2009	Won Best Airport in Asia-Pacific Award, Best Airport by Size Award (25 to 40 million passengers), ASQ Special Recognition Award - The result was based on the 1:1 customer satisfaction survey of 250,000 airport users. The survey was divided into 34 categories, including 7 service sectors, 27 facilities, and management, and was conducted in each quarter of 2009 by ACI.
2006-2010	Won Best Airport in the World at GT Tested Awards by USA's Global Traveler for five consecutive years
2008	Won 2008 IATA Eagle Award, World's Best Airport Award
2008	Won Best Cargo Airport 2008 by Air Cargo World, the biggest airport cargo magazine in USA - Every year, airports around the world get evaluated on 4 different categories: reliability, customer satisfaction, disposal facilities, and management facilities
2009	Named World's Best Airport for 2009 by U.K.'s Skytrax
	Won Best Airport in the World at GT Tested Awards 2009 by Global Traveler
	Won International Airport of the Year 2009 at CAPA Aviation Awards for Excellence
	Achieved 70,000-hour continuous operation of the navigation safety facility

Table2-3-8 Incheon International Airport's Rank and Score (maximum five-point scale)

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Rank	6	4	2	1	1	1	1	1	1
Score	3.92	3.98	4.16	4.47	4.66	4.78	4.91	4.99	4.96

Source : Incheon International Airport Corporation. Annual Report

**2) Incheon Airport’s Enhanced Operation Performance and Operating Income**

The number of flights has increased from 86,000 in 2001 to 214,000 in 2010, while the number of passengers has gone up at an annual average of 8.3 percent, increasing from 14 million in 2001 to 33.48 million in 2010, surpassing the accumulated total of 200 million passengers as of March 2009. Currently, international passenger transport of the airport ranks eighth in the world with 72 percent of Korea’s total outbound and inbound passengers using Incheon Airport.

Cargo transportation has increased at an annual average of 8.5 percent since 2002 from 1.19 million tons in 2001 to 2.68 million tons in 2010, the second largest cargo volume in the world, exceeding the accumulated total of 10 million tons as of June 2006. Incheon Airport is an international gateway for 24 percent of Korea’s total trade volume and emerging as an economic hub.

With the passenger transfer ratio of 18.5 percent and cargo transshipment ratio of 47.2 percent, Incheon Airport is becoming more important as a Northeast Asian hub airport, outperforming Narita International Airport in Japan and Shanghai Pudong International Airport in China. Its operating income already swung to black in 2004 with continuously growing net income from 123.9 billion won in 2005 to 266.8 billion won in 2009.

Table2-3-9 Operation Performance of Incheon International Airport

Classification	Unit	2003	2004	2005	2006	2007	2008	2009	2010
No. of Flights	10,000	13.0	16.0	16.1	18.2	21.1	21.1	19.8	21.4
No. of Passengers	10,000	1,979	2,408	2,605	2,819	3,123	2,997	2,855	3,348
Vol. of Cargo	10,000 tons	164	213	215	222.7	255.6	242.4	231.3	268.4

Source : Incheon International Airport Corporation. Annual Report

**3) Korea’s Gateway, Contribution to Increasing Global Passenger and Cargo Transportation**

Despite the global economic recession, Incheon Airport established the “Kangaroo Route” by attracting a Finnish airline, Finnair Plc, and an Oceanian airline, Aircalin. As a result, the number of transfer passengers to Europe and Oceania increased by 20 to 50 percent, and arterial and feeder lines were also enforced. Continuously inducing new airlines and adding new routes in service, it hosted 59 airlines, and served 41 destination countries and 133 cities in 2005, which increased to 70 airlines, 53 countries, and 176 cities in 2010.

In particular, transfer time between flag carriers was recently shortened to 45 minutes from 55 minutes in 2007, a 10 minute-drop, promoting passengers’ convenience. The airport boasts the world’s shortest immigration and border control wait time: 18 minutes for departure and 13 minutes

for arrival, about one quarter of the recommendation by the International Civil Aviation Organization’s 60 minutes and 45 minutes, respectively. This was possible thanks to Incheon Airport’s decision to quickly apply Korea’s advanced IT technology, such as the passenger forecasting system.

**4) Increased Capacity of Airport Facilities responding to Demand**

Following the completion of second phase expansion project in 2008, Incheon Airport built a 4,000 meter-long and 60 meter-wide runway and raised its annual passenger capacity from 30 million to 44 million. A concourse of 166,000m<sup>2</sup> was added, and annual cargo capacity increased from 2.7 million to 4.5 million tons. The airport’s facilities include passenger terminals, cargo terminals, mooring facilities, navigation safety facilities, and transportation systems. The passenger terminal building complex, the largest freestanding building in Korea measuring 496,000m<sup>2</sup>, has 270 check-in counters, 120 immigration counters, and 28 security checkpoints with departing passenger capacity of 6,400 persons per hour. Its cargo facilities with a capacity to simultaneously park 24 aircraft are capable of handling 1.7 million tons of cargo per year. Incheon Airport’s mooring facilities, measuring 1.089 million square meters, are capable of simultaneously mooring 60 aircraft.

The 22-story control tower is 100 meters tall. Runways are equipped with automated landing control systems and aerodrome markings, designed for landing with the visibility of only 200 meters. With Incheon Airport at the center, residential areas in Yeongjong Island will be home to about 6,200 households. In public facility areas, educational facilities and parks will also be constructed.

Upon the completion of the final fourth phase in 2035, Incheon Airport is expected to have five runways, the passenger terminal as large as 1.312 million square meters, the number of passengers at 100 million per year, the cargo volume of 10 million tons, and the number of flights at 740,000.

Table2-3-10 Incheon International Airport's Status of Facilities

Total Site	56.06 million m <sup>2</sup>	Equivalent to 7,800 international standard soccer fields
Runways	3 runways	Capable of simultaneous take-off and landing of jumbo jets, such as A380 (1 on the 4,000m runway, 2 on the 3,750m runways)
Aprons	Passenger Apron (2.44 million m <sup>2</sup> ) Cargo Apron (740,000m <sup>2</sup> )	144 aircraft can be parked simultaneously (108 passenger flights, 36 cargo flights)
Passenger Terminal	500,000m <sup>2</sup>	Passenger terminals can park 44 aircraft and concourses can park 33, simultaneously Equivalent to 60 international standard soccer fields
Concourse 1	170,000m <sup>2</sup>	Concourse 1 can simultaneously park 3 A380s
Traffic Center	250,000m <sup>2</sup>	Stations of Incheon Airport Railroad Express and a maglev propulsion train are located on the premise Parking area for 4,758 cars (long-term parking, 5,427 vehicles)
Navigation Safety Facilities	Control Tower/Radar/ Aerial Communication	Asia's first airport capable of CAT IIB operations Non-stop operation of 70,000 hours
Free Trade Area	Cargo Terminal (230,000m <sup>2</sup> ) Airport Logistics Complex (990,000m <sup>2</sup> )	Opened in March 2006 Houses branch offices of global distribution companies such as DHL, AMB, Schenker, and KWE (The second phase will bring additional airport logistics complex of 920,000m <sup>2</sup> )

Source : Incheon International Airport Corporation

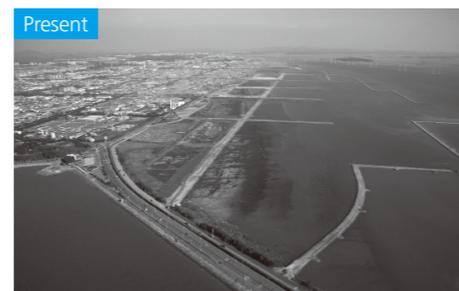
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## 4 Lake Sihwa Reclamation Project

### 1. Project Outline

Location & Size	Part of tideland surrounding Lake Sihwa around Siheung City and Ansan City							
Project Duration	2002~2016 (K-Water)							
Total Cost	3.5221 trillion won							
Development Plan	9.256km <sup>2</sup>							
	Total Area (km <sup>2</sup> )	Advanced Industries	Infrastructure	Logistics	School Zone	Commercial Zone	Residential Area	Public Area
	9.256 (100%)	2.399 (25.9%)	0.383 (4.1%)	0.283 (3.1%)	0.374 (4.0%)	0.868 (9.4%)	0.145 (1.6%)	4.804 (51.9%)



Upon the completion of a seawall in Lake Sihwa in January 1994, a vast tideland emerged around the lake. The Ministry of Commerce, Industry and Energy suggested to the Ministry of Construction and Transportation in February 1996 that a Multi Techno Valley (MTV) should be built in the northern tideland of the lake in advance to ease the shortage of industrial land in the Seoul metropolitan area.

As the large-scale tideland was poorly managed, illegal acts were rampant, such as garbage

dumping, illegal alteration of land shape and quality, and illegal construction and occupation. In order to prohibit such illegal acts, the Ministry of Construction and Transportation additionally designated 115.12 square km of the south and north tideland around the lake, along with the already designated area of 116.33km<sup>2</sup> in the Sihwa Industrial Complex in Ansan and Siheung City under the Notification No. 1998-374 of the Ministry of Construction and Transportation as part of the Banwol Special Area, and had the Korea Water Resource Corporation (K-Water) manage the area.

Upon the request from the Ministry of Commerce, Industry and Energy, the northern tideland of the lake was planned to be systematically developed into a future-oriented advanced industrial complex, focusing on knowledge-based industries, such as high-tech and venture companies. The aim of the complex was to balance various functions including support functions such as R&D and logistics, ecological functions such as tourism and leisure, and environmental education functions. In August 2001, the Sihwa MTV Development Project was notified in order to secure financial resources for the improvement of the lake's water quality. However, odor complaints in the Sihwa and Banwol Industrial Complex and water pollution in the lake stirred environmental movement in the region. After the Notification No. 2001-222 of the Ministry of Construction and Transportation concerning the development plan of the Sihwa MTV, local civil environmental groups demanded the government to cancel the development plan and to resolve environmental issues in the Sihwa and Banwol Industrial Complex before pursuing the MTV development. The government and the civic groups were in sharp conflict, but they recognized the need for a cooperative relationship to build a framework for social consensus on environmentally sound and sustainable development. Thus, in January 2004, the Sihwa Sustainable Development Council (hereinafter "SSDC") was established. Through a four-year-long consultation, the SSDC designed a road map for special measures to improve Sihwa region's environment, implemented an environmental improvement project for the existing industrial complex, and mapped out eco-friendly development measures for the Sihwa Development Project.

### 2. Project Background and Purpose

#### 1) Project Background

The Sihwa District refers to the area surrounding the Lake Sihwa, which belongs to Siheung, Hwaseong, and Ansan City, created by the completion of a seawall in 1994. The district is close to major metropolitan cities, about 40km from Seoul City and 20km from Incheon, with good transportation accessibility via the Seohaean Expressway and Ansan subway line. In addition, with Incheon Airport and Incheon Port nearby, the district has a great potential to emerge as one of Northeast Asia's industrial centers and to meet various development needs of the west coast close to the Seoul metropolitan area.

The southern and northern tideland, created by the completion of the seawall, garnered attention as an alternative to provide the metropolitan area with much needed industrial land. In fact, in February 1996, the Ministry of Commerce, Industry and Energy requested the Ministry of Construction and Transportation to develop the northern tideland. In the process of designing the development plan for the MTV project, media reports on the pollution of the lake came out in April 1996, which made the district a symbol of environmental pollution in Korea. The media and environmental activist groups urged the government to take responsibility for the pollution of the lake and to find solutions. They brought the issue to the public’s attention, arranged a series of consultation with relevant authorities and advisory conferences, conducted research and due diligence, and prepared the Water Quality Improvement Measures for Lake Sihwa worth 532.5 billion won.

K-Water agreed to design improvement measures from a project operator’s point of view, and financing for the measures was concluded to come from K-Water’s own fund and the expected profits of the MTV project.

Table2-4-1 Water Quality Improvement Measures for Sihwa Lake

Detailed Projects	Cost (Unit: 100 million won)	Content
Construction of Tidal Plants	3,551	To be completed in 2011 (Launched in December 2004)
Expansion of Sewage Treatment Plants	843	Expansion of sewage treatment plants in Sihwa and Ansan
Survey and Maintenance of Piping System	20	Repaired 2,651 junctions (1,519km)
Reed Wetland Park	293	314,000 pyeong (Traditional Korean unit, approx. 3.3058m <sup>2</sup> ) at the upper stream of Lake Sihwa
Algal Ponds	10	Water hyacinth and air blow equipments
Stream Maintenance (Ansan Stream)	53	Heightened river bed and dredging work in Ansan Stream
Storm Drain for Polluted Rainfall	67	11km storm drain, 8 pump stations
Environment Improvement Projects	448	Service contract for sediment treatment
Service Contracts for Lake Sihwa’s Development	40	Service contract for water quality improvement measures
Seawater Circulation through Sluice Gates	-	Seawater circulation of 30 million m <sup>3</sup> /day
Lake Aerator	-	100 aerator installed around sluice gates
Total	5,325	

Source : Ministry of Land, Transport, and Maritime Affairs, Marine Environmental Policy Division. “Comprehensive Management Plan.” 2001.

In addition, from the 1980s to the early 1990s, pollution-causing factories, which were disqualified for the Seoul metropolitan area, entered the Banwol and Sihwa Industrial Complex en masse, worsening air pollution and odor. Consequently, local communities experienced difficulties in helping their residents secure regional identity or sense of settlement. Against this backdrop, a development plan has been in discussion for the total area of 10.48km<sup>2</sup>, including a 3.31km<sup>2</sup> of the northern tideland and a 7.17km<sup>2</sup> of the tideland near Lake Sihwa. For two years from June 1999, the plan had been consulted with 22 relevant authorities and was finalized and notified in August 2001, kicking off the Sihwa MTV Development Project.

### 2) Project Purpose

The primary objective of the project is to strengthen industrial competitiveness and the regional economy based on complementary cooperation with the existing industrial complex and to prevent reckless and sporadic development by utilizing favorable locational conditions and offering well-planned space. Its secondary purpose is to facilitate the utilization of environmental resources in nearby coastal areas by improving air quality in the Sihwa area and securing stable water quality in the lake and, at the same time, to develop an eco-friendly composite complex by developing sufficient green space.

### 3) Project Content

The Sihwa MTV Development Project, which centers on knowledge-based industries such as high-tech and venture companies, aims to develop a future-oriented advanced industrial complex that combines various functions including support functions such as R&D and logistics, and leisure functions such as tourism and recreation. The authorities attempt to cover the cost for environmental improvement measures in the Sihwa area with development profits in an effort to dramatically improve air and water quality of the local environment.

Its basic directions are to complement various infrastructures in line with the development of the existing complex, Banwol and Sihwa, to promote long-term development of nearby cities, Siheung, Ansan, and Hwaseong City, and to build connectivity with regional transportation system. The project plans to nurture a stable and pleasant environment for workers at the industrial complexes and local residents, to strengthen the economic foundation of Siheung and Ansan by promoting high value added service industries in such a way that does not infringe upon the regional commercial markets in Siheung and Ansan, and to promote efficiency in a land usage plan.

#### 4) Project Agency

The project agency is the Ministry of Construction and Transportation with K-Water as the operator. Since conflicts over the project are all related to the development and usage of the lake's basin, five ministries of the Korean government, Gyeonggi Province and three cities individually reviewed how to utilize the lake and its tideland.

Table2-4-2 Usage Plan for Lake Sihwa's Basin

Planner	Plan
Ministry of Construction and Transportation	Having designated the southern and northern tideland as large as 1,123.9km <sup>2</sup> , composed of 425.5km <sup>2</sup> of Lake Sihwa, 118.7km <sup>2</sup> of the northern tideland and 607.3km <sup>2</sup> of the southern tideland, as the Banwol Special Area in November 1998, the area is planned to be developed into a low density residential and commercial area as well as advanced industrial complex
Ministry of Oceans and Fisheries	Establishing a plan to build a tidal power plant with the capacity of 240,000 kW and a port that can accommodate 90 ships
Ministry of Agriculture and Forestry	With public water reclamation license having been acquired on September 2nd, 1998, the reclamation work to develop agricultural land as large as 3,636 ha on the southern tideland started. Regarding agricultural infrastructure, Lake Tando, which is 760 ha in size, will be formed in order to supply water to the agricultural land of the southern tideland.
Ministry of Culture and Tourism	Korea's Natural Monument No. 414, Dinosaur Egg Tracksite in Gojeong-ri of Hwaseong, designated on March 21st, 2000, will be developed into a tourist destination and the National Natural History Museum will be constructed
Ministry of Commerce, Industry and Energy	Yeongheung thermal power plant's transmission circuit will be laid through the lake
Gyeonggi Province	The province commissioned a research service on the development strategies for Gyeonggi Province's west coast including the lake
Ansan City	The city plans to build Sihwa ecological park
Siheung City	The city plans to minimize the development of industrial land and secure green and leisure space for higher quality of life in nearby residential cities
Hwaseong City	The city plans to develop prehistoric sites such as the Natural Monument No. 414, Dinosaur Egg Tracksite in Gojeong-ri of Hwaseong, designated on March 21st, 2000, into tourist destinations

#### 5) Project Progress

The timeline of the project including the construction of the Sihwa Seawall and the development of Sihwa MTV, according to the development plan of Sihwa District, is as follows.

Table2-4-3 Progress of Sihwa Tideland Development Project

Date	Content
September 27th, 1986	Banwol Special Area was changed into a development district, and a basic plan for Sihwa District Development was notified
December 30th, 1986	Site building work for Sihwa Industrial Complex was launched
June 10th, 1987	Seawall construction was launched
January 24th, 1994	Embankment construction was completed - Lake Sihwa and its tideland were created
February 9th, 1996	The Ministry of Commerce, Industry and Energy raised the need for developing and expanding Sihwa Complex - The northern tideland development was necessary to provide the metropolitan area with industrial land
April 17th, 1996	The Ministry of Construction and Transportation established management measures for the tideland - Management of tideland: The area was designated as Banwol Special Area to be managed until the project launch - Development of tideland · Northern tideland: Developed in part of the first phase of expansion construction · Southern tideland: Developed considering demand for urban and industrial land
November 14th, 1998	Expansion of Banwol Special Area was notified, including Lake Sihwa and its northern and southern tideland
August 29th, 2001	Sihwa MTV Development Plan was notified
January 2002-June 2005	Consultation of environmental impact assessment
January 16th, 2004	Sihwa Sustainable Development Council (SSDC) was formed
February 2004-November 2006	SSDC designed development measures for Sihwa MTV
February 28th, 2006	Outsourced research to verify the project's size was completed - Research result: Development size, 9.26km <sup>2</sup>
March 20th, 2007	The first revision notification of the development plan - to reflect environmental impact assessment and SSDC's consultation
June 4th, 2007	Environmental impact assessment was reflected in the first revision by the Han River Basin Environmental Office - the first revision also included the SSDC's consultation
August 16th, 2007	Partial permit of the project by Seoul Construction and Management Administration was notified and the project was partially launched - river, park, green zone, and borrow pit were included in the permit
December 2007	The construction of Sihwa MTV was partially started
April 11th, 2008	Environmental impact assessment was completely reflected in the second revision by the Han River Basin Environmental Office - post-environmental impact assessment plan was consulted with a post-management team and reflected in the revision
June 23rd, 2008	Full permit of the project by Seoul Construction and Management Administration was notified - the full area of the project received the permission
November 20th, 2009	Revised Sihwa MTV Development Plan was notified - SSDC's consultation was additionally considered

### 3. Arguments and Grounds of Proponents and Opponents

#### 1) Issues and Logic of Proponents and Opponents

##### (1) Civic Group's Proposal on Tideland Usage vs Long-term Comprehensive Development Plan

- Arguments and Grounds of Opponents (Proposal by People's Coalition for Lake Sihwa)

Responding to water pollution of the lake and worsening atmospheric environmental issues due to the operation of the large-scale industrial complex, local communities opposed the project itself and developed a deep distrust against the government's environmental policies. The opponents argued that inappropriate development would destroy traditional local communities and create a number of problems. After the water pollution issue of the lake came to the fore, individual civic groups demanded to 'improve water quality first and then develop the tideland', tear down the seawall, circulate the seawater, and form a public-private joint consultative group.

Table2-4-4 Water Quality of Lake Sihwa

Classification	National Average		Lake Sihwa	
	1996	2006	1996	2006
Sewage Processing Ratio (%)	52.4	81.4	18.0	100
COD (ppm)	-	-	13.5	4.4
No. of Odor Complaints	from 1,479 cases in 1999 to 653 in 2006			

Source : Ministry of Land, Transport, and Maritime Affairs

Since the late 1990s, experts and local civic groups have demanded environmental improvement of the lake and reexamination of the existing development plan. In March 2000, they proposed an ecological park as an alternative idea. The idea, which assumed that the lake remained a seawater lake, was proposed as a ways to effectively utilize its tideland in a bid to turn the area into a symbol of sustainable development for regions with environmental concerns. During this period, local civic groups waged a strong campaign against the Sihwa MTV Development and the construction of Yeongheung transmission circuit. The groups judged that their proposal, which incorporated a new regional concept and preservation measures and was voluntarily participated by local experts and citizens, did not receive any systematic reviews from the central government and the project agency.

The civic proposal, taking a full consideration of natural conditions in both sides of the region, contained the ideas of helping the ecosystem restore itself and focusing on promoting tourism business with little harm to the ecosystem's structure and function, but it did not include additional reclamation. On the contrary, a long-term comprehensive plan established by the government through a public hearing entailed: first, to build an advanced and venture business complex in 10.48km<sup>2</sup> of the northern tideland, for which development notification had been already announced to provide much needed industrial site for the metropolitan area; and, second, to develop a tourism and leisure complex on a 56.76km<sup>2</sup>-wide land out of the 93.06km<sup>2</sup> of the southern tideland, while excluding 36.3km<sup>2</sup> of designated agricultural land.

- Arguments and Grounds of Proponents (Long-term Comprehensive Development Plan for Sihwa District)

The Sihwa Policy Development Conference, participated by the central government, local governments, and project agency, established the Long-term Comprehensive Development Plan. The Board of Audit and Inspection had conducted an intense audit on development progress of the project from September 7th to December 23rd, 1999 and requested the Ministry of Construction and Transportation to set up a comprehensive and reasonable plan prior to pursuing a large-scale project like the development of the Banwol Special Area. Accordingly, in order to establish a government-wide comprehensive direction for the development of the lake and its tideland, the Ministry of Construction and Transportation formed the Sihwa Policy Development Conference with the members from the Ministry of Agriculture and Forestry; Ministry of Commerce, Industry and Energy; Ministry of Environment; Ministry of Oceans and Fisheries; Cultural Heritage Administration of Korea; a relevant director-general of Gyeonggi Province; a deputy mayors of Siheung, Ansan, and Hwaseong City; K-Water; and Korea Agricultural and Rural Infrastructure Corporation. The conference compiled the research, which had been conducted for about three years by five research institutes including Korea Research Institute for Human Settlements, and made it public through a public hearing in December 2003. The hearing proposed a blueprint to build an advanced city of ecology, tourism, and leisure on the tideland, equipped with a tidal power plant. The blueprint suggested creating an advanced comprehensive complex on the northern tideland and sites for tourism, leisure, research, and residence on the southern tideland.

##### (2) Confrontation during Planning Process of Environmental Improvement Measures

- Arguments and Grounds of Opponents

Civic groups came into conflict with the project operator over the cause of environmental issues in the area and the party in charge of resolution. The civic groups argued that K-Water,

the project operator, had a primary responsibility for the environmental problems and demanded K-Water to fully cover for environmental improvement costs and to carry out the improvement measures first, regardless of future development.

• Arguments and Grounds of Proponents

The project operator asserted that, considering its moral duties as an operator, it could partially share the burden of the environmental improvement costs, even though the central and local governments should be held responsible for the cause of environmental issues.

Table2-4-5 Opinions on Environmental Improvement Measures

Classification	Content
Government/Project Operator (Proponents)	<ul style="list-style-type: none"> <li>• Air pollution is a sole responsibility of the Ministry of Environment and local governments</li> <li>• Government contribution for atmospheric environmental improvement of 30 billion won according to consultations with the Ministry of Environment</li> <li>- It is unfair to ask the project operator to find solutions for all environmental issues</li> </ul>
Environmental Groups/Local Residents (Opponents)	<ul style="list-style-type: none"> <li>• K-Water should fully cover environmental improvement costs</li> <li>• Without environmental improvement, no additional development</li> </ul>

(3) Confrontation over the Size of Sihwa MTV Development

• Arguments and Grounds of Opponents

The civic groups, while emphasizing tangible and intangible environmental values such as protection of the ecosystem, which was reviving after seawater circulation in the lake, biodiversity and productivity of tideland, its purifying effect of water pollutants, and ecological experience, demanded a limited development for the exposed 3.31 square km<sup>2</sup> of tideland. The conflicts on environmental values continued as there were no direct or objective tools to measure the value of the tideland against the value of its development. The civic groups maintained that additional reclamation was not acceptable as it would destroy the environment and cause additional environmental pollution. They also criticized the antimony of improving the environment with development gains derived from environmental destruction.

• Arguments and Grounds of Proponents

The project operator insisted upon developing a 10.47km<sup>2</sup>-wide tideland into Sihwa MTV in order to turn the existing Sihwa and Banwol Industrial Complex into an eco-friendly and advanced comprehensive industrial complex.

Table2-4-6 Opinions on the Size of Sihwa MTV

Classification	Content
Government, Project Operator (Proponents)	It is inevitable to grow the size of the project up to a certain point to cover the cost of environmental improvement at 450 billion won - The minimum size is suggested to be 9.26km <sup>2</sup>
Environmental Groups, Local Residents (Opponents)	The minimum project size of 9.26km <sup>2</sup> should be verified, even considering environmental improvement costs

(4) Confrontation over the Land Use Plan of Sihwa MTV Development

• Arguments and Grounds of Opponents

The civic groups called for adjustments to the land use plan such as restrictions on general manufacturers in the complex in order to prevent environmental pollution, which might be caused by some unqualified firms relocating from the Seoul metropolitan area. In line with the title of the project, they argued that the plan should be revised to build an advanced industrial complex, which could also upgrade industrial structure in the existing Banwol and Sihwa Industrial Complexes.

• Arguments and Grounds of Proponents

The project operator refuted the civic groups' proposal, saying that the unilateral restrictions on general manufacturers went against the purpose of a national industrial park, and that it was inevitable to invite general manufacturers to the park in order to boost its growth as the environmental improvement measures were expected to sufficiently ease pollution issues. It added that, considering the linkage between production facilities and intermediate goods, it would be impossible to operate a competitive industrial park only with advanced technology firms.

2) Persuasion Strategy

(1) Establishment of System to ease Conflicts

• Foundation of Sihwa Sustainable Development Council

In order to ease conflicts stirred during the project's progress and to seek reasonable development plans, the government proposed forming a consultative body with local residents and governments to find measures together. Accordingly, the SSDC, a public-private joint partnership with civic and environmental groups, was founded in January 2004 in order to ease conflicts and collect opinions. The SSDC discussed the development of Sihwa District in the Banwol Special Area, environmental improvement related to water and air quality in the Sihwa area, agreements made in the SSDC and their implementation, and issues to be included in the project.

Table2-4-7 Classification of Identified Issues by Subcommittee

Classification	Issues
Development Subcommittee	<ol style="list-style-type: none"> <li>1. Reduction in development size of Sihwa MTV</li> <li>2. Social, economic, and environmental impacts of Sihwa MTV</li> </ol>
Atmosphere Subcommittee	<ol style="list-style-type: none"> <li>1. Status, issues, and solutions of the atmospheric environment of the existing industrial complex</li> <li>2. Survey on odor emitters in Sihwa and Banwol Industrial Complexes</li> <li>3. Restriction on pollutant emitters applying to be housed in Sihwa MTV</li> </ol>
Water Quality and Ecology Subcommittee	<ol style="list-style-type: none"> <li>1. Status of water pollution in main water ways in Sihwa area and improvement measures</li> <li>2. Status of sediment pollution in Lake Sihwa and improvement measures</li> <li>3. Supplementary measures to build migratory birds' habitat</li> </ol>

(2) Operation of the SSDC

- Discussion

The SSDC was operated to seek a consensus of various stakeholders in a discussion framework to verify the pros and cons through contemplating the economic and social feasibility, including the environmental aspects, and through earnest discussion and learning about ways to balance between development and environment. The Council had held 151 rounds of meetings from 2004 to 2007 and reached an agreement on the national project, which was deemed successful in resolving conflicts.

3) Major Contributors to Resolving Conflicts

(1) Preliminary Discussions

Prior to a meeting at the Council, the agenda and issues to be dealt with were actively discussed, preventing unnecessary arguments and helping the discussions proceed smoothly. The members, who represented the civic groups, fine-tuned their arguments in collaboration with People's Coalition for Lake Sihwa in advance, while the Ministry of Construction and Transportation and K-Water also exchanged their opinions, in preparation for the next meeting.

(2) Sharing Administrative Procedures

Once the agenda was decided, information on related rules and regulations, necessary administrative procedures, and legal time requirements were all shared. Necessary procedures were decided in order to carry out the project in accordance with the set process of which the schedule was also shared. The council provided the general public, who were not familiar with procedures, rules and regulations, with information on them, necessary administrative procedures, and legal time requirement.

(3) Immediate Implementation of Derived Conclusion

The SSDC made public related reports on the lake and its neighboring regions, and the council members participated in local environmental events. They conducted daily monitoring of the water quality in the severely contaminated the fourth main waterway, surveyed all of the pollutant emitters immediately, and installed a banner to connect participating institutions' webpages with SSDC's.

(4) Solution to Disagreement

If there was a disagreement due to unverified fact or insufficient information, the SSDC chose to ease it by commissioning research work through an objective survey and confirmation, experts' advice, and collective learning.

(5) Decision Making through Consultations

The SSDC's decision making process was not a majority vote but a unanimous consensus. Any party, who had a different opinion but did not explicitly oppose or did so with strings attached, was regarded to agree. And the items in disagreement were listed to be discussed in the future.

(6) Integration between Subcommittee and Plenary Meetings

The SSDC had three special subcommittee meetings of which the agenda were compiled and fine-tuned in the plenary meetings, while newly identified agenda in the plenary meeting were also discussed in-depth in the subcommittee meetings.

(7) Release of Information

Information was given in a simple but well-organized manner to help some members, who did not have expertise, understand professional issues. Additional information was always available upon request. After being reviewed, meeting results were posted online for the general public.

(8) Intensive Debate

Aside from regular meetings, a separate meeting was also called upon for an intensive debate, which often took place in special venues, such as in the suburbs, in order to encourage new ideas and strengthen personal ties. Agenda for the intensive debate were decided when a plenary meeting identified current issues and selected agenda to be dealt with later on through free discussion. When opinions were sharply divided without rendering an alternative, or an alternative was not agreed on, more discussions followed. Issues that were resolved and agreed upon at a meeting were separately recorded from those that were not.

(9) Group Study

One of the characteristics of the SSDC's operation was a group study in which all its members participated. Experts were also invited to give lectures and hold discussion sessions on topics that were critical to conducting a discussion or finding a solution, and that required the members to have new information or knowledge.

### 4. Economic and Social Costs From Conflicts

#### 1) Direct Costs

Direct costs include additional construction costs due to the delay and economic costs to the nation or local governments caused by delayed production. The project had been delayed for five years since its announcement in August 2001, deferring job creation and weakening industrial competitiveness, as businesses had to build their own production sites individually in the Seoul metropolitan area. It took three years and six months to discuss the environmental impact assessment.

#### 2) Indirect Costs

Indirect costs include environmental damages incurred by delayed environmental improvement projects in Sihwa and Banwol and social costs due to conflicts among the central government, local governments, local residents, and NGOs. These social and economic costs are incalculable as there is no research or estimation data on them.

### 5. Verification and Evaluation of Proponents' and Opponents' Arguments

The SSDC reviewed and assessed the contrary arguments of the opponents and the proponents of the Sihwa Tideland Development Project. Based upon detailed operation guidelines, the Council demonstrated a democratic operation and reasonable negotiation process in establishing the best practice of eco-friendly development by reaching an agreement on the road map for water and air quality improvement, the launch of the southern tideland development plan, the construction of a tidal power plant, and the northern tideland MTV development plan.

#### 1) Agreement on the Road Map for Water and Air Quality Improvement in Sihwa (October 28th, 2004)

In the late 1990s, the number of civil complaints about odor exponentially increased, and, in particular, soared in 2004 when residents started moving into a large apartment complex in Ansan City. This was when the environmental concerns of the Sihwa Industrial Complex expanded to become region-wide environmental issues. As a response, the atmospheric subcommittee of the SSDC designed the road map for air quality improvement special measures in line with the atmospheric environment improvement project.

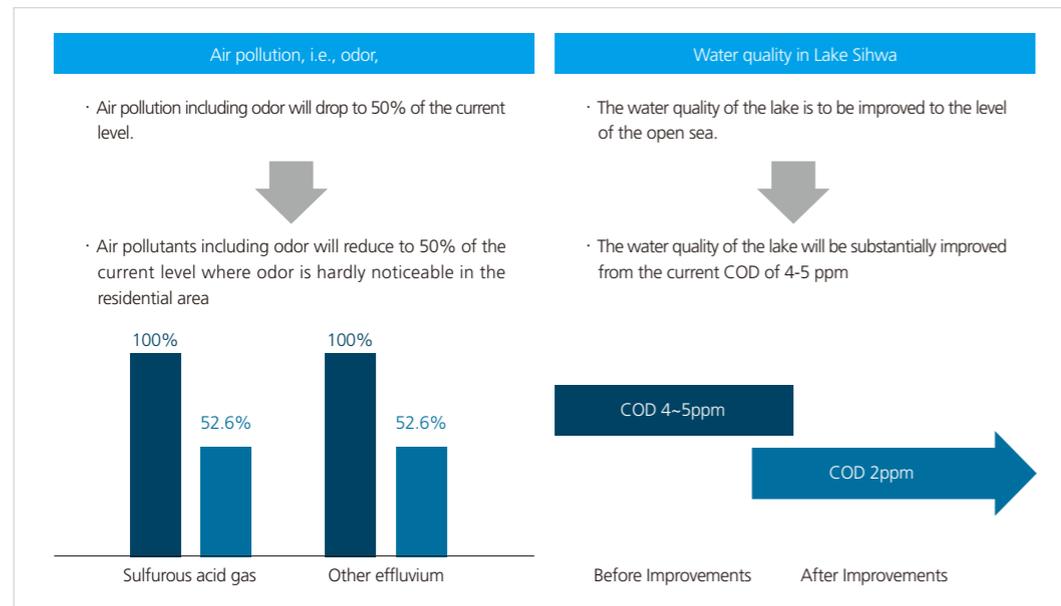
As the water quality worsened again after 2000, the SSDC's atmospheric and ecology subcommittees formed a task force to compile future plans or on-going measures by various institutions for water and ecological environment improvement, and drew a road map of special water quality improvement measures suitable for the lake. In October 2004, a workable road map to improve water and air quality written by experts on the premise of the development of the Sihwa area was agreed. The government proposed using all development profits from the MTV development on the northern tideland to finance the improvement measures.

Table2-4-8 Road Map for Special Water Quality Improvement Measures

Road Map	Project Cost (Unit: 100 million won)
Total	920
1. Water quality improvement measures for main waterways - the measure for the fourth waterway to be implemented first - increasing capacity of temporary storm drain - the water quality improvement measures for the first, second, and third waterway to be pursued	120 (20) (40) (60)
2. Complete enumeration survey on water pollutant emitters	20
3. Pollutant inflow prevention facilities to be installed at the industrial complex	60
4. Ecological streams to be built - basic plans to restore natural ecological river to be established - restoration projects to be carried out	200 (6) (194)
5. Improvement of contaminated sediments	500
6. Functions of artificial wetland to be enhanced and facilities to be improved - research and experiments of water treatment - facilities in wetland to be supplemented	20 (5) (15)

Source : Sihwa Sustainable Development Council. Web. <www.sihwa-sd.com>

Figure2-4-1 Effect of Environmental Improvement Measures



Source : Sihwa Sustainable Development Council

### 2) Agreement on the Size of Sihwa MTV Development (June 19th, 2005)

The development of the northern tideland of the lake began for the purpose of securing financial resources for water quality improvement in the lake. Afterwards, a new consensus was made that the size of development should be decided in consideration of economic and social feasibility, in addition to securing financial resources for environmental improvement and environmental feasibility. Thus, all the parties agreed to have further discussions on the size based on research conducted by a third-party research institute. Experts, recommended by the civic groups, participated in the research, reviewing the options for the proper size of the project from 3.31km<sup>2</sup> suggested by the civic groups to 10.48km<sup>2</sup> by the project operator in terms of environmental, economic, and social aspects. On the assumption that the entire development profits would be used for environmental improvement costs in the Sihwa area, the research concluded that the appropriate size should be at least 9.26km<sup>2</sup> to meet the necessary costs. Having gone through a 7 month-long consideration and discussion, the SSDC fixed the size of development at 9.26km<sup>2</sup>.

### 3) Agreement on the Land Use of Sihwa MTV (November 21st, 2006)

In consideration of Sihwa District's characteristics, the land use plan was revised to increase green zones according to the SSDC's recommendations based on the research on the project size and restriction on general manufacturing businesses.

Table2-4-9 Agreements on the Land Use of Sihwa MTV

Classification	Original Plan	Research Outcome	Final Agreement
Industrial Land	39.4%	32.0%	27.0%
Parks and Green Areas	20.3%	27.5%	27.5%
Commercial Land	7.0%	10.0%	10.0%
Back-up Land	13.0%	13.0%	12.0%
Public Land	23.7%	17.5%	23.5%

Source : Sihwa Sustainable Development Council

## 6. Project Implementation Effects

The implementation effects of the project were the establishment of the eco-friendly land use plan by the SSDC through open and frank discussions among the central government, the project operator, the local governments, and the civic groups. A ratio of parks and green areas increased from 13 percent to 27.5 percent. Pollution emitters such as general manufacturing businesses were prohibited from operating in the complex, while advanced technology enterprises were encouraged to join the park. A waterfront green area plan was also established in consultation with experts on October 2006.

In addition, the plan to reinvest expected development profits in regional environmental improvement projects was confirmed. Ninety-two billion won was earmarked for improving water quality in the lake, while 355.1 billion won was planned for the use of reducing air pollution including the conversion of incineration facilities into public corporation.

What is expected from these efforts is the continuous improvement of water and air quality in the area, the revitalization of the local economy, and contribution to the national economic development through job creation. The Sihwa project is expected to employ 70,000 persons a year, create a production effect worth nine trillion won, upgrade the backward industrial structure of Sihwa and Banwol complex, and build an innovative cluster. With the lake at the center, reed wetland, Sihwa MTV, tidal power plants, and Songsan Green City are expected to help the region emerge as a hub city of marine culture, turning it from the city of environmental pollution to the city of environmental restoration.

Table2-4-10 Economic Ripple Effects : Investment Effect (Construction Effect)

Classification	Production Inducement (Unit: trillion won)	Added Value (Unit: trillion won)	Employment (Unit: 10,000 persons)
Sihwa and Gyeonggi Province	4.2	3.3	5.8
Others	1.3	1.0	1.3
Nationwide	5.5	4.2	7.2

Source : Korea Planners Association. "Research on Sihwa MTV Development." 2006.

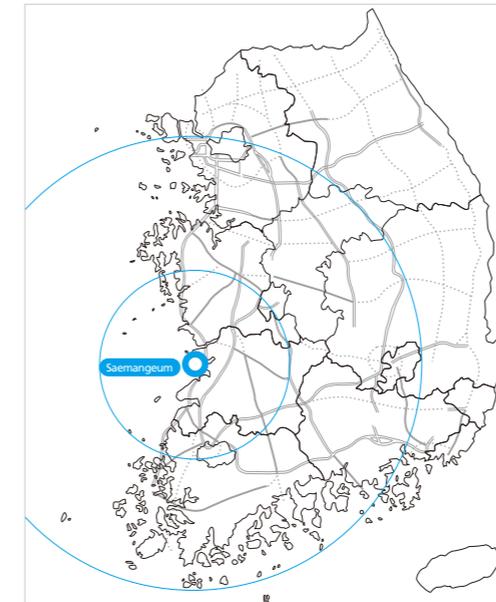
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## 5 Saemangeum (Development) Project

### 1. Project Outline

Origin of Project Name	With "sae" meaning "new," "man" is from Mangyeong Plain and "geum," which also reads "gim," is from Gimje Plain in North Jeolla Province, Korea, meaning the project will create a new plain in the region * The brand name of "Ariul" was launched for global promotion on January 28, 2010 when the Comprehensive Plan was designed.
Size of Area	401km <sup>2</sup> (2/3 size of Seoul, 140 times larger than Yeouido, 5 times larger than Manhattan, 4 times larger than Paris)
Length of Seawall	33.9km (the world's longest seawall) * The Zuiderzee Seawall in the Netherlands is the second longest at 32.5km



The Saemangeum Development Project is a national project aiming to expand Korea's territory by 401km<sup>2</sup> including a 283km<sup>2</sup>-wide reclaimed land and a lake of 118km<sup>2</sup> by building the world's longest seawall of 33.9km<sup>2</sup> connecting Gunsan and Buan in North Jeolla Province on the west coast of Korea. With a preliminary investigation that began in 1971, the Saemangeum seawall was completed in 2010. The project was first planned to reclaim land for agricultural use but later transformed into a multi-purpose development for industrial, tourism, and economic purposes due to economic and social changes.

## 2. Project Background and Purpose

### 1) Project Background

Severe droughts in the late 1960s and the global food crises in the early 1970s forced the Korean government to import rice. In a bid to strengthen food security, the government conducted a research to find potential sites for reclamation across the country and set up the tideland reclamation project on the southwest coast to acquire arable land. The reclamation project was designed to develop agricultural land of 4,020 square km as well as a large-scale comprehensive agricultural development project around the Geum River, Pyeongtaek, the Yeongsan River, and the Sapgyo River. The Saemangeum area was selected as part of the reclamation project at that time and, in 1971, it became part of the Okseo district large-scale agricultural development plan (hereinafter “Okseo Plan”).

The first phase of the Okseo Plan intended to develop the estuary of the Geum River and to improve irrigation and drainage around the river. The second phase attempted to reclaim land in Gimje, Buan, and Okgu District and to improve irrigation and drainage around the Mangyeong River. With IBRD’s aid, the Korean government pursued the first phase, which became the starting point of the Saemangeum development project. As reclamation projects aim to create new land from ocean, the entire southwest coast filled with well-developed mud flat became the target of the project. In the 1970s, the self-sufficiency of staple crops was a key national agenda and there was no opposition to reclamation projects. Moreover, the success of the Gyehwa Island reclamation project as a part of the First Five-year Economic Development Plan made not only farmers but also the general public welcome other reclamation projects.

During the second phase of the Okseo Plan targeting Gimje, Buan, and Okgu District around the Mangyeong and Dongjin River, rice production was hit hard by a cold wave in the early 1980s. The then Ministry of Agriculture, Forestry and Fisheries thus established a long-term development plan for the overall reclamation project on the southwest coast in January 1986 by expanding the ongoing large-scale agricultural development project. The long-term development plan, which combined several tideland reclamation projects, included the Buan District Comprehensive Rural Development Project by integrating Gimje, Okseo, and Buan Districts into one project unit. This was when large-scale reclamation projects such as Saemangeum were contemplated. The Ministry of Agriculture, Forestry and Fisheries conducted an internal feasibility study on the project and confirmed it by announcing the Action Plans of West Coast Reclamation Project on May 12th, 1987. The Saemangeum Project was finally launched in November 1991, having completed a series of legal procedures in the 1980s, such as analysis of economic feasibility, environmental impact assessment, consent of local residents, consultation with relevant government offices, and issuance of public water reclamation license.

### 2) Project Purpose

The objective of the Saemangeum Project has evolved over time. From enhancing food security at its early stage, the objective has been transformed into easing flood damages and water shortages, expanding national land, developing North Jeolla Province and the west coast, planning a new origin of human civilization, making a hub for new renewable energy, and developing a creative green waterfront city.

This section reviews the purpose and meaning of the project in terms of national land development and economic and social aspects.<sup>20)</sup> The national land development aspect is as follows.

First, the project can provide land resources necessary for industrial sites and urban land with affordable prices in addition to 200km<sup>2</sup> of agricultural land by reclaiming tidelands. Second, the large-scale reclaimed land can substantially expand the area of cultivated land per household, which was 1.37 hectares in Korea in 2000, lowest among OECD members, and facilitate an advanced farming system in the 21st century by adopting commercial farming and a new scientific farming system. Third, a new freshwater lake will be built in the mouth of the Mangyeong River and Dongjin River, which will provide farmlands with water and Mangyeong Plain with stable control of drainage. Fourth, poor transportation system in Jeolla Province will be substantially improved, as airports, ports, railroads and highways will be constructed in and around the reclaimed land in the Saemangeum area. Fifth, a variety of tourism industry will be promoted, such as agriculture tourism, industrial tourism, freshwater lake tour and West coast tour. Such tourist resources will be used to create a region-wide tourism structure by linking with other tourist destinations such as Byeonsan Peninsula, Mt. Naejang and Mt. Deokyu in North Jeolla Province.

On the other hand, economic and social purposes of the project are as follows. First, through raising the economic competitiveness of North Jeolla Province and its level of development, the project will help this lagging region accelerate economic development and thus contribute to balanced regional development. Second, the project will promote regional development by increasing income and jobs. Third, the project will help build a front base for continental trade in the era of the west coast. The Saemangeum reclaimed area, which is located at the very center of the Pan-Yellow Sea Rim embracing the entire Korean Peninsula, the east coast of China and the southern part of Japan, allows it to take advantage of its geographical centrality. Fourth, Korea’s economic development concentrated on the Gyeongbu axis, which connects Seoul and Busan, could spill over to the west coast by enhancing east-west connectivity between inland areas and the west coast.

As summarized in the Saemangeum Basic Plan, the project’s goals and meanings are as follows: increasing rice production at 95,000 tons a year, securing one billion tons of water resources, improving drainage for the frequently flooded 120-square kilometer-wide area in the Mangyeong Plain in Gimje, achieving transportation system efficiency by reducing the current 97.3km-long coastline to a length of 31.3km, and creating an employment of about 13,000 man-days during the project period.

20) Hong Uk-hi. “Environmental Disputes Cost Three Trillion Won: Saemangeum.” Jiseong, 2004. 70~76.

### 3) Project Content

The content of the Saemangeum Project has been changed over time. It includes the 33.9km km-long seawall, two sluice gates, 283-square kilometer-wide land, and a 118km<sup>2</sup>-wide freshwater lake. On March 16th, 2011, the Sixth Saemangeum Development Committee announced the Master Plan, which describes various plans to build a world-class green waterfront city. The Master Plan also includes the promotion of inflow of people, capital and technology through a spatial proximity of work and housing and the connection to a new port, the introduction of public transportation zones and Bimodal Trams, the active operation of marine transportation such as water buses and taxis, and the development of a world-class, green, and water friendly city. A new and renewable energy area, about 20km<sup>2</sup>, will house a photovoltaic energy and hydrogen fuel complex as well as a new and renewable energy technology R&D center in order to make the area a mecca of new renewable energy. An ecological and environmental area will also be developed as a repository of clean ecosystem where human and nature exist in harmony. Equipped with global competitiveness, agricultural land will be developed into an export base of high quality and advanced agricultural products. A complex marine leisure town will be constructed in the already created Sinsi-Yami tourism and leisure site. In addition, landmark construction will be actively pursued to create a future-oriented city brand for the Saemangeum area.

Figure2-5-1 Land Development and Infrastructure under the Master Plan (March 16th, 2011)



Table2-5-1 Saemangeum Project Outline

Classification		Content
Location		• Tideland in Gunsan, Gimje and Buan of North Jeolla Province
Project Duration		• First Phase : 73% of the total area by 2020 • Second Phase : 27% after 2021
Project Owner		• 7 agencies : Ministry of Education, Ministry of Culture, Sports and Tourism, Ministry for Food, Agriculture, Forestry and Fisheries, Ministry of Knowledge Economy, Ministry of Environment, Ministry of Land, Transport and Maritime Affairs, North Jeolla Province ※ The Saemangeum Development Committee includes the Ministry of Strategy and Finance and the Ministry of Security and Public Administration
Total Cost		• Total 22.2 trillion won (1.251 trillion won by 1999)
Project Content		• Area to be developed : 401km <sup>2</sup> - Land : 283km <sup>2</sup> - Freshwater Lake : 118km <sup>2</sup> - Sea Dikes : 33.9km from Gunsan to Buan
Sea Dikes	Length Cost Term	• 33km (19km completed with 59% constructed) • 1.73 trillion won (1.251 trillion by 1999) • November 1991-2003
Saemangeum Lake	Lake Size Basin Size Total Pondage Effective Pondage No. of days Average Depth River Inflow	• 96.7km <sup>2</sup> (Mangyeong Lake: 68.1km <sup>2</sup> , Dongjin Lake: 28.6km <sup>2</sup> ) • 2,924km <sup>3</sup> (30.2 times larger than the lake) • 535 million tons • 355 million tons • 129 days (in normal season), 98 days (with the Geum River water of 20 CMS) • 5.5m • 7 Streams and Rivers including the Mangyeong River (57.0km), the Dongjin River (43.9km), and the Jeonju Stream
Internal Development Project	Total Size Cost	• 283km <sup>2</sup> • 480 billion won

Source : Saemangeum Master Plan

### 4) Project Agency

The Saemangeum Project began in 1991 under the supervision of the Ministry for Food, Agriculture, Forestry and Fisheries. However, as its purposes multiplied, a host of government agencies such as the Ministry of Land, Transport and Maritime Affairs, the Ministry of Culture, Sports and Tourism, the Ministry of Education and Science Technology, the Ministry of Knowledge Economy, the Ministry of Environment, and the North Jeolla Provincial Office formed a project agency. The Ministry for Food, Agriculture, Forestry was responsible for building water banks, agricultural land, and rural towns; the Ministry of Land, Transport and Maritime Affairs for building infrastructure, such as roads and ports, and sites for multi-functional and hinterland cities; the Ministry of Culture, Sports and Tourism for developing a R&D site; the Ministry of Knowledge Economy for setting up a new renewable energy site;

and the Ministry of Environment for creating an environmental site. The Saemangeum Development Committee, established under the Prime Minister’s Office and the Saemangeum Development Task Force, which supports the committee, was responsible for coordinating and fine-tuning the project.

### 5) Project Progress

The progress of the Saemangeum Project is as follows.

Table2-5-2 Saemangeum Project Progress

Date	Content
1971-1986	• Investigation on potential sites for the Saemangeum Project and other basics
1986-1991	• Analysis of economic feasibility, assessment of environmental impact, legal procedures such as collection of residents’ agreement
November 28th, 1991	• Initiation of the Saemangeum Seawall construction
May 1999-August 2000	• Initiation of public-private joint research on water quality, tidal flat, economic feasibility
May 25th, 2001	• Decision of the Korean Government to set up an eco-friendly, gradual development direction
August 2000-March 2006	• Ongoing litigation against the project (The government won the case at the Supreme Court)
April 21st, 2006	• Final closure of the seawall
April 3rd, 2007	• Establishment of the Saemangeum Land Development Plan (farmland 72%, non-farmland 28%)
December 27th, 2007	• Legislation of the Special Act on Promotion of the Saemangeum Project (The Act went into effect on Dec. 28th, 2008)
April 2008	• Designation of 2,860 ha of the Saemangeum area as a part of the Saemangeum and Gunsan Free Economic Zone
October 2008	• Revision of the Saemangeum Land Development Plan into a complex development at a Cabinet meeting
December 2008	• Approval of the revised Saemangeum Land Development Plan by the Ministry for Food, Agriculture, Forestry and Fisheries
July 23rd, 2009	• Announcement of a draft of the Comprehensive Plan on Saemangeum Development (FDI+International business+tourism and leisure ⇒ development into a high-end complex city)
January 28th, 2010	• Announcement of the final Basic Land Development Plan and Comprehensive Implementation Plan on Saemangeum
April 27th, 2010	• Completion ceremony for the Saemangeum Seawall
March 16th, 2011	• Release of the Master Plan of the Saemangeum Project

The progress is divided into four phases as follows.

#### (1) Before the Formation of the Public-Private Joint Investigation Group (1971-May 1999)

Investigation on potential sites and basic items was conducted in 1971 for the Saemangeum Project. Since the mid-1980s, the government have gone through a host of preparatory work including economic feasibility analysis, basic plan, consultation with relevant government offices, environmental impact assessment, public announcement, collection of residents’ consent, issuance of Public Water Reclamation Licenses. It launched the construction of the seawall on November 28th, 1991.

The early stage of the project went smoothly until environmental activist groups began stressing the need to preserve mud flats in a bid to join the Ramsar Convention<sup>21)</sup> in 1996. At the same time, Sihwa Lake’s water pollution issue aroused concerns about the Saemangeum Project. As the water quality of the Mangyeong River, the upper stream river flowing into the Saemangeum Lake, exceeded the standards required for agricultural water, it was necessary to improve and protect water quality of the upper stream river and the Saemangeum Lake. In addition, the value of mud flat, which has not been previously considered in reclamation projects, and the impact of reclamation projects including impact on marine ecosystem, came to the fore for public debate.

North Jeolla Province environmentalists’ campaign against the project in 1997 grew into a public debate over whether to stop the project, as the voices of civic groups became louder and the importance of global environmental protection grew along with the launch of the “Government of the People” of the Kim Dae-jung administration in 1998. On April 27th, 1998, the Board of Audit and Inspection of Korea initiated a special inspection on the project and released its report on September 24th. The report estimated that the plan to develop a multi-functional industrial complex, instead of an agricultural land, would cost 28 trillion won, which provided a reason for the groups against the project to question the economic feasibility of the project.

On January 11th, 1999, Yu Jong-geun, the Governor of North Jeolla Province, said at a press conference that the entire project could be reexamined. On the next day, Kim Seong-hun, then the Minister of Food, Agriculture, Forestry and Fisheries also said that he would consider the reexamination upon the provincial office’s request. Environmental groups demanded a complete halt or cancellation of the project and a public-private joint investigation for a fair evaluation. In response to these demands, North Jeolla Province suggested a public-private joint investigation on January 14th, 1999. The Commission on Protection of the Quality and Supply of Fresh Water Resources under the Office of the Prime Minister conducted four rounds of relevant ministry meetings and two rounds of private committee meetings on water management policies and finalized a joint investigation plan

21) The Ramsar Convention is an international treaty for the conservation and sustainable utilization of wetlands. On February 2nd, 1971, 18 nations gathered and signed the convention in Ramsar, Iran, which took effect on December 21st, 1975. As of 2008, 157 nations joined the convention with Korea the 101th member. In 2008, Korea held the 10th Conference of Parties meeting in Changwon, South Gyeongsang Province.

for the environmental assessment of the Saemangeum Project on April 22nd, 1999. On May 19th, the government formed a public-private joint investigation task force on the environmental assessment of the Saemangeum Project and decided to temporarily suspend the construction of the seawall and conduct an overall review of environmental impact assessment of the project.

#### (2) Public-Private Joint Investigation on Environmental Assessment and Government's Deliberations on Decision (May 1999-May 2001)

The joint investigation task force was mandated to investigate, research, assess, and review environmental impact, economic feasibility including the economic value of mud flat and rice paddies, modeling outcomes of the Saemangeum Lake's water quality estimations, and draft protection measures of water quality. For about 16 months from May 1999 to August 2000, each subcommittee conducted an in-depth review on three aspects including economic feasibility, environmental preservation, and the possibility of water quality preservation in the Saemangeum Lake. On August 18th, 2000, the task force submitted its final report to the Prime Minister's Office and was dissolved.

As the joint task force was disbanded without having reached a conclusion whether to stop the project or not, the Prime Minister's Office then took over the project from the Ministry for Food, Agriculture, Forestry and Fisheries. Since August 2000, the political circles, the government, and civic groups have been in a heated debate whether to continue the project. The Korean Federation for Environmental Movement, the Green Korea United, some religious groups, and supportive figures from the academic and cultural circles banded together to issue a statement urging the immediate halt of the project by shedding a spotlight on its water quality issues and economic value of mud flat. In result, the Saemangeum project became embroiled in a nationwide dispute.

Against this backdrop, the Ministry of Environment submitted a report to the Prime Minister's Office in late 2000, which basically said that the water quality of the Saemangeum Lake could not be improved to level IV, the standard water quality level with a total phosphorus concentration less than 0.10 milligram per liter. The Ministry of Environment, citing the results of the National Institute of Environmental Research on the water quality under the scenario suggested by the Ministry for Food, Agriculture, Forestry and Fisheries, North Jeolla Province and the joint investigation task force, concluded that regardless of the counter measures, the water quality could not be improved to the suitable level for agricultural water, indirectly expressing its opposition to the project.

Upon receiving the report from the ministry, the Commission on Protection of the Quality and Supply of Fresh Water Resources at the Prime Minister's Office immediately ordered relevant authorities to review existing water quality protection measures all over again and to design additional measures to lower the level of water contaminants flowing into the Saemangeum Lake. In early March 2001, the Ministry of Oceans and Fisheries expressed its opposition, citing concerns over severe marine pollution and extensive

damage to the tidal flat. As such, opinions diverged within the government: the Ministry for Food, Agriculture, Forestry and North Jeolla Province argued for the project, whereas the Ministry of Environment and the Ministry of Oceans and Fisheries suggested its suspension. A tug-of-war continued until May 2001.

On May 7th, 2001, the Prime Minister's Office and the Commission on Sustainable Development co-hosted three rounds of public discussions to reach an agreement, which bore no fruit. Considering the outcome of the joint committee and the public opinion compiled from the public discussion, the government settled on an eco-friendly, gradual development and resumed the project on May 25th, 2001. The plan was first to develop the relatively cleaner Dongjin River and later to develop the Mangyeong River after the reassessment of the water quality improvement effects. In August 2001, the government announced detailed action plans, in which the Task Force for Environmental Impact of Saemangeum Project was to be set up under the Office for Government Policy Coordination and the Water Quality Protection Committee under the North Jeolla Provincial Office in order to monitor and evaluate the implementation measures of environmental policies of the project.

#### (3) After the Government's Policy Decision (June 2001-April 2006)

The campaign against the Saemangeum Project had been quiet for about a year after the government's policy decision in 2001. With the beginning of Roh Moo-hyun administration, the Saemangeum project became once again a social issue in lieu with opposition movements against most of the national projects such as the Gyeongin Canal, the Seoul Ring Expressway, Gyeongbu High-Speed Railway, radioactive waste processing facilities and the Hantan River dam. With the argument that a large-scale agricultural land development was no longer needed due to years of good rice harvest, some religious leaders and environmental groups led a "three steps and one bow" walk for 305km from Buan to Seoul, attracting wide media coverage. This, in turn, stirred a serious dispute over the project, making it as the most conflictual national project in Korea.

The protesters also filed a lawsuit against the project to stop it. Environmental groups and some local fishermen filed a total of five lawsuits such as three administrative litigations, one constitutional complaint, and one request for suspension of execution, in order to stop the project's reclamation license (Table 2-5-3).

However, the Supreme Court ruled that "there were no flaws big enough to disturb the project's purpose and as the constitution recognizes the value of not only the environment but also development, a balanced, reasonable, and rational approach is needed to resolve the issue of conflicting values of environmental protection and development in implementing the project." As such, the legal battle, which had lasted for four years and seven months, came to an end in favor of the government. On April 21st, 2006, the successful completion of the last tide embankment construction settled the dispute over the seawall construction for the time being.

Table2-5-3 Lawsuits against the Saemangeum Project

Case Name	Plaintiff	Defendant	Content	Progress and Ruling
Administrative Litigation	Jeon Su-jin and 174 others (Green Korea United)	<ul style="list-style-type: none"> <li>Minister of Agriculture, Food and Rural Affairs</li> <li>Minister of Oceans and Fisheries</li> </ul>	Cancellation of public water reclamation license	<ul style="list-style-type: none"> <li>Filing date: May 4th, 2000</li> <li>Original ruling: July 25th, 2001 - dismissed</li> <li>Appeal Court ruling: May 15th, 2003 - dismissed</li> <li>※ The case was ruled unqualified as it did not go through administrative trial procedures and had unqualified plaintiffs</li> </ul>
Constitutional Complaint	Jo Gyeong-hun and 3,538 others (Korean Federation for Environmental Movement)	<ul style="list-style-type: none"> <li>Prime Minister</li> <li>Minister of Agriculture, Food and Rural Affairs</li> </ul>	Cancellation of the government's policies and plans	<ul style="list-style-type: none"> <li>Filing date: August 22nd, 2001</li> <li>Court ruling: January 30th, 2003 - dismissed</li> <li>※ Unqualified constitutional complaint</li> </ul>
Request for Suspension of Execution	Choe Yeol, Jo Gyeong-hun, Sin Hyeong-rok and others	<ul style="list-style-type: none"> <li>Prime Minister</li> <li>Minister of Agriculture, Food and Rural Affairs</li> </ul>	Suspension of execution of the Saemangeum Seawall	<ul style="list-style-type: none"> <li>Filing date: June 12th, 2003</li> <li>Original ruling: July 15th, 2003 (decision to suspend the execution)</li> <li>Immediate complaint: July 15th, 2003 (Seoul High Court)</li> <li>Appeal Court ruling: January 29th, 2004 (reversing of the original ruling)</li> <li>Withdrawal of the suit: January 12th, 2005 (The government won the case)</li> </ul>
Administrative Litigation	Jo Gyeong-hun and 3,538 others (Korean Federation for Environmental Movement)	<ul style="list-style-type: none"> <li>Prime Minister</li> <li>Minister of Agriculture, Food and Rural Affairs</li> </ul>	Cancellation of the government's policies and plans	<ul style="list-style-type: none"> <li>Filing date: August 22nd, 2001</li> <li>Original ruling: February 4th, 2005 (Seoul Administrative Court)</li> <li>Appeal Court ruling: December 21st, 2005 (The government won the case)</li> <li>Supreme Court ruling: March 16th, 2006 (The government won the case)</li> <li>※ Final supreme court decision</li> </ul>
Administrative Litigation	Lee Hwa-sun and 60 others	<ul style="list-style-type: none"> <li>Minister of Agriculture, Food and Rural Affairs</li> </ul>	Revocation of refusal disposition of the request for the cancellation of public water reclamation license	<ul style="list-style-type: none"> <li>Filing date: July 27th, 2005</li> <li>Withdrawal of the suit: March 21st, 2006 (The government won the case)</li> </ul>

(4) After the Seawall Construction (April 2006-)

Since the government won the legal battle, the construction of the Saemangeum Seawall continued and, in April 2006, the 33.9km-long seawall was completely connected. In addition, the construction to reinforce cross sections and level up the road was scheduled to be completed in the first half of 2011. For the convenience of local residents and tourists, the road on the seawall was

temporarily opened in April 2010.

The government designed the land development plan with the site mostly developed into farmland (72 percent farmland and 28 percent non-farmland) in April 2007. However, in October 2008, the government revised the land use plan allocating 30 percent of farmland and 70 percent of multi-functional land to meet the future demand associated with the idea of Northeast Asia's economic hub. This revision was based on an intensive review including the feasibility study of Korea Research Institute for Human Settlements, public hearings, briefing sessions for farmers' associations, consultations with local governments, and Cabinet meeting reports.

Under the revised plan, the government finalized and announced the Saemangeum Basic Development Plan and the Comprehensive Action Plan on Saemangeum Development on January 28th, 2010, which incorporates a broad land usage and infrastructure plan. These plans aimed at developing the inland tideland gradually into sites for farming, industries, tourism, new renewable energy, and environmental purposes. Based on the spatial planning suggested by the Saemangeum Basic Development Plan, the Sixth Saemangeum Development Committee, in March 16th, 2011, examined and finalized a comprehensive development plan, which includes more specific land use plan for eight sites and an infrastructure building plan.

### 3. Arguments and Grounds of Proponents and Opponents

#### 1) Issues and Logic of Proponents and Opponents

##### (1) The Need for Prime Farmland Development

- Arguments and Grounds of Opponents

The opponents argued against the large-scale prime farmland development project, citing reasons such as excessive rice inventory, curtailment policies including set-aside payment programs for rice paddies, and continuous decrease in farmland and rice consumption. Considering such background conditions, the opponents emphasized the weak rationale for farmland development.

They added that it was meaningless to estimate the value of food security amidst the current international circumstances and a liberalization trend of global trade. And it was also unreasonable to appraise the security value of rice with the Contingent Valuation Method, despite the existence of market value for rice. The opponents also argued that the valuation method conducted by non-professionals entailed a risk of double calculation of agricultural benefits, the creation of a new freshwater lake, and the effect of expanding national territory.

- Arguments and Grounds of Proponents

The government had a firm stance that the long-term stable supply of staple crops was necessary by securing prime farmlands, considering the extreme weathers worldwide, the possibility of food shortages in China, food crisis in North Korea, the domestic food self-sufficiency rate of 27 percent, and the necessity of farmland restructuring such as the utilization of marginal farmland with falling productivity when converted into a farmland.

Supplemental arguments were made by the government. The world grain market was highly volatile, as only a few grain exporters could manipulate grain prices through export restrictions and price control. The Presidential Advisory Council on Science and Technology reported that global food production had increased 2.3 percent in the 1990s, while the global population had increased more than 10 percent, posing serious burden on food supply. The General Director of the Food and Agricultural Organization (FAO), Jacques Diouf, was quoted to have warned of imminent global food crisis due to the shortage of grain inventory and its soaring prices. With respect to rice in particular, the International Rice Research Institute was quoted to have expected that Asia would experience food shortages in the mid-21st century and food security would become more important than military security. The government further argued that, with smaller arable land per capita and lower food self-sufficiency rate, Korea would need to secure productive farmland in order to gain a foothold in competition for global agricultural products amidst the increasingly open global market due to free trade agreements and the Doha Development Agenda.

## (2) Water Quality Improvement of Saemangeum Lake

- Arguments and Grounds of Opponents

The opponents argued that the project should be cancelled, as it was impossible to improve the water quality for the following reasons: possible lawsuits like those related to Lake Sihwa; infeasible government's measures to improve water quality; recent lifting of the greenbelt in Jeonju; difficulties in reducing fertilization on farmlands and in attaining the Ministry of Environment's water improvement target.

With respect to water quality, the joint committee, based on the water quality improvement measures suggested in the project plan, predicted the level of total phosphorus ("T-P") concentration of 0.19 milligram per liter for the Mangyeong River and 0.10 milligram per liter for the Dongjin River. The Board of Audit and Inspection expected 12.1 milligram per liter of Biological Oxygen Demand (BOD) level. Even with all the theoretically possible measures implemented, Mangyeong River's water quality would still fall short of the standard level IV, estimated at 0.103 milligram per liter of T-P concentration. The estimated T-P concentration

level would not be critical to agricultural water. However, as hyper-eutrophic conditions were expected, it might lead to excessive breeding or extinction of birds and negative impacts on the lake's ecosystem during the process of dissolution, which would make it harder to manage water quality in the Mangyeong River. In short, the opponents insisted that the project itself could possibly go to waste, failing to achieve its goal to supply agricultural water.

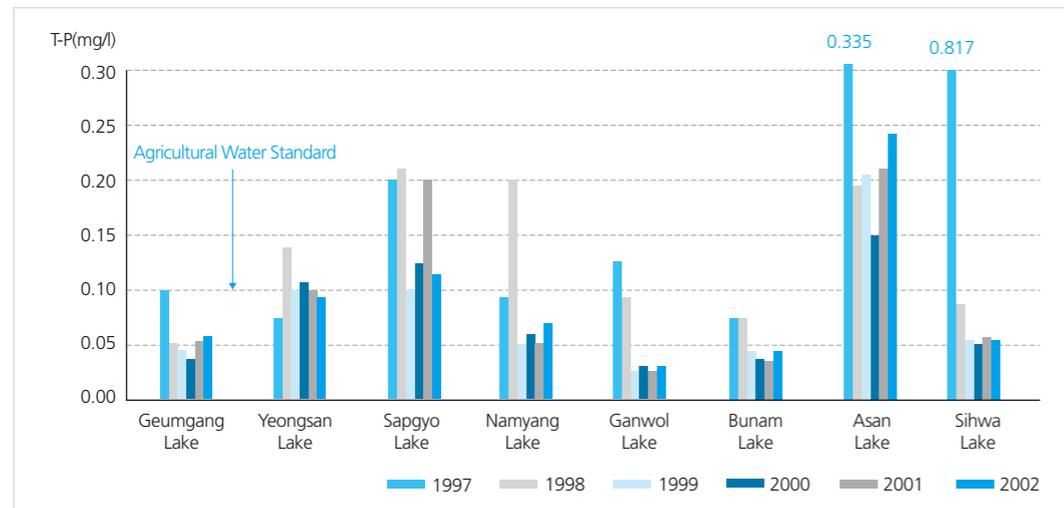
- Arguments and Grounds of Proponents

The government held a position that it had already achieved or is nearly achieving the 2012 forecasted water quality level of the Ministry of Environment, due to reasons such as the fundamental differences between Saemangeum Lake and Sihwa Lake, firm implementation of water quality measures such as basic treatment facilities, the designation of the green belt in Jeonju area, the introduction of a total pollution load management system, and the accomplishment of the reduction target of fertilization. It also added that continuous water quality management policies would help fully achieve the target quality.

The government saw it feasible to attain a target to reduce 94.5 percent of livestock manure discharged from Wanggung livestock farming estates located in the upper basin of the Saemangeum Lake as the target for the Saemangeum area was not exceptional, but similar to those of Korea's major rivers; 95.9 percent for the Nakdong River, 93.9 percent for the Geum River, and 93.4 percent for the Yeongsan River. The government added further explanations: while total phosphorous can cause hyper-eutrophic conditions, algae caused by hyper-eutrophic conditions emerges temporarily and limitedly only when external conditions are satisfied; and it does not pose serious problems, as lakes have active water circulation and receive muddy water when flooded.

As for Korea's freshwater lakes located in the estuary of a river, similar to the Saemangeum Lake, the Namyang Lake's T-P concentration level temporarily rose to 0.348 milligram per liter in July 2000, but regained its normal level of 0.008 in August. The figure ranged from 0.093 to 0.679 for the Asan Lake, from 0.079 to 0.248 for the Sapgyo Lake, and from 0.048 to 0.178 for the Yeongsan Lake. However, they neither have algae formation by hyper-eutrophic conditions on a constant basis nor any problems in supplying agricultural water.

Figure2-5-2 T-P Concentration in Korea's Freshwater Lakes



Source : Hong Uk-hi. "Environmental Disputes Cost Three Trillion Won: Saemangeum." Jiseong, 2004. 160.

### (3) Economic Feasibility of Saemangeum Lake

#### • Arguments and Grounds of Opponents

The opponents asserted that mud flat should be preserved for the following reasons: 1) the joint committee's economic feasibility study was distorted with double-counting; 2) ecological value of mud flat is higher than that of agricultural land; 3) the estuary wetland has scarcity value; and 4) the area is a global destination for migratory birds. Furthermore, mud flat is emphasized as sustainable resources with its growing value over time. New valuation methods such as integrated model of ecology and economy would emerge and improve methods to measure the value of mud flat. Quoting the estimated ecological value of the estuary mud flat worth 9,990 dollars per hectare, which is 100 times more than that of agricultural land worth 92 dollars, from the Nature journal, the opponents came up with the estimated value of the Saemangeum area between 200 to 800 billion won per year if preserved.

They added that Korea, as a signatory of the Ramsar Convention and a member of the World Trade Organization, might ruin its reputation when it damages or destroys the environment. Once again, the importance of the Saemangeum tidal flat as an international habitat for migratory birds was emphasized.

#### • Arguments and Grounds of Proponents

Both economic feasibility studies, conducted by the Korea Institute for Industry and Economics in 1988 and the joint committee in 2001, were said to be reliable since many experts from the academia participated in them. The proponents rebutted that article in Nature journal, often

cited by environmental activist groups, lacked fairness as it estimated the value of rice fields at 110,000 won per hectare, while arguing that a vast area of valuable tidal flat still remained. From 1986 to 1988, the Korea Institute for Industry and Economics carried out an economic feasibility study on three types of development: agriculture-centered development, agriculture and fisheries oriented development, and comprehensive development. The study revealed that the agriculture and fisheries oriented development, for which the reclamation license was issued, was economically feasible, posting the benefit to cost ratio at 1.19 with a 10 percent discount rate and the internal rate of return at 11.5 percent. Values for tidal flats and agricultural lands differed by experts; the Sejong Institute at Sejong University estimated that the value of agricultural land was 2.6 times higher than that of the tidal flat; the Korea Institute for Industry and Economics, 1.9 times higher; and Chung-Ang University, 1.4 times higher. Being wetlands like tidal flats, agricultural land was pointed out to play various environmental preservation roles and was expected to have increasingly higher value in the future than tidal flats.

Table2-5-4 Issues of the Saemangeum Project's Economic Feasibility

Classification	Proponents' Arguments	Opponents' Arguments	Remarks
Land Expansion Effect	28,300 ha, 84 times larger than Yeouido, Seoul	Increase in agricultural and fishery products, prevention of flood, and provision of shelter were already counted and thus there existed double counting	Double counting eliminated by a scenario analysis
Value of Food Security	Annual benefit of 42.9 billion won	Overstated and abstract value of rice security	Same as above
Public Interests of Rice Fields	Annual benefit of 380.6 billion won: flood control, water quality improvement	Overstated benefit, considering the total value of the tidal flat	Aesthetic and scenery value of rice fields should be considered
Tourism Benefits	Annual benefit of 143.3 billion won as of 2030	Doubts over the reliability of the study	-
Value of Tidal Flat	Annual benefit of 242.2-501.7 billion won	Omitted value of various biological resources and birds, and increasing value of tidal flat	Cost Team's analysis
Rise in Land Value of Gogunsan	158-220.2 billion won	Calculation of financial benefits from public projects goes against academic customs	-
Value of Fishery Product	Annual value of 50 billion won as of 2013	Omitted decrease in fishery products around the Saemangeum area	Cost Team did not submit the analysis data

Source : National Commission on Sustainable Development's report on the Saemangeum Project, "Inflated Economic Feasibility of Saemangeum." Donga Daily 13 March 2001.: 32

The proponents refuted the arguments of environmental groups on the grounds that: the Ramsar Convention focused on wise utilization of tidal flat for food supply rather than on its preservation; the World Trade Organization recognized the multifaceted function of agricultural land; and the most populated habitats in Korea for migratory birds were mostly reclaimed lakes or farmlands such as the Cheonsu Gulf and Yeongsan Lake.

Table2-5-5 Value of Saemangeum Tidal Flats vs. Value of Rice Fields

Classification	Korea Ocean Research & Development Institute	Korea Institute for Industry & Economics	Chung-Ang Univ.
Research Object	Tidal flat and farmland	Phase IV of Yeongsan river development	Saemangeum Area
Report Date	December 1996	July 1998	November 1999
Value of Tidal Flat per ha	20.25 million won	9.36 million won	9.01 million won
Value of Farmland per ha	6.1 million won	17.37 million won	12.76 million won
Compared Economic Value	Value of tidal flat was 3.3 times higher than that of farmland	Value of farmland was 1.9 times higher than that of tidal flat	Value of farmland was 1.4 times higher than that of tidal flat
Remarks	<ul style="list-style-type: none"> <li>Case studies of wetland focusing on biological value in other countries were applied to tidal flat in Korea</li> <li>Farmland was only evaluated for its rice production</li> </ul>	<ul style="list-style-type: none"> <li>Natural disaster control and atmosphere clean-up function was not reflected in the value of tidal flat</li> </ul>	<ul style="list-style-type: none"> <li>Environmental value of farmland not reflected in other country studies was considered</li> <li>Farmland had environmental clean-up function, 1.3 times higher than that of tidal flat</li> </ul>

Source : Hong Uk-hi. "Environmental Disputes Cost Three Trillion Won: Saemangeum." Jiseong, 2004. 106.

(4) Stoppage of Seawall Construction and Seawater Circulation

• Arguments and Grounds of Opponents

The opponents claimed it was more favorable and economical for regional development to stop embankment construction at the mouth of the seawall and to open a part of the fourth seawall and build a bridge across the gap so as to let seawater circulate permanently and to preserve the tidal flat.

They also criticized that even if the development took place gradually, it would stop seawater circulation, which, in turn, would destroy the intertidal zone and marine ecosystem. Moreover, when the Saemangeum waters were desalinated, it was pointed out that the increase in chemical oxygen demand would reach a whopping 90 milligram per liter.

• Arguments and Grounds of Proponents

The government asserted that, although past reclamation cases showed a partial increase in pollution during the process of desalination, it could be effectively eased through sluice gates and bottom water removal facilities. For example, the Geumho Lake in South Jeolla Province, of which the seawall was completed and the desalination process began in 1996, revealed the water quality of 3.2 to 6.9 milligram per liter at an early stage of desalination in 1997 and maintained the quality in the range of 3.7 to 6.8 milligram per liter until now, satisfying the agricultural water standards.

The government explained that if the construction was suspended, leaving the 2.7km-long mouth incomplete, the originally expected outcomes of the project would all have been abandoned, including prime farmland and freshwater lakes. It also added that dirt and rocks, which composed an already completed seawall, would be washed away by the fast current and high waves, which, in turn, would cause enormous environmental damages and massive economic losses. If this happened, there would be strong protests by local residents, who had expected the project to be completed ahead of schedule, and thus would add social confusion.

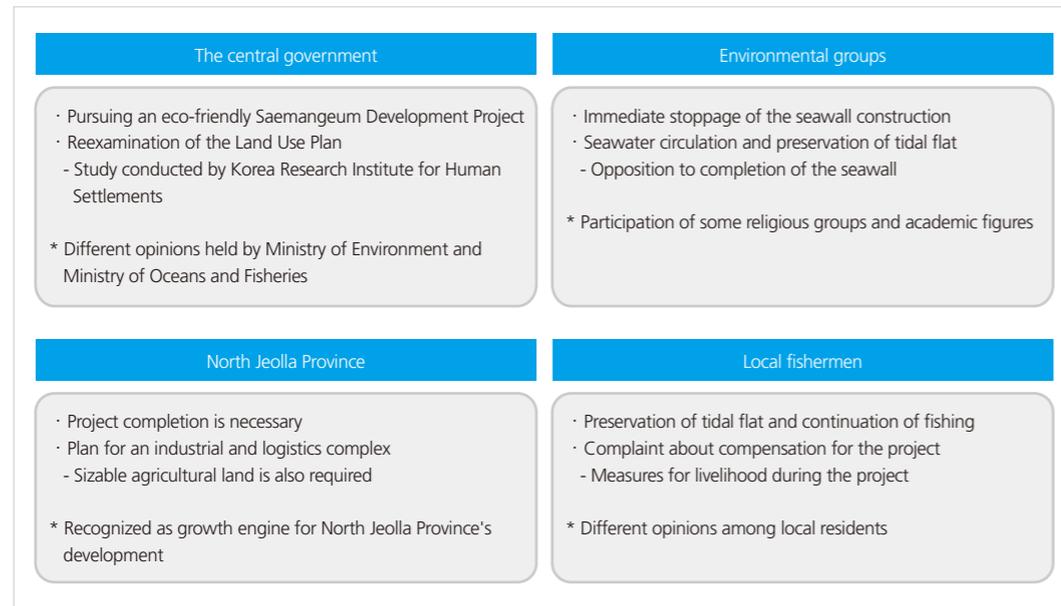
2) Persuasion Strategy

(1) Parties in Conflict

Parties in conflict surrounding the Saemangeum Project are divided into the proponents, the Korean government and North Jeolla Province, and the opponents, environmental activist groups and some local fishermen. There were different opinions about the project among ministries, such as the Ministry of Environment and the Ministry of Oceans and Fisheries, as well as among local residents.

The Ministry for Food, Agriculture, Forestry and Fisheries maintained a consistent stance that the project should be completed in order to achieve national development and agricultural competitiveness, considering the circumstances wherein the country is situated. The ministry took a position that decisions on land use will be made after fully reflecting opinions from various sectors regarding the study by the Korea Research Institute for Human Settlements, while carrying out environmental measures to improve the quality of the Saemangeum Lake. The Ministry of Environment was skeptical about the quality preservation of the Saemangeum Lake, while the Ministry of Oceans and Fisheries focused on the preservation of the tidal flat. To the public, these different stances certainly looked like discords within the government.

Figure2-5-3 Parties in Conflict and Arguments



From the early stages of the project, North Jeolla Province continued to hold a position that the Saemangeum project should be completed as a growth engine for the province. Local residents mostly thought that the province lagged behind other regions in economic growth. While dissatisfied with the movement of environmental groups, who opposed to the project, local residents reacted strongly. With a local government at the front, they rolled up their sleeves to improve water quality of the Mangyeong and Dongjin River, waging a voluntary clean-up campaign.

Environmental activist groups and some religious groups, which were mainly comprised of members of the Korean Federation for Environmental Movement and Green Korea United, demanded an immediate halt of the project and made it clear that there would be no dialogue without the promise of the stoppage of the seawall construction. While amplifying the core issues of the debate such as water pollution of the Saemangeum Lake, the economic value of the tidal flat, and the unnecessary development of large-scale farmland, these groups raised constitutional complaints, suspension of execution, and administrative litigation along with various campaigns one after another.

As the project emerged as social conflict, local fishermen in the Saemangeum area became the new stakeholder. They received substantial compensation as they were in favor of the project at an early stage of the development. However, as the project was prolonged due to the opposition movement by environmental groups and their compensation was exhausted, some of them turned their backs on the project. On the contrary, most local fishermen were hoping for the prompt completion of the

seawall construction, which would boost the local economy and create new fishing grounds outside the seawall so that they could go back to work.

### (2) Types of Conflicts

An acute confrontation between proponents and opponents was a cause of conflict in the Saemangeum project. Opponents took diverse and active strategies. The types of conflicts came in the form of lawsuits, media campaigns, symposiums, academic conferences, and various events such as artistic performances. In particular, as environmental issues became a social interest, journalists' role to report the arguments of environmental activist groups had a grave impact on amplifying the disputes between the proponents and the opponents.

In addition, media pieces written by scholars majoring in humanities and sociology, who recognized the value of environment, made an emotional appeal to the public. Some religious leaders' performance such as a "three steps and one bow" walk,<sup>22)</sup> had a strong appeal. These movements made public recognize the project as a major social conflict by focusing on the problems instead of the whole picture of the project.

Another type of strategy often used by groups and individuals who oppose the national projects is lawsuits. Regarding the Saemangeum project, although Green Korea United organized a lawsuit in defense of future generation and the Korean Federation for Environmental Movement brought a constitutional complaint. Even though two administrative litigations were dismissed one after another by the court, they brought a similar litigation to the court in another name.

These groups also waged a campaign to make the Saemangeum an international issue by participating in international environment-related events and forging solidarity with globally renowned environmental activist groups such as Japanese environmental groups against the Isahaya Bay Reclamation Project.

22) "Three steps and one bow" walk is the most humble and respectable way to practice asceticism and pray with repentance in Buddhism. Prayers walk three steps, prostrate, rise and repeat.

Table2-5-6 Major Issues and Arguments of Proponents and Opponents over Saemangeum Project

Classification	Opponents (Environmental Organizations)	Proponents (Government)
Concerns over Another Environmental Disaster Such as Sihwa Project	Considering the fact that, compared to Lake Sihwa, Saemangeum Lake is shallower in depth and 1.3 times larger in per unit population, accommodating 8 times more Korean native cattle, 13 times more pigs, and 10 times more rice paddies and 5 times more fields, there will be more serious environmental problems, if Saemangeum turns into a freshwater lake	<ul style="list-style-type: none"> <li>• Comparison between the two lakes is impossible because Lake Saemangeum is fundamentally different from Lake Sihwa in terms of several factors, including distribution of pollution sources, quality of inflow rivers, and circulation cycle of lake water                             <ul style="list-style-type: none"> <li>- Water Quality : Lake Sihwa 27.5mg/l, Mangyeong River 7.1mg/l, Dongjin River 2.9mg/l</li> <li>- Circulation Cycle : Lake Sihwa 10 months, Lake Saemangeum 2.5 months</li> </ul> </li> <li>• Unlike Lake Sihwa, in which problems emerged after the final closure, measures on water quality were implemented before the final closure in Lake Saemangeum</li> </ul>
Livestock Manure	94.5-percent treatment target of livestock manure is not feasible	94.5-percent treatment target of livestock manure from the Wanggung livestock complex on the upper region of Lake Saemangeum is similar to water quality control targets in Korea's other major rivers (Nakdong River 95.9%, Geum River 93.9%, Yeongsan River 93.4%)
Loss of Migratory Birds' Habitat	Loss of tidal flats will cause loss of migratory birds' habitat and subsequently, migrant birds	The census of winter birds conducted by the Ministry of Environment in 1999 showed that the top 7 most popular habitats out of 69 places for migratory birds were reclaimed lands (60.6%, 1.068 million birds)
Reduction of Shellfish	Saemangeum project will cause 50-percent reduction of shellfish nationwide	Statistical Yearbook of Maritime Affairs and Fisheries published by the Ministry of Oceans and Fisheries in 1999 indicated that the volume of shellfish produced by the entire general fishing and aquafarming industry of North Jeolla Province took up a mere 3.3% of Korea's total production in 1998 (Argument of 50-percent decrease turned out to be erroneous) <ul style="list-style-type: none"> <li>- Nationwide 319,000 tons, Northern Jeolla 11,000 tons</li> </ul>
Loss of Tidal Flats	If the Saemangeum project starts, tidal flats of Saemangeum, which are the treasure trove of the marine ecosystem, will go extinct	Even after the seawall was formed in the Southwestern coastal region by tidal sedimentation, new tidal flats have continued to be created <ul style="list-style-type: none"> <li>- 219km<sup>2</sup> of tidal flats have been created in Saemangeum after the projects were conducted in the Okgu, Jinbong, and Gwanghwal regions between the 1920s and 1940s, the Gyehwa region in 1968</li> <li>- Tidal flats were also created in Asan, Sapgyo, lower region of the Geum River, and the Southern region of Ganghwa</li> </ul>

(3) Persuasion Strategy on Conflicts

The government and project operators made diverse efforts to resolve the conflicts and forge social consensus. For the first time in Korea's history, a public-private joint investigation team on environmental impact of a national project was formed and operated, and issues were publicly discussed through open forums. Efforts were also made to promote the project nationwide and persuade the public. After the project was decided to proceed, the Committee for Environmental Improvement of Saemangeum Project was formed and operated, leading the Saemangeum project to become an eco-friendly one through monitoring environmental impact and water quality.

With the Water Quality Improvement Task Force of the Prime Minister's Office playing a key role in intergovernmental discussions during April 1999, the government announced the Public-Private Joint Investigation Plan on the Environmental Impact of Saemangeum Project on April 22nd, 1999. The Public-Private Joint Investigation team was composed of three subcommittees, including economic feasibility, water quality, and marine and environment, including a total of 30 members (21 experts from the private sector and 9 director-generals of relevant government agencies). Of the 20 experts except the head of the investigation team, ten members were recommended by relevant government agencies, while the other ten members were recommended by environment organizations. Investigation and research plans of the team were approved after plenary sessions, and the results of investigation were confirmed at the plenary sessions after the review of subcommittee meetings. The introduction and operation of the Public-Private Joint Investigation team was meaningful in that it was the first system in Korea introduced under the aim of managing conflicts and forming social consensus over a national project.

In the process of laying out additional government measures after the completion of the public-private joint investigation, open forums were held by multiple stakeholders, such as the National Assembly, academia, civil groups, and media. Between May 7th and May 11th, 2001, three rounds of open forums and assessment sessions were held jointly by the Office for Government Policy Coordination and the Commission on Sustainable Development. During the open forums, there were disputes among the government, private experts, environmental organizations, and North Jeolla residents, and intensified debates about the pros and cons of the project among the public. In result, there was no way of reaching an agreement through discussion.

During the two-year period of the joint investigation and open forums, the government realized that the halt of the seawall construction that had already proceeded for nearly ten years was causing soil erosion and thus a waste of budget. Moreover, the government became aware of that, if the disputes went unchecked, conflicts and distrust might grow and lead to division of public opinion. Therefore, the government made a judgement that it was urgent to make a reasonable decision based on investigation results and opinions collected so far. Against this backdrop, on May 25th, 2001, the government held the Coordinating Committee on Water Management Policy chaired by the Prime

Minister and decided on the policy of eco-friendly sequential development in which “the seawall will be completed under the condition that Dongjin waters with relatively high water quality will be among the first areas to be developed, whereas the development of Mangyeong waters will be postponed until its water quality satisfies the target standards.”

On August 6th, 2001, in accordance with government policy, the Ministry of Agriculture and Forestry, the Ministry of Environment, the Ministry of Oceans and Fisheries, and Northern Jeolla Province respectively set out their own detailed follow-up plans for the implementation of environment measures, and the Task Force for Environmental Measures of Saemangeum Project joined by private experts was set up within the Office for Government Policy Coordination to monitor and assess the progress of implementation of environment measures.

Policy promotions toward the general public were also actively pursued. In response to environmental organizations’ aggressive media manipulation, public relations placed an emphasis on the economic benefits of the project such as territorial expansion, securing water resources, increasing food production, reducing traffic, preventing floods, and promoting tourism, while raising the public awareness of the government determination towards environmentally friendly development such as the efforts to improve the water quality of Lake Saemangeum, and the need for securing farmlands in preparation for future food shortage. Diverse PR methods, such as media, PR materials, advertisements, the Internet, and field visits, were adopted to promote understanding and persuade the public.

Feature writings were heralded through holding press conferences and distributing press releases on each issue, concerning the construction of final closing of the Saemangeum seawall, court decisions on the Saemangeum lawsuit, and decisions on the land use of Saemangeum. Journalists, including correspondents and editorialists, were invited to the site and were encouraged to broadcast and report on the activities on the site and relevant interviews. Experts in the fields of civil engineering, environment, and tourism, and representatives from relevant institutions who supported the project contributed articles to newspapers and participated in open forums on TV and interview programs to highlight the need for the project. PR videos that filmed the progress of the project and blueprints were made and shown to visitors at the construction site, and pamphlets, leaflets, and brochures were also distributed. In addition, a TV documentary about overseas eco-friendly reclamation projects, including those in the Netherlands, Japan, and China, was made and broadcast, and CDs were distributed. In crisis situations like court ruling of suspension of execution and a defeat in the first trial, advertisements appeared in media featuring agricultural organizations’ statement of the approval and resumption of the project.

The government ran websites for the Saemangeum project and the Saemangeum environment-friendly research and sent newsletters on major controversies, issues, and progress of the project to opinion leaders. Major stakeholders who led the public opinion, such as journalists and agricultural organizations, were invited to the construction sites.

## 4. Economic and Social Costs of Conflicts

### 1) Direct Costs Incurred by Delays and Changes Made to the Project Implementation

The Saemangeum project was halted twice due to various conflicts. The first suspension occurred for two years between June 1999 and May 2001 to hold public-private joint investigations and forums. The second suspension of the entire construction of seawall took place for three days after the Seoul Administrative Court’s ruling of suspension of execution between July 16 and July 18, 2003. The Korea Rural Community Corporation assessed that the two suspensions of construction have incurred a loss of 508.7 billion won.

First was soils washed away due to high waves in the midst of the suspension of seawall construction during the public-private joint investigations. The damage was done because the soil on the unfinished side of the already-established part of the seawall was constantly washed away by waves, tsunami, and wave overtopping. In August 2000 when the typhoon Prapiroon made landfall, the loss of dredged soil and rubble mound caused a loss of 2.5 billion won. In addition, apart from the typhoon, the washed-away soils incurred a loss of around 4.2 billion won because reinforcement work was not consistently carried out.

Second was the loss of foundation ground under water due to the increased tide speed of the opening section of the seawall. During the public-private joint investigations, the three opening sections spanning 9.6km allowed the flow of 7.2 billion tons of seawater four times a day, the speed of which was as fast as 2-5 m/s. This incurred a loss of 7.8 billion won due to a seepage erosion of the foundation ground that was built with gabion under water.

Table2-5-7 The Cost of Construction Suspension of Saemangeum Project

Loss from Construction Suspension	Unrealized Added Value from Project Withdrawal (Present Value as of February, 2005)	Note
750 billion won 2 and a half years of suspension	Total : 5.4218 trillion won • Sunk cost of the project : 2.269 trillion won • Unrealized added value : 2.2703 trillion won • Unrealized project costs’ added value creation effect • Additional 882.5 billion won	• Assumed lifespan of reclaimed land was 60 years • The present value of added value was the average of net present value of 10 alternatives submitted by the joint Saemangeum investigation team

Source : Korea Chamber of Commerce and Industry

Third, over the period of a long suspension of the construction, the project was delayed and thus the project costs also jumped because the unit cost of construction increased with inflation, resulting in a loss of 23.8 billion won.

Fourth, the delay in the project caused another damage. Project costs, which was taxpayers' money, were already invested in the construction but expected added value for the completion of the project was unrealized. According to the analysis of the public-private joint investigation team, an economic loss of 468.9 billion won occurred during this period because of the unrealized added value.

Fifth, the Seoul Administrative Court's ruling of suspension of execution of seawall construction stopped the project for three days between July 16 and July 18, 2003 and incurred economic losses. Bank materials and ripraps, which were the construction materials for the seawall, were washed away by heavy rains in summer and waves, incurring a loss of 600 million won. Unused equipment and workforce resulted in a loss of 900 million won. In total, there was an economic loss of 1.5 billion won.

Meanwhile, according to the Korea Chamber of Commerce and Industry's Study on Suspensions of Major National Projects and the Implications released in April 2005, the suspension of the Saemangeum project incurred a loss of 750 billion won over the period of two and a half years. The study estimated that, in the case of withdrawal of the project, over 5.4 trillion won worth of added values would be unrealized.

## 2) Indirect Costs Incurred by Social Conflicts

Indirect costs of social conflicts surrounding the Saemangeum project were enormous. These costs include an economic loss from the two and a half years of suspension of construction and ten years of constant social conflicts occurred between 1996, when issues were raised over the water quality of Lake Saemangeum, and March 16th, 2006, when court ruled in favor of the government. Indirect costs entail socio-economic losses, the amount of which is beyond assessment. They include litigation expenses caused by frequent recurrence of conflicts, damaged government capability for national management, environmental damage caused by discarded development sites, and conflicts between the residents of neighboring regions.

## 5. Verification and Evaluation of Proponents' and Opponents' Arguments

In the end, major conflicts surrounding the Saemangeum reclamation project were resolved. However, conflicts between development and environmental conservation are expected to remain a challenge that should be further addressed.

### 1) The Need to Build Collective Prime Farmlands

To improve productivity in collective prime farmlands, experiment and research projects, including floriculture, arboriculture, forage crops, and landscape crops, have been carried out on exposed reclaimed lands in Saemangeum since 2006. Efforts are being made to develop competitive field ground formation technology, implement advanced agriculture technology to boost resident farmers' income, and subsequently secure competence in the face of the opening of global agricultural product market. In collective prime farmlands, state-of-the-art technologies and high-quality export agriculture with global competitiveness, including mixed grain park, ecological organic park, horticulture park, agriculture theme park, low-carbon green-growth model park, and agriculture industry cluster, are being fostered.

### 2) Lake Saemangeum's Water Quality Improvement Issues

Detailed follow-up plans for the implementation of environment measures laid out under the 2001 government measures have been faithfully carried out. The Saemangeum Committee under the Prime Minister's office have been monitoring the site on a regular basis and concluded that the project had been normally operated until 2009. In May, 2001, an Eco-friendly Sequential Development Plan set the water quality target of 2011 at level IV agricultural water. Currently, however, the target has been raised to the degree that allows recreational activities in water, which matches the name of the "City of Water."

In order to improve the water quality of Lake Saemangeum, the government has strengthened water quality standards, such as introducing chemical treatment to wastewater discharge on the upper side of the river, and is planning and implementing water quality improvement measures, such as measures on non-point pollutant sources and river-management flow securement. The water quality of inflow rivers such as the Mangyeong River and Dongjin River, had improved until 2003 and has slightly deteriorated since then. However, the causes for this seem to be the increases in pollution sources and changes in river-management flow, such as changes in precipitation in the upstream. After the final closure of seawall in 2006, the water quality has slightly deteriorated due to a reduced volume of seawater circulation. However, by allowing the flow of seawater through Shinsi and Garyuk Floodgates, the water maintained level II - III of the lake water quality standard until September 2010. Over the five year period between 2001 and 2005 before the final closing of the seawall, the water quality of an area designated to become Lake Saemangeum was COD 1.8-2.0 mg/l, T-N 0.334-0.375 mg/l, and T-P 0.045 mg/l, which belong to level II of the seawater quality standard.

The top priorities of the 2010 Comprehensive Plan on Saemangeum Development involve implementing water quality improvement measures in the upper part, such as the Mangyeong River and Dongjin River as well as in Saemangeum, and applying low-carbon green-growth to land development. Therefore, the water quality of Lake Saemangeum is expected to further improve.

### 3) Saemangeum Project's Economic Feasibility Issues

Up to now, the estimated values of tidal flats and farmlands vary depending on the assessment criteria. A new economic assessment is called for, since the Draft Comprehensive Plan on Saemangeum Development was drawn up in January, 2010, including building a multi-function city to guarantee high quality and competitiveness, and the Master Plan was laid out in March, 2011.

### 4) Suspension of Seawall Construction and Seawater Circulation Issues

The final stop gate for the Saemangeum seawall was successfully established on April 27<sup>th</sup>, 2006. After a completion ceremony in April 2010, a road was built and opened on the seawall to meet residents' demand and attract tourists.

Up until now, seawater has been circulated through drainage gates in Lake Saemangeum. Although verification has not yet been conducted, the year 2020 will be the target year for conversion to a fresh water lake, on condition that an interim check will be done by the first half of 2015. Current target water quality of Lake Saemangeum is level IV on the agricultural water standard. The target is being applied differently depending on places. For farmland areas, the target is to supply agricultural water, while for city areas, the target has been strengthened to allow waterfront activities such as tourism and leisure activities.

With the aim for reducing water pollution in the future, Lake Saemangeum will be divided into three areas, upper region, intra-lake, and sea, and 2.89 trillion won will be invested for numerous tasks by 2020. In the upper region, measures are being taken such as treatment of non-point pollutant sources and livestock manure, and securement of channel flow for maintenance. In the intra-lake area, measures for reduction of pollution sources such as management of inflow water and facilities for phosphorus removal will be added to existing measures. In the sea area, plans for 24-hour monitoring of six offshore vertexes are underway.

## 6. Project Implementation Effects

### 1) Construction of Saemangeum Seawall Brought About Territorial Expansion and Revitalization of Local Economy

On April 27<sup>th</sup>, 2010, a ceremony for the completion of the Saemangeum seawall was successfully held at the Saemangeum Shinsi square. The ceremony was an opportunity to let the world know the full-scale development of the Saemangeum project and to present new hopes and visions for Saemangeum.

Thanks to the completion of the Saemangeum seawall, Korea's territory expanded from 98,800 km<sup>2</sup> to 10,600km<sup>2</sup>, meaning a 10m<sup>2</sup> increase per capita. The project also created a tourist attraction that spans across Gogunsan-gundo and Byeonsan-bando, which attracted 8.8 million tourists over a period of one year, making great contribution to revitalization of the local economy. In particular, the Byeonsan-bando National Park reaped the largest economic benefit from the opening of a road on the Saemangeum seawall in April 2010 by attracting more tourists.<sup>23)</sup>

### 2) Saemangeum Seawall Listed on Guinness World Records

The 33.9-kilometer-long Saemangeum seawall was certified by the British Guinness World Records as the world's longest seawall and, on August 2nd, 2010, a certification awarding ceremony was successfully held. The ceremony served as an opportunity to introduce the project to the world, highlight the prestigious image of Saemangeum, and showcase the excellence of Korea's reclamation technology to the world. The Discovery Channel, a world renowned documentary channel, also made and broadcast a documentary, "Revealed: Dream City of the Future," in September 2010. As such, Saemangeum is currently building up its own unique brand.

### 3) Ensuring Status of National Strategic Project to Secure Future Growth Engines

The Saemangeum project is not merely confined to North Jeolla Province, but a national strategic project to secure future growth engines and is one of the major national projects that the government places an emphasis. The Presidential Council for Future and Vision under the Korean Presidential Office released the Grand Vision National Territory 2040 on June 11<sup>th</sup>, 2010 and projected that Saemangeum will become the global hub for future cutting-edge industries, eventually turning into the new cradle of civilization.

In addition, on March 16<sup>th</sup>, 2011, the Sixth Saemangeum Development Committee reviewed and confirmed the Master Plan and the Comprehensive Plan for Phase Two of Water Quality Improvement in the Saemangeum Area. With the aim to realize Ariul, a city that opens new civilization, the committee set a creative, green waterfront city as the vision of the city and suggested five major implementation plans.<sup>24)</sup>

23) "A Study on the Economic Spillover Effects of National Parks" published by the Korea National Park Service on March 2011 showed that the economic spillover effects of 12 national parks, including Mt. Sorak, Mt. Jiri, and Mt. Bukhan, Gyeongju, Hallyeohaesang, Dadohaehaesang, Byeonsan-bando, Mt. Wolchul, amounted to 1.2952 trillion won of production inducement effect, 233.5 billion won of added value inducement effect, and employment of 21,648 people. In particular, the Byeonsan-bando National Park reaped the largest economic benefit from the opening of a road on the Saemangeum seawall in April 2010 due to the increase in the number of tourists.

24) It was made clear that the project aims to gain a growth engine for the future, laying out five implementation plans: ① Building a carbon-free city ② Forming an ecological green belt network ③ Realizing a prestigious waterfront city ④ Establishing a virtuous cycle of resources ⑤ Expanding supply of new renewable energy

#### 4) Strengthening Water Quality Improvement in Saemangeum through Measures such as Environmental Improvements of Wanggung Settlement Village

The Wanggung Settlement Village is an area where issues regarding water pollution and odor from livestock manure and poor residential environment have been constantly raised. The village has been regarded as a major culprit for water quality aggravation and became a major issue at the heart of the conflicts over the environment. The animal waste from Wanggung takes up 3.6 percent of the pollution in the Mangyeong River and 2.0 percent of the pollution in Saemangeum. Due to aging of farmers and the falling number of livestock, however, the pollutant loading rate of livestock manure from Wanggung is likely to diminish.

At present, through the Council for Environmental Improvement in Wanggung that has been operated since its foundation in March 2010 and consultations with experts, the Comprehensive Plan for Environmental Improvement in Wanggung Settlement Village was laid out in July 2010. It is expected to help facilitate the improvement of environment and water quality through the dismantlement of pens, the formation of forest belts and ecological streams. Recently, the Comprehensive Plan for Environmental Improvement in Wanggung Settlement Village was agreed upon in a conference presided over by the Prime Minister's Office, which will make great contributions to the water quality improvement in Saemangeum.

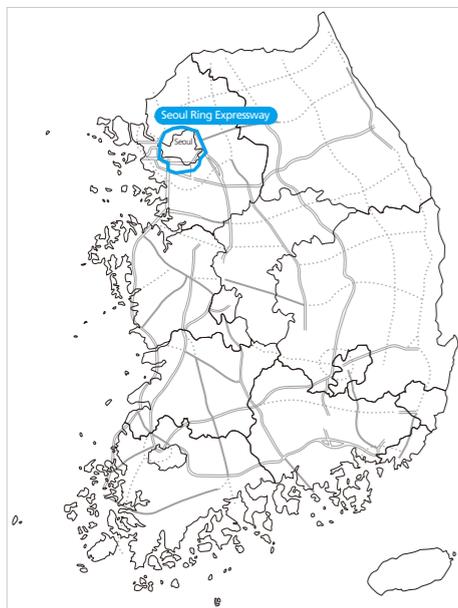
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## 6 Seoul Ring Expressway Construction Project

### 1. Project Outline

Project Duration	1988~2007 (19 years)
Total Investment	5.7824 trillion won
Project Volume	Total length : 127km (8-lane roads for the entire expressway) Phase 1 : Toegyewon-Pangyo-Ilsan, 91km, Phase 2 : Ilsan-Toegyewon, 36km * Phase 2 Ilsan-Toegyewon section was built by private investment facilities project



The Seoul Ring Expressway was proposed in order to alleviate Seoul's traffic jam, enhance accessibility between regions within the metropolitan area, and prevent Seoul outskirts traffic from passing the downtown by traffic dispersion and detour. During the first phase, a four-lane highway that had been built earlier between Pangyo, Guri, and Toegyewon was extended to eight lanes. This was followed by a Ilsan-Pangyo project that aimed at resolving traffic jams in new towns, including Pyeongchon and Sanbon. In total, 91km were extended during the phase one.

Phase two was a highway on the Ilsan-Toegyewon section, which was constructed as a private infrastructure investment project in accordance with the Private Investment Act. The Ilsan-Toegyewon section is an eight-lane road with the length of 36km. It is the final section that links the entire route of the Seoul Ring Expressway. The Ilsan-Toegyewon section, which spans across Northern Seoul,

passes through rugged mountainous areas, including Mt. Nogo, Mt. Sapae, Mt. Surak, and Mt. Bulam. Accordingly, structures took up a large share of the construction in this section, with tunnels and bridges accounting for 54 percent of the total length. Major structures involve 50 bridges (7,923 meters), five tunnels (11,820 meters), five entrance facilities (Goyang, Tongil-ro, Songchu, Uijeongbu, Byeollae), and six operation offices (Goyang, Tongil-ro, Yangju, Songchu, Mt. Bulam, Byeollae). Due to civil petitions that were filed against the passage of Mt. Sapae and other places within the Mt. Bukhan National Park, the Ilsan-Songchu (18.3km) and Uijeongbu-Toegyewon (10.5km) sections were completed in June 2006, whereas the rest of the section, the Songchu-Uijeongbu section (7.5km), was completed in December 2007 after the conflicts were resolved.

Figure2-6-1 Seoul Ring Expressway Route Map



## 2. Project Background and Purpose

### 1) Project Background

The Seoul Ring Expressway project was undertaken along with the new town building projects in Bundang, Pyeongchon, Sanbon, Jungdong, and Ilsan. Since the 1960s, population in Seoul grew rapidly and subsequently new towns emerged on the outskirts of the city and their boundaries also expanded. Naturally, the traffic volume increased rapidly and resultant traffic jams not only in Seoul but in the neighboring areas incurred huge socio-economic costs. To resolve this problem, the government decided to build the Seoul Ring Expressway.

### 2) Project Purpose

The Seoul Ring Expressway project aimed to enhance industrial competitiveness and people's convenience, and promote balanced development between regions within the Seoul metropolitan area by facilitating the flow of traffic and logistics within Seoul and the metropolitan area. In short, the Seoul Ring Expressway was a project pursued to alleviate Seoul's traffic congestion and enhance accessibility between regions within the metropolitan area by preventing outskirts traffic from passing downtown by traffic dispersion and detour.

### 3) Project Content

Under the Seoul Ring Expressway project, a 127km-long route was divided into the following eight sections of which constructions were separately conducted (Table 2-6-1). Of all the sections, the Ilsan-Toegyewon and Pangyo-Anyang sections brought about the most severe environmental disputes.

Table2-6-1 Current Status of Each Section of the Seoul Ring Expressway

Section Name	Length	Number of Lanes	Project Duration	Remark
Phase I	91.0			
Toegyewon-Pangyo	33.0	8	December 1988-December 1993	
Pangyo-Anyang	15.8	8	December 1991-October 1996	Passes through Mt. Morak
Anyang-Jangsu	21.3	8	June 1995-December 1999	
Jangsu-Seoun	6.5	8	May 1992-July 1998	
Seoun-Gimpo	9.0	8	June 1995-December 1999	
Gimpo-Sinpyeong	3.0	8	December 1992-October 1997	
Sinpyeong-Ilsan	2.4	8	May 1997-September 2001	
Phase II	36.0			
Ilsan-Toegyewon	36.0	8	June 2001-December 2007	Passes through Mt. Sapae
Total	127.0			

### 4) Project Agency

Initially, the Ministry of Construction and Transportation and the Korea Expressway Corporation were to build the entire route of the Seoul Ring Expressway. In 1996, however, the government decided to allow the use of private capital in building the Ilsan-Toegyewon section in order to ease the burden of the project's massive budget. Accordingly, the Ministry Of Construction and Transportation selected Seoul Beltway Corporation as the project agency, who was to carry out the project by a BTO method (Build-Transfer-Operate) in which the ownership was transferred to the nation after the completion of the expressway and in turn the private agency was to run the road for 30 years.

### 5) Project Progress

With the aim of addressing traffic jams in the Seoul metropolitan area and responding to the traffic demand from new towns, the government confirmed the Seoul Ring Expressway project in 1985 under the Conceptual Plan for Comprehensive Traffic Network System in Seoul Metropolitan Area. The Korea Expressway Corporation began the construction in Pangyo in 1988 and then went on to complete the phase one southern sections, Pangyo-Toegyewon in 1993, Pangyo-Anyang in 1996, Gimpo-Sinpyeong in 1997, Jangsu-Seoun in 1998, Anyang-Jangsu and Seoun-Gimpo in 1999, and

Sinpyeong-Ilsan in 2001. The construction of the southern sections of phase one that linked five new towns in the metropolitan area took 13 years and cost 5.782 trillion won of state funds.

Meanwhile, in 1996, the Ministry of Planning and Budget designated the construction of the Northern Ilsan-Toegyewon section, which was the second phase project, as one of the private investment promotion projects. After the Seoul Beltway Corporation became the project agency in 2000, the construction of the Ilsan-Toegyewon section began in 2001. The Ilsan-Toegyewon section was a mountainous region that passes through the Mt. Bukhan National Park. For this reason, environmental organizations and religious groups strongly opposed the project, worrying over environmental degradation. Facing the opposition, the construction had to stop in only five months after its kickoff. Eventually, the construction resumed two and a half years later, after the president in person stepped in to mediate and make compromises.

The expressway underwent many twists and turns during the process of construction. On December 28th, 2007, 19 years after the first construction began in Pangyo, the entire sections of the expressway opened. Now the Seoul Ring Expressway is a road for the Seoul metropolitan area, which links major cities in Northern and Southern Gyeonggi regions around Seoul.

Table2-6-2 Progress of Seoul Ring Expressway Construction Project

Date	Content
1985	The construction plan for the Seoul Ring Expressway was confirmed under the Conceptual Plan for Comprehensive Traffic Network System in Metropolitan Area
1988	The construction began in Pangyo
1993	The Pangyo-Toegyewon section was completed
1996	The Pangyo-Anyang section was completed
2001	Links between 5 new towns, Toegyewon-Pangyo-Anyang-Ilsan, were completed
2007	The entire sections of the expressway opened

### 3. Arguments and Grounds of Proponents and Opponents

#### 1) Issues and Logic of Proponents and Opponents

##### (1) Passing through Mt. Morak

- Arguments and Grounds of Opponents

When a master plan and a feasibility study for the Pangyo-Anyang section had been completed and a detailed route had been decided on in March 1991, the Organization for Uiwang Environment Conservation and Local Development was formed, mainly by housewives who opposed the passage of Mt. Morak. The mountain, which kept its beautiful nature intact without much development in neighboring areas, was a tourist attraction that local residents enjoyed visiting. The local organization held signature campaigns to petition for rerouting the expressway and filed a petition for the alteration of the route.

Moreover, local residents strongly protested against the construction of the Pangyo-Anyang and Hagui-Pyeongchon sections not only because those sections were to pass through densely populated residential areas but because some parts of those sections were to pass through a forest area that had been built only two years prior to the construction. As the construction began and the project proceeded ahead in December 1991, the Organization for Uiwang Environment Conservation and Local Development filed a lawsuit for the cancellation of the public notice of urban planning facilities against the Minister of Construction and Transportation in 1993. The construction was suspended during the process of lawsuit for over a year, but the project eventually resumed and was completed in 1996 after the court ruled against the resident group.

- Arguments and Grounds of Proponents

The Korea Expressway Corporation raised issues that, if changes were made to the passage section on the Mt. Morak route as the residents demanded, environmental degradation would become more serious compared to the initial route, road curves would cause safety problems, new civil complaints would be raised, and massive additional construction costs would impose greater burden.

While the nation was swept by social conflicts over the establishment of public facilities, such as nuclear waste dump sites and waste disposal sites, the court decided against the Organization for Uiwang Environment Conservation and Local Development. The court dismissed 173 Uiwang residents' request for the cancellation of public notice of urban planning facilities, which was a lawsuit against the Minister of Construction and Transportation, citing "no grounds". In short, the court said, "The government has no

obligation to listen to and reflect relevant residents' opinion in the case of road construction projects that are in the interest of the entire nation." It also said, "There are no provisions on the Urban Planning Act stipulating procedures to reflect residents' opinion to urban planning projects led by the Minister of Construction and Transportation." After the court decision, the project that was suspended for approximately a year resumed and the Pangyo-Anyang section was completed in 1996.

(2) Passage through Mt. Sapae

Initially, Seoul's 1989-1999 master plan allowed the Mt. Sapae route to pass the center of the Mt. Bukhan National Park. Later, the Korea Expressway Corporation's 1996-1998 implementation plan shifted the route to the Mt. Sapae section and made it pass through a tunnel for the reason of minimizing environmental damage to the national park. Accordingly, environmental organizations and Buddhist groups strongly protested against the passage of Mt. Sapae on the grounds of environmental destruction, underground water leakage, and disruption to ascetic practice.

Amidst heated debates over the route passing through Mt. Sapae, alternatives were reviewed, including the routes bypassing the outskirts of the national park, and the routes entirely bypassing the North of Uijeongbu. Expansion and use of other roads by linking national routes no. 39, 43, 3, and a southern bypass were also reviewed. The government examined various alternative routes and concluded that, given natural landscape, ecological impact, function, accessibility, and economic feasibility of highway, the route that passes through Mt. Sapae Tunnel was the best option.

Table2-6-3 Initial Construction Plan vs. Alternative Bypass Routes

Classification	Initially Planned Route	Alternative Bypass Routes	
		Outskirts of National Park	Outskirts of Uijeongbu
Length	25.3km	27.8km (A 2.5-km extension)	35.3km (A 10.0-km extension)
	Length of passage of national park 4.6km (Tunnel 4.0km, Others 0.6km)	Length of passage of national park 7.1km (Tunnel, Bridge 2.2km, Others 4.9km)	Bypassing Mt. Bukhan National Park
Size of Forest Destruction	1.7km <sup>2</sup> (Byeokje-Toegyewon)	2.0km <sup>2</sup> (An extension of 0.4km <sup>2</sup> )	2.7km <sup>2</sup> (An extension of 1.1km <sup>2</sup> )
	0.16km <sup>2</sup> (Songchu-Uijeongbu)	0.54km <sup>2</sup> (An extension of 0.38km <sup>2</sup> )	-
	National park section 0.08km <sup>2</sup>	National park section 0.51km <sup>2</sup>	-
Project Cost	1.164 trillion won	1.334 trillion won (A 170-billion-won increase)	1.876 trillion won (A 712-billion-won increase)
Merits	<ul style="list-style-type: none"> <li>Minimizing forest destruction</li> <li>Securing road functions</li> <li>Maintaining investment efficiency</li> </ul>	<ul style="list-style-type: none"> <li>Passes without long rail tunnel</li> </ul>	<ul style="list-style-type: none"> <li>Preventing damage to the Mt. Bukhan National Park</li> </ul>
Demerits	<ul style="list-style-type: none"> <li>Partial damage to the Mt. Bukhan National Park</li> </ul>	<ul style="list-style-type: none"> <li>Excessive damage to the Mt. Bukhan National Park (6.5 times)</li> <li>Passes through densely populated residential areas</li> <li>Colliding with public obstacles, eg. catholic cemetery park, Shinheung Health College, and Uijeongbu Art Center</li> <li>Civil complaints from the other party</li> <li>The Ministry of Environment and environment organizations opposed during the assessment of environmental impact</li> </ul>	<ul style="list-style-type: none"> <li>Road function deterioration (Traffic 30%, Decrease in user population 2.5 million → 700,000)</li> <li>Excessive forest destruction (1.6 times)</li> <li>Lower investment efficiency</li> <li>Increase in fees for using road (82 billion won/year)</li> <li>Passes through an army base (ammunition battalion)</li> <li>Passes through densely populated residential areas</li> <li>Civil complaints from the other party</li> </ul>
Note	<ul style="list-style-type: none"> <li>95% of the land on initially planned route was already purchased</li> <li>Completion rate compared to the entire section as of November 2003: 27%</li> <li>Following the agreement, the construction was suspended from April 14th, 2003, when 34% and 91% of the excavation were completed in the Mt. Surak and Mt. Bulam Tunnels respectively.</li> </ul>		

Source : Seoul Beltway Corporation. "Resolutions to Conflicts over Public Projects." August 2006.

① Route and Tunnel passing through Mt. Sapae

• Arguments and Grounds of Opponents

The opponents argued that, building a route passing through the national park would bring about disruption in wildlife habitats, resulting in an enormous damage to the ecosystem. More specifically, forests in the national park would be destroyed, tunnel excavation would cause noise and vibration, and roadkill and pollution from car lights and exhaust gas would rise. They claimed that the Uijeongbu Outskirts Bypass, a route passing between Uijeongbu and Pocheon, was a better option than the route passing through the Mt. Bukhan National Park. The opponents claimed that, in the short run, the alternative route might cost more than the initially planned route, but, in the mid to long-term, the alternative route would absorb traffic from Northern Gyeonggi including Pocheon and Dongducheon, which in turn would distribute the soaring traffic between regions around Seoul. They regarded it as a reasonable alternative that satisfied the purpose of the Seoul Ring Expressway because this would not only solve the traffic jams in Uijeongbu, but promote harmonious and balanced growth of urban areas.

• Arguments and Grounds of Proponents

The government argued that, of all the alternatives examined, the option of Mt. Sapae Tunnel turned out to be the best with the least damage to the environment. It stressed that, with the Mt. Sapae Tunnel in place, 4km out of 4.6km of passage area in the national park would become a tunnel. And therefore a direct forest destruction, would amount to a mere 0.6km, for which the most eco-friendly restoration work would be carried out.

The government further explained that, although it was desirable not to build a tunnel inside the national park, it was inevitable to do so to protect a larger part of the environment. Such examples as the Gugi Tunnel in the Mt. Bukhan National Park, the Jungnyeong Tunnel in the Mt. Sobaek National Park, and the Gwanwol Tunnel in the Jōshin'etsu-kōgen National Park were provided.

Meanwhile, as the government urgently needed solutions to serious traffic congestion in Northern Seoul and Northern Gyeonggi, it came to conclusion that the route passing through Mt. Sapae was essential because it was closer than Uijeongbu outskirts bypass. At that time, due to the traffic volume that exceeded the road capacity, traffic congestion was serious on the East Main Road, and the national routes no. 39 and no. 43, which were the major road network in Uijeongbu. Furthermore, an explosion in traffic demand was expected from the surrounding regions where a large-scale housing site development was underway. Therefore, an expansion of the highway was an urgent matter. In addition, Dobong and Nowon in Northern Seoul did not have main bypass networks, and the traffic from the inside and the inflow traffic from Northern Gyeonggi were concentrated on national route no. 3 and the East

Main Road. This caused serious traffic jams, forcing the government to take an immediate action to solve the problem. (Table 2-6-4)

Therefore, there existed an urgent need to solve traffic congestion in Northern Seoul, Uijeongbu, and Northern Gyeonggi by expanding roads in surrounding areas or building alternative road networks. To this end, the government considered a western bypass and an alternative road to national route no. 3, to the north-south direction, and the Seoul Ring Expressway (Ilsan-Toegyewon), to the east-west direction. Meantime, residents in Dobong and Nowon located in Northern Seoul requested an early construction of the route passing through Mt. Sapae to relieve severe traffic jams in the area. (Table 2-6-5)

Table2-6-4 Traffic Situation in Surrounding Areas

Road Name	Section	Traffic Volume in 2000 (10,000/day)	No. of Lanes	Capacity (No. of Cars/hour)	Traffic Congestion (V/C)
East Main Road	Seoul-Uijeongbu	14.1	6	12,600	1.55
National Route No. 3	Seoul-Uijeongbu	4.6	4	3,200	2.00
National Route No. 39	Daejadong-Uijeongbu	4.9	4	3,200	2.12
National Route No. 43	Donggudong-Uijeongbu	4.7	4	3,200	2.04

Source : Ministry of Construction and Transportation. "Statistical Yearbook of Traffic Volume in 2000." 2001

Table2-6-5 Polls showed that the Majority of Respondents Expressed Support

Classification	Approval	Disapproval
DongA.com Survey (November 29, 2001)	70.3%	29.7%
KBS Radio Kim Jongchan Program (January 26, 2002)	87.8%	12.2%
Bulkyo News Internet Survey (January 22-29, 2003)	88.0%	12.0%
Internet Beopbo Shinmun Survey (September 19-25 2003)	81.8%	17.6%

## ② Environment and Vegetation

### • Arguments and Grounds of Opponents

The assessment report on the environmental impact of the expressway construction concluded that natural monuments that must be protected were not found in the investigated area. However, environmental organizations raised issues that, because the report excluded the impact on natural monuments, the consequences of damage done to mobility and habitats of wildlife were never taken into account.

In 2002, *Crypsinus hastatus*, a legally protected species designated by the Ministry of Environment, was found during a field investigation in the designated construction site of the tunnel passing the Mt. Bukhan National Park. This brought up a need for environmental protection measures. The opponents predicted that the *Crypsinus hastatus* community would be destroyed because it was found only 37 meters away from the designated construction site. Since the *Crypsinus* community was close to the designated entrance and exit of the tunnel, it meant the community would have to bear all the damage from changes in underground water and gas emission from a daily average of 140,000 vehicles in the case of opening of the road.<sup>25)</sup> The opponents argued that the discovery of the *Crypsinus* community was evidence to the poor quality of the investigation report on environmental impact.

Meanwhile, undermining Buddhism practices was another issue. The argument was that the construction of the Mt. Sapae Tunnel would result in a dismantlement and transfer of temples. For example, Heungbub Temple, Cheonin Temple, and Bohyun Temple would become deserted because the lands would be expropriated for the construction. Twenty seven other temples, including Cheongryong and Seongak Temple, would have to bear direct and indirect damages. The opponents claimed that the temples would not be able to operate normally due to noise, vibration, exhaust gas from vehicles, while the construction would also destroy the environment for Buddhism practices and living spaces.

### • Arguments and Grounds of Proponents

By the end of 2002, the National Museum of Korea conducted an additional investigation on the wildlife in the national park and found *Crypsinus hastatus* in the Anmal area, which was planned to become an entrance to the Mt. Sapae Tunnel. Accordingly, in February 2003, Seoul Beltway Corporation, the project agency, commissioned a thorough vegetation survey to the University of Seoul, an expert organization. The survey was carried out twice in March and May of 2003 on the passage area in the national park. As a result, *Crypsinus hastatus* was found in 19 places. The project agency explained that it would set out environment

conservation plans to reduce environmental impact, to thoroughly protect the *Crypsinus hastatus* in Anmal, which the highway construction would affect most.

Meanwhile, the proponents argued that, both of the alternative routes, bypassing the outskirts of the national park and Uijeongbu, would be worse in terms of environment than the initial route because they would incur a much larger forest destruction. The route bypassing the outskirts of the national park goes through the park by seven km and hence would incur 6.5 times more destruction than the initial route, whereas the route bypassing the outskirts of Uijeongbu by ten km would incur 1.6 times more destruction.

## ③ Leakage of Underground Water

### • Arguments and Grounds of Opponents

The construction of underground structures such as tunnels almost always entail leakage of underground water. The opponents argued that a massive outflow of underground water would deplete underground water in surrounding areas and cause a drastic decline in the underground water level.

They also pointed out that, despite the requirements by the standard specifications for tunnels and the design standard for tunnel construction, which state that “measures for water depletion should be delivered in response to the impact to the ground surface and underground water in the surrounding areas of tunnel construction” as well as that “investigations should be done at least for one year for tracking seasonal changes to obtain three data items regarding water storage and drainage conditions under seasonal changes and climate changes,” the project agency carried out an investigation for only 40 days. Moreover, the opponents pointed out the negligence of the project agency by saying that “since the area penetrated by Mt. Sapae Tunnel is an area of ground water flow system within fractured rocks, a geological structure which consists of fracture zones that control the flow of the underground water, it requires a modeling based on calculations of hydraulic conductivity of each fracture zone and a statistical distribution interpretation based on the analysis on the existence and continuity of faults, spatial distribution analysis, satellite images and aerial photographs.”

25) *Crypsinus hastatus* is a protected wildlife designated by the Ministry of Environment under environment conservation law. Therefore, it is prohibited to capture, collect, transplant, process, export, ship, distribute, store, destroy, and defoliate the plant, except for special purposes approved by the Ministry of Environment, such as academic research.

- Arguments and Grounds of Proponents

At the time of the work planning (December 1996-June 1998) and environmental impact assessment (March 1997-July 2001), the project operator conducted geological surveys including drilling investigation on the Mt. Sapae Tunnel and found no ground water artery. Based on the result, the project agency predicted that the tunnel construction's impact on the changes in underground water would be minimal given the fact that the ground water recharge rate was ten times larger than the discharge rate.

Following the request by the Korea National Park Service, asking a close investigation on changes in underground water in the case of tunnel excavation as a precondition for a permission for occupying and using the national park, the project operator commissioned to Pukyong National University a water level fluctuation analysis after it began construction. The water level fluctuation analysis and underground water modeling were conducted for 40 days and used various data acquired from the work planning, including aerial photographs, geological maps, drilling logs, water pressure experiments. In November 2001 when the Buddhist circle filed for an injunction to suspend the construction, the report on the water level fluctuation analysis was judged credible by the Seoul Northern District Court after the court commissioned to an expert organization to examine the content.<sup>26)</sup>

### (3) Procedures for Approval and Permission (Environment Impact Assessment and Decision of Road Areas)

- Arguments and Grounds of Opponents

The opponents of the Mt. Sapae Tunnel pointed out that the Ministry of Construction and Transportation's decision to dispose the road area was illegal because it neglected the process of environmental impact assessment. The Article IV of the Environment, Traffic, and Disaster Impact Assessment Act, and the Appendix I of Article 2.2 of the Enforcement Ordinance stipulates that, in order to build a new road that exceeds four km, consultations based on an environmental impact assessment are required before making a disposition of road area decisions. By pointing out that the Minister of Construction and Transportation made a disposition on the decision prior to the submission of a complement assessment report, the opponents raised an issue that it was an administrative disposition with grave procedural errors.

- Arguments and Grounds of Proponents

Since the procedures of environmental impact assessment were supposed to be carried out simultaneously with consultations on the decision on road area after the completion of the work plan, according to the then Environment Impact Assessment Act in the 1990s, the

<sup>26)</sup> Yonsei University conducted the analysis on May 2002.

project agency refuted the allegations made by the opponents about procedural defects regarding the environmental impact assessment on the Ilsan-Toegyewon section of the Seoul Ring Expressway. The proponents stressed that there were no problems because the construction was carried out after the environmental impact assessment in accordance with the prohibition on advance implementation of construction stipulated on the Article 27 on the Act. They went on to argue that, there were no procedural errors because, in accordance with the Article 2 on the Enforcement Ordinance, an environmental impact assessment report was submitted on December 15th, 1998, which was before the notice of decision on road area was delivered on June 24th, 1999.<sup>27)</sup>

## 2) Persuasion Strategy

### (1) Formation and Operation of Committee for Investigation of Routes

The government laid out various measures to listen to the voices of religious, environmental, and residents' organizations and to open a communication window for the Mt. Sapae Tunnel issues. In an attempt to end the legal disputes and physical confrontations between environmental and Buddhist organizations, on the one end, and the government and project operator, on the other end, regarding the passage through the Mt. Bukhan National Park, and to produce social consensus through dialogue, the Ministry of Construction and Transportation, on August 14th, 2002, forged an agreement between the project operator, the Korea Expressway Corporation, and the Buddhist circle on forming and operating the Committee for Investigation of Routes. The committee was run for more than four months from August 14th, 2002 to December 31st, 2002. The Buddhist circle and the project operator made an effort to examine the overall validity and economic feasibility of the route and address civil complaints through activities in the committee, but they failed to reach an agreement.

### (2) Formation and Operation of Committee for Reexamination of Routes

After the inauguration of the 'Participation Government', President Roh Moo-hyun stressed the need to forge a conclusion within the first half of the year under the supervision of the Prime Minister's Office through efforts of persuasion and compromise. Accordingly, on April 14th, 2003, the Ministry of Construction and Transportation agreed to form and operate the Committee for Reexamination of Routes in an attempt to produce an agreement in the shortest possible time through dialogue with the Buddhist circle. The committee was operated for 45 days between April 22nd to June 5th, 2003, but the parties involved failed to reach an agreement.

Representatives of the project operator in the committee claimed that it was only a matter of

<sup>27)</sup> The Environment, Traffic, and Disaster Impact Assessment Act revised in 2001 stipulates that ordering and undertaking a construction should be done after consultations on environmental impact assessment are finished and subsequent decisions on road areas are made. However, this did not apply to the Seoul Ring Expressway, which received an approval for the project before the revision.

course to build the route in the way it was initially planned as soon as possible, given the following factors: the appropriateness of the initially planned routes for rearranging traffic network system in relatively less developed Northern Seoul and Northern Gyeonggi and user safety; minimization of costs for using the road due to shortest distance; and the initially planned route's environment-friendliness compared to the routes passing long rail tunnels of the Mt. Bukhan National Park, Mt. Surak, and Mt. Bulam. They also suggested the need for a more proactive approach towards calculating the value of environmental damage, given the fact that both parties agreed on considering not only economic values, including traffic convenience in particular, but also other values, such as environment, cultural heritage, religion, and geomancy.

On the other hand, representatives of the Buddhist circle said that the initially planned route appeared to be at a disadvantage especially when focusing on the destruction done to the national park section. However, they mentioned a need to examine which route was more environmentally-friendly when taking into account the total size of the forest destruction.

### (3) Holding a Public Forum

In accordance with proper procedures and methods, the Prime Minister's Office was to coordinate and make a decision based on the overall judgement of the report submitted by the Committee for Reexamination of Route, if the committee failed to reach an agreement on the final route. Consequently, the committee has made efforts to deliver an agreement on the optimum route by holding six rounds of discussions, a field investigation, and a workshop since the first meeting on April 22nd, 2003. Nevertheless, representatives from each party and experts from different fields failed to forge an agreement. In the course of coordinating and determining the final policy, the Prime Minister's Office reported the content of the committee's report to the general public and held a public forum to listen to relevant experts' and citizens' opinions.

### (4) Public Relations Aiming at Resolving Civil Complaints

PR materials were made to inform the public of the project and the need for the resumption of construction, as part of an attempt to address civil complaints and minimize the loss from the suspension or delay of construction. In order to give correct information about the project, approximately 450,000 various PR materials were distributed not only to the opponents of the construction but to local residents and the general public who were going to benefit from the expressway. The PR materials had become a catalyst to form a consensus over the feasibility of the planned routes and the effect on local economic development, resolve the possible misunderstanding of people having biased views, and expand attention and support from the local residents who called for the resumption of the construction.

In particular, from January to November, 2003, when the construction was halted, flyers were distributed and residents' signature campaigns were held in places like mountain trails, towns, and public offices. Meanwhile, the heads of government agencies and local governments, local councils of Guri, Yangju, Goyang, and Uijeongbu, media, and academic societies were invited to the seminars that explained the feasibility of the project and the problems with delays in construction.

## 4. Economic and Social Costs From Conflicts

### 1) Direct Costs

The Pangyo-Anyang section did not cause a loss because the opposition was made against the project during the process of design.

The Ilsan-Toegyewon section was conducted in the way of BTO, in which nine private enterprises were to make investment 1.684 trillion won out of the total construction fee of 2.384 trillion won and these enterprises would retrieve the investment by collecting tolls for 30 years. The suspension of the private infrastructure investment project led to additional corporate expenses. Due to the two-year suspension of the construction, an operating reserve of 28.8 billion won, including labor costs and overhead expenses, was incurred. The constructor had to sacrifice an additional 25.8 billion won for indirect labor costs, profits from construction, rents for temporary construction sites, etc.

### 2) Indirect Costs

The Pangyo-Anyang section was open roughly one year later than scheduled because of residents' complaints and a lawsuit against the Minister of Construction and Transportation at the stage of designing. It is estimated that a social loss of 270 billion won occurred if average indirect expenses were calculated at 720 million won per day.

Because the Songchu-Uijeongbu IC section, which is the Mt. Sapae Tunnel section, was open roughly two years later than scheduled, all vehicles on the expressway had to bypass, using the surrounding roads in Uijeongbu. This in turn led to social problems induced from serious traffic jams in Northern Gyeonggi and Uijeongbu. The government estimated that the two years and a month of construction suspension incurred a loss of 520 billion won in total, an average of 720 million won per day.

It turned out that the complete opening of the Ilsan-Toegyewon section reduced the driving distance by 10.9km and the travel time by 50 minutes, compared to using the national routes no. 39 and 43, saving 760 billion won of logistics expenses annually. Therefore, the two-year construction suspension was estimated to cause a loss of 1.52 trillion won to the people.<sup>28)</sup>

28) Professor Choi Chang-kyu of Myongji University. Munhwa Ilbo. December 29th, 2007.

## 5. Verification and Evaluation of Proponents' and Opponents' Arguments

### 1) Impact on Natural Ecosystem such as Noise

From 2002 to 2008, the Seoul Beltway Corporation had conducted seven rounds of monitoring and investigation on changes in the natural ecosystem in the upper areas of the Mt. Sapae Tunnel on a regular basis. As a result, changes that could be proven to be affected by the construction of the tunnel turned out to be insignificant. In terms of the flora, various species were found to repeat a cycle of presence and absence, rather than consistently dying out. In particular, the monitoring results of the *Crypsinus Hastatus* community in the Anmal Area of upper Mt. Sapae, which were conducted in summer and winter seasons, showed that the number of leaves in good or average growth and the number of new leaves revealed a repeating pattern of increase and decrease over time. There were no significant problems found in daytime and nighttime noise measurement results of the surrounding areas of Hoeryong Temple. The overall monitoring results showed that, after the construction of the tunnel, there had been little impact caused by a decrease in the underground water level due to increased dryness, noise, and vibration.

Table2-6-6 Monitoring Results of *Crypsinus Hastatus* Community in Anmal Area of Mt. Sapae

(Unit : Jang (Traditional Korean unit, approx. 3.03m))

Classification	2004	2005	2006	2007	2008	2009
Summer	1,184	1,303	1,751	1,321	1,027	1,020
Winter	648	954	781	913	789	-

Source : Seoul Beltway Corporation. "A Commissioned Investigation of Changes in Natural Ecosystem of the Surrounding Areas of the Entrance of the Seoul Ring Expressway's Mt. Sapae Tunnel." 2010.

Table2-6-7 Noise Measurement Results of Hoeryong Temple in Mt. Sapae

(Unit : dB)

Classification	2004	2005	2006	2007	2008	2009
Daytime	57.4	45.4	44.8	45.1	46.7	46.1
Nighttime	38.9	40.3	40.2	40.1	40.8	41.3

Source : Seoul Beltway Corporation. "Result Notification of Follow-up Investigation on Environment Impact of Construction of Seoul Ring Expressway Byeokje-Toegyewon Section." 2011.

### 2) Building Environment-Friendly Expressway

The entire sections of the Seoul Ring Expressway was open in December 2007. The construction process was aimed at minimizing environmental damages. Two large electric dust collectors were installed at the center of the tunnel's wall, which were state-of-the-art systems that absorbed and purified the dust, and released clean air back to the tunnel.

Because the Mt. Sapae Tunnel ran through the underground of the Mt. Bukhan National Park, two of the dust collecting facilities were installed, one on the uphill road to Songchu direction and the other on the downhill road to the Uijeongbu direction, in order to prevent dusts from spreading outside the tunnel. Forty-five large fans with 1.5 meter diameters were installed on the ceiling of the tunnel to purify dust in a way that the fans spun to bring the dust inside the tunnel to electric dust collectors.

In response to the voices against the tunnel that ran through a national park, 4km out of the 4.6 km that passed through the national park lied under the tunnel, significantly lowering direct forest destruction to 0.6km. This 0.6km section was restored as eco-friendly as possible.

### 3) Efforts to Shorten Construction Duration of Mt. Sapae Tunnel

In order to catch up with the schedule delayed by the construction suspension of the Mt. Sapae Tunnel, the project agency firstly carried out consultation with the Norwegian Geotechnical Institute on how to shorten construction duration from November 2002 to March 2003. Secondly, it collected construction data of major overseas tunnels to draw up measures to shorten construction duration. Thirdly, the agency operated a task force comprised of domestic tunnel engineers in order to set out measures to cut construction duration from March to June 2004.

Measures to improve construction included: the excavation of both upper and lower parts simultaneously using the Long-Bench method; and the use of bulk emulsion explosives and super-size jumbo drills to enhance work efficiency. These measures helped reduce construction duration. In addition, turning labor-intensive into mechanized constructions helped boost precision and efficiency of the construction. Each phase of the construction adopted various types of construction methods and applied them simultaneously. Pipe utility conduits building and concrete lining, which were initially planned to be done after excavation, were carried out concurrently with the excavation.

### 4) Evaluation of Proponents' and Opponents' Arguments

#### (1) Construction Work of Mutual Trust and Coexistence

Various efforts were made to overcome numerous obstacles by building trust through the events inviting religious and environmental organizations to the construction site, and strengthening bonds with local residents. The construction of the Mt. Sapae Tunnel became perceived as beneficial to all.

In addition, the foundation for the resumption and continuation of construction for mutual benefits was laid in the course of supporting local charity works and cherished projects, and parties for seniors. Efforts for coexistence bore fruits, such as receiving a plaque of appreciation that represented friendship and gratitude for conflict resolution and support from local temples that had filed civil complaints against the construction.

### (2) Site of Social Conflict Turning into a Site of Harmony

The passage of the Mt. Sapae Tunnel became a symbol of harmony that overcame the confrontations and conflicts of the past. Religious and other relevant organizations, local residents, and those involved in the construction, who were once in conflict, had a gathering to celebrate the passage of the tunnel and to wish for a speedy and accident-free completion of the construction. This was considered as a meaningful success case that turned a site of conflict and confrontation into a site of harmony through efforts for coexistence. In a time when numerous national projects are mired in conflicts and confrontations with local residents and the concerned organizations, the case of conflict resolution of the Mt. Sapae Tunnel serves as an excellent model to be benchmarked.

### (3) Opening the Age of Seoul Ring Expressway

The Seoul Ring Expressway had overcome numerous obstacles, adopted state-of-the-art construction methods, and protected the environment in surrounding areas through the implementation of environment-friendly construction. This enabled the expressway to become the most beautiful and convenient highway, leaving a message of hope for the Korean people.

## 6. Project Implementation Effects

Compared to national road no. 39 and 49, the opening of the Seoul Ring Expressway cut driving distance by 11km and travel time by one hour and 50 minutes, which were translated into saving 520 billion won in logistics costs. The improvements made to construction methods and cost reduction led to the saving of 66 billion won of project costs. The opening of the Mt. Sapae Tunnel reduced bypass distance by approximately 47 percent, compared to national road no. 39. In particular, as of 2009, the traffic volume of the Songchu-Dongducheon section had increased by 1.4 times more than the previous year, standing at 67,293 vehicles per day. In contrast, the volume to capacity ratio of national road no. 39 improved from 1.7 in 2007 to 1.1 in 2009. In addition, Mt. Sapae Tunnel, construction of which had been suspended for two years, was completed six months ahead of schedule. This led to the saving of construction costs, which in turn generated increased revenue and thus enabled the reduction of the toll fee from the initial 5,000 to 3,000 won for the benefit of users.

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## 7 Seoul Cheonggye Stream Restoration Project

### 1. Project Overview

Project Volume	5.8km from Taepyeong-ro, Jung-gu to Sindapcheol Bridge in Seongdong-gu
Project Duration	July 1st, 2003~September 30th, 2005 (2 years and 2 months)
Project Cost	387 billion won in total
Major Specification	Dismantlement of structures, restoration of city-type stream, maintenance of drainage system, building roads, bridges, and water pipes



Source : Cheonggye Stream Museum (Seoul Metropolitan Government)

Cheonggye Stream is a stream that flows from downtown Seoul to the Majang-dong, located in the east of Seoul. It had been covered and used as a road for a long time. A 5.8km overpass was built on Cheonggye Stream from Majang-dong to Gwanggyo Bridge, serving as an important traffic function of linking downtown Seoul with Eastern Seoul. The Cheonggye Stream overpass had been a symbol of Korea's struggle for development. From the 1990s, however, voices for the dismantlement of the overpass emerged as it became considered old and unsafe as well as an obstacle to development. At the same time, as people's demand for quality of life increased with the arrival of the 21st century, the improvement of downtown environment became an important issue. In accordance with the changes of the times, mayoral candidate Lee Myung-bak pledged a Cheonggye Stream restoration project during his election campaign for the Mayor of Seoul in 2002.

The Seoul Cheonggye Stream Restoration Project can be considered an inevitable transition in city development paradigm to tackle problems in downtown areas caused during the process of industrialization. The project also aimed to boost downtown economy by inducing redevelopment of surrounding areas as well as to demolish cover structures and restore the area into a stream. As the project proceeded ahead, disputes and conflicts among various stakeholders intensified. In particular, sharp confrontations and conflicts over issues regarding the restoration, such as traffic congestion, business loss of merchants, and restoration direction of cultural heritage, erupted. The Seoul Metropolitan Government succeeded in implementing the project by using diverse conflict management mechanisms that could help alleviate complaints from the opponents and induce policy compliance. The achievement of the Seoul Cheonggye Stream Restoration Project is clearly recognized by people from both home and abroad. Although a restored Cheonggye Stream has limitations as a natural stream, the project provided Seoul citizens with a water-friendly space in a clean-water stream, and created the city's landmark, while revitalizing surrounding areas' economy.

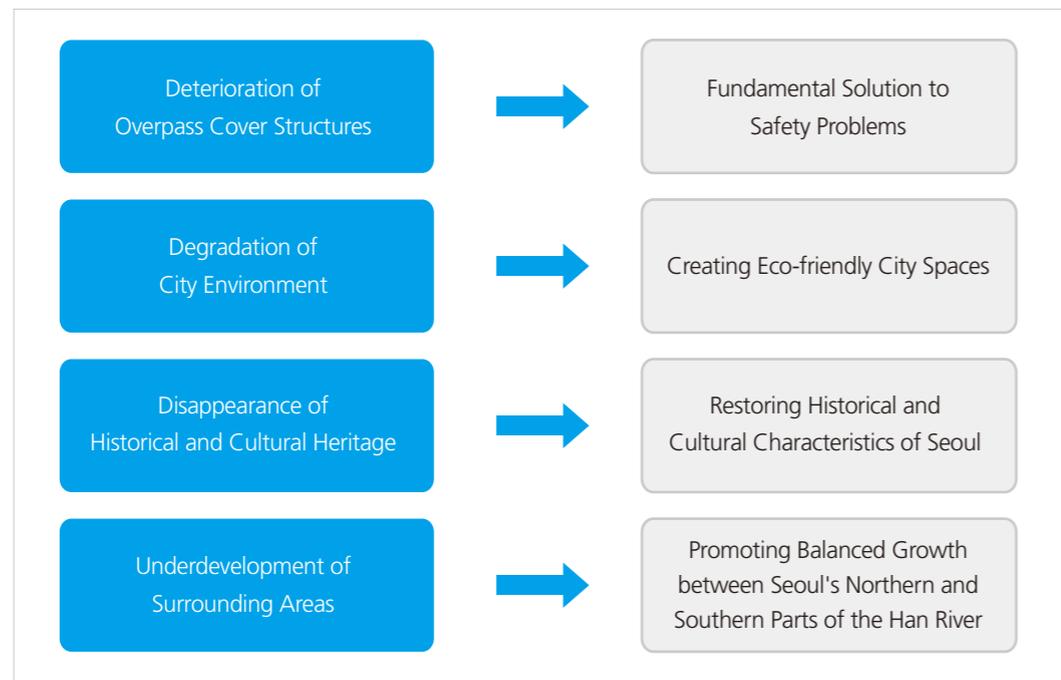
### 2. Project Background and Purpose

#### 1) Project Background

The direct background of the Cheonggye Stream restoration project was to secure the safety of the cover structures of the Cheonggye Stream. Cheonggye Stream's cover structures and overpass were old facilities that could not be maintained only by partial repair, and the bottom of the covered stream was seriously polluted by heavy metals like lead, chrome, and manganese. As the corrosion of structures inside Cheonggye Stream caused by carbon monoxide and methane had accelerated, the demolition of the cover structures and overpass of Cheonggye Stream became a task that could no longer be delayed. The maintenance costs for the cover structure were estimated at around 100

billion won, so it was considered more desirable to ensure citizens' safety and prevent deterioration of the surrounding areas of Cheonggye Stream through dismantlement. At the same time, one of the background factors of the project was the need to create a pleasant environment with a clean-water stream that would meet citizens' increased demand for improvements in the environment of downtown Seoul. Similarly important was the need to instill historical pride by restoring the cultural heritage of the Joseon Dynasty that had been buried underneath the covered Cheonggye Stream. Lastly, development disparities between Seoul's Southern and Northern parts divided by the Han River were another important factor behind the project. These factors are listed in the Figure below as presented by the Headquarters for Seoul Cheonggye Stream Restoration Project.

Figure2-7-1 Background of Seoul Cheonggye Stream Restoration Project



Source : Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006.

## 2) Project Purpose

- Transforming into a Human-centered Ecological Environment City

There had been a widespread awareness over the need to improve downtown Seoul's environment that was covered by concrete as a result of a development-oriented city building after the 1960s, and to offer places for waterfront activities in order to improve citizens' quality of life by restoring

Cheonggye Stream into a clean-water stream. The expectations over the prospect of the Cheonggye Stream restoration project that it might become an important opportunity to restore such a pleasant environment served as a significant momentum for the project.

- Restoring Seoul's Historical Characteristics and Creating Cultural Spaces  
One of the purposes of the Cheonggye Stream restoration project was to recover historical pride by restoring and protecting cultural heritage of the Joseon Dynasty remaining on Cheonggye Stream, such as the Gwangtong Bridge and the Supyo Bridge. Along with this, the project also sought to create a cultural space where citizens could have quality time.
- Revitalization of Cheonggye Stream's Surrounding Underdeveloped Areas in Downtown Seoul  
One of the determinations behind the Cheonggye Stream restoration project was to lay a foundation for the city's economic revitalization by recovering the downtown area surrounding Cheonggye Stream. As a long-term goal, the project also aimed to alleviate regional disparities and promote balanced growth between Southern and Northern parts of the Han River through the revitalization of downtown Seoul.

## 3) Project Content

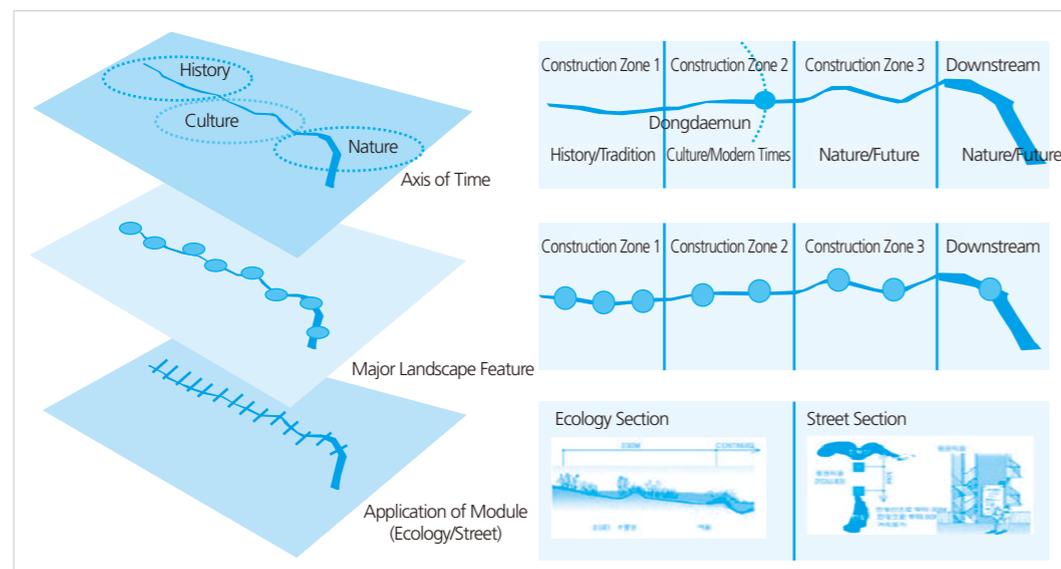
The Seoul Metropolitan Government sought to create "an urban stream surrounded by nature" through the Cheonggye Stream Restoration Project. The would-be restored area covered 5.8km from Taepyeong-ro, Jung-gu via Dongdaemun to Sindapcheol Bridge in Seongdong-gu. The area was divided into three sections and different themes were applied to each section: history and tradition for the two km up to Gwangjang Market; culture and modern times for the 2.1km from Cheonggye Square to Nangye-ro; and finally, nature and future for the 1.7km from Nangye-ro to Sindap Rail Bridge. The project involved a demolition of the overpass and cover structures, restoration of stream; supply of maintenance water, sewerage maintenances, construction of roads on both sides of the stream, access roads, Cheonggye Stream bridges, ecological spaces and cultural facilities, and formation of nightscape.

Table2-7-1 Project Content

Classification	Project Content
Dismantlement of Structures	Cover structure 5.39km; Overpass 5.91km; Intercepting sewer 5.0km; Sewage Culvert 0.30km
Restoration of City-type stream	5.7km
Sewerage Maintenance	16.8km in total: Shifting and building intercepting sewer 6.26km; Pipes for excess overflow 10.54km
Construction of Roads and Bridges	Roads on both sides 5.8km; 22 Bridges (15 Road bridges, 7 Pedestrian walkways)
Water Pipe	17.4km (900-1100 mm pipes)

Source : Lee In-geun. "Seoul Cheonggye Stream Restoration Project." Korean Society of Civil Engineers 53.11 (2005): 120.

Figure2-7-2 Basic Plan for Seoul Cheonggye Stream Restoration Project



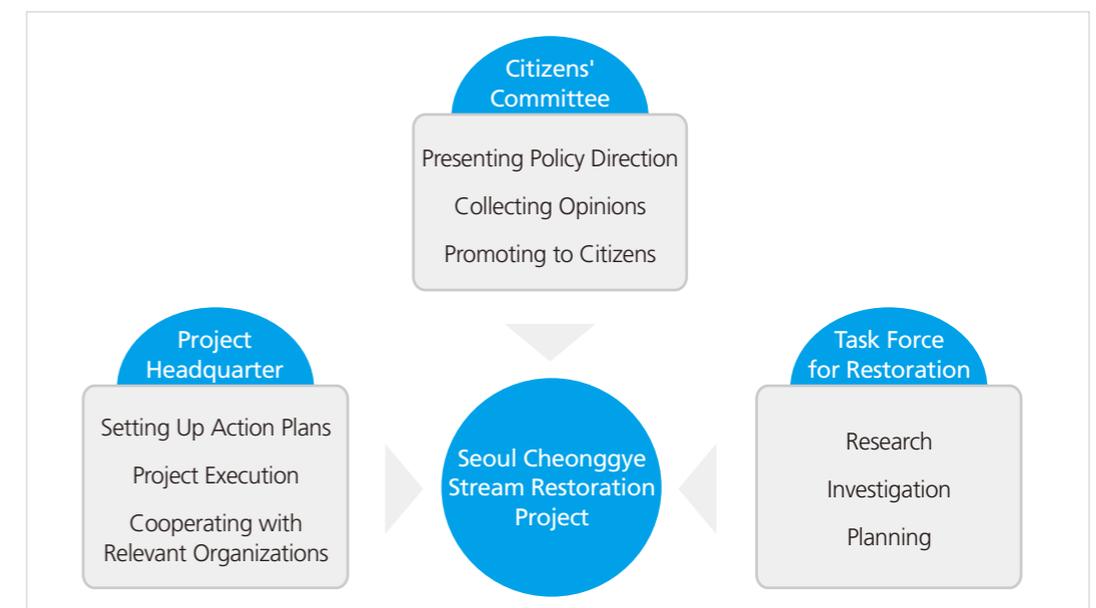
Source : "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 2." 374.

#### 4) Project Implementation Agency

The Seoul Metropolitan Government set up three organizations to implement the restoration project in an effective and systematic manner. First, it set up the Headquarter for Cheonggye Stream restoration, and then organized a task force for Cheonggye Stream restoration who would be in

charge of research assistance involving feasibility assessment and the establishment of basic plans. Subsequently, the Citizens' Committee for Cheonggye Stream Restoration which would take charge of suggesting policy directions for the restoration of Cheonggye Stream, collecting citizens' opinion, and carrying out PR was organized. Experts from various fields, scholars, and civic organizations took part in the committee. The only problem with the committee was the fact that the participation of local merchants and residents of Cheonggye Stream area, whose interest was directly involved in the project, was limited. This was a factor that could cause disputes, but as the project proceeded ahead, the Council for Residents and Merchants was established to collect opinions.

Figure2-7-3 Implementation Framework of Seoul Cheonggye Stream Restoration Project



Source : Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006. 98.

#### 5) Project Progress

On February 11th, 2003, the Seoul Metropolitan Government announced the Draft Basic Plan on Seoul Cheonggye Stream Restoration Project and implemented the project accordingly. The project progress is as follows.

Table2-7-2 Project Progress of Seoul Cheonggye Stream Restoration Project

Date	Content
July 2002	Setting up Headquarter for Seoul Cheonggye Stream Restoration Project
July 2002	Formation of a task force for supporting restoration
August 2002	Formation of the 1st Committee for Protection of Cheonggye Stream Business Area
August 2002-June 2003	A Program for Citizens' Field Observation of Cheonggye Stream
September 2002	Formation of the Citizens' Committee for Cheonggye Stream Restoration
December 2002	Submission of the Draft Basic Plan on Cheonggye Stream Restoration
January 2003	Opening of the Council for Residents and Merchants
February 2003	Announcement of the Draft Basic Plan on Cheonggye Stream Restoration
March 2003	The 1st Session of the Council for Residents and Merchants
March 2003-March 2004	Distribution of PR materials for Seoul Cheonggye Stream Restoration Project
April 2003	Formation of the Council for Clothing Shops
April 2003	The 2nd Session of the Council for Residents and Merchants
April 2003	Establishment of the Plans for Maintenance of Surrounding Streams in line with Cheonggye Stream restoration
May 2003	The 3rd Session of the Council for Residents and Merchants
June 2003	Agreement completed on prior environmental feasibility test of the Cheonggye Stream Restoration Project
June 2003	Initiation of execution design
June 2003	The 4th Session of the Council for Residents and Merchants
July 2003	Commencement of the Cheonggye Stream Restoration Project
July 2003	Confirmation of the basic plan for Cheonggye Stream restoration
August 2003	Commencement of demolition of cover structures
October 2003	Agreements reached on environmental impact assessment
October 2003	Notice of the Basic Plan for Sewerage Maintenance
November 2003	The 5th Session of the Council for Residents and Merchants
March 2004	Transfer of the disassembled remains of Ogan Watergate to the site of the Jungnang Sewage Treatment Station
April 2004	The 6th Session of the Council for Residents and Merchants
May 2004	Completion of shifting and constructing intercepting sewers
December 2004	The 7th Session of the Council for Residents and Merchants
December 2004	Completion of the demolition of cover structures
January 2005	The 8th Session of the Council for Residents and Merchants
March 2005	Designation of the Gwangtong Bridge area as Historic Site No. 461
May 2005	Completion of waterfront facilities and Gwang Bridge
August 2005	Restoration of Gwangtong Bridge completed
September 2005	Mediation of disputes over stream water by the Central Committee for Management of Streams
September 2005	Conclusion of agreement on the consignment of management of Cheonggye Stream
September 2005	Completion of the construction of Cheonggye Stream restoration
October 2005	Completion ceremony, Proclamation of restoration

Source : Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." Summary and Extract from Appendix No. 1. 2006.

### 6) Project Funding

The Seoul Metropolitan Government covered the entire project cost from the city's general account. The city government covered the cost of restoration project with a budget saved through increased efficiency of the administration of city affairs - reduction in 100 billion won of total repair cost of overpass and other unnecessary projects, changes in construction methods, and introduction of creative ways of working.<sup>29)</sup>

## 3. Arguments and Grounds of Proponents and Opponents

### 1) Issues and Logic of Proponents and Opponents

The main thrust of the opposition by interest groups and civic organizations, merchants of surrounding areas in particular, was not an opposition against the Cheonggye Stream Restoration Project itself but rather an opposition against the lack of measures for issues that could occur during the process of restoration. The key issues were traffic congestion, and threats against business rights and livelihoods of street vendors in surrounding areas. Apart from these issues, as the project had been kicked into high gear, issues were raised on how to restore and protect Cheonggye Stream's cultural heritage. In addition, some civic groups and experts voiced their concerns that the restoration of Cheonggye Stream might be reduced to a creation of an artificial stream rather than a restoration of a natural stream.

#### (1) Merchants' Business Loss and Livelihoods

- Arguments of Opponents

Many of the opponents against the restoration project argued that traffic jams would be unavoidable due to a reduction in roads on Cheonggye Stream, which in turn would bring a massive business loss to merchants who were running businesses in the surrounding areas of Cheonggye Stream. The Cheonggye Stream area was a large business district with roughly 60,000 stores employing 200,000 people. They were worried that the restoration project might lead to a serious business loss. Alongside the stores, there were 1,500 street vendors in the Cheonggye Stream area, operating mainly around Hwanghak-dong. The vendors strongly protested against the project on grounds of threats to their livelihoods.

<sup>29)</sup> Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006.

- Arguments of Proponents

A major obstacle for the Seoul Metropolitan Government in implementing the restoration project was the opposition from the merchants in the surrounding area of Cheonggye Stream. Accordingly, the city government sought measures to boost the economy of the business district and tackle inconveniences in operating business through active consultations and interviews with the stakeholders. In doing so, the city government aimed at minimizing damages to the merchants and vendors operating in the area, while mapping out plans for the systematic development of the surrounding areas of Cheonggye Stream from a long-term perspective. At the same time, the city government maintained its stance that potential traffic problems caused by the project could be prevented by delivering measures such as expansion of one-way street in downtown area, median bus exclusive lanes, and a self-car-free-day system.

## (2) Restoration of Ecology: Natural Stream vs. Artificial Stream

- Arguments of Opponents

Although the Seoul Metropolitan Government suggested the restoration of ecology and history as one of the project objectives of Cheonggye Stream restoration, the civil society consistently raised questions over whether, in reality, a restored stream would function as a natural stream. The opponents strongly argued that Cheonggye Stream, which was disconnected from stream basins and had to supply water artificially, would become a mere landscape facility. Some of the opponents also claimed that, given electricity and other energy consumption needed for pumping water, a restored Cheonggye Stream would inevitably be anti-ecological.<sup>30)</sup>

- Arguments of Proponents

It was concluded that, although Cheonggye Stream might not be able to be restored into a perfectly natural stream like in the past, it could be restored into a stream that would change from an artificial to a natural stream gradually from the starting section to the lower section, as was stated in the basic plan. The proponents claimed that an ecological space with relatively high quality nature could be built at the heart of the city by restoring and linking the east and west of the 5.8-kilometer-long water-based green axis that had been disconnected for the past 40 years, while connecting the green axis between north and south of the Jongmyo and Mt. Nam as well.<sup>31)</sup>

30) The leading arguments of the opposition involve: An Byeong-ok. "The Cheonggye Stream Restoration Project as a Nature-Gardening and Social Experiment." ECO Vol.4 (2003); and Cho Myung-Rae. "Contending the Renaturalization of Cheonggye Stream in Seoul." ECO Vol.4 (2003).

31) Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006.

## (3) Restoration of History and Cultural Heritage

- Arguments of Opponents

Some experts voiced their concerns that, despite the fact that the Cheonggye Stream Restoration Project included a restoration of historical heritage, there was high possibility of damages during the actual construction process. Regarding Gwangtong Bridge and Supyo Bridge, in particular, civic organizations and a few members of citizens' committee stuck to their stance on a restoration direction in which the bridges were restored in the way of keeping their original form and location.

- Arguments of Proponents

The city government stressed that the project would restore history through surface investigation, test pitting and precision excavation of cultural heritage, while taking the surrounding environment into consideration. However, as the restoration of historical sites required experts' insights, it could not be decided solely by the city government. Accordingly, the city government suggested that it would follow the decision of the Cultural Heritage Administration, the third party.<sup>32)</sup>

## 2) Persuasion Strategy

### (1) Formation of Public Opinion

During the early stage of discussions and awareness building process of the Cheonggye Stream project, strategies to garner support from the general public were actively put in place. Through media, the cover structures and overpass of Cheonggye Stream were framed as a product of the development age that should be removed, while a pleasant environment in downtown Seoul was presented as a policy vision. This drew a positive response from citizens. The Seoul Metropolitan Government actively promoted the appropriateness of the restoration project under the slogans of "From Development to Environment," "From Vehicle to People," and "From Efficiency to Equity," to secure citizens' support and alleviate anxiety and opposition of Cheonggye Stream merchants. Such efforts included various events, such as programs for citizens' field observation of Cheonggye Stream and a number of contests, opening the Cheonggye Stream Public Information Center, and consistently persuading citizens through the Internet and media.<sup>33)</sup>

32) Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006.

33) Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006.

(2) Various Committees including Citizens' Committee

With the aim of securing credibility of policy implementation agency and resolving conflicts over the process of project implementation, the Seoul Metropolitan Government organized the Cheonggye Stream Citizens' Committee that represented all walks of life. The committee was a legislative organization which had rights to investigation, research, and deliberation, and was in charge of building expertise, critical review, and collecting citizens' opinions. The city government sought to secure the fairness and credibility of the policy by forming the committee with members who were chosen based on criteria such as age, gender, expertise, and reputation. At the same time, six subcommittees were run to secure the project's expertise in various fields, namely history and culture, nature and environment, construction and safety, traffic, city planning, and citizens' opinion.<sup>34)</sup> Some criticized, however, that the committee's role in reality was confined to giving legitimacy to the project despite such member arrangements.<sup>35)</sup>

Basically, the restoration project implemented strategies of building new committees to address conflicts when they erupted. These committees involve the Citizens' Committee, the Council for Merchants and Residents, the Advisory Council of Experts on Historical Restoration, the Experts' Committee on Preservation of Cultural Heritage, and the Subcommittee of the Cultural Heritage Administration. Initially, the Advisory Council of Experts on Restoration of Cheonggye Stream's History had been formed to address the opposition from the Citizens' Committee against problems with the restoration of cultural heritage. However, the Citizens' Committee and Cheonggye Stream Federation protested the idea, so the Experts' Committee on Preservation of Cheonggye Stream's Cultural Heritage was set up to proceed with the project. Despite all these efforts, the Citizens' Committee and Cheonggye Stream Federation once again rejected the decision of the experts' committee. Subsequently, the Subcommittee of the Cultural Heritage Administration was formed, and it determined policies on issues regarding cultural heritage. The opponents criticized that these committees were run in the way that they did not make independent decisions but were influenced by the city government, compromising with reality.<sup>36)</sup>

Table2-7-3 Committees regarding Seoul Cheonggye Stream Restoration Project and Characteristics of the Committees

Name of Committee	Background of Formation	Characteristics
The Citizens' Committee for Cheonggye Stream Restoration	The need to complement the expertise and the function of collecting citizens' opinion for the project implementation	A deliberative and legislative organization for the restoration project in charge of investigation and research, collecting opinions from relevant interest groups and citizens, and policy promotion
Advisory Council of Experts on Restoration of Cheonggye Stream's History	Opposition from citizens' committee on issues regarding cultural heritage restoration	Advisory council of experts in the field of restoration of cultural heritage
Experts' Committee on Preservation of Cheonggye Stream's Cultural Heritage	Opposition from citizens' committee and Cheonggye Stream Federation against decision on cultural heritage restoration policy	To make major decisions on cultural heritage restoration projects
Subcommittee of the Cultural Heritage Administration	Opposition from citizens' committee and Cheonggye Stream Federation against decision of experts' committee	To make final policy decisions on cultural heritage restoration projects

Source : Rearranged from Choi Geun-hee. "A Comparative Study on the Cheonggye Stream Renewal Policy of Seoul and the Dockland Redevelopment Policy of London." Journal of the Korean Urban Management Association 21.3 (2008): 305.

(3) Direct Dialogue and Coordination

The restoration project not only involved a relatively thorough preparation prior to the implementation, but went through a process of actively collecting opinions from Cheonggye Stream merchants. Ever since its establishment on July 2nd, 2002, the Headquarter for Seoul Cheonggye Stream Restoration Project placed a heavy emphasis on collecting opinions from the stakeholders, including vendors. The opinions were collected and mediated through various ways involving public hearings, citizens' committees, council for residents and merchants, policy councils, project seminars, on-site civil affairs offices, and task force for merchants. The headquarter was able to build a trust relationship over the one-year process of visiting stores roughly 4,000 times in person and listening to the opinions of merchants. It was considered a success in forming a consensus with the merchants and inducing their cooperation through the effort.

Specifically, the city government organized and ran the Council for Residents and Merchants in Cheonggye Stream Area to address the opposition from the merchants in the area, with 60 members from representatives of the merchants and residents in Cheonggye Stream's surrounding areas, and members of the city and district councils. The council functioned as a platform to provide benefits within the reasonable range in which the opponents in turn supported the implementation of the

34) Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006.

35) Seong Ji-Eun. "The Study of Conflict Management Strategy in Cheonggye Stream Restoration Project." Korean society and public administration 15.4 (2005): 155-177.

36) Seong Ji-Eun. "The Study of Conflict Management Strategy in Cheonggye Stream Restoration Project." Korean society and public administration 15.4 (2005): 155-177.

project and demanded partial revisions. The council, however, did not accept demands from the opposing parties for the compensation of business losses incurred by the restoration project. In particular, the city government engaged in collecting opinions and negotiations with meticulous preparations during the process of managing conflicts with the merchants. Propensity and demands of the merchants were identified through a thorough prior field investigation. There were no potential conflicts with owners of lands and buildings because they were expecting an increase in property values after the project. On the contrary, local merchants and some of the residents were likely to stir up conflicts. Therefore, a council for residents and merchants was set up to open an official communication channel. Of all the stakeholders, merchants were selected as primary negotiation partners, and the city government proceeded with collecting opinions from the merchants and holding project seminars. In the quest for conflict management with the merchants, a policy council was run prior to the commencement of construction whereas a task force for the merchants was operated after the construction began. The formal and informal negotiations with them helped make the restoration project a success.<sup>37)</sup>

Prior to the commencement of the restoration project, negotiations with merchants were carried out through policy councils. The negotiations were held seven times, and the issues on the table involved those of common interest, including compensations, reaching agreements, and follow-up operations and management. The major negotiation issues and demands were as follows.

Table2-7-4 Dates of Policy Council and Negotiation Issues

Date	Negotiating Party	Negotiation Issues and Demands
February 18, 2003	Seoul Metropolitan Government	<ul style="list-style-type: none"> <li>• A meeting with the policy council</li> <li>• Discussions on how to operate the policy council</li> <li>• Discussions on issues regarding the restoration project</li> </ul>
	Merchant Representatives	
February 27, 2003	Seoul Metropolitan Government	<ul style="list-style-type: none"> <li>• Rejection to compensation for loss</li> <li>• Effort to minimize inconveniences in doing business and boost the economy of the business district</li> <li>• Active support for an alternative area when designated</li> </ul>
	Merchant Representatives	
March 13, 2003	Seoul Metropolitan Government	<ul style="list-style-type: none"> <li>• Impossible to delay the commencement of construction scheduled for July</li> <li>• Examining measures for indirect support</li> </ul>
	Merchant Representatives	
March 20, 2003	Seoul Metropolitan Government	<ul style="list-style-type: none"> <li>• Explaining about the project and collecting recommendations</li> </ul>
	Merchant Representatives	
April 3, 2003	Seoul Metropolitan Government	<ul style="list-style-type: none"> <li>• Suggesting stronger focus on producing actual measures rather than arguments over delay in commencement of construction and compensation for business loss</li> <li>• Agreement on dividing teams into relocating and remaining ones and having a meeting once a week</li> </ul>
	Merchant Representatives	
April 8, 2003	Seoul Metropolitan Government	<ul style="list-style-type: none"> <li>• Merchants' protest against putting up a banner about the introduction of traffic control slated for July 1st. The policy council broke down</li> </ul>
	Merchant Representatives	
Breakdown of Policy Council		
June 9, 2006	Seoul Metropolitan Government	<ul style="list-style-type: none"> <li>• Continuing to revitalize the business district</li> <li>• Examining the size of the alternative area</li> </ul>
	Merchant Representatives	

Source : Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006. 280.

Merchants who attended the official negotiations with the city government during the policy council failed to go further than expressing a basic idea of the opposition against the project because their interests were diverse, which made it hard to reach an agreement. Accepting merchants' recommendations, the city government built a council for merchants. Beginning from November 15th, 2003, which was after the commencement of construction, 17 rounds of meetings were held. The dates and main contents of discussions at the Council for Merchants were as follows.

37) Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006.

Table2-7-5 Dates and Main Contents of Council for Merchants

Date	Main Content
December 15, 2003	<ul style="list-style-type: none"> <li>• Awarding letters of appointment</li> <li>• Collecting merchants' recommendations</li> <li>• Holding temporary and representative meetings: Cooperation for voluntary removal of obstacles on the streamside of Cheonggye Stream</li> </ul>
December 19, 2003	<ul style="list-style-type: none"> <li>• Measures, including additional installation of U-turns on Cheonggye Stream-ro</li> <li>• Schedule for implementation of settlement complex</li> <li>• Collecting recommendations from merchants</li> </ul>
January 16, 2004	<ul style="list-style-type: none"> <li>• Explaining about the draft plan on land use of the Munjeong District</li> <li>• Plan on additional installation of U-turns on Cheonggye Stream-ro</li> <li>• Issues regarding installation of street lights and planting trees on Cheonggye Stream-ro</li> <li>• Plans to utilize loading zones</li> <li>• Results of advertising normal operation of the stores on Cheonggye Stream</li> </ul>
February 20, 2004	<ul style="list-style-type: none"> <li>• Problems with operating free buses in surrounding areas of Cheonggye Stream</li> <li>• Normal operation of loading zones on Cheonggye Stream-ro at the earliest possible time</li> <li>• A demand for a flexible application of parking violation of business vehicles</li> </ul>
March 19, 2004	<ul style="list-style-type: none"> <li>• Issues regarding cultural heritage on Cheonggye Stream construction site</li> <li>• Progresses regarding Cheonggye Stream festival and merchants' cooperation</li> <li>• Progresses in redevelopment of the surrounding areas of Seun shopping mall</li> <li>• Progresses in building settlement complex</li> <li>• Explanations, including progresses in the Cheonggye Stream Restoration Project</li> </ul>
April 14, 2004	<ul style="list-style-type: none"> <li>• Issues regarding the excavation of cultural heritage during the Cheonggye Stream Restoration Project</li> <li>• Cooperations from merchants regarding Cheonggye Stream festival</li> <li>• Progresses in construction</li> <li>• Issues, including operation of loading zones</li> <li>• Collecting other recommendations</li> </ul>
May 28-29, 2004	<ul style="list-style-type: none"> <li>• Plans for efficient operation of task force for Cheonggye Stream merchants</li> <li>• Evaluation and discussions of the results of the launch of Cheonggye Stream festival</li> <li>• Discussions on other measures for merchants</li> </ul>
June 18, 2004	<ul style="list-style-type: none"> <li>• Discussions on the schedule for relocation measures and issues at hand</li> <li>• Headquarter' final decision on the composition of a deliberative committee on candidates for relocation after consulting a draft basic plan with the Council for Merchants at a temporary meeting</li> </ul>
August 20, 2004	<ul style="list-style-type: none"> <li>• Discussions on progresses in measures for the Cheonggye Stream project</li> </ul>
September 17, 2004	<ul style="list-style-type: none"> <li>• Selection of candidates for scholarship for Cheonggye Stream merchants's children</li> <li>• Demanding for complementing the traffic signal system on the east and west of Cheonggye Stream-ro at the Heunginmun-ro intersection</li> </ul>
October 29, 2004	<ul style="list-style-type: none"> <li>• Progresses in creating the Southeastern Distribution Complex</li> <li>• Explanation on recommendations for U-turn at Ogansu Bridge</li> <li>• Explanation on next schedules for the transfer</li> <li>• Explanation on other measures for tenant merchants in relation to redevelopment</li> </ul>
November 19-20, 2004	<ul style="list-style-type: none"> <li>• Issues regarding the establishment of the Southeastern Distribution Complex</li> <li>• Other issues at hand</li> </ul>
December 21, 2004	<ul style="list-style-type: none"> <li>• Progresses in 2004 measures and future measures for merchants</li> <li>• Collecting other recommendations</li> </ul>
January 28, 2005	<ul style="list-style-type: none"> <li>• Qualifications of businesses and selection standards for lines of trade that were relocating into the Dongnam District Shopping Mall</li> <li>• Business direction of the shopping mall (Formation of union, public development, public-private joint development, etc.)</li> </ul>
February 18, 2005	<ul style="list-style-type: none"> <li>• Explanation on the types of development project for the Dongnam District Shopping Mall - public development, public-private partnership, and private development</li> </ul>
March 18, 2005	<ul style="list-style-type: none"> <li>• Explanation on progresses in deliberation of transfer candidates' qualifications and future plans</li> </ul>
April 8, 2005	<ul style="list-style-type: none"> <li>• Plans for tidying up advertisements</li> <li>• Planting street trees on Cheonggye Stream-ro</li> <li>• Reporting on results of a deliberative committee held</li> </ul>

Source : Seoul Metropolitan Government. "A White Paper on Seoul Cheonggye Stream Restoration Project Vol. 1." 2006. 282.

The Seoul Metropolitan Government actively utilized unofficial negotiation channels along with the aforementioned official channels.<sup>38)</sup> Compared to official negotiations, unofficial negotiations were more effective due to less restrictions and more chances to form interactive relations. Negotiation teams of both the city and the merchants evaluated unofficial negotiations highly useful and valuable.

Public Official A: Although the channels were unofficial, they were helpful in obtaining information.

Merchant Representative B: Unofficial channels allowed us to communicate in times of fierce confrontation when we could not have in-depth discussions through the official channels.

Merchant Representative B: Official policy consultative meetings were more like a "persuasive meeting." That is because the city government only explained already-established plans and tried to persuade us. However, during the unofficial meetings, things were different. The city listened to us and showed its will to reflect our ideas in the plan. The same was true for the merchants. We told the city that we were not opposing the plan for the sake of opposing, but that was our only option left. We also asked the city to find alternative measures that we can accept.

Source : Seoul Metropolitan Government. "A White Paper on Cheonggye Stream Restoration Project Vol. 1." 2006. 283.

#### (4) Establishment of Compensation System

In order to manage conflicts, the city government devised compensation measures differently for the public, who would feel the impact of the restoration project, and the interested parties, who would be directly affected by the project. The main point of the compensation measure for the public was preventing any damages that could incur by traffic congestion due to demolition of roads. The measures included ways to resolve possible traffic congestion by deterring the use of passenger cars and improving public transportation system.<sup>39)</sup> Meanwhile, for the interested parties, the city government proposed the following diverse types of measures. First, for the merchants in the area, various measures were proposed in order to prevent the decrease of visitors due to traffic inconveniences: measures regarding trucks and freight-related parking on the Cheonggye Stream-ro; changes of bus routes around Cheonggye Stream; operation of free shuttle buses in the area; free parking services for store visitors in the region. Secondly, there were measures regarding compensation for the business losses of the merchants during the construction period. The city government said it

38) Seoul Metropolitan Government had 15 rounds of unofficial negotiations from April 17th to June 6th, 2003 with members of the Task Force for Protection of Cheonggye Stream Business Area and the Committee of Clothing Stores who opposed the Cheonggye Stream Restoration Project.

39) Seoul Metropolitan Government carried out various measures: improving the metro's transport capacity, extending the exclusive median bus lane, enhancing the capacity of exclusive roadside bus lane, operating city bus with circulation courses, and increasing downtown parking fees. (Seoul Metropolitan Government, 2006)

could not compensate the business losses, but instead tried to ease merchant's objections by providing measures to minimize inconveniences, vitalizing business areas through redevelopment, and providing relocation assistance for the merchants. The third type of measures was related to the street vendors, who fiercely opposed the restoration project because the implementation of the project would mean the loss of their livelihood. The city government initially decided not to have negotiations with the vendors since they were illegally operating. However, with continued resistance from the vendors' organization, the city government decided to engage in negotiations with them. As a result, it decided to build a temporary flea market in Dongdaemun Stadium to manage conflicts. The city government opened the Seoul Folk Flea Market in January 2004 and carried out supportive measures including the expansion of accommodations in the market.

## 4. Verification and Evaluation of Proponents' and Opponents' Arguments

### 1) Improving Urban Environment and Providing Water-Friendly Spaces

Most people including the opponents agree that the Cheonggye Stream Restoration Project dramatically improved city's environment including air quality and provided resting places for the public. Even though the artificial stream still has room for improvement, walking paths constructed along both sides of the stream are welcomed by the citizens. The restored stream and nearby water-friendly facilities emerged as Seoul's landmark, attracting a large number of people.<sup>40)</sup>

### 2) Restoration of Historical Relics

The restoration project shed new lights on the historical relics of Joseon dynasty, including Gwang Bridge. The Stone Revetments, which had been under the concrete covering, saw light, and Gwang Bridge, which had disappeared, was restored near its original location. Ogan watergate near Dongdaemun also came back to its original place even though its shape has changed. However, not every historical relic was able to be restored due to various realistic problems including the lack of the original forms and preservation difficulties. Supyo Bridge was not restored at its original location but moved to another place for preservation, and Mojeon Bridge could not be restored. As such, the project left room for improvement in that it left regrets in terms of the restoration of historical relics due to partly unsatisfied outcome.<sup>41)</sup>

40) Cho Myung-rae. "Accomplishments and Limits of Cheonggye Stream Restoration." Journal of KSCE 53(11): 149-155. 2005.

41) Seoul Metropolitan Government. "A White Paper on Cheonggye Stream Restoration Project Vol.3." 2006.

### 3) Natural Stream vs. Artificial Stream

Creating eco-friendly environment in the city was one of the major purposes of the restoration project along with the restoration of historical relics, but they drew the strongest criticisms. It is true that the restored Cheonggye Stream cannot be seen as a natural stream because water is not naturally coming from the nearby river basin, but pumped up from the Han River. Even if water was designed to come directly from the river basin, it would be very difficult to manage the flow of water during the dry or flood seasons. However, pumping up 120,000 tons of water a day to run the stream costs huge amount of money because of excessive energy consumption, which is the project's major drawback. It is undeniable that the design of Cheonggye Stream, which focused on water-friendliness and landscape, was not the most appropriate to guarantee ecological diversity.

## 5. Project Implementation Effect

### 1) Fundamental Solution to Overpass Safety Issue

One of the most visible achievements of the restoration project is that it fundamentally solved safety issues of the facilities near the stream, by pulling down the concrete covering above the stream and the overpass. Even the opponents agree that by tearing down such facilities, instead of temporarily fixing them, the project brought in more economical and effective results from a long-term perspective.<sup>42)</sup>

### 2) Improvement of City Environment and Downtown Revitalization

Restoration of Cheonggye Stream dramatically improved the city's environment and created an urban landmark. The overpass near the stream was blocking the sights and undermined the landscape along with other disordered buildings. In addition, by causing noise and dust, the overpass deteriorated the city environment. Thus, the demolition of the overpass solved such problems regarding the landscape and the environment.

### 3) Restoration of Urban Ecosystem and Provision of Water-friendly Spaces

By restoring a clean stream and creating waterfront ecological parks, the project provided water-friendly spaces where citizens can take a rest in nature. Not even Hong Kong or other Asian mega cities were able to create such places in urban areas. In that sense, the restoration project can be seen as the biggest achievement of Seoul Metropolitan Government, as the environment was recovered and the quality of life was enhanced through the project thanks to improved air conditions, which resulted from

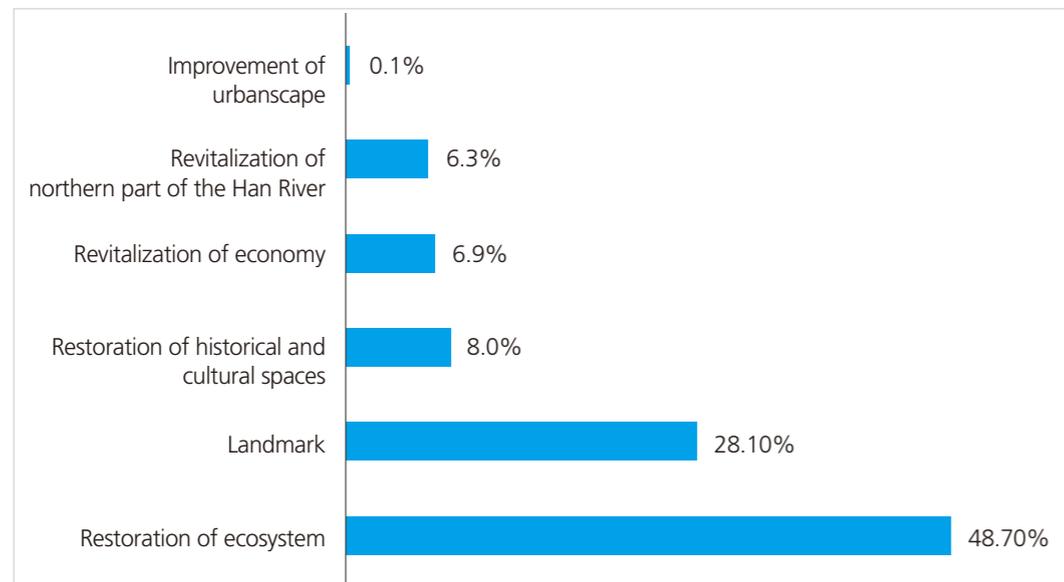
42) Cho Myungrae. "Accomplishments and Limits of Cheonggye Stream Restoration." Journal of KSCE 53(11): 140-155. 2005.

reduced urban heat islands and newly created wind paths.<sup>43)</sup> However, the fact that it costs seven billion won annually to pump up 120,000 tons of water from Han river to flow the water in Cheonggye Stream 24 hours a day is the biggest drawback of the project, which still draws much criticism.

#### 4) Urban Renewal and Revitalization of Neighbouring Areas

Another visible and direct effect of the Cheonggye Stream restoration is changes in land use of adjacent areas and accompanied increases in the value of land. In addition, the local economy was revitalized as various economic activities took place near the Cheonggye Stream. This is one of the great accomplishments of the project. When the aforementioned effects of the restoration project are analysed through the frame of social costs and benefits, total quantified costs are estimated to be 1.8 trillion won including the project cost, traffic congestion cost, and maintenance and administration cost after the restoration. Quantified benefits are estimated to be 3.3 trillion won including reduced maintenance and administration costs for the overpass and improved environment. Total social benefits far surpass total social costs, when unquantified benefits such as improved air conditions and economic spill-over effects are added.<sup>44)</sup>

Figure2-7-4 Accomplishments of Cheonggye Stream Restoration Project



Source : Seoul Metropolitan Government. "A White Paper on Cheonggye Stream Restoration Project Vol. 3." 2006.

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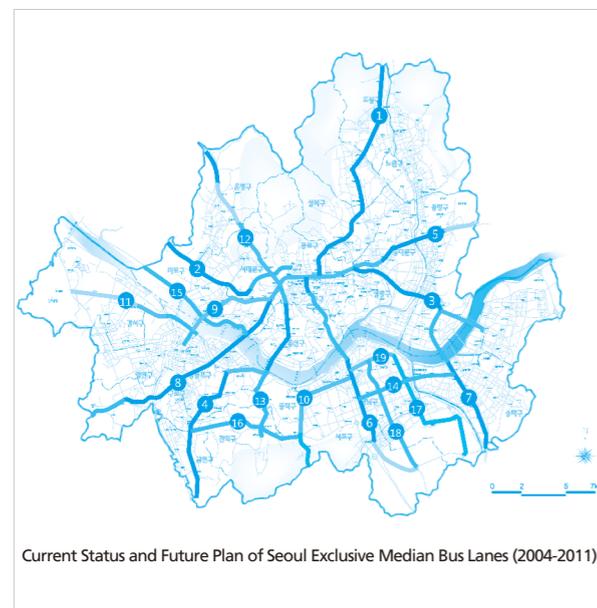
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## 8 Seoul Exclusive Median Bus Lane Project

### 1. Project Outline

Length	14 roads of 107.7km (as of December 2010)
Total Cost	80.34 billion won (2005~2010)
Project Duration	July 2004~December 2012 * Plans to establish and manage 19 roads of 214.7km; 14 roads of 124.4km by 2011 and 5 additional roads of 90.3km by 2012



As of early 2000s, Seoul’s transportation infrastructure was over-saturated as a result of concentration of population, businesses, and industries in Seoul. In particular, with high dependency on imported energy, the idea that passenger-car-oriented travel behavior should be replaced with energy-efficient travel behavior was gaining ground. At the time, average city bus speed was only 16 km per hour, and the quality of bus service was very poor. In order to solve such problems, the Seoul Metropolitan Government decided to carry out extensive reforms on bus transportation system, including the Exclusive Median Bus Lane Project in 2004.

From 2004, the city government has been gradually carrying out the project with an aim to implement 214.7 kilometer-long Exclusive Median Bus Lane in 19 roads until the end of 2012. As of late 2010, the exclusive lane was secured in 14 roads that run 107.7km.

In carrying out the Exclusive Median Bus Lane Project, various types of conflicts emerged from the planning phase: user inconvenience, road management efficiency and safety, and fierce confrontation between interested parties. However, the city government was able to create positive public opinion about the project by proposing project implementation effects in an objective fashion. Through consultation with the interested parties, direct dialogue and mediation were conducted. In addition, the city government was able to smoothly carry out the project with persuasion strategies including the appliance of new governance through a citizen’s committee.

### 2. Project Background and Purpose

#### 1) Project Background

In 2004, when the Seoul Metropolitan government introduced the Exclusive Median Bus Lane System, the city’s transportation infrastructure was able to handle 2 million cars while there were 2.8 million cars in the city. In addition, about 3.15 million cars were traveling between Seoul and nearby cities within the metropolitan area, causing the saturation of the transportation capacity in the city. In particular, as oil price continued to rise, the country, with its heavy dependance on imported energy, needed a practical policy that could deter the further use of passenger cars. At the time, the average bus speed was slowing down to 16km per hour, which already fell short of the average passenger car speed, 19.8km per hour. In addition, the quality of bus service was very poor because of old vehicles and related facilities, which caused a further decrease in the share of bus in all transport.

In addition, people called for improved bus service, as more people began to realize the need to secure the right of the socially weak groups such as the elderly, children, and the poor who could not freely use passenger cars as well as the need to control the use of passenger cars in order to manage air pollution.

Against this backdrop, there emerged a need to improve bus service through overhauling bus transportation system. As a result, exclusive median bus lane was promoted.

#### 2) Project Purpose

The purpose of the project was to enhance the speed, punctuality and capacity of bus service so as to reduce travel time of bus users and to strengthen public transportation user convenience at a low cost.

### 3) Project Content

The Exclusive Median Bus Lane Project was part of an effort to reform the public transportation system in the city. The public transportation reform project was composed of various interconnected projects including the introduction of Exclusive Median Bus Lane System, restructuring of bus routes, introduction of quasi-public management system of bus service, and fare system reform. Major contents of the Seoul public transportation system reform project are as follows.

#### (1) Exclusive Median Bus Lane System

Under the project, the existing exclusive roadside bus lanes were to move to the center of the roads. Target roads were those that connect central and subcentral areas of Seoul with neighbouring cities. More specifically, they included: major arterial roads going through developing areas of high density; roads in areas with poor subway service and high bus usage demand; and roads where more than three lanes per direction could be secured.

Figure2-8-1 Exclusive Median Bus Lane Installation Plan

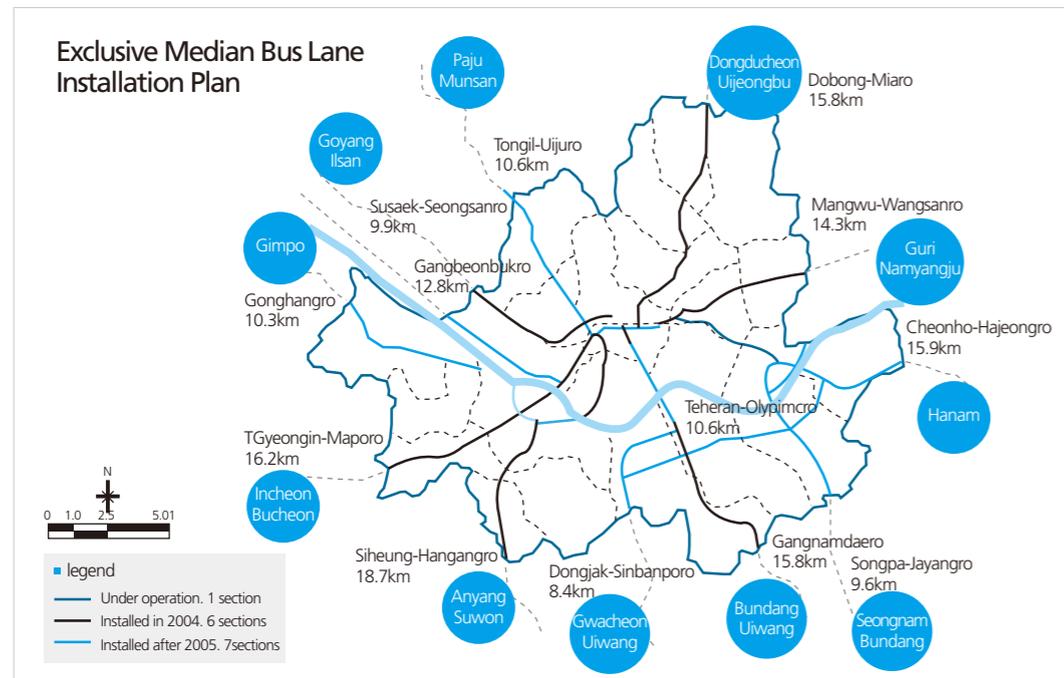
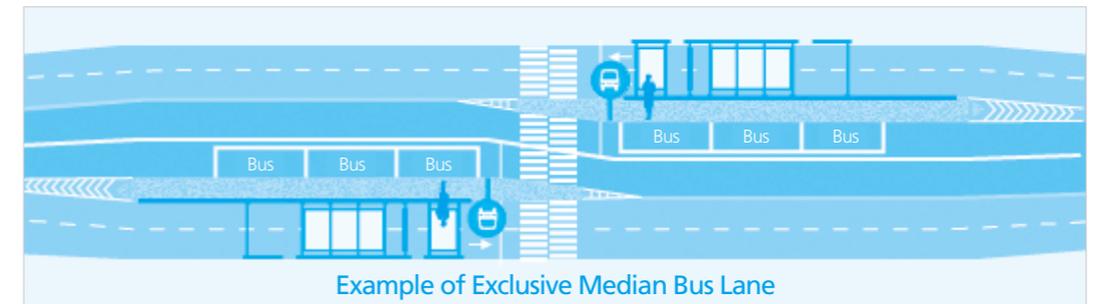


Figure2-8-2 Example of Seoul Exclusive Median Bus Lane



Source : Seoul Metropolitan City. "Comprehensive Analysis and Future Development Direction of Exclusive Median Bus Lane System as a Transportation System in a Mega City." 2009.

#### (2) Restructuring of Bus Routes

Under the restructuring project of bus routes, unreasonable city bus routes, which were long, redundant and curved, were reorganized and divided into a dual system of trunk lines and branch lines. Trunk lines were the backbone of transportation system in the city, while branch lines connected various transportation means.

In designing the routes, trunk lines, which dealt with medium and long distance travel demand, were planned to be under public management system in order to have improved mobility, punctuality and service. Branch lines were designed to improve user convenience, link with trunk bus lines and subway by fully harnessing the existing lines, and expand the existing routes with poor services.

#### (3) Introduction of Quasi-Public Management System of Bus Service

Along with the introduction of the Exclusive Median Bus Lane System, the city government introduced a quasi-public management system with an emphasis on the public nature for bus services, for which up to that time private providers had operated. Under the quasi-public management system, the rights on most private bus routes would be owned by bus companies, but the revenues coming from the routes would belong to the public revenue management organization to be distributed to the bus operating companies, according to the operation ratio of each route. However, a bidding system was introduced for a number of newly created routes.

#### (4) Fare System Reform

Unlike the then existing independent fare system under which the fare was charged according to the number of service use, the reformed fare system, largely represented as a distance-based and transit-fare system, was an integrated transportation fare system that would charge fare according to the total distance, regardless of the number of transit between transportation modes.

The unified bus fare was maintained and was also applied to the fare of inter-city buses, which charged extra fare for traveling additional distances. In addition, a new transfer fare system was introduced: free transfer when the total distance is shorter than the basic distance of 10<sub>km</sub>, while extra charge for every 5<sub>km</sub> when the total distance exceeds 10<sub>km</sub>.

### 3. Arguments and Grounds of Proponents and Opponents

#### 1) Issues and Logic of Proponents and Opponents

Various types of conflicts emerged from the planning phase of the Seoul Exclusive Median Bus Lane Project. These conflicts are categorized into four issues: service quality in terms of user convenience, road management efficiency, road management safety, and the issues between interested parties. Opponents' and proponents' arguments and grounds for each issue are as follows.

##### (1) Service Quality Regarding User Convenience

- Arguments and Grounds of Opponents

The opponents argued that the introduction of the Exclusive Median Bus Lane with a system of trunk and branch lines would require several transfers to get to certain places, whereas a single ride would be sufficient by the existing bus routes and system. In addition, they claimed that the new system would cause inconveniences for the passengers because they needed to walk longer distance. The reason was explained that bus passengers might need to walk more between bus stops for trunk and branch lines, since only trunk line buses would be allowed to use the exclusive median lanes. Adding to such inconvenience, passengers would have to bear with longer travel time and larger fare due to transfers and waiting.

- Arguments and Grounds of Proponents

The Seoul Metropolitan government argued that the introduction of the exclusive median bus lane would resolve user inconvenience as it would improve the punctuality of the bus system, which had been a drawback compared to the subway. With the introduction of the distance-based fare system and an integrated transfer discount system, the overall fare system would become reasonable, as users pay only for the distance travelled. Moreover, the city government emphasized that the overall competitiveness of public transportation system would be improved by integrating bus and subway. Through such improvements including bus service quality, the city government expected a rise in the share of bus in all transportation modes, which had been declining. Moreover, the city government saw a great symbolic meaning, as it prioritized public transport users in road usage.

##### (2) Road Management Efficiency

- Arguments and Grounds of Opponents

The reasons for opposing the exclusive median bus lanes were spelled out that while the speed of some trunk line buses that use exclusive median bus lanes could improve, vehicles that could not use the lane such as passenger cars, taxis, trucks, branch line buses and town buses, would effectively have one fewer lane to use and therefore face serious traffic congestion and chaos. The opponents thus proposed that it would be desired to use the existing exclusive roadside bus lanes. They made an additional point that the introduction of the exclusive median bus lane system might cause traffic congestion, as it would be hard to deal with traffic at crossroads and in and out of alleys.

- Arguments and Grounds of Proponents

The Seoul Metropolitan Government refuted that the existing exclusive roadside bus lanes were not effective because of illegal parking and stopping as well as cars using backside roads. The city persuaded the opponents, arguing that the introduction of the exclusive median bus lane system would increase bus speed, decrease travel time, and reduce traffic congestion. The city government added that the new system could enhance the quality of bus service by improving the punctuality of bus service, increase the transport share of buses, and in result generate huge social benefits.

##### (3) Road Management Safety

- Arguments and Grounds of Opponents

The opponents argued that since most of the existing left-turn and u-turn sections would have to be abolished to build and run the exclusive median bus lane, there would be increased possibility of traffic accidents caused by confusions on the part of passenger cars or other vehicles using the lanes.

- Arguments and Grounds of Proponents

The proponents refuted that the introduction of exclusive median bus lanes would improve road management safety by reducing drivers' confusion through clearly distinguishing lanes for passenger and other vehicles and lanes for buses.

#### (4) Conflicts Between Interested Parties

- Arguments and Grounds of Opponents

The opponents argued that public transportation service gap between the regions with exclusive median bus lanes and the regions without them could be widened, causing regional conflicts. They predicted that, due to the restructuring of bus routes, unnecessary social conflicts might occur between companies that run high-profit bus routes and other companies. In particular, when bus routes are restructured following the implementation of exclusive median bus lanes, the operating stability of bus companies could decrease and result in poor bus service quality. The introduction of the exclusive median bus lane system would also decrease the number of roadside bus stops, posing potentially negative impacts on neighbouring business areas. The opponents argued that the exclusive median bus lane system should not be introduced unless the city government takes an overall traffic signal system reform including the introduction of a priority signal system for buses coming from feeder roads to the median lane.

- Arguments and Grounds of Proponents

The proponents stressed an opportunity of resolving potential conflicts between parties of different interests in the reform process of the public transportation system including the exclusive median bus lane system. Furthermore such a process could provide a basis of a new regional and public governance system regarding public projects.

## 2) Persuasion Strategy

In order to mitigate conflicts related to the project, the city government utilized various persuasion strategies: forming public opinion by informing the prospective effects of the project, having direct dialogue and coordination based on mutual understanding, and introducing a new governance scheme of participatory administration through the Citizen's Committee on Bus Service Reform.

### (1) Creating Public Opinion by Informing the Prospective Effects of Project

The Seoul Metropolitan Government reviewed the effects of the exclusive median bus lane through the pilot projects in 4.5km-long Cheonhodaero and 7.6km-long Hajeong-ro, where the exclusive median bus lanes were implemented in 1996 and 2003 respectively. Through the process, the city government was able to make the public recognize that the project was a well-prepared policy and that related problems were already taken into account. At the time, as a result of the introduction of the exclusive median bus lanes in Cheonhodaero and Hajeong-ro, the speed of bus during rush hours increased from 18.2km per hour to 35.0km per hour and from 20.0km per hour to 29.1km per hour, respectively.

In addition, the city government told the media on the unreasonable aspects of the existing bus system, including the privatization of bus routes and the insolvency of small bus companies. By doing so, the city government concentrated on building a favorable environment and social consensus on the overall reform of the bus system.

It also introduced success stories of relevant projects in other cities such as Bogota, Columbia, Osaka, Japan, Hong Kong, and Curitiba, Brazil to shape positive public expectations on the restructuring of Seoul's public transportation system.

### (2) Direct Dialogue and Coordination Based on Mutual Understanding

During the process of shaping ideas for the bus system restructuring, the city government collected opinions from experts and interested parties through public hearings, discussions, and consultative meetings. Through the process, the city government was able to acknowledge, in advance, the interested parties' diverse opinions that could result in conflicts and to prepare effective countermeasures. Conflicts between the parties of different interests can be divided into the following. First, the conflicts between the Seoul Metropolitan Government and the Seoul Bus Transport Union were about the introduction of a quasi-public management system of bus service. The city government argued for the restructuring of bus management system to enhance the public nature of bus. On the other hand, the Seoul Bus Transport Union claimed that the introduction of a quasi-public management system, which was the core of the restructuring plan, meant an infringement on private property rights.

Second, within the Seoul Bus Transport Union, conflicts emerged between bus companies with high profit routes and other companies. Third, conflicts between the city government and the National Police Agency emerged regarding the safety and communication issue of the target areas of exclusive median bus lane implementation and the establishment of plans for traffic management. The city government requested interested parties to submit objective reports on controversial issues so that all interested parties could have fact-based discussions and thus reach mutual understanding and agreement. For example, regarding the calculation of the transport unit cost, which was the main point of the quasi-public management, the city government and the Bus Transport Union submitted different reports and reached an agreement through numerous meetings discussing the findings of the reports.

### (3) New Governance of Participatory Administration<sup>45</sup>: Citizen's Committee on Bus Service Reform

The Seoul Metropolitan Government organized the Citizen's Committee on Bus Service Reform, which was a policy consultative body that included all the interested parties. The committee was

<sup>45</sup> New Governance : A measure in which various actors such as governments, states, markets, and civil groups create horizontal networks, interactions and collaboration to minimize conflicts and to carry out policies or plans. (Pierre, 2000)

comprised of the representatives from all parties including the Seoul City Council, the Seoul Bus Transport Union, the Seoul Town Bus Transport Union, the Bus Transport Labor Union, transport experts, civil groups, and the National Police Agency.

Representatives from various interested parties participated in the deliberation of policies from the early stage, which enhanced mutual understanding in a candid atmosphere of committee meetings.

Different interests and conflicts were successfully mitigated through direct negotiations between the parties in the committee. As a result, an agreement was reached based on mutual considerations and concessions between the parties. Thus, the effectiveness of a participatory governance was proved through the operation of the Citizen's Committee on Bus Service Reform.

## 4. Verification and Evaluation of Proponents' and Opponents' Arguments

### 1) Improved Service Quality Regarding User Convenience

With the enhanced punctuality of buses after the implementation of the Exclusive Median Bus Lane System, Seoul city buses' transport share rose from 27.6 percent in 2006 to 27.8 percent in 2009. The modal share gap between the bus and the subway (with a 35.2 percent share in 2009) was narrowed. In addition, the number of public transportation users in Seoul increased by 2.2 percent, from 10.19 million in 2006 to 10.41 million in 2009, indicating that the exclusive median bus lane system improved the overall quality of public transportation service.

In particular, according to a survey on citizens' satisfaction on public transportation, people's satisfaction on bus service improved by 12.4 points from 59.2 in 2006 to 71.6 in 2009, compared to a mere increase from 65.6 to 69.7 of taxi satisfaction during the same period, suggesting that the quality of bus service dramatically improved.

### 2) Road Management Efficiency

The Exclusive Median Bus Lane System won Grand Prize in 2009 Local Government's Public Transportation Policies. Nearby Incheon city, Gyeonggi-do, and other metropolitan governments began introducing the system. Indeed, in a 2009 survey on citizens regarding downtown traffic system improvement, 86.8 percent of the respondents answered that the exclusive median bus lane system was necessary for solving traffic congestion.<sup>46)</sup>

With the implementation of the exclusive median bus lane system in the arterial roads connected

to downtown, it became easier for people from the metropolitan area to get to downtown by bus, mitigating the concentration of passenger cars in downtown Seoul.

In particular, the traffic speed of the roads in downtown continued to improve after the introduction of the system. The speed in Dobong-Miari has increased by 81.8 percent from 11km per hour to 20km per hour, while the speed in Susaek-Sungsanro and Kyungin-ro has increased by 51.9 percent and 35.0 percent, respectively. Likewise, the speed of city buses has increased by 28 percent on average. In addition, the case of Hangang-ro shows that not only the speed of buses, but also other vehicles' speed has increased by 10.6 percent from 24.5km per hour to 27.1km per hour, suggesting that the exclusive median bus lane system has improved the operation efficiency of the overall road network.

As of 2007, the benefits<sup>47)</sup> of the eight major roads with the exclusive median bus lane system were estimated to be 70.78 billion won per year and the B/C ratio between 2005 and 2035 was estimated to be 3.0-18.6, proving the efficiency of the project.

### 3) Road Operation Safety

The number of traffic accidents on the exclusive median bus lanes slightly increased right after the system was introduced, but then decreased as drivers and citizens became accustomed to the system. According to the Road Traffic Authority, 881 cases of traffic accidents took place in downtown Seoul in the first half of 2004. In the second half, the number slightly rose to 925. However, the number continued to decrease to 816 in the first half of 2005 and to 714 in the first half of 2006.

### 4) Conflicts Between Interested Parties

Seoul city organised and operated the Citizen's Committee on Bus Service Reform in which all the interested parties participated. Through this participatory governance scheme, the city successfully implemented the quasi-public management system for the bus service, which could have gone to waste because of the conflicts between interested parties in the past. In addition, the city government made an exemplary case for the establishment of new governance system in conflicts mitigation. In short, the committee played a key role in the successful introduction of a quasi-public management system, guaranteeing fairness for both the city government and the Seoul Bus Transport Union.

46) Seoul Metropolitan Government. "Comprehensive Analysis and Future Development Direction of the Exclusive Median Bus Lane System as a Traffic Policy in a Mega City." 2009.

47) Project cost in 2005-2010 for eight roads is 80.34 billion won as of 2007 while the cost of the benefits (operating cost, traffic accident, travel time, environmental cost) is 364.3 billion won

## 5. Project Implementation Effects

According to an analysis on the operation status of the three arterial roads of Gangnamdaero, Susaek-Sungsanro and Dobong-Miara, where the Exclusive Median Bus Lane System was implemented, the punctuality of buses has been improved by 16 percent, and bus speed by 4.5-9.8 km per hour, compared to the exclusive roadside bus lanes.<sup>48)</sup>

Furthermore, the deviation of bus travel time was one to two minutes, showing that the punctuality of buses has greatly improved to become almost equivalent to that of the subway. The bus speed has increased by 30 percent on average.<sup>49)</sup> With enhanced convenience, the number of bus users<sup>50)</sup> per day increased by 22,000 in 2009, contributing to the improvement of demand and transport share of buses.

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48) Seoul Development Institute. "A Case Study on Conflict Management in Bus Service Reform Process in Seoul." 2005.

49) Bus speed increased by four km per hour on average, minimum 12 percent and maximum 82 percent, and became equivalent to that of passenger-cars

50) Number of bus users of each route increased by two to ten percent, number of bus users per day increased by 22,000 from 5.66 million in 2006 to 5.68 million in 2009

Chapter

03

## Synthesis of Conflict Incidences of National Projects and Policy Implications

1 Changes of Conflicts over National Projects	194
2 Characteristics of Conflicts in Each Era	197
3 Synthesis of Conflict Incidences of Eight Major Projects	197
4 Policy Implications	209

# 3 Synthesis of Conflict Incidences of National Projects and Policy Implications

## 1. Changes of Conflicts over National Projects

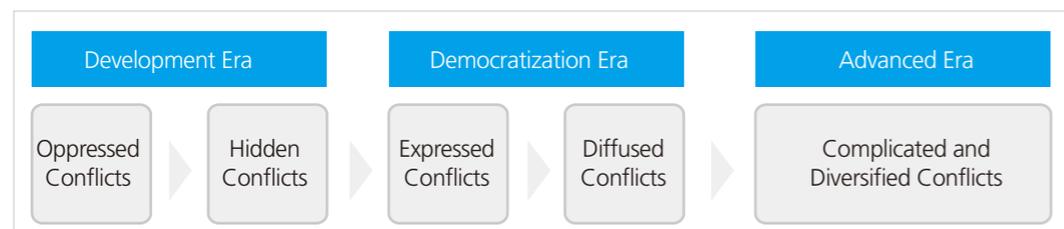
Korea has been experiencing big and small social conflicts over national projects, as it has been going through the era of compressed growth and development beginning from the 1960s.

In particular, after Korea achieved political democratization through the June Uprising in 1987, different interests and values clashed all across the society. Korea underwent costly learning process as numerous events of social conflicts incurred enormous social costs. Up until the mid-1980s, the major cause of social conflicts was people's demand for political democratization.

After Korea achieved democratization, it went through the era of growing pains of compressed conflicts, where various conflicts between private institutions and civil groups, regions, classes, generations, and ideologies erupted over national land development, environmental conservation, division of wealth among classes, and the issues of ideologies and values. Korea is still faced with big and small social conflicts regarding different interests and values across the society.

Conflicts over national projects in the past showed different and distinct characteristics: some were oppressed or hidden, others were exposed and diffused, and more conflicts became complicated and diversified. As such, diverse types of conflicts can be divided into those of development era, democratization era, and advanced era, according to their characteristics.

Figure 3-1 Changes of Conflicts over Public Policy



### 1) Conflicts over National Project in Development Era

Korea was virtually under the rule of military governments from the Third Republic to the Fifth Republic (1963-1988). The central government was very authoritative and, in many cases, restricted or reserved people's freedom and rights. The authoritarian government, which prioritized national development and efficiency, wanted every national project to be carried out in perfect order from planning to decision-making to execution. That is why at the time, the government saw negligible oppositions or conflicts over national projects. In addition, any objections to national projects were even considered as a social evil that could cause social unrest. The government was decisive in resolving potential conflicts from the start with the intervention of government power. As a result, all the unresolved social conflicts remained hidden under the surface as a latent force for potential social unrest.

Until the Fifth Republic, all the mayors and governors of cities or provinces were public officials who were appointed by the central government, since the local self-governing system was not fully implemented. All of them were required to fully comply with the orders or decisions from the central government. In addition, the public had limited access to information or knowledge regarding complicated social issues such as large-scale national projects. That is because, at the time, expert groups in every social sector were weak and no tools like the Internet were available. Most experts were on the government's side in developing and rationalizing government policies. The social environment at that time took for granted the exclusion of the public from the decision-making and execution processes of national projects. Meanwhile, Korea as a divided country in a cold war era faced sharp ideological conflicts internally, breeding potential social unrest.

### 2) Conflicts over National Project in Democratization Era

The June Uprising in 1987 gave people a sense of autonomy and citizenship. As a result, Korean people began to express their demands for all sorts of things, which have been oppressed under the authoritarian government in the past. Thus diverse types of social conflicts began to erupt in all corners of society.

Politically, these demands were expressed as the revision of the Constitution based on the direct presidential election system with a single five-year-term, the establishment of a democratic system, the recovery of citizen's rights to live, and basic human rights. From then on, ruling practices and regulations of authoritarian governments began to change over time. With the implementation of the local self-governing system in the mid 1990s, people began to be conscious about the self-reliance of their regions and became sensitive about their regions' interest. With complete political freedom given to citizens, social conflicts appeared in a fashion totally different from those of the development era, and these conflicts gradually permeated into larger issues of society.

Economically, people made a strong voice for fair distribution of wealth, leading to the introduction

of public-ownership system of land in the early 1990s. This is also the time when full-fledged labor movements to protect workers' rights began. Specifically, experts in all the fields began to organize numerous civil groups, which then raised new issues such as environment, region, and human rights as an important social value. In particular, the issue of environment came to the fore in the case of land development-related national projects. As social awareness on the value of environment rose, it led to the clash of values between environment and development, generating social conflicts over national projects.

At the same time, civil groups armed with expertise began to raise issues concerning economic feasibility, environmental and regional problems of large-scale SOC-related national projects. They often made confrontational relations with the government by claiming civic values. This was the time when direct clashes occurred between government's national land development policies and civil groups' values on environmental protection. As a result, the government began to accommodate representatives of civil groups in the decision-making processes.

### 3) Conflicts over National Development in Advanced Era

Large-scale national projects such as the Incheon Airport and the high-speed railway brought about successful results, overcoming intense social conflicts in early stages. During the process, both the government and project agencies, and the civil groups in opposition, were able to accumulate valuable experiences from raising to resolving issues. As such, the government and civil groups, which learned greatly through big and small social conflicts in the democratization era when environmental values were cherished, began to view conflicts from a new perspective after the mid-2000s.

Both of them realized that excessive social conflicts could pose great burden to the entire nation, undermining national development. The analysis of Samsung Economic Research Institute in 2009 estimated that, if the level of social conflicts in Korea drops to that of the OECD average, GDP per capita would increase by more than 27 percent, or 5,000 dollars more.

In addition, both sides clearly recognized that the one who does not have moral grounds or ethical values has no choice but to lose in the case of conflict. Therefore, the society as a whole has been working to set up the foundation for conflict resolution through laws and regulations and has been evolving into a mature system, wherein conflicts are resolved and consensus are forged rationally within the frame of laws and regulations.

In 2007, the Regulations on Prevention and Resolution of Conflicts for Public Institutions was enacted and, in 2009, the Presidential Committee on Social Cohesion was established as an effort to lower social costs by mitigating conflicts between classes, ideologies, regions and generations.

However, supplementary efforts are needed because laws and regulations and systems to prevent conflicts over the implementation of national projects are yet to be fully established. It should also be noted that conflicts tend to be multi-faceted as conflicts over national projects are intertwined with those over regional interests and values.

## 2. Characteristics of Conflicts in Each Era

### 1) Characteristics of Conflicts in Development Era

From the Third Republic to the Fifth Republic (1963-1988), most of the social conflicts in Korea were about power and ideology. The legitimacy of power was the focus of conflicts with the major concerns with regaining people's rights and political democratization, which were deferred under the de-facto authoritarian military government. Ideological conflicts regarding anticommunism were another major type of social conflicts at the time.

### 2) Characteristics of Conflicts in Democratization Era

After achieving political democratization, civil groups grew rapidly in number and power. These groups raised diverse issues regarding women's rights, human rights, and environment, which led to social conflicts. Balanced regional development and conflicting interests between regions became a socially sensitive issue as well.

### 3) Characteristics of Conflicts in Advanced Era

Both the government and civil groups began to recognize positive and negative aspects of conflicts and placed importance on the rational management of conflicts and agreement formation. Sustainability and ethical values became important criteria in mitigating conflicts as people cherished values such as the quality of life, balancing economy and environment, and social cohesion.

## 3. Synthesis of Conflict Incidences of Eight Major Projects

### 1) Types of Opponents' Logic

The grounds of opponents' arguments made during the implementation process of the eight major national projects including the Gyeongbu Expressway can be grouped into the following: damages to environment and historical relics; economic feasibility and securing financial resources; balancing regional development and social equity; feasibility of location and routes; lack of technologies; and political motivation. However, most of the issues could have been resolved through the natural process of recovery, the substitution of one location to another, and supplementary measures.

### (1) Damaging Environment and Historical Relics

Entering the end of the 1980s, oppositions based on environment prevailed whenever a large-scale national project was carried out. More specifically, this type of oppositions included potential damage to the habitats of rare animals and plants, increased noise, degraded water quality, and increased frequency of disasters. In these cases, in spite of possibilities of reducing environmental damages such as pollution by applying new construction methods or shortening construction duration as well as conducting quantifiable comparisons between alternatives, the opponents tended to completely ignore such possibilities.

In addition, recent conflicts based on environmental issues are unfolding in a way that does not accept the procedural legitimacy, the assessment outcomes of environmental impact evaluation, and licensing permission. Moreover, projects are often delayed for a long period, because the academia, religious groups, and environmental civil groups are united in conducting group actions and filing law suits to oppose the project.

For example, the Gyeongbu High-Speed Railway Construction Project was delayed for a while because of a lawsuit regarding the salamander habitat in Mt. Cheonseong led by Monk Ji-yool. During the construction of Incheon Airport, the Joint Council on Yeongjong Island New Airport Issues, which was comprised of civil groups and academics, opposed the project saying that the project might destroy the habitat for migratory birds in Yeongjong Island and pollute the ocean. In the case of Lake Sihwa, local civil groups called for the demolition of the seawall or seawater circulation to improve water quality and demanded an overhaul of the comprehensive plan including land use. As for the Saemangeum Development Project, Green Korea United, environmental movement union, and some experts opposed the project saying that Saemangeum would become the “second Lake Sihwa”, since reclaimed freshwater lake would fall into decay and water quality would not be able to meet the environmental quality standards. In the process of constructing the Seoul Ring Expressway, tunnel construction was ceased because civil and religious groups claimed that the project could damage the environment such as rare plant habitat in Mt. Sapae and interrupt the practice of asceticism in temples.

Regarding the Seoul Cheonggye Stream Restoration Project, some civil groups called for the restoration of the historical relics’ original forms and opposed the relocation or abandonment of restoring the original forms, despite the fact that relics’ restoration process should consider the surrounding environment.

### (2) Economic Feasibility and Securing Financial Resources

On the whole, oppositions against national SOC projects were due to the obsession with domestic micro-circumstances from a short-term perspective, while disregarding international macro-circumstances from a long-term perspective.

For the Gyeongbu Expressway and the Incheon Airport, the opposition groups in and around political circles questioned the economic feasibility of these projects, arguing that they were too big to handle and were not in urgent need. Such oppositions were raised because the opponents did not expect a rapid increase of domestic and international transportation demand resulting from increased income and leisure activities.

In addition, in the case of national projects that required huge amount of project cost, the opponents frequently argued that the resources were insufficient and such projects could interrupt other projects. However, the opponents did not recognize that the national budget would increase along with national development. In addition, they underestimated the capacity of re-investing the operating profits after the completion of the projects.

For example, on November 7<sup>th</sup>, 1967 the government and the leaders of the ruling party decided to launch the Gyeongbu Expressway Construction Project in a joint meeting. However, even the ruling Republican party, Economic Planning Board, and the Ministry of Finance opposed the project, saying that the total project cost of 43 billion won accounted for 23.5 percent of the national budget and would pose great burden on national fiscal management. The Federation of Korean Industries officially recommended that the government review the project, since only 36 trillion won could be secured, while it would cost a total of 69 trillion won for the SOC investment for the next decade.

In addition, in the case of Incheon Airport, the opponents argued that the airport site of 56.10 million square meters was too big as it was five times larger than the London Heathrow Airport and Japan’s Kansai Airport, and that its construction costs exceeded 10 trillion won. Questioning the capacity of the baggage handling system, the media also made remarked that the opening of the airport should be delayed.

### (3) Balanced Regional Development and Social Equity

Some of the opponents of the Gyeongbu Expressway and the Gyeongbu High-Speed Railway projects argued that the construction of key national transport infrastructure along the Gyeongbu axis would result in unbalanced regional development by intensifying the concentration of the population and industries in the regions along the axis. In the case of Incheon Airport, the opponents stressed that the lack of transport linkages with local cities away from Seoul would result in low accessibility from those cities to the airport and thus pose difficulties in nurturing new growth industries in them.

In addition, some expressed opinions that since the major funding source of national projects were people’s taxes, the benefits of those projects were supposed not to be confined to particular social classes. Some, who opposed the Gyeongbu Expressway, criticized that the project would benefit only the rich in a country where most people could barely afford to eat.

In addition, some of the opponents raised an issue with the efficiency of the projects, bringing

the location or routes of national projects into question. Along with the route selection issues of the Gyeongbu Expressway and the Gyeongbu High-Speed Railway, there were oppositions against the Incheon Airport, stating that the project would not be able to result in the intended effects because inadequate location was selected in terms of geography, meteorology and accessibility.

More specifically, in the case of the Gyeongbu Expressway, some politicians argued that prioritizing the project was a discriminative policy, despite the fact that the single-track Honam railway was dilapidated. They expressed strong concerns with the implications of the Gyeongbu project on imbalanced regional development and proposed instead the priority of the east-west road connections. Regarding the Gyeongbu High-Speed Railway Construction Project, the opponents repeated the same arguments that the Express Railway project would result in the vicious cycle of population and industry concentration and environmental degradation in national land management, considering an already heavy concentration of industries along the Gyeongbu axis. The project, argued by the opponents, would further aggravate the concentration in the Seoul metropolitan area, worsening imbalanced regional development in the future. Opposing the Incheon Airport Construction Project, the opponent groups argued that Yeongjong Island was not a suitable location for an airport because of bird strikes, fogs, and ground subsidence due to heavy loads during take-off and landing. A further argument was added that Incheon Airport, like Gimpo Airport, could not function as a convenient international airport for the users across the country due to its location in the north-western corner of the country.

With regards to the Cheonggye Stream Restoration Project, local merchants opposed the project as it was directly related to their livelihood as well as social equity. In the Cheonggye Stream area, there were about 60,000 stores employing more than 20,000 persons. The merchants who had business there worried about the possible business loss due to the restoration project. In addition, 1,500 street vendors in the area strongly opposed the restoration project because of their livelihood.

#### (4) Lack of Technology

With respect to national projects requiring the introduction of new technology, some opponents expressed their concerns with the ineffectiveness of new technology in achieving intended functions when combined with the low level of domestic technology. A related argument was also made that the newly introduced technologies for the project would not remain as cutting-edge technologies after the completion of the project due to rapid technology development. In the case of the Gyeongbu High-Speed Railway, some experts in the opposing group worried about technology dependence on France for the high-speed railway and stated that French technology based on wheel-type would be outdated by the time of opening since new technologies such as magnetic levitation train were almost ready to apply. There was also a strong opposition against tunnel construction for the reason of potential tunnel collapse in certain sections due to the existence of active fault zones.

Regarding the Seoul Exclusive Median Bus Lane Project, the opponents strongly opposed the project, arguing that it would not be successful without an overall reform of Seoul's traffic signal system including a priority signal system for buses coming from the feeder roads.

#### (5) Political Interests

In the past, some politicians opposed national projects according to their political interests, downgrading the national projects as pork-barrel projects or ones favoring specific classes or regions. In the case of the Incheon Airport Construction Project, politicians criticized the political aspect of the project and demanded modifications in the project's size and period, claiming that the project would undermine balanced national development. Some of the opponents argued that it was premature to carry out the project without objective evidence on the project effects, disregarding the long-term effects of such large-scale national projects. As for large-scale transportation projects, the opponents tended to insist that the expansion of national roads and railways would be sufficient enough to meet the demands at the initial period of the concerned project, while ignoring the future demand for high-speed transportation arising from economic development and increased income.

The Gyeongbu Expressway is the case in point. The opponents claimed that building an expressway, which was not a part of the Second Five-year Economic Development Plan (1967-1971), was a pork barrel to win more votes for the next presidential election. As such, they downgraded an important national project to a pork barrel for election.

Some opponents regarded the Gyeongbu High-Speed Railway as premature for the country. Even some transport experts suggested postponing the project by 5 to ten 10 years, because the preparatory period of the project from planning to designing to the ground breaking was too short and the project feasibility was low. In the case of Incheon Airport, the opponents even claimed that the construction of a new airport would benefit only some chaebols and thus recommended that the project be passed onto the next administration in order to avoid suspicions over raising political funds at the end of the administration at that time.

#### 2) Types of Persuasion Strategy

When national projects faced strong opposition and resulted in social conflicts, the government or project agencies utilized the following persuasion strategies: providing objective and scientific data and supplementary measures; forming multilateral consultative bodies that include major interested parties; enhancing PR activities to persuade the public and form consensus; direct responses from the government official in charge and the recovery of delayed process; and resuming suspended projects based on active responses to lawsuits. Such persuasion strategies were sincerely and consistently carried out and in many cases, various strategies were utilized simultaneously.

### (1) Provision of Objective and Scientific Persuasion Data and Supplementary Measures

In order to persuade the opponents or refute their logic, the government and project agencies provided empirical data for persuasion including the need for national projects, funding plans, economic feasibility, and measures to lower environmental impact based on the case studies of advanced nations and the government's own investigation.

For example, in the Saemangeum Development Project, the project agency provided the results of detailed analysis on such items as expanding land, securing water resources, managing water quality, increasing food production, preventing flood damages and effects on tourism as well the case studies of systematic management of lakes and swamps in advanced nations, including the Netherlands and Japan.

Regarding the soft ground in the Incheon Airport Construction Project, the agency presented detailed measurement data compared with other airports abroad in order to prove safety. To refute the argument that the wider gap between adjacent runways would be necessary to increase the runway's capacity, the project agency presented an evidence suggesting the low effectiveness of such wider-gap runways.

With respect to environmental deterioration issues, the government and project agencies conducted detailed investigations and analyses and developed additional supplementary measures to resolve problems. As for the Seoul Ring Expressway, two detailed investigations on vegetation were conducted and a preservation plan was established, responding to the objections that the colony of *Crypsinus hastus*, a protected plant near Mt. Sapae would be damaged by the project. Similarly, a reexamination report by experts based on the detailed investigation on the changes of nature was submitted in response to the issues raised over the environmental impact evaluation result of the Mt. Cheonseong passageway in the second phase of Gyeongbu High-Speed Railway Project.

### (2) Formation of Multilateral Consultative Bodies that Include Major Interested Parties

In order to persuade the opponents, the government and project agencies organized a multilateral consultative body which included citizens who would be directly affected by the project, civil groups, experts, and government agencies. By doing so, they succeeded in broadening mutual understanding on the projects and achieved agreements on the project implementation period, volume, and methods.

For example, the Sihwa Sustainable Development Committee was established in 2004, wherein the related central government agencies, three local governments, local residents, civil groups, and experts participated. Through this committee, a reasonably acceptable agreement was made including the roadmap for improvement measures for water and air quality in Sihwa area, the development plan for the southern part of Lake Sihwa, a tidal power plant, and Sihwa MTV Development Project.

In some cases, a joint committee comprised of a project agency and interested parties was created in order to find measures to reach an agreement. In the case of the Seoul Ring Expressway

Construction Project, the project operator and the Korea Expressway Corporation established the Committee for Investigation of Routes with the Buddhist community in 2002 and operated the Committee for Reexamination of Routes in 2003 in order to resolve serious conflicts over the tunnel construction at Mt. Sapae in northern Seoul.

As for the Saemangeum project, a public-private joint investigation task force was organized and operated to mitigate conflicts surrounding the problems of environmental impact, water pollution and economic feasibility by joint deliberation of investigation results in an objective manner.

For the Seoul Cheonggye Stream Restoration Project, the Citizen's Committee on Cheonggye Stream Restoration comprised of experts, academia, and civil groups was created. As the committee was allowed to collect people's opinion, promote the project, and make policy decisions, conflicts were mitigated and trust was earned from the citizens. Regarding the local merchants whose interests were at stake, the project agency secured their support and collected their opinions through numerous policy consultative meetings and merchants' countermeasure task force meetings.

In the case of the Seoul Exclusive Median Bus Lane Construction Project, the city government, civil groups, expert groups, and bus companies, who were the direct stakeholders of the project, established the Committee on Bus Service Reform to resolve expected conflicts in advance.

### (3) Enhanced Activities to Persuade the Public and Residents and Forming Consensus

In some cases, the government and project agencies led the local governments to persuade the public and carry out a signature collection movement in order to raise people's awareness and support on the project. With respect to the Cheonggye Stream Project, efforts to persuade the public were constantly carried out including various events such as Cheonggye Stream Citizen's Observation Program, and contests and persuasion schemes such as the establishment of a public information center and the utilization of the Internet and media.

For most of the national projects including the Gyeongbu High-Speed Railway, Saemangeum, and Lake Sihwa, public promotion was actively pursued through the media such as newspapers, magazines, and broadcasting. More specifically, the government in collaboration with experts made and distributed press release materials based on scientific evidence to refute logically and respond sincerely to the opponents' claims. To provide easily understandable information on the projects, the government made and distributed videos or pamphlets as well as operated public information centers and the Internet webpage.

In addition, public hearings, discussions, information sessions for residents were held focusing on controversial issues. Expert symposiums and international conferences with foreign experts on environment, city development, and technology issues were held in order to promote the project and to supplement it through discussions.

#### (4) Direct Responses From the Government Official in Charge and the Recovery of Delayed Process

In some cases, the conflicts over the implementation of national projects were not resolved despite the establishment of a public-private consultative body. Then the government official in charge directly engaged in conflict resolution. As for the Mt. Sapae Tunnel construction in the Seoul Ring Expressway, the Ministry of Construction and Transportation and the Buddhist community established the Committee for Reexamination of Routes and reviewed alternative routes, but they failed to reach an agreement. Thereafter, the president himself visited the Jogye Order to ask their support for the construction and in return the Buddhist community agreed to support government policies. As a result, the construction was able to resume after it had been halted for two years and one month.

The government also put various efforts including the introduction of new technologies in order to shorten the delayed construction schedule in national projects, which were halted for a long time due to social conflicts.

#### (5) Resumption of Suspended Projects Based on Active Responses to Lawsuits

In some cases, the government actively responded to the lawsuits filed by the opponents, which called for the cancellation or suspension of projects. By winning these lawsuits, the government was able to secure the legitimacy of projects and thus to smoothly carried them out. With regards to the Saemangeum project, environment groups and some local fishermen filed a lawsuit to cancel the reclamation license of the project. Then, the government appealed to the Seoul High Court to repeal the suspended execution on the seawall construction from the Seoul Administrative Court. The Seoul High Court then dismissed the application for injunction by the environment groups and thus the project was able to be carried out without problems. But it took four years and seven months. In the case of the Gyeongbu High-Speed Railway, the Supreme Court dismissed the application for injunction on the prohibition of beginning the construction in Wonhyo Tunnel at Mt. Cheonseong, which was filed by temples located at Mt. Cheonseong and civil groups. Consequently, the government was able to carry out the construction as scheduled. It took 96 days since the lawsuit was filed.

### 3) Project Outcomes and Verification on Opponents' Arguments

The outcomes of the aforementioned eight national projects were reviewed by verifying the opponents' arguments regarding the projects' contribution to national economic development, regional development, the improvement of environmental issues, the accumulated capacity of core technologies, and the achievement of world-class technological prowess.

#### (1) Remarkable Contribution To National Economic and Regional Development and Improvement of Quality of Life

Contrary to the concerns and objections expressed by the opponents with the low economic feasibility compared to investment volumes of the Gyeongbu Expressway, the Gyeongbu High-Speed Railway and the Incheon Airport project at the initial stage, these projects made a big contribution to the development of logistics, tourism, and the economy, and in result greatly improved people's quality of life.

- Gyeongbu Expressway : There were oppositions to excessive project cost, but it laid the foundation for economic development dubbed the "Miracle on the Han River" by opening an era of expressways and dramatically compressing the national space
- Gyeongbu High-Speed Railway : Reduced travel time between regions making one-day business trips and half-day life zones a reality. Seoul-Busan: 4 hrs 10 mins (2003) ⇨ 2 hrs 18 mins (2010), Seoul-Dajeon: 1 hr 31 mins (2003) ⇨ 49 mins (2010), Busan-East Daegu: 1 hr 5 mins (2004) ⇨ 39 mins (2010)
- Incheon International Airport : Became Northeast Asia's hub airport housing 68 international airlines with flights to 171 cities in 53 countries as of September 2010, and 200 million accumulated users as of March 2009. Additional expansion is planned due to increasing flight demands
- Lake Sihwa, Saemangeum : Number of visitors to the Lake Sihwa reed wetland increased by more than 9-fold from 38,000 in 2002 to 320,000 in 2009. 88 million people visited the Saemangeum Seawall in 2010 alone when the construction was completed.
- Seoul Cheonggye Stream Restoration Project : Creation of water-friendly spaces in urban areas led to partial recovery of nature and improved urban air conditions including reduction of heat islands and creation of wind path, which improved people's quality of life
- Seoul Exclusive Median Bus Lane Project : Operation punctuality of buses increased by 16%, and the operation speed increased by 30% or 4.5-9.8km/h and the number of bus users increased by an average of 22,000 a day in 2009 compared to 2006, thereby greatly improving bus users' satisfaction

In particular, there were fierce oppositions on the grounds that the Gyeongbu Expressway, Incheon Airport and Gyeongbu High-Speed Railway projects have very low economic feasibility and they would aggravate unbalanced regional development during the early stages of the projects. However, those projects have now become the nation's key infrastructures, not only securing international competitiveness but also drastically changing the nation's logistics system and people's mobility patterns.

In addition, for some national projects, there were strong oppositions that the projects' locations and routes were not appropriate regarding topography, meteorology, accessibility and balanced regional development. However, those criticisms were inconsequential as these facilities are now being utilized nation-wide, enhancing accessibility to transportation for most people and contributing to regional development. Meanwhile, most of the alternative routes and locations proposed by the opponents turned out to have low economic feasibility due to extra construction costs and low environment improvement effects.

- Gyeongbu Expressway : Compared to the alternative Seoul-Gangneung road axis, and other east-west roads, it generated significant economic growth and regional development
- Incheon International Airport : Contrary to the opponents claim that the airport location is not appropriate to be an international airport due to its low accessibility nationwide, the airport equipped with a nation-wide transport network accounts for 72% of the national total inbound and out bound passengers in 2009 and 24% of total trade volume, or 164.1 billion dollars
- Seoul Ring Expressway : New towns and housing sites developments have been continuing nearby Pyeongchon, Bucheon, Songnae, Gimpo, Ilsan, and Goyang, and the opening of the road enabled large-scale housing site developments in Uijeongbu, Yangju, and Namyangju

## (2) Dispelling Concerns over Environmental Issues by Establishing Eco-friendly Foundations for National Projects

Whenever national projects to build expressways, high-speed railways or airports were proposed, potential environmental deterioration was the key reason taken by the opposition groups. These concerns or allegations, however, lacked scientific evidence and were often exaggerated. For example, most of the arguments regarding the destruction of rare animal and plant habitats, ground subsidence, water pollution, and obstacles to improvements turned out to be nothing more than mere worries, when monitored after the completion of projects.

However, the opponents' concerns and opinions provided an opportunity for the government to lay the foundation for eco-friendly projects. Furthermore, those concerns and opinions made the government or project agencies devise improvement measures, especially when environmental issues were not fully considered in the process of government's environmental impact assessment or environment problems were developed during the construction phase.

- Gyeongbu High-Speed Railway : There were oppositions that the project might damage the environment and ecosystem in Mt. Cheonseong including the habitat for Korean salamanders. However, according to the monitoring results after the completion of the project, no changes have occurred in the ecosystem near Mt. Cheonseong
- Lake Sihwa Project : The lake is becoming a repository of ecosystem, home to wild animals including birds and fish. With the seawater circulation, the water quality of the lake improved from COD 17 ppm in 1998 to 3.7 ppm in 2008
- Saemangeum (Development) Project : There were strong oppositions that Saemangeum would become the "second Lake Sihwa." However, the water quality of Mangyeong river, and Dongjin river is 4-5 and 3-4 grade, respectively. In order to secure clear water that fits the vision of creating a "City of Water", measures to improve water quality with an upgraded aim are being implemented

## (3) Securing Export Capacity through the Accumulation of Core Technologies

When the plan for Gyeongbu High-Speed Railway construction was proposed, some of the opponents argued that because of the low level of domestic technology regarding KTX, Korea might become dependent on foreign companies and eventually controlled by them. Additional concerns that the technologies to be introduced at the time would be obsolete at the time of completion turned out to be incorrect and ungrounded. Today, Korea's KTX-related technologies are world-class in terms of safety and punctuality, enabling the country to export these technologies abroad. This was possible through the accumulation of technologies, which were dependent on foreign counties in the beginning but independently developed by Korea in later periods.

- Gyeongbu High-Speed Railway : There was criticism that the project ignored the development of domestic technology. However, the world-class level of technologies are already secured with the development and operation of KTX, along with the possibility of exporting to Brazil. The project led the development of railway related industries
- Incheon International Airport : 10 years after the completion of the project, the risk level of ground subsidence remains at a stable level of 28-64% of management standards. There are barely any cases of aircraft damages and flight cancellation due to bird strikes or fog

#### (4) Creating Success Stories by Overcoming Criticisms

There were criticisms that most projects in the beginning phase were quixotic ones that ignored the reality. Now, most of the infrastructure established by national projects boast the world-class service and competitiveness.

For example, the investment priority of the Gyeongbu Expressway, the initiative of Incheon Airport as a Northeast Asian hub airport and the investment efficiency of the Gyeongbu High-Speed Railway drew much cynicism and opposition from both home and abroad in their beginning. However, these projects produced unequivocal outcomes that no one can dispute.

For many projects, because of the lack of domestic technologies, it was inevitable to import core construction technologies and operating knowhow at the time of construction. However, with the acquisition and development of the technologies, Korea now has its own technology comparable to that of advanced nations. Incheon Airport won first place in ASQ by ACI for six consecutive years from 2005, and its construction and operation strategies are being benchmarked by major airports around the world. In addition, exporting the technologies of high-speed railways to Brazil is underway.

The Cheonggye Stream Restoration Project is evaluated as a success story of urban redevelopment by many countries, as it demolished the Cheonggye Stream overpass and concrete coverings and created a clean stream and water-friendly spaces despite various controversies over traffic chaos and business losses of local merchants.

- Gyeongbu High-Speed Railway : In 2009, the number of daily railway users reached 102,000. As an eco-friendly transportation mode, the railway boasts the world highest record of 98.3% in punctuality. Technology exports to USA and Brazil are under way
- Incheon International Airport : The airport has grown into Northeast Asia's hub airport with a capacity of 44 million annual users, and 4.5 million tons of cargo. The airport was awarded first place at ASQ by ACI for six consecutive years, and won the World's Best Airport Award from Global Traveler for five consecutive years from 2006
- Cheonggye Stream : With the demolition of overpass and the recovery of an ecosystem near the stream in downtown, the project is evaluated as an exemplary case of environmental improvement and urban renewal. Moreover, the U.S. Harvard Design School included the case in their textbooks

## 4. Policy Implications

### 1) Establishing Social Atmosphere for Objectivity and Responsibility

The conflict-driven delay of major large-scale national projects including Saemangeum, Seoul Ring Expressway, Gyeongbu High-Speed Railway incurred immense social and economic costs. Therefore, any arguments regarding the implementation of future national projects should be based on objective logic and accurate facts. Also, the proponents and opponents concerned should be responsible for their perspectives of the arguments.

### 2) Establishing Elaborate and Convincing Communication Strategies for National Projects

Even though most objections over national projects in the past turn out to be unfounded worries, it is true that project agencies did not have elaborate strategies and sufficient efforts to convince the opponents during the planning phase of the project. Therefore, the government needs to develop a logical framework that can persuade the public about the necessity of the project by fully explaining the potential effects on people's quality of life, national economic development, job creation and technology accumulation. Meanwhile, the government should constantly make efforts to persuade the leaders of opponent groups so that they can broaden their understanding on the project. In addition, the government needs to strengthen communications through a town-meeting like format so as to induce the soft landing of national projects.

### 3) Promoting the 'Prosumer-type' National Projects with Nationwide Participation

Every one in the nation is a consumer as well as a producer of national projects. Therefore, the government should remind people of such dual roles by constantly communicating with them. In order to make national projects take root in people's lives, a "Prosumer Approach", where the government and people create and implement the national projects together, is important. To strengthen the prosumer approach in national projects, the government needs to establish various communication channels so as to incorporate people's diverse views, while making the projects more persuasive.

### 4) On-time Promotion of National Projects to Preemptively Respond to Global Trend

As the G20 member countries established a global coordination system and took joint steps after the global economic crisis in 2008, the global economy has been recovering gradually. Korea needs to prepare strategies for another set of major national projects, which can guarantee the country's rapid development around 2020, when the global economy is expected to reach its peak. Following those precedents of national projects, which were embarked on in the 1990s and have recently

been producing returns, Korea needs to identify and promote national projects for new growth engines.<sup>51)</sup> Based on the convergence of information communication technology, nano technology, bio technology, energy technology, and cultural content technology, which are the new global growth engines, Korea should pursue new national projects so that it can become an IT powerhouse in the world. Specifically, green growth projects such as the construction of high-speed railways and renewable energy projects need to be promoted in earnest so as to raise public awareness about the importance of green growth from both perspectives of global and domestic development.

### 5) Prioritizing National Projects Creating Quality Jobs

Conflicts and oppositions over national projects can be significantly reduced if the public feels that national projects lead to job creation. Therefore, a future emphasis should be placed on those national projects that create quality jobs with high income and stable employment opportunity. In particular, the government needs to pay more policy attention on local employment and local outsourcing to maximize the spillover effects of national projects on the localities where they are located.

### 6) Creating Global Exemplary Development Agenda, Achievement of G20 Seoul Summit

At the G20 Seoul Summit, which was successfully hosted in Seoul in November 2010, “Seoul Development Consensus for Shared Growth” was adopted as a development agenda for developing countries. In order to carry out the development agenda, Korea needs to actively support underdeveloped countries to apply Korea’s national development experience accumulated over various national projects in a way that fits their nations’ circumstances and contributes to their economic development. If Korea’s experiences of overcoming conflicts and successfully carrying out projects can be passed onto developing countries, it will be recorded as an international exemplary case of practicing development agenda for developing countries.

### 7) Demonstrating Creative Leadership and Promoting Social Integration Based on the Principle of “Thesis-Antithesis-Synthesis-Thesis+”

Most of Korea’s major national projects went through the process of “thesis-antithesis-synthesis-thesis+” like Hegelian dialectic.<sup>52)</sup> At the time of the government’s announcement on the promotion of a national project, the project enters the phase of thesis. When the project faces opposition by

local residents, experts or civil groups, then it moves into the phase of antithesis. By that time on, social conflicts develop over the project. However, if the government provides objective evidence, incorporates opponents’ reasonable opinions in the project, and takes constant efforts to persuade the opponents for a favorable foundation of the project, the project transforms into the phase of synthesis. When national projects take a smooth landing and are successfully implemented, they begin to produce visible economic and social outcomes that satisfy the people. Then, these projects finally reach the phase of thesis+, where they shape the backbone of future national development. Based on the accumulated experiences from economic growth and national development, and the principle of “thesis-antithesis-synthesis-thesis+” of national projects, the government needs to develop a grand vision on the long-term national projects and demonstrate creative leadership to implement national projects in cooperation with people. To do so, the government should first present a future vision of society and then strive for the identification of policies and projects that can realize the vision, perhaps emphasizing the value of national development with social integration.

51) Otto Hieronymi argued in his book that “what we need to do is to maintain and expand the existing facilities and to establish a new system that meets future demand on time.” Otto Hieronymi. “Policy Decisions for SOC Investment: Environmental and Planning Issues.” OECD International Futures Programme, 1993.

52) Hegel, Georg Wilhelm Friedrich (1770-1831), who completed idealism in German philosophy, tried to explain movements of objects with a basic principle of contradiction and confrontation, unlike formal logic that is based on the law of identity. In a word, he argued that the entire world of nature, history, and mind goes through constant changes and developments, and these processes can be explained with a principle of dialectic that has its base on “thesis-antithesis and thesis-antithesis-synthesis”

## Reference

- Otto Hieronymi. "Policy Decisions for SOC Investment: Environmental and Planning Issues." OECD International Futures Programme, 1993.