Seoul experienced a tremendous rapid growth and change over the course of the late twentieth century. Though impressive, the abrupt and phenomenal growth has resulted in today's intractable pressing problems virtually in every front of the city administration: transportation, environment, housing, infrastructure, social welfare and other public services—all desperately demanding a priority of public actions. Since they are so intense in an unusual compact milieu, Seoul embodies one of the most acute contemporary urban challenges.

This book is a collection of essays on Seoul's current major issues of urban management, ranging from regional growth management to local planning issues to accountable urban governance. By adding the case of Seoul to the literature of world urbanization and city management, the book seeks a vital exchange of urban experience and policy ideas with neighboring Asian cities as well as other world urban centers.

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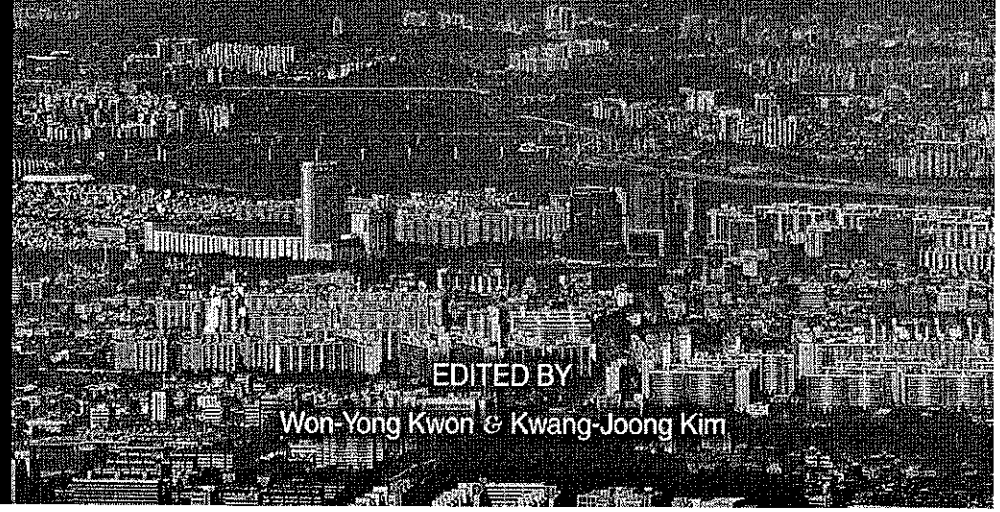

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Seoul Development Institute was founded in 1992 as a non-profit, independent research organization by Seoul Metropolitan Government. The SDI provides vital research and planning expertise to develop an informed basis for the coordinated decision-making of Seoul Metropolitan Government. The SDI is composed of scholars and experts in principal areas of urban studies and policies including urban planning, transportation, environment, urban management, social development, and urban information. More than 50 regular research fellows work on a wide range of research projects supported by some 100 research assistants. The SDI publishes research reports, books and periodical journals to foster wider discussion on Seoul's increasingly complex urban problems and newly emerging social issues.

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Contents

List of Illustrations

Table

Figure

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The urbanization process in Seoul has been intense and so have the policy responses. It is no easy task to deliver the essence of major policy issues of an ever-changing mega-city like Seoul. We are deeply indebted to many dedicated individuals inside and outside the Seoul Development Institute for the birth of this book. We appreciate SDI contributors who endured a long process of writing and rewriting for this book. They all volunteered to work on this painstaking, yet worthwhile, project amid their own pressing research work.

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The Editors
December 2001

Introduction

Won-Yong Kwon and Kwang-Joong Kim

Why Seoul?

Seoul experienced a tremendous rapid growth and change over the course of the late twentieth century. From a town devastated by the Korean War, it has grown to become a modern metropolis with a population of some 10 million, leading the fast growing economy during the recent decades. Once an unknown regional city, Seoul now ranks among the largest global cities in world city system (Friedmann, 1998). However, though impressive, the abrupt and phenomenal growth has resulted in today's intractable pressing problems virtually in every front of the city administration: transportation, environment, housing, infrastructure, social welfare and other public services—all desperately demanding a priority of public actions. These issues, of course, are what any sizable urban region battles against in one way or another. Yet, as they are so intense in an unusual compact milieu, Seoul embodies one of the most acute contemporary urban challenges.

This book intends to add the case of Seoul to the literature of world urbanization and city management. There is a growing attention to Asian cities in many intellectual fronts, as this region is believed to lead world urbanization in the foreseeable future. The World Bank (1993) estimates that Asian urban regions will have to accommodate an additional 1.5 billion people in the next 25 years. Especially, due to the growing economy of China, East-Asian urban centers are likely to play an important role in this formidable Asian urban expansion. Choe (1995) identifies Be-Se-To (Beijing-Seoul-Tokyo) cross-border megalopolis is already one of the largest and intense urban conglomeration with a population of 97 million and 109

cities with over 200,000 residents along the 1,500 km corridor. The emerging Asian urban galaxy implies that the current Western-centered urban theories and planning thoughts need to be supplemented by Asian cases as well as other world regions.

Similarly, recent urban discourses call for further understanding of Asian cities. The issue of "sustainability" has much focused on Western context and its resultant solutions also have been Western. For instance, a widely accepted concept of "Compact City" is now questioned in Asian cities where already dense urban living has been sustained (Marcotullio, 2001). Indeed, Seoul is now struggling to combat against dense residential and commercial development through bold down-zoning measures. The question of "how dense is dense" depends very much on land-use tradition and development patterns of different cultures.

Globalization of economy also demands a refreshing look at the world cities. As they compete vigorously for more power of economy, the role of large urban centers is under serious scrutiny in the new discourse of urban theory (Sassen, 1994). Asian cities are again the target of vital examination since this region is expected to carry the fastest economic growth in the coming decades (Yeung, 1998). On the other hand, Simmonds and Hack (2000) document the emergence of global city regions defined by the spatial extent of closely linked economic activity. They are a dominant living space that has determined the quality of life of the majority of world populations. This indicates another reason why world mega-cities like Seoul are increasingly becoming vital subjects of urban studies and public policies throughout the world.

Nonetheless, although English-speaking Singapore and Hong Kong have been by and large exceptional, most Asian cities have not been significantly presented in international communities of urban planning and management. A full-fledged urban discussion requires both Western and Eastern cities to be well represented in a balanced manner. And then, the commonalties and differences will lead us to a sounder theory building and relevant policy response.

In all, these are the impetus behind the publication of this book. What follows is a brief history of Seoul for those who are not familiar with one of the most rapidly growing, densely populated human settlements.

A Brief History of Seoul

At the dawn of the twentieth century, when London and New York were cosmopolitan cities populated by millions, Seoul was an unknown pre-industrial city of some 300,000 residents (SDI, 2002). A century later, Seoul, with nearly 10 million inhabitants, ranks among the largest cities in the world. Seoul has indeed transformed itself from a remote regional province to a vibrant global city in the course of the twentieth century. As an urbanite once remarked, no other city has experienced such a rapid and condensed transformation in human history (Meier, 1970). This, however, does not connote that Seoul is a young, frontier city. Like many major cities, Seoul has a long, colorful, yet unique history as manifested in its culture and urbanism. Although abundant archeological artifacts of prehistoric settlement were uncovered in Seoul, its urban history can be traced back to some two thousand years ago.

Kingdom and Dynasty Years: Before the 20th Century

Located in the central part of the Korean peninsula and with the Han River connecting the sea and inland, Seoul has been vigorously contested by many forces throughout Korean history. The eastern part of Seoul was an early capital of the Baekjae Kingdom (BC 18-AD 660), although not for very long. Since then the city's name, status and profile varied from one period to another, depending on who ruled the area. After the Koryo Dynasty (918-1392) unified the peninsula, Seoul became a local province with increasing importance, eventually becoming one of Koryo's two sub-capitals in the eleventh century (SMG, 1997).

It was not until 1394 that Seoul was firmly established as the capital of the Chosun Dynasty (1392-1910), which overturned ailing Koryo. Seoul was chosen and laid out as the new capital given its practical merits of location, defense and transportation, as well as spiritual well being, as defined by the principles of Feng Sui and other Chinese city planning ideas (Lee, 1994). Surrounded by lush mountains and endowed with an abundant water supply, Seoul accommodated royal palaces, ritual institutions, public buildings, commercial districts, and residential quarters within its 16 square kilometer walled

and gated enclave. Seoul's official boundary, however, included the outside rural suburbs surrounding the city wall, having its southern city limit marked by the Han River. Except for periodic fluctuations in its political and socio-economic situation, Seoul remained predominantly unchanged as the walled and gated capital of the Chosun Dynasty, warding off unfamiliar foreign values and cultures as a means to protect itself.

Hard Times: the 1900s-1950s

The dynamic change was palpable in the late nineteenth century as Korea first opened its doors to foreign forces that claimed their respective interests. The opening of the country was soon followed by Japanese colonial rule (1910-1945). During this period, Seoul's traditional landscape was significantly modified, reflecting the work of colonial town planning (Sohn, 2001). New arterial roads were laid out, dissecting royal and sacred places, while large buildings of colonial institutions replaced existing fine-grained urban fabric. New land-use zoning laws created commercial and industrial districts where various colonial businesses thrived (Lee, 1995; Japanese Colonial Government, 1930).

During the colonial period, Seoul saw a significant population increase from 300,000 people at the turn of the century to some one million in 1942. Once a rural suburb, the areas outside the walls were plotted into a massive residential grid by employing Japanese land readjustment techniques (SMG, 1990). As a result of World War II, Korea was liberated in 1945. Many people flocked to Seoul from foreign asylum, resulting in the continuous growth of Seoul. Seoul's jurisdiction was expanded to 268 square kilometers in 1949, accommodating about 1.4 million people (SMG, 1962).

The subsequent Korean War (1950-1953) between the divided South and North seriously devastated Seoul. Nearly a third of houses plus numerous institutional and business buildings were destroyed (SDI and Institute of Seoul Studies, 2000). Although post-war rebuilding efforts were on going, it was a difficult time for Seoulites who lost their homes and suffered from meager supplies of daily necessities and building materials under extreme poverty. Yet, Seoul was still perceived as providing the best chances of survival. Seoul saw an influx of people from the communist-governing North and even harder hit rural areas, producing squatters throughout the city (SMG History Commission, 1983; Kim and Yoon, 2001). Seoul was ill equipped for the onslaught of urban problems that lay ahead, which was particularly aggravated due to the mounting domestic political turmoil that plagued the late 1950s.

Explosive Growth Years: the 1960s-1970s

The year of 1961 saw the emergence of a new military leadership, known as the Park Jung-Hee Era or the Third Republic. Under this dictatorial power's development agenda, Seoul experienced explosive growth during the 1960s and 70s. In an effort to escape chronic poverty, President Park employed an export-oriented industrialization policy sustained by low wages and cheap agricultural products (Cha & Kim, 1995). Seoul was a prime executor of this urgent national strategy, provoking a sharp increase in the city's population and doubling its jurisdiction to 594 square kilometers. Seoul, under the mayoral leadership of the avid followers of President Park's agenda, underwent an unprecedented transformation in the 1960s (SMG, 1965-1969). It was during this period that extensive construction endeavors were launched, including the development of Yeouido, the center of Seoul's financial district today (SMG, 1985).

The 1970s brought on even more dramatic changes. Korea's economic growth was well on its way, enjoying successive record-breaking years of foreign trade and national wealth: a 250-dollar GNP per capita in 1970 rose to a 1000-dollar in 1977. At the center of this achievement were Seoul's export-driven light industries that nestled in the outlying manufacturing zones and downtown apparel factories. In order to curb seemingly endless territorial expansion, which was perceived as leaving the city vulnerable to attacks by the North since relations at the time were highly strained, a "Green Belt (Development Restriction Zone)" was imposed on the outskirts periphery of the city. Additionally, in order to tackle the burgeoning overcrowding of the northern part of the Han River, a substantial development project, in what is known today as Kangnam, was initiated (SMG, 1990; Sohn, 1998 & 1999). This 6250-acre area currently houses an amalgam of vast apartment complexes, large-scale shopping centers, high-rise cor-

porate offices, and dense commercial developments.

Seoul continued to grow through the 1970s. Office towers, luxury hotels, a trade and exhibition center, cultural buildings, roadways, tunnels, bridges, and sewage plants—all erased the image of the destroyed capital of the poor, divided country, and garnered the city the international acclaim of the "Miracle of the Han River."

A Time of Achievement and Reflection: the 1980s-1990s

Seoul, the nation's economic engine, had an 8.5 million population in 1980. In the process of phenomenal economic growth, Seoul saw the emergence of big businesses and more diversified industries, as well as a budding middle class. Seoul's hosting of the 1986 Asian Games and the 1988 Summer Olympic Games also prompted an aggressive citywide attempt to beautify and improve the city (SMG, 1981-1988).

Seoul never stopped working even in the post-Olympic years of the 1990s. Now a capital city of 10 million in a newly industrialized country with a GNP per capita of 10,000 dollars, Seoul needed to be capable of sustaining a highly sophisticated economy and meeting the citizen's needs. Citywide construction involved many important civic projects including four more subway lines, new bridges, roadways, cultural venues, and private building projects that changed Seoul's skyline. And increasing motorization was altering metropolitan landscape as many people fled out to suburban new towns.

However, the 1990s served as a new beginning for Seoul in many ways. Above all, Seoul had to witness the negative consequences of eagerly rushed growth. The tragic disasters of the fall of a major bridge, a massive underground gas explosion, and the collapse of an upscale department store, which claimed more than 1400 lives, forced Seoulites to reflect on its growth-driven ambition of the late twentieth century. It was imperative that the city improve its construction and maintenance program and even rebuild existing structures. The 1997 IMF bailout also gave Seoul a rude awakening to how it was going to find the means to sustain growth. As the debt-ridden, conglomerate-centered economy buckled, Seoul had to face new problems such as unemployment, labor unrest, homelessness and social welfare.

The revival of local political autonomy was another turning point

for Seoul. Local elections for the mayor and city councilmen brought a fundamental change to local politics, necessitating extensive citizen participation in every aspect of public administration. Once a top-down enterprise, public opinion and interests were now incorporated into the formulation and implementation stages of city-building initiatives.

At the end of the twentieth century, Seoul saw its single-core structure completely transformed into a polycentric one that encompassed a number of distinctive neighborhoods and a metropolitan population of about 20 million citizens (Lee, 2001). The recent opening of the Incheon International Airport and the impending completion of the Seoul-Busan high-speed rail system are likely to reinforce Seoul's position as the center of international trade and cooperation in East Asia. Furthermore, with the development of the Digital Media City, a high-tech new town, Seoul is hoping to take further initiatives towards maintaining its competitiveness in the information society.

Urban Management Issues in Seoul

This book is a collection of essays on selected aspects of the current urban management issues in Seoul. The first three chapters provide a gateway to this volume as they view Seoul from historical, national and regional perspectives. Kwon (chapter 1) begins with the most comprehensive overview by looking at Seoul's urban process at a national level. Under the theme of globalization and sustainability, he highlights various current issues such as CBD congestion toll, Green Belt and solid waste management. While being concerned about globalization causing spatial disparity, Kwon sees no need to sacrify either economy or environment in order to reach the ultimate goal of long-term sustainability.

Although American state growth management has emerged as a new planning approach in recent years, it is not well known that Seoul area has had a long tradition of equivalent metropolitan growth management since the 1960s. It is a unique central intervention, in that national defense was the main, if not the sole, impetus of this growth-control program and has been strong enough to rearrange the economic activities of the region. Ahn and Ohn (chapter 2) detail the

evolution of this central policy that has framed Seoul's transformation over the decades. Providing a good introduction to Seoul's regional context, they present points and counter-points regarding this controversial metropolitan growth management, one that has attracted relentless debates among planners and economists.

It is debatable whether central growth management has indeed prevented a much worse sprawl, which the Seoul area could otherwise have experienced. Whatever the truth may be, according to M-H Kim and Jung (chapter 3), Seoul is now only a center city of a larger urban region of 22 million inhabitants. Its built-up area grew 1.8 times, and more than 400 km² of open space and farmland have been gobbled up in the last 15 years. Now this metropolitan area continues to further expand as manifested in flourishing exurban housing developments occurring at 40-50 km away from the city center. The authors call for a new metropolitan growth management based upon interregional cooperation between constituent local governments.

The following chapters discuss major policy issues of the city of Seoul. Recent citizen surveys consistently ranked traffic congestion as one of top problems to be solved. Hwang's essay (chapter 4) should be a good reader for those who want to know basic fact of Seoul's "notorious," in his term, transportation realities with key indicators such as travel behavior, car ownership, roadways, and public transportation. Summarizing the current transportation policies, Hwang sees Seoul's dual task of transportation demand management and infrastructure construction, as the city is experiencing fast motorization without adequate supply of roadways and public transit.

Shin and Byeon (chapter 5) follow with the issue of local economic development. Like many other metropolitan cities, Seoul is at the center of a new industrialization. Once a leading engine of a growing economy, Seoul's traditional manufacturing has faded away in part by governmental growth management policy (see chapter 2) and in part by a changing economic structure. They report that Seoul is restructuring its economy, a process that they call " new industrialization" where knowledge-based, technology-driven new businesses are expected to secure continuing prosperity of Seoul. Shin and Byeon summarize a number of promotion programs that the Seoul Metropolitan Government is doing and contemplate how they will affect Seoul's future growth.

The next three chapters address some aspects of housing policies and developments in Seoul. The housing development has been so intense since the 1980s that it changed entire cityscape in a radical manner. It was because a growing economy generated an increasingly large body of middle class and their demand of home ownership has been explosive. Every year, Seoul has produced some 100,000 units on the average in the last decade, a remarkable difference from New York City's recent average annual production of 10,000 units. Indeed, as Jang (chapter 6) reviews, housing policy has been a business of the central government, and it considered little but the quantitative supply both for housing supply itself and for sustaining the domestic economy. She argues that now is the time to turn to quality, as Seoul's once chronic housing shortage has been much ameliorated. But, she warns, more than 50 per cent of total households still live in rental housing and low-income people are in need of decent homes—sufficient reason of why Jang suggests that local housing policy target this less-cared realm of social class.

Gallent and K. S. Kim (chapter 7) explores the possibility of the extended role of burgeoning mixed-use housing development (MXD, large-scale single buildings incorporating residential and commercial functions). Until the beginning of the twentieth century, Seoulites had never employed multiple-story living and thus are not familiar with mixed-use development. It was only in the 1960s that the first high-rise MXD apartment buildings were constructed. Yet, they are now burgeoning at major city centers and prime view sites, catering luxurious housing for the upper class. Gallent and Kim find much room that MXD can serve broader spectrum of households and contribute to decentralization strategy of city's spatial planning.

K-J Kim (chapter 8) chronicles Seoul's aggressive housing renewal policy, which has been increasingly privatized over time. This program was originally conceived as a squatter clearance measure. Now that the squatters are gone, this program serves as a general residential redevelopment technique boasting popularity with its profit-making development formulae. So popular, this program has been instrumental in changing Seoul into an apartment forest during the 1980s and 1990s. Kim analyzes the mechanisms of project execution and its resultant consequences on urban environment, balancing the arguments for and against this type of urban change.

The subsequent two essays deal with environmental issue ranked highly by the citizens as the most urgent problems to be solved. C-W Lee (chapter 9) reviews how Seoul has formulated Seoul Agenda 21 (SA 21), a local version of Local Agenda 21 generated out of the Rio Conference in 1996. He states that SA 21 has achieved an important shift in environmental policies: from reactive to proactive and preventive. Yet, visioning is one thing and acting upon it is another. Despite a number of innovations and new approaches included in SA 21 and the related local charters and ordinances, there appears to be little interdepartmental coordination towards a common goal of environmental sustainability. Lee demands that SA 21 not simply be an environmental program, but be a new paradigm for city administration.

W-S Kim (chapter 10) focuses on air pollution, one of Seoul's most pressing problems. In chapter 2, Hwang indicated that car use is the major cause of Seoul's pressing traffic congestion. Yet, as Kim presents, it is also pivotal in solving the air pollution problem in Seoul. He points out that more than 85 per cent of air pollutants come from motor vehicles. Thus, Kim argues, transportation planning holds the key to solving Seoul's air pollution. Kim sees that a number of counter measures are already in place, but he stresses that Seoul's transportation policy must reduce the use of automobiles. Currently, 2.2 million vehicles are registered in Seoul, which grew rapidly from 60,000 in the early 1970s. He suggests the concept of "environmental road capacity" that he himself devised for this urgent environmental issue.

What follows is K-H Kim's discussion (chapter 11) about social welfare issues in Seoul. Social welfare services used to be a responsibility of the central government. After the introduction of local autonomy system in the 1990s, the role of local government has been significantly expanded. Kim reviews various social welfare programs targeting different social groups in need— low-income people, elderly, handicapped, persons with disabilities, women, and children and youth. Kim's assessment indicates that Seoul needs to improve its skills and energies for this segment of less-fortunate people. Limited service coverage, insufficient subsidy level, reactionary responses, lack of program development, and inefficient service delivery system are all viewed as areas that improvement efforts should target.

Y-W Lee (chapter 12) goes back to the regional level to present the current area-wide public service delivery system in the Seoul

Metropolitan Area. Like many other metropolitan areas, regional problems pay no attention to administrative boundaries. According to Lee, so should solutions. He believes Seoul is in an infant stage to deal with intergovernmental problems such as water supply, wastewater treatment, and waste management, all sharply distinguishing losers and winners more often than not. Lee suggests employing market principles in cost-benefit sharing and service charge, along with intergovernmental cooperation and more citizens input.

Finally, Choi (chapter 13) introduces the changing profile of Seoul's once a top-down administration to citizen-centered, user-oriented services. As he points out, there has been a big shift in the way that city government handles people's needs and grievances. Now citizens are to be treated as customers, consumers and clients—a new wave that was introduced with revival of local autonomy in the early 1990s. Choi presents a number of innovative programs geared to increase the transparency in city administration. Those are initiated under the leadership of the current Mayor, Kun Goh. Choi focuses on one of the anti-corruption programs, known as OPEN, which prevents unnecessary delays or unjust civil affairs by opening the decision-making process on the Internet. Choi sees this is a right direction "from local government to local governance."

These are the urban management issues in Seoul that this book deals with. Since many people contributed to this book, readers might be confused with some terminology used in this book. Seoul Metropolitan Government (SMG) is the official name of the city of Seoul. Although its name may connote a regional government governing the Seoul Metropolitan Area, SMG's jurisdiction only covers the inner city of Seoul. Thus, some authors use "the City of Seoul," instead of SMG. In some cases, "the Special City of Seoul" is used as it is termed legally. Readers should be reminded that these three terms are used interchangeably in the book. Similarly, the terms "Seoul Metropolitan Area" and "Seoul Metropolitan Region" are used interchangeably with the same meaning. The only exception is in Chapter 2, where the authors distinguish these two terms and "Capital Region" as they are defined by law.

Seoul's urban management issues are far more diverse than this single volume brings about. Nonetheless, this book seeks a vital exchange of experiences and ideas of urban management among

neighboring Asian cities. Though at varying stages of urbanization and economic development, they share similar urban context as manifested in population density, development patterns, and growing economies. They also face serious urban problems and other planning challenges that Seoul might have experienced earlier or will do later. Seoul and neighboring Asian cities, thus, have much to learn from each other, whether they are successful stories or lamentable mistakes—or unavoidable common destinies.

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CHAPTER ONE

Globalization and Sustainability in Seoul

Won-Yong Kwon

Introduction

Globalization is characterized by increasing functional and spatial integration of economic activities among countries and has intensified competition among cities articulated to the world's urban system. Sustainability concerns economic growth and environmental quality. While globalization was once thought of as the answer to continued growth and development, recent impacts, including the ongoing Asian financial crisis, have forced Asians to seriously reconsider the role of transnational flows and integration of cities of the region.

Globalization processes have sharpened the conflicts between the urban "haves" and "have-nots". It has also generated a rift between those that promote global infrastructure to increase urban competitiveness and those interested in delivering basic services and providing jobs for the poor. These tensions have materialized within Korea's largest and most globalized city, Seoul. As an important member of the regional and world city system, Seoul, is the location of Korean domestic and transnational corporation headquarter functions. It has therefore grown and benefited from increased functional integration of economic activities within the region and global marketplaces. It has also been severely hurt by the recent Korea economic crisis.

The paper was originally published as "Globalization and the sustainability of cities in the Asia Pacific region: The case of Seoul", in Lo, Fu-chen and Marcotullio, Peter J. (eds.), *Globalization and the Sustainability of Cities in the Asia Pacific Region*, UN University Press, 2001, and has been reprinted by permission from the publisher.

As the Asian financial crisis has been painful to citizens of the city, it has forced a re-evaluation of priorities. Amid the recent turbulence created by globalization, this chapter argues that Seoul's relentless growth should be reconsidered in the light of 'sustainability'. It includes four sections. The first section presents an overview of the urbanization trends in Korea from 1960-95. This section explains the development of Korea's urban order and highlights the predominance of Seoul within this system. The government countermeasures to relieve heavy concentration in Seoul are briefly outlined. In the second section the changing spatial patterns are described in conjunction with the decentralization of population and manufacturing employment from Seoul. Emphasis is placed on the needs for metropolitan planning and management. In the third section the dynamics of Seoul's urban economy are discussed from the globalization perspective and in relation to the expansion of international transactions, producer services, and urban competitiveness. The fourth section examines the delicate balance between the maintenance of economic and environmental sustainability. This section focuses on quality of life (QOL) issues such as transportation congestion, the greenbelt, and solid waste disposal.

The overall objective of this chapter is to describe and analyze what Seoul is and how it has come to be, rather than to present its prospects for the future. The conclusion summarizes and reflects on some of the lessons learned from the Korean urbanization experience and identifies policy constraints and opportunities. It is hoped that this work will provide the basis of Seoul's sustainable development into the next century.

Urbanization in Korea: an Overview

Trends: 1960-1995

Over the past thirty years, the Republic of Korea has experienced an unprecedented increase in the rate of urbanization in both absolute and relative terms. The number of cities with a population of more than 50,000 increased from 27 in 1960 to 73 in 1995. During that period, the level of urbanization skyrocketed from 35.8 per cent in 85.0

Table 1.1 Urbanization in Korea and population concentration in Seoul

Year	Total population ('000)	Urbanization level (%)	Population concentration in Seoul (%)	Davis primacy index*
1960	24,989	35.8	9.8	1.09
1970	31,434	49.8	17.6	1.53
1975	34,707	58.4	19.9	1.51
1980	37,436	66.7	22.3	1.43
1985	40,467	73.8	23.8	1.39
1990	43,520	79.6	24.4	1.35
1995	44,609	85.0	23.0	1.21

Source: Economic Planning Board. *Population and Housing Census*, various years.
Note: * refers to the ratio of the primate city population divided by the total population of next three largest cities.

percent reaching the saturation point (Table 1.1).

Urban growth can be measured in terms of size, speed and spatial balance. Since 1960, the size of the Korean urban population has increased by 15.8 million, more than the increase in the total national population over the same period. As shown in Table 1.2, the speed of urbanization accelerated between 1966-70 directly after the implementation of the country's first Five-Year Economic Development Plan (1962-66). Government efforts to modernize Korea played a decisive role in its urban growth. For example, an industrial town, Ulsan, was constructed in 1963 by vigorous government initiatives, which thereafter ignited remarkable industrial growth throughout the 1960s and 1970s.

Rapid urbanization itself, however, does not imply a spatial problem. The major urban problems in Korea arise from heavy population concentration in the capital city, Seoul, leading to a skewed pattern of urban development. Korea suffers from an urban spatial imbalance. For example, Seoul's share of the national population increased from

Table 1.2 Speed of urbanization as measured by the population growth rate (percentages)

Period	Urban area (A)	Whole country (B)	Speed (A—B)
1960-66	5.0	2.6	2.4
1966-70	6.3	1.9	4.4
1970-75	5.2	2.0	3.2
1975-80	4.2	1.9	2.3
1980-85	3.7	1.6	2.1
1985-90	3.0	1.4	1.6
1990-95	1.8	0.4	1.4

Source: Economic Planning Board. *Population and Housing Census*, various years.

7.3 percent in 1955 to 23.0 percent in 1995. The recent national census revealed that the population of Seoul has already reached more than 10 million while the second largest city, Busan, reached 3.8 million and the third largest, Daegu, 2.4 million. Currently, Seoul, approximately 0.63 per cent of the national territory, accommodates nearly a quarter of the national population.

Causes of Seoul's Growth

Urbanization in Korea can only be discussed in conjunction with the rapid expansion of urban manufacturing that absorbed the inflow of cheap labor from rural areas. In Korea, urbanization and industrialization have been strikingly correlated (Table 1.3). The particular pattern of urbanization and industrialization, however, privileged the growth of Seoul over other urban centers. Both economic and policy factors have contributed to population concentration in Seoul.

The dramatic growth of Seoul is largely attributed to the export-led industrialization programs of the Korean government. The initial expansion of labor-intensive industries in Seoul caused a large number of rural residents to move into the city. The dominance of Seoul's economy over the rest of the country was reinforced by the continued influx of rural migrants that further fueled growth. As the

Table 1.3 Urbanization and industrialization in Korea (percentages)

Year	Urbanization level (A)	Industrialization level (B)*	Difference (A—B)
1966	42.1	42.1	0.0
1970	49.8	49.6	0.2
1980	66.7	66.0	0.7
1985	73.8	75.1	−1.3
1990	79.6	81.7	−2.1
1995	85.0	87.4	−2.4

Source: Economic Planning Board. *Population and Housing Census*, various years.
Note: The industrialization level means the ratio of manufacturing and service sector employment to national total employment.

city expanded and manufacturing industry grew, Seoul functioned as the development engine for the entire national economy.

A survey of urban migrants to Seoul, by the Korea Research Institute for Human Settlements (1980), demonstrated that economic motives underlay the movement of many Koreans to the nation's capital. More than 40 per cent of the respondents mentioned job related, job seeking or business convenience factors as the principal motivation for their migration to the city (Table 1.4). Initially, manufacturing firms accompanied the movement of population. They created Seoul's comparative advantage in labor, information, finance, and government's administrative services benefits (Kim, 1995). The country's strong centralist tradition enhanced the citys attractiveness to firms as it meant access to government decision-making. As more business headquarters located in Seoul, it enhanced the opportunities for jobs.

More recently, the tertiary sector of the urban economy has become the economic base of Seoul. The number of white-collar jobs such as professional, managerial, and clerical workers has been rising, while the number of blue-collar jobs has been falling. Despite the change in urban economic structure, high incomes and job creation associated with the expansion of the new urban economy have continued to induce a steady and sizeable flow of migrants to the city.

Table 1.4 Reasons for residing in Seoul (percentages)

Reasons	Response
1. Job-related	26.3
2. Born in Seoul	23.9
3. Education of household head or children	17.9
4. Joining family	11.7
5. Job seeking	8.2
6. Convenience for business transactions	7.8
7. Influence of friends or relatives	2.1
8. Others	2.1

Source: Korea Research Institute for Human Settlements (1980).

Consequences of Population Concentration

There are, at least, three unfavorable consequences of having one very dominant city (Kwon, 1981). First, regional disparities arise from the uneven distribution of population and economic activities. The distorted spatial organization resulting from Seoul's dominance in the national urban system has undeniably contributed to interregional inequity. For example, the concentration of population has lead to high housing rents and crowded schools within Seoul. At the same time within rural communities there is an abundance of vacant houses and underutilized schools.

The second consequence is the diseconomies within Seoul itself and the strain they place on the city's management. Rapid population growth resulted in severe urban problems such as traffic congestion, land speculation, housing shortages, overcrowding, pollution, and backlogs in infrastructure development. Combined with municipal financial difficulties, the provision of urban services has continued to be a critical problem. The third and possibly the most important consequence concerns national defense. The location of this very large agglomeration within range of North Korean artillery is disadvantageous in terms of military security.

The Korean government responded to the above-mentioned consequences in the form of population decentralization policies. A host

of strong policy measures have been adopted to fight concentration and centralization since the 1970s. These included development control by a rigid zoning system and establishment of greenbelts; industrial relocation; and, dispersal of government offices and universities from Seoul. The goal of these government efforts was simply to reverse the tendency for people to concentrate in Seoul.

Despite controversy, population decentralization policies that endeavored to relieve the primate city phenomena were not successful (Choe, 1990; Hong, 1997). There are several reasons for these failures. First, the influence of government programs *vis-à-vis* market forces remains unclear. Even if the programs were successful, their ability to de-concentrate population may well have been overcome by economic forces. Second, there was an inevitable mismatch between the rhetoric of planning and spatial policy implementation. What was called de-concentration policy was not implemented as such. Third, neglecting local autonomy was a mistake. The systematic devolution of the government power might have relieved the heavy concentration in Seoul, but it was not tried. Lastly, Korea has already reached the stage of 'mature urbanization', by the time the policies were implemented. Thus, the population decentralization problem became a metropolitan management, not a regional problem.

Metropolitan Growth and Change

The metropolitan region, as a planning unit, includes the surrounding area that has socio-economic linkages and interdependency with the central city. In this context, population distribution and employment location are two major determining variables whose changes bring about patterns of metropolitan settlement. Similarly, metropolitan commuting patterns reflect energy related environmental sustainable trends. Therefore, new town development is regarded as a strategically important policy instrument, so far as its aim is to accommodate the spillover of people and jobs from the central city to outlying areas.

Seoul is endowed with a beautiful landscape that changes dramatically with each season. The two main geographical features that dominate the city are the mountain axis extending from the north to the south and the Han River flowing from east to west. Figure 1.1

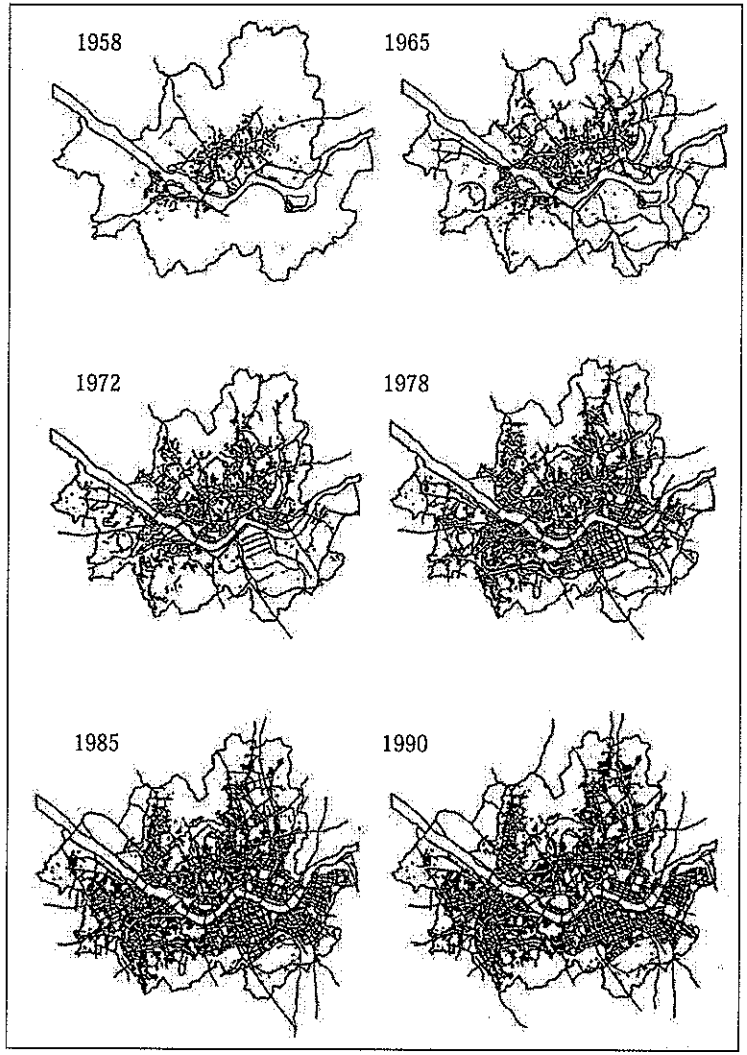
demonstrates how these factors affected the spread of Seoul's urban development and the expansion of the transportation network from 1958 to 1990. Due to rapid population growth since the early 1960s, building-sites have encroached upon agricultural and forest lands. Over the last three decades, the Seoul Metropolitan Region (SMR), consisting of Seoul City and its adjoining Kyonggi Province, grew to occupy the entire area within a 50-60 km radius from the city's center (size: 11,726 km²). At present, about 45 per cent of Korean people live and work in the SMR as a functional urban region.

Population Distribution

Before the 1970s, Seoul was a mono-centric city spreading out from a point located principally north of the Han River. This basic urban structure remained despite a doubling in land size since 1963. The central business district (CBD) is 9.2 km² (1.5 per cent of the total land area of Seoul) and is the central core from which all major arterial roads radiate. The CBD of Seoul formerly was a residential zone. Through "invasion and succession," commercial offices and various facilities have replaced older residential areas (Kwon, 1987). The consequence of the outward movement of people resulted in the transformation of the built environment. For example, many elementary schools in the CBD had to close due to the decline in the school-aged population. Currently, the core functions as a center of commercial employment; white-collar jobs in government institutions, headquarters of business firms, banks and insurance companies.

Concomitant with the decrease of residential buildings in the center there has been an increase in the residential population south of the Han River and the gradual emergence of two sub-centers; Yoido (once a riverside island) and the Youngdong area. The south's share of the city population rose from 21.8 per cent in 1970 to 49.3 per cent in 1995 with the construction of large high-rise apartment complexes south of the river. Recently, another movement of commercial office building has followed the residential shift. Table 1.5 presents the current status of the deconcentration of office space from the center to these sub-centers. Commercial and residential development in these areas is part of their emergence as secondary CBDs.

Figure 1.1 Physical expansion of built-up area in Seoul



Source: Seoul Metropolitan Government, *The Comprehensive Plan for Seoul*, 1997.

Table 1.5 Office floor space distribution in Seoul (1993)

Total	CBD (downtown)	Youngdong (subcenter)	Yoido (subcenter)	Others
1,695	419	494	384	397
(100.0)	(24.7)	(29.2)	(22.7)	(23.4)

Source: Park (1996), p.75
Note: Public, commercial and office buildings with more than 10 stories or floor space of 100,000 m²

While Seoul has gradually transformed into a multi-centric city, it also underwent a metropolitan growth process. This process began with the completion of the subway (line number one) in Seoul and two suburban rail transit systems (from Seoul to Inchon and from Seoul to Suwon) in 1974. Suburban access by rail facilitated commuting and led to rapid urban development along two main transportation corridors dispersing the SMR population.

As shown in Table 1.6, the population of the SMR increased from 5.2 million in 1960 to 20.2 million in 1995. During this same period the nation's total population increased from 25.0 million to 45.5 million. This indicates the growth in this region accounted for approximately 73 per cent of the total national population growth. Since the 1980s, however, the speed of population growth within Seoul has slowed considerably. The residential population has dispersed to the outer fringes of the city. Also Table 1.6 demonstrates the population growth rate in Kyonggi province doubled that of Seoul in the 1980s. This distribution has been perceived as a state of "relative decentralization" in the sense that the population is increasing in the outlying areas of the city much faster than within Seoul itself (Klaassen, et al., 1981).

It is also noteworthy that the sources of population growth in Seoul are changing, the metropolitan expansion is increasingly dependent upon natural increase rather than in-migration. With higher levels of urbanization, the impact of rural migration became increasingly less significant. Presently, there are extremely few young people among farm workers in Korea, which implies a virtual exhaustion of the "rural migration stock". Subsequently, the migration pattern within Korea has changed from a rural to urban to an urban to urban type. In

Table 1.6 Population growth in the Seoul Metropolitan Region

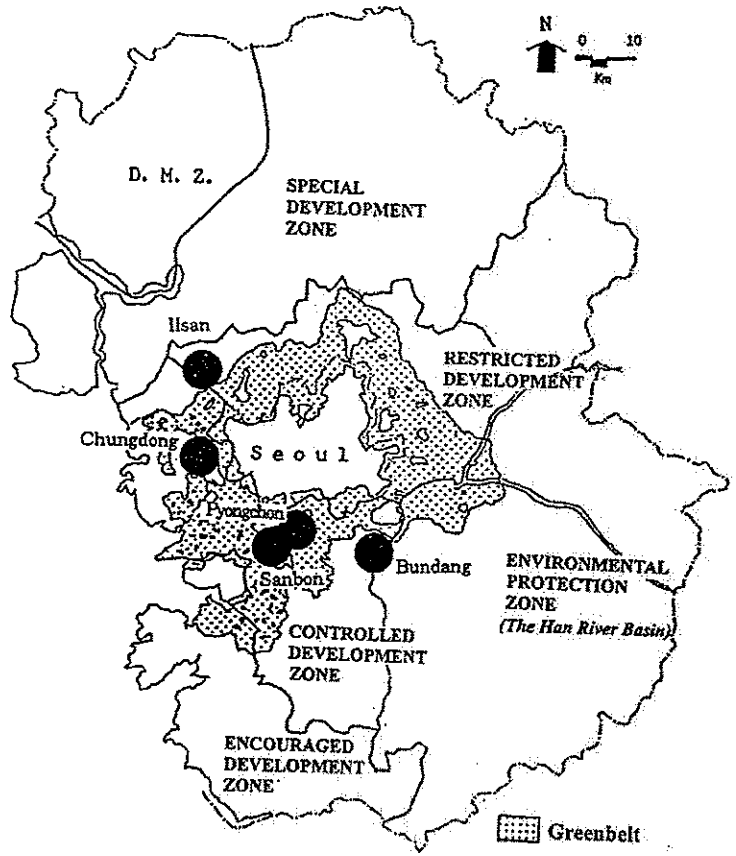
	Population (,000)				
	1960	1970	1980	1990	1995
Seoul(A)	2,445	5,433	8,364	10,613	10,231
Kyonggi (B)	2,749	3,358	4,934	7,974	9,958
SMR (A+B)	5,194	8,791	13,298	18,587	20,189
	Annual growth rate (percentage)				
	1960-70	1970-80	1980-90	1990-95	
Seoul(A)	7.9	4.3	2.4	-0.7	
Kyonggi (B)	1.8	3.8	4.8	4.4	
SMR (A+B)	5.4	4.1	3.3	1.7	

Source: Economic Planning Board, *Population and Housing Census*, various years.

1988, the year of the 24th Olympiad, Seoul achieved the status of a mega-city in terms of its sheer size by recording a population of 10 million. Only two years later, in 1990, Seoul experienced a net out-migration (91 thousand persons) for the first time. It is premature, however, to conclude that the SMR is now entering into a phase of "absolute decentralization."

In view of the prospect of urbanization in the 1990s and beyond, new forms of region-wide planning and management are necessary. Many urban services, for example, spill over political jurisdictions. Transportation, electric power, water supply, and air pollution pay no attention to local political borders. Thus, in Seoul controversial issues that have focused policy attention include: the coordination of metropolitan transportation networks; location of public facilities (e.g. garbage and solid waste disposal site, cemeteries); allocation of new towns containing industrial and housing estates; and environmental conservation. Among these, protecting water quality of the *Han River* is undeniably of vital importance to achieve sustainable development for the SMR (Figure 1.2).

Figure 1.2 Green belt and five new towns in Seoul Metropolitan region



Source: Ministry of Construction, 1984

Employment Location and Commuting

Since the 1970s, Seoul has experienced an absolute decline in manufacturing jobs and a decrease in the share of the total population within the SMR. At the same time, Kyonggi province has gained in both population and jobs. Table 1.7 indicates that such de-concentration of the Seoul population to its satellite cities and suburban areas occurred simultaneously with a shift in manufacturing employment.

Table 1.7 Distribution of manufacturing employment and population between Seoul and Kyonggi province (percentages)

	1973	1978	1983	1988	1995
Manufacturing employment					
Seoul	70.6	52.3	45.7	36.5	26.8
Kyonggi	29.4	47.7	54.3	63.5	73.2
Total	100.0	100.0	100.0	100.0	100.0
('000 persons)	(581)	(1,031)	(1,019)	(1,515)	(1,379)
Population					
Seoul	63.2	63.7	62.3	58.7	50.7
Kyonggi	36.8	36.3	37.7	41.3	49.3
Total	100.0	100.0	100.0	100.0	100.0
('000 persons)	(9,959)	(12,275)	(14,783)	(17,526)	(20,189)

Source: Economic Planning Board. *Mining and Manufacturing Census, 1973, 1978, 1983, 1988, 1993.*

Note: Manufacturing establishments with 5 or more employees.

Despite the continuing decentralization of manufacturing employment to outer rings of the SMR, the shift in population is also due to high housing costs and housing shortages within Seoul. According to the 1995 census, there were 7.3 million commuters in the SMR as a whole and approximately 0.8 million suburban residents commute daily to Seoul. Table 8 reveals that average commuting distance has increased substantially between 1980 and 1995. Further, cross-commuting has been increasing between Seoul and its outlying Kyonggi province. Inbound commuting from Kyonggi to Seoul, however, remains more significant than outbound (reverse) commuting from Seoul to Kyonggi. The former prevails primarily because com-

muting is less costly to suburban residents than housing. The latter occurs partly due to white-collar workers who have stayed in Seoul so that their children have access to high quality education.

Table 1.8 Changing commuter patterns of the Seoul Metropolitan Region (percentages)

	1980	1990	1995
Average Commuting Distance	9.10 km	9.82 km	10.28 km
Seoul → Seoul	65.3	55.3	45.8
Seoul → Kyonggi	3.9	4.7	4.8
Kyonggi → Seoul	5.9	10.1	11.1
Kyonggi → Kyonggi	24.9	30.2	38.2

Source: Economic Planning Board, *Population and Housing Census, 1980, 1990, 1995.*

In general, cross commuting represents a job/housing imbalance and the undesirable separation of home and workplace (Cervero, 1989). The underlying cause of this separation in the SMR is inefficient land use patterns and transportation networks. Metropolitan spatial structure is an important determinant of energy demand because it affects the separation of urban activities and therefore energy use (Breheny, 1992). In the light of sustainable metropolitan development, it would be more preferable to minimize the need for commuting through the creation of mixed land use zoning laws and the "compact city" urban design model.

New Towns and Housing

During the 1970's, the population in Seoul grew rapidly while the supply of housing slowly followed. Mainly due to soaring land prices, Seoul has suffered from acute housing shortages since the 1970s and that little has changed since that time. In order to alleviate both the chronic housing shortages and population concentration in the city the national government announced a bold development plan in 1989. The plan called for the construction of five new towns to be built in the SMR.

Table 1.9 Profiles of five new towns in the Seoul Metropolitan Region

	Pundang	Ilsan	Chungdong	Pyongchon	Sanbon
Area (ha)	1,964	1,574	545	511	420
Planned Pop.	390,000	276,000	170,000	170,000	170,000
Housing Units	97,500	69,000	42,500	42,500	42,500
Gross Pop. Density	198	175	312	333	404
Floor Area Ratio (%)	184	169	226	204	205
Road Space (%)	19.7	20.9	26.1	23.3	15.2
Parks and Open Space (%)	22.0	24.1	12.9	13.9	21.2

Source: Korea Research Institute for Human Settlements (1997) and Lee and Kim (1995).

The five new towns are located within about 20-km from the city center just beyond the outer edge of the greenbelt (Figure 1.2). Bundang and Ilsan were developed as self-contained independent towns for the middle-income classes and the remaining three were similar to "new towns-in-town." As shown in Table 1.9, compared with other existing towns in the country, roads, parks and open space, made up a significantly larger portion of land use. Also noticeable was the application of a new technique of urban design that included such land use components as bikeways and pedestrian facilities.

The five new towns not only successfully provided housing to a large number of families, but the projects were completed rapidly, taking only five years (1989-93). Yet in terms of other indicators they have not completely fulfilled their promises. Approximately 90 per cent of the housing units built were high-rise apartments. These buildings have a monotonous appearance, lack diversity and have even been considered inhumane. They have created transportation problems since two-thirds of new town residents have their jobs in Seoul. In the largest new town, Bundang, more than 70 per cent of workers commute daily to Seoul (Table 1.10). Lastly, there were enormous negative side effects from their hasty and massive construction. These include

such unintended macro-economic repercussions as labor cost inflation and skilled manpower and building materials shortages.

Table 1.10 Job location of new town residents (percentages)

Job location	New towns					
	Bundang	Ilsan	Chungdong	Sanbon	Pyongchon	Total
Total	100.0	100.0	100.0	100.0	100.0	100.0
Seoul	72.8	68.0	44.6	54.9	66.3	66.0
Incheon	0.5	2.7	13.7	1.9	0.4	2.9
Own New Town	12.1	12.3	28.6	22.2	17.2	16.7
Kyonggi	11.8	7.7	11.4	21.6	15.3	12.9
Outside the SMR	2.8	0.4	1.7	0.6	0.8	1.5

Source: Chung and Lee (1996), p. 60.

The new town construction provides a good example of the negative aspects derived from neglecting urban governance. Urban governance refers to the basic relationship between national, regional, and local governments in the management of the mega-cities (Stubbs and Clarke, 1996). However, 'governance' as a concept is much broader than government and includes partnerships between public, private and voluntary sectors. Before the advent of local autonomy in the early 1990s, there were few opportunities for citizens' participation in such important decisions as constructing new towns in the SMR. During last 30 years, Korea's central government's containment policy has prevented Seoul from pro-actively participating in its own urban development. Instead, central government corporations have monopolized almost all of large-scale housing projects even within the city's borders. Further, the active role of private developers in public works (e.g., industrial parks) has not been encouraged until recently. For sustainable metropolitan development, consensus and commitment of multi-stakeholders from both public and private sectors should be made through a variety of negotiation forms.

Globalization and the Seoul Economy

The Increase in International Transactions

There has been enormous and consistent growth in the Korean economy since the 1980s. This growth is highly related to increases in international economic transactions. For example, the total amount of foreign trade as a share of GNP increased from 20.6 per cent in 1962 to 60.6 per cent in 1991 (SaKong, 1993). Considering its poor natural endowments, limited market size, and the availability of capital and technology, Korea's success has been determined by access to international markets, foreign capital and imported technology. For this reason, enhancing globalization could not but become a national policy objective for sustaining economic growth. The gateway functions to increase globalization have undoubtedly been given to Seoul. Accordingly, the globalization of the Korean economy has been directly related to transformations in Seoul's economy. Seoul has played a central role in servicing and financing international trade, investments and headquarters operations. Nationally, Seoul continues to be the site of concentrated economic power,[1] while provincial cities continue to suffer from stagnant or relatively declining economies.

Since the 1988 Summer Olympics, Seoul has gradually expanded its role as one of key political and economic locations in the Asia Pacific region, whereas the nation has achieved an impressive increase in foreign trade. Table 1.11 shows an increasing tendency of international flows of people and commodities into Seoul. Over the period of 1985-95, the number of foreign visitors and air passengers and the volume of airfreight almost tripled. More than half of foreign visitors, however, originated from only three countries: Japan (46 per cent), the U.S.A. (9.3 per cent), and Hong Kong (3.4 per cent). It goes without saying that the destination countries of overseas calls from Seoul follow exactly the same order. At the same time, Seoul's trade with Asian cities increased substantially in the 1990s. Table 1.12 shows dramatic increases in intra-Asian airfreight traffic volumes. It is particularly worth noting that Seoul's high growth rate (4 to 5 times between 1983-90) and international linkages provide evidence of its deepening economic linkages with the Asian urban system.

A key feature of the globalization trend of Seoul in the 1990s is the

Table 1.11 Seoul's international flows of people and commodity

	1985	1988	1990	1992	1994	1995
Foreign visitors ('000)persons)	1,446	2,172	2,720	3,009	3,375	3,565
Rate of increase[a]	<100>	<150>	<188>	<208>	<234>	<247>
International air passengers[b] ('000 persons)	3,776	5,417	8,443	9,800	11,865	13,366
Rate of increase	<100>	<143>	<224>	<260>	<314>	<354>
International air freight ('000 tons)	317	477	746	807	1,080	1,256
Rate of increase[a]	<100>	<150>	<235>	<254>	<340>	<395>

Source: Korea Research Institute for Human Settlements, *Social Overhead Capital Statistics* (1997).
Note: a. Base : 1985 = 100,
b. Outgoing from and incoming to the Kimpo airport only.

Table 1.12 Intra-Asian air freight (in tons)

	TO			FROM		
City	1983	1990	% change	1983	1990	%change
Bangkok	24,607	73,895	+200	44,310	132,232	+198
Beijing	2,602	1,815	−30	523	2,314	+342
Hong Kong	79,425	199,046	+151	87,883	227,911	+159
Jakarta	5,985	23,140	+287	6,615	37,540	+468
Kuala Lumpur	15,317	36,274	+137	10,170	44,651	+339
Manila	19,739	31,836	+61	14,657	40,863	+179
Seoul	**49,595**	**267,149**	**+439**	**38,658**	**253,382**	**+555**
Shanghai	667	1,045	+57	430	4,464	+938
Singapore	61,151	181,164	+196	41,285	164,380	+298
Taipei	29,246	116,593	+299	76,621	172,031	+125
Tokyo	111,475	344,089	+209	84,520	214,450	+154
TOTAL VOLUME	1983:	423,761	1990:	1,355,563	%change:	+220

Source: International Civil Aviation Organization, 1984 & 1991, from Peter J. Rimmer, unpublished manuscript.

increase in the new types of international transactions. The growth in foreign direct investment (FDI) is one example of international economic flows related to Seoul's economy (Table 1.13). Generally speak

Table 1.13 Trends of foreign direct investment in Korea (million US dollars)

Year	Total Amount	Inbound	Outbound
1990	1,761.5	802.6	958.9
1991	2,511.0	1,396.0	1,115.0
1992	2,112.4	894.5	1,217.9
1993	2,306.3	1,044.3	1,262.0
1994	3,614.7	1,316.5	2,298.2
1995	5,008.1	1,941.4	3,066.7
1996	7,378.9	3,202.6	4,176.3

Source: The Bank of Korea, *Monthly Bulletin (September), 1997.*

ing, the amount of inbound FDI into Korea is small and unstable compared with outbound FDI from Korea. In 1996, outbound FDI reached US$ 4,176 million. The largest portion, 38.4 per cent, was invested in Southeast Asia, 37.7 per cent went to North America and 15.6 per cent landed in Europe. The increasing share of Korean outbound FDI to Southeast Asia draws our special attention because intra-Asian FDI flows have been growing rapidly in recent years. Growing economic interdependence reflects Seoul's increasingly integrated production network with other mega-cities in the region (Lo and Yeung, 1996). While this integration has benefited the country and city, it also has had a cost. Such close economic relationships played an important part in the crisis of 1997, particularly in terms of loan arrangements. Also, Table 1.14 summarizes the total amount of the FDI that has accumulated in Seoul from 1988 to 1996. Foreign capital came, by and large, from advanced countries and was mainly invested in service industries. As a consequence, various locations of fast food restaurants and convenient stores led the tendency of what has been called McDonalization, which has been shaping the cityscape of Seoul.

Table 1.14 Foreign direct investment in Seoul (million US dollars)

	Japan	U.S.A.	Europe*	Malaysia	Singapore	H.K.	Others
Manufacturing	174	207	56	88	32	12	39
Service	1,705	921	1,106	271	52	50	223
Total	1,879	1,128	1,162	359	84	62	262
(%)	(38.0)	(22.8)	(23.5)	(7.3)	(1.7)	(1.3)	(5.4)

Source: Ministry of Finance and Economy, *Financial Statistics*, 1996.
Note: * includes such countries as U.K., Germany, Netherlands, France and Ireland.

Expansion of Producer Services

Another salient feature of the globalization of Seoul's economy is the growing number of Transnational Corporations (TNCs) in the city. The number of parent TNCs of Korea is the highest among developing

countries. Most of Koreas TNCs are based in Seoul (Brotchie and Batty, 1995). The advanced information and telecommunication requirements of TNC headquarters have a strong impact on the spatial organization of Seoul. This is a new form of agglomeration of central managerial functions (CMFs) both at the national and international scales. Further, the production of services for these headquarters is a growing part of the economy in Seoul. These services include, *inter alia*, banking, finance insurance, real estate, legal services, accounting, economic consulting, design, printing and advertising. Seoul's dominance, within the national and regional urban system, in these key activities is the source of its new growth engine and new comparative advantage, replacing the once-dominant manufacturing sectors.

Table 1.15 demonstrates that producer service employment has contributed to the great concentration of major economic activities and actors in Seoul. A recent survey reveals that Seoul alone accounts for over 45 per cent of all producer services in Korea, and 57 per cent of the most specialized ones. Prior to the Asian financial crisis, globalization accelerated office development in downtown Seoul. The key location factors for international business activities were convenience of transportation and telecommunications and the supply of high-quality offices (Hahn, 1997). It is also argued that information technologies actually contribute to spatial concentration (Sassen, 1995). For these

Table 1.15 Expansion of producer service employment in Seoul (persons in thousands)

	1981		1986		1991		1996	
	No.	%	No.	%	No.	%	No.	%
Whole industry	2,378	100.0	2,869	100.0	3,629	100.0	3,612	100.0
Manufacturing	722	30.4	880	30.7	1,133	31.2	810	22.4
Tertiary industry	1,186	49.9	1,655	57.7	2,092	57.6	2,421	67.9
Producer Services	**208**	**8.7**	**298**	**10.4**	**418**	**11.5**	**515**	**14.3**
- Banking/Finance	73	3.1	109	3.8	135	3.7	124	3.4
- Insurance	39	1.7	55	1.9	82	2.3	101	2.8
- Real estate	47	2.0	68	2.4	70	1.9	72	2.0
- Business service	46	1.9	62	2.2	126	3.5	192	5.3

Source: Economic Planning Board, *Comprehensive Census of Industries*, 1981, 1986, 1991 and 1996.

reasons, many corporation headquarters as well as their back offices have moved across the Han River to the newly formed 'secondary CBDs' in South Seoul as described in the previous section.

Promoting Urban Competitiveness

The trend of globalization demands more advanced lifestyles and urban infrastructure. Highly educated professional workers (e.g., managers, scientists and technicians) are extremely sensitive to the quality of living environment. If the high level of office rent prevails in Seoul, TNC headquarter functions and growth of advanced business services and ancillary services cannot be accommodated. The high cost of housing and the lack of English-speaking people are comparative disadvantages in the competition for enhanced global flows among other cities in the region. Besides, Seoul has acquired the image of a non-cultural hardworking city. Image making combined with various amenity[2] factors (e.g., clean air) is of critical importance to attract entrepreneurs and international investment. The perceptions of Seoul as a "world city" and the mental images held by visitors have become lynchpins to its future economic success.

On the other hand, the provision of global infrastructure is a key ingredient used by governments to influence the new urban economy. One of the major urban strategies used by cities in the region to accommodate globalization flows has been the construction of large-scale international airports whose provision functions as a hub-airport to cities in East Asia. Seoul's Kimpo airport has a maximum capacity of 24 million passengers per year and considering its current annual passenger growth rate of 17 per cent, it is expected to reach maximum capacity by the end of the 1990s. Plans for the new Seoul international airport on Youngjong island include an annual passenger load of 27 million at the initial stage, and eventually 100 million passengers per year at the final stage. There are also other mega-projects under consideration for the SMR including the construction of a teleport, convention centers, and high-tech industrial parks.

Environmental Sustainability

Despite the current focus on sustainable development there is yet no agreement upon its definition[3]. Despite the lack of rigor concerning the term, the important point to consider is that it is closely related to "environmentally friendly" development.

Cities are heavily implicated in the sustainability of the environment. Mega-cities are massive consumers of resources and generators of many forms of waste and pollution. Urban activities involving transport, the heating (or cooling) of buildings, and the fueling of production processes contribute to global warming. The 1992 Rio conference increased public concern for the urban environment and 'green' issues, but we are now only beginning to address the notion of sustainability and to consider the need for a full-scale environmental reappraisal of urban development.

Generally, increased economic growth translates into increased environmental concern and quality of life for urban residents (Friedmann, 1998). Seoul citizens have begun to express dissatisfaction with the lack of parks and open space, and severe air pollution mainly caused by automobiles within the city. Today, imbalances between economic growth and environmental improvement are increasingly not tolerated by the public. In this connection, Seoul has three environmental sustainability issues: CBD congestion toll, greenbelt maintenance, and solid waste management.

CBD Congestion Toll

Of all modern technologies, the automobile has had the most profound impact on the urban environment. In Seoul, since 1988, auto ownership has increased at the phenomenal annual rate of 20 per cent. Ironically, however, as people have attempted to increase their mobility by driving cars, they have actually decreased their travel time due to slower traffic flows (Wright, 1992). The automobile society tends to consume most urban land in car-oriented uses fueling further demand for cars. The more lanes and parking lots supplied by governments, the more cars pour into streets. Notwithstanding the slow traffic, car congestion and increasing land devoted to cars, automobile usage incurs social and amenity costs, accidents, noise, air contamination,

and pedestrian sidewalk destruction.

Supply-sided remedies to solve traffic congestion have generated a vicious circle of inadequate policy remedies that have created more traffic rather than decreased vehicle loads. Building more roads does not reduce the intensity of peak-hour traffic congestion and increasing carrying capacity attracts more drivers (Downs, 1992). Alternatively, Transportation Demand Management (TDM) techniques have recently caught Seoul's policy-maker's attention. TDM has gained noticeable popularity because it aims to achieve the maximum utilization of existing transportation facilities without an additional financial burden. In order to discourage automobile use, a CBD congestion toll is under implementation now as one of TDM programs.

Beginning on November 11, 1996 a congestion price of 2,000 *won* was charged to all automobiles[4] with less than three passengers using the *Namsan* Tunnels (#1 and #3). These tunnels are main access roads to Seoul's CBD. The charge was levied from 7 AM through 9 PM during weekdays and 7 AM through 3 PM on Saturday. During the first four weeks of policy implementation, the average daily traffic volumes of Tunnel #1 decreased by 22.3 to 26.2 per cent and the flows through tunnel #3 decreased by 22.4 to 25.8 per cent. For both tunnels, the traffic depressing effects of congestion pricing were significant (Hwang and Son, 1997). Accordingly, the daily average speed has improved drastically after one month by 41.1 per cent from 25.3 km/hour to 35.7km/hour for tunnel #1 and by 77 per cent from 17.8km/hour to 31.5km/hour for Tunnel #3. Also, the number of passenger cars with less than three passengers using the two tunnel corridors substantially decreased by 43 per cent from 36,062 cars to 27,429 cars after the implementation of congestion pricing.

During the four-week observation period, traffic volumes for the alternative roads to the CBD increased by only 5.3 to 7.3 per cent after the implementation of the congestion toll. This result invalidated some of the arguments against congestion pricing. Those against the policy suggested that congestion pricing would push traffic from toll roads to free roads without reducing the total volume of traffic.

Congestion pricing has proved to be very effective in reducing traffic volume and a powerful encouragement to car-pooling and the use of mass transit. The most serious shortcoming of CBD congestion toll is its unintended affect on low-income groups (Lee, 1998).

Wealthy people now prefer to use the toll roads and can do so without significantly affecting their total incomes. Middle- and low-income drivers, however, suffer from the regressive charge from road pricing and yet need to use the system to take advantage of the time saved in travel. Thus, for equity measures, the government should use the revenue acquired under this policy to improve mass transportation and environmental quality. Due to political and technical reasons, however, it does not seem feasible to expand the toll roads to many parts of Seoul as originally planned.

Establishment of Greenbelt vs. High-density Urban Redevelopment

The first greenbelt, established in 1971, comprised approximately 143.4 km² of open space surrounding Seoul (see Figure 1.2). The greenbelt was implemented to restrict urban sprawl. Since that time, not only has the containment policy been firmly and consistently administered, but also the total area protected was expanded to include 1,567 km². Land owners in the greenbelt are prohibited by law from constructing new buildings and changing existing land uses for purposes other than agriculture. While this policy has been a powerful and effective tool for controlling physical growth such as encroachment upon farmland and forests, it also proved to be a 'straight-jacket' program with its own social costs.

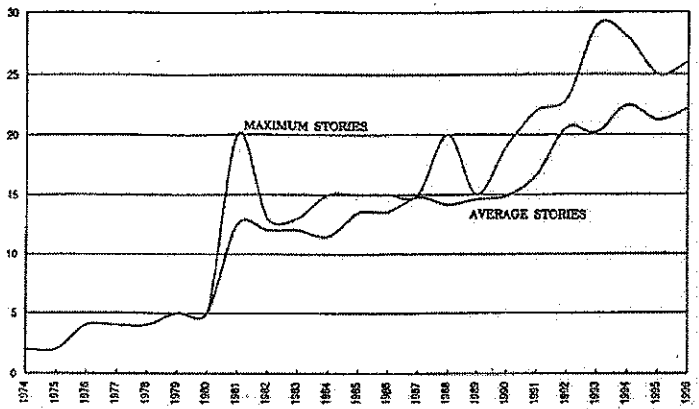
Residents in the greenbelt area did not receive any compensation for the relative decline in their property values. This turned out to be a double disadvantage given that the pressure for housing development has increased over the years. Moreover, villages in the middle of the greenbelt have limited growth capacity and have missed an opportunity to reap economies of scale in providing public facilities. Furthermore, the protection of the greenbelt is costly. Enforcement through ground and aerial surveillance is a routine and high priced operation. This responsibility has fallen into the hands of local authorities, becoming a source of intergovernmental conflicts. Lastly, because designations were made without detailed surveys, the boundaries of the greenbelt ignore the landscape and do not follow natural contour lines.

On the other hand, high-rise apartment house blocks are being built, replacing mostly 'squatter' houses on the hilly slopes in Seoul.

Although various urban redevelopment methods had been employed, in the early 1980s, massive renewal and rebuilding projects, called "partnership redevelopment," emerged as the most important housing development style[5]. As of 1996, 279 substandard housing redevelopment districts were designated for renewal, covering 2.2 per cent of the total city area. Among those planned for redevelopment, 128 districts are completed and 100 more are under construction. The remaining 51 districts have yet to submit project plan for the approval. Although redevelopment itself takes 4-5 years, the overall process from district designation to project completion has taken more than 12 years on average (Kim et. al., 1997). The partnership method inevitably seeks high-density redevelopment to secure profits (Figure 1.3). This situation was enhanced by the government's blind policy to maximize housing supply.

Today, political and economic interests are shaping the skyline in Seoul. Urban design imperatives do not determine the city's growth. Poorly planned buildings are obstructing the beautiful mountain views surrounding the city. While Seoul's planners and citizens have advised against *vertical sprawl*, there is a lack of aesthetic control on

Figure 1.3 Trend of the height of redeveloped apartment houses in Seoul



Source: K. -J. Kim et. al., 1997

urban redevelopment and improper conservation of historic areas within the city. The added population has contributed to traffic congestion overcrowded schools, overloaded water supply and sewage and lack of parking and open space. In general there is a decline in the quality of life of Seoul's population.

Many economists argue that the high-density urban redevelopment is caused by the greenbelt. They insist on its immediate repeal to make up for the lack of developable land within the commuting distance. Seoul now confronts the dilemma of whether to continue vertical sprawl or promote horizontal sprawl. The greenbelt is increasingly becoming a controversial issue among stakeholders, not to mention landowners. Environmentalists and planners, by and large, would favor sustaining the greenbelt with just compensation for its residents under strict regulations. Detailed investigations by the government to review the benefit/cost of implementing the greenbelt policy are currently under way. In view of environmental sustainability, any decision to harmonize the policy goals of preserving the green area and controlling high-density redevelopment deserves our attention.

Solid Waste Management

Solid waste management solutions include a flexible combination of source reduction, recycling (and composting), waste incineration and landfilling. Among these, source reduction is high among environmentally sound management practices because it avoids waste. Recycling is a waste reuse technique, which saves landfill space, energy and natural resources. Combustion is a volume reduction technique that is also designed to produce energy for beneficial use.

Until the 1980s, waste was mostly dumped in landfills as Seoul lacked the necessary infrastructure for other more advanced solid waste treatment practices. It was only after 1992 that a state-of-the-art sanitary landfill for the SMR was built on reclaimed land (size: 20.7 km^2) in the west coastal area. By sharing such a common metropolitan landfill site, Seoul has been able to cope efficiently with solid waste problem.

The average amount of waste generation in Seoul is 1.22 kg per person/day. The substance of wastes varies a great deal from source to source. Of the total amount, the half of domestic waste is foods,

whereas 61 per cent of office waste are paper. The total amount of food thrown away a day reaches 27.8 per cent of all waste products. Koreans tend to have lavish meals, favoring soups with high water content. This has created problems due to leakage at landfill sites. The best option would be to reduce food waste at home and the best way to implement this strategy is through collaboration with housewives. According to food waste recycling projects implemented through a *Local Agenda 21* program, four composting plants (capacity: 400 tons per day) will be constructed.

The introduction of the "volume rate" system of waste reduction is one of important programs for environmental sustainability in Seoul. The system was enforced on January 1, 1995 as a means to reduce waste generation from the sources and encourage separation of recyclable wastes. All households must buy standardized bags of different volumes distributed by the municipalities. By doing this, domestic waste was reduced by 8.4 per cent from 15,397 to 14,102 tons per day while recyclable waste collection increased by 30 per cent (Tark, 1998).

In an era of the financial crisis, efficient use of wastes through diverse measures for thriftiness will become increasingly important. Government subsidies and technical assistance should be provided to small scale recycling businesses in Seoul. Each municipality is currently building a treatment plant for recycling wastes. The successful promotion of markets for the recycled materials will be based on the new environmental ethic of sustainability. It should be remembered that sustainable urban development is simply a form of development that does not create negative environmental impacts.

Conclusions

The development of Seoul since the 1960s has been regarded as a symbol of the rapid economic growth of Korea. Seoul has served multiple social, economic, and cultural functions across national and international borders. At the same time, Seoul has experienced urban problems: traffic congestion, chronic housing shortage, pollution and environmental disruption, fiscal plight and so on. Such problems called for better "management and planning," whether they be social (how to deliver public services *equitably*), economic (how to foster investment *efficiently*), and physical (how to regulate sprawl *effectively*). Seoul is said to be an emporium of urban problems; its locus occupies the midway between the advanced countries of the North and the developing countries of the South. In this context, Korea's experience in policy responses to urban transformation of Seoul yields a number of lessons:

- The containment policy of the Primate City, Seoul, did not guarantee the automatic growth of provincial areas. Slowing down the rapid urbanization was like swimming against the tide. But it was worth attempting to catch up with urban infrastructure provisions.
- The government placed too much emphasis on control measures simply because they do not involve any financial cost. A "more carrots, less sticks" policy scheme, which works with the market, would be preferable.
- Urbanization policy should incorporate "equity" considerations into population dispersal programs. Particularly, industrial relocation and squatter housing removal plans discriminated against blue-collar jobs, the urban poor, and the informal sector.
- Spatial disparity within the national urban system tends to be exacerbated by globalization. The borderless economy weakens, to a great extent, governments power to regulate industrial locations and to mitigate the excessive concentration of urban population.
- The real estate (i.e., capital) market played a more prominent role in the allocation of land uses than governmental development controls. Development by agreement needs 'communication and negotiation' skills to resolve conflicting interests, along with people's participation.

In the present global economy, economic sustainability depends on the invisible financial flows around the world. Amid the ongoing Asian financial crisis, Seoul's development goals and strategies should be inevitably reoriented. Despite the successful match of "industrialization and urbanization" in the past decades, Seoul must embrace new forms of adaptation and transformation; it must keep pace with the globalization process, but also provide amenities for its citizens. To sharpen its competitiveness under the economic crisis in Korea, Seoul is challenged to bridge two seemingly divergent paths (i.e., pro-

vide low cost of production factors and create a high quality of life environment). There is a compelling need to trade-off between restructuring the urban economy and creating environmental sustainability. In the past, environmental sustainability was often sacrificed to economic demands. At this moment in history, we have an opportunity to re-evaluate our focus and consider some of the shortcomings of these policies.

In little ways also, Seoul can make growth sustainable by promoting jobs that will help improve environmental conditions. Examples include employment geared to: the maintenance and renewal of deteriorated public facilities; preservation of historic and cultural centers within the city; enhancement of the waste management and recycling systems; production of pollution control equipment; woodland protection and urban organic farming; and, building of data bases for Geographic Information Systems analysis of environmental problems.

In other ways, attention must be focused on the provision of basic needs infrastructure including adequate housing, public transportation and open space. In this sense, making Seoul a humane city by enhancing people's QOL may be a more important factor to determine its competitiveness in the long run than upgrading its industrial structure.

Finally, Seoul was relatively low in its international contributions in comparison with its population size and export-oriented nation's economy. But the mega-city has enormous potential in terms of its geo-political and geo-economical status. It can connect socialist economies and capital economies, as well as accommodate Western and Asian cultures. No doubt, in the new millenium, Seoul will continue to function as a major center of regional cooperation in the Asia Pacific region.

Notes

1. As of 1995, Seoul alone occupied 24.2 per cent of the national GDP whereas its share of the Seoul Metropolitan Region (SMR) as a whole accounted for 46 per cent.
2. The term, 'amenity' includes an appreciation of quality in the natural environment or built environments of cities.
3. The followings are some components of sustainability: **Environmental capacity** - We must pursue economic growth that does not permanently damage the environment. In practice this means travel, energy consumption, polluting industries and waste. **Quality of growth** - Development must put more emphasis on the quality of growth, rather than the quantity of growth. **Inter-generation equity** - Planning decisions have to take into account the needs of future generations as well as current generations. **Social equity** - Equity considerations should be made because the poor almost always live in worse environments than the more affluent.
4. Taxis, all buses, vans, trucks, emergency cars, diplomat vehicles, and journalist cars and government cars are exempted.
5. Partnerships are contracts between landowners and construction company, with the former providing land and the latter redevelopment cost.

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CHAPTER TWO

Metropolitan Growth Management Policies in Seoul: A Critical Review

Kunhyuck Ahn and Yeong-Te Ohn

Introduction

The past thirty-five years was an era during which Seoul experienced unprecedented growth in its six hundred years of history. The growth of Seoul coincided with the rapid growth of the national economy. During the past three decades, there was a ninety-fold increase in per capita income: from US $81 in 1960 to US $7,440 in 1992. The industrial output increased at an annual rate of 24 percent during the same period. Korea, one of the poorest countries in the world, has jumped to a progressive industrial country, owing to its rapidly growing economy, in thirty-five years. It is widely accepted that the growth of Seoul has served as the primary locomotive of economic development of the nation.

However, the Korean government has placed itself in a negative position on the matter of rapid growth of Seoul. The government has held a policy to restrict the growth of Seoul to balance the developments throughout the nation since 1964. Criticisms on the effectiveness of the adopted means and arguments, which concerned relatively minor procedural matters, have continuously been raised. However, there has been a general consensus, in terms of its broad goals, on the policy to restrict the growth of Seoul.

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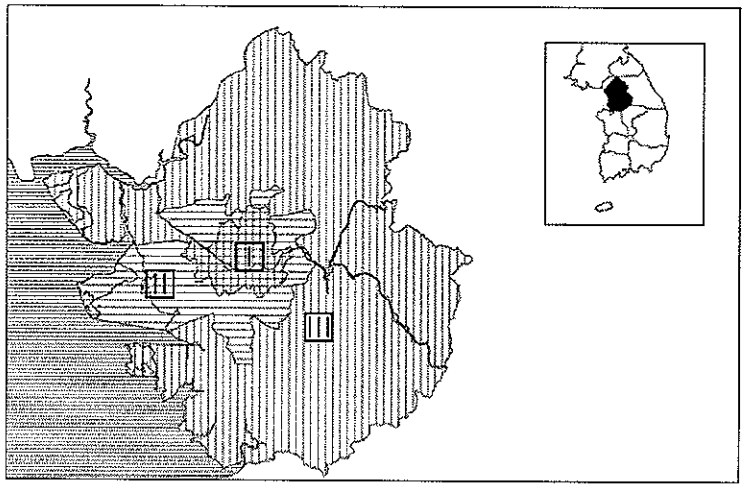
Recently, there have been many criticisms on the containment policy against the growth of the Seoul Metropolitan Area (SMA)[1]. A variety of new and old approaches to urban growth management policy now vie with one another. These represent a moment of transition as one new concept attempts to replace an old one. The debate over the urban growth management policy has splintered into two: market-critical and market-oriented. The latter claims that free transaction will promise efficiency and progress. The growth of the SMA should not be restricted through compulsive measures. Rather, it should be guided in a way to go with the trend, so as to maximize the economy of agglomeration while minimizing the negative externalities. The former views it differently. Without curbing the growth of the SMA compulsorily, not only the harmonious progress among regions in the nation, but also the continuos thrive of the SMA cannot be expected.

Figure 2.1 The Seoul Metropolitan Area



Note: Seoul (I)
Seoul Metropolitan Region (I + II)
Capital Region (I + II + III)

This paper is about urban growth management policy of the SMA, a topic which many think need to be changed. The authors will try to inject some clarity into the current confused state of the debate on the policy. This paper, for better understanding of the matter, begins with a brief description of Seoul becoming a metropolis and the development of growth management policy since 1960. Then it moves to the review of various criticisms on policy measures and identifies the competing ideas attempting to replace old ones. Finally, it discusses the issues embedded in those ideas, and also suggests new policy directions in relation to the changing socio-economic circumstances in Korea.

The urban growth management policies of Seoul since the 1960's are the locus of strenuous efforts of the government in a developing economy to attenuate the problems rising from a rapid growth of a prime city: over-crowding and congestion of the city and the regional income disparity between the central city and other regions. We hope that discussions about the past experiences in Korea in this paper will be informative in searching for a new policy direction in Korea, and also other countries suffering from similar problems.

Metropolitanization Process of Seoul

The Han River basin where Seoul is located has been the most important region in the Korean peninsula in geo-political aspects. Owing to its location, Seoul has maintained its position as the capital city of the nation for over six hundred years. It is known that inhabitants of Seoul in 1394, when it was newly built as the capital city of Chosun kingdom, was about 100,000, and in 1910 when the kingdom was colonized by Japan was 250,000. During the 35 years of Japan's occupation it increased to 1 million. After the Korean War in 1950, the population of Seoul sharply increased.

The growth of Seoul began in the early 1960's when Korea's capacity was fully mobilized for rapid industrialization. This triggered the momentum for nationwide geographical movement of people from rural into urban areas. Seoul, as the nation's political, economic, cultural and educational center, was the most attractive city for people to search for better employment opportunities, education, health and social services. This resulted in a sharp increase in its population.

There was a 1,360 thousand net increase in population during 1960-1966. According to a study, out of the net increase, 11% was due to annexation (1963), 31% to natural increase and the rest 58% to immigration (Yu, 1980: 143-175). Immigration rose to 81% of the population increments during 1966-1970. The growth was accelerated over the years; the annual rate of population growth during 1960-1966 was 7.4%, and 9.8% during 1966-1970. Seoul grew to be a giant metropolis with a population of 5.5 million in 1970. Seoul contained 18% of the total national population in 1970, compared to 9.8% in 1960 and 13% in 1966.

From the beginning of the 1970s', the rate of growth began to decrease, but it was still high. The national population growth rate was 1.57 percent per annum, while that of Seoul was 2.4 percent. In 1980, 8.4 million people lived in Seoul. Throughout the 1980's, even though the growth rate tapered off to 2.4%, the absolute size of the population was still on the increase: 9.6 million in 1985 and 10.6 million in 1990. The share of Seoul's population increased accordingly: 22.3 % in 1980, 23.8 % in 1985 and 23.4 % in 1990. A marked change emerged from the middle of the 1980's in the growth trend of Seoul. It was the population deconcentration within the metropolitan area, called *'relative decentralization'*: the population in the outlying suburban areas began to grow faster than that of Seoul. This trend was persistent throughout the later half of the 1980's, and suburban areas began to be an integral part of the Seoul Metropolitan Area. The population of the capital region as a whole increased sharply: 13.3 million in 1980, 15.8 million in 1985 and 18.1 million in 1990 (Park, 1995: 211-212).

In 1993 the population of Seoul began to decrease: 10.2 million in 1990, 10.7 million in 1993 and 10.2 million in 1995. This evidence is never sufficient enough to show that Seoul has entered into the stage of *'absolute decentralization'*. However, many agree that the population of Seoul will decrease continuously, or at least the downward trend will not be reversed.

Seoul has expanded physically from 597km² in 1963 to 627km² in 1973, which corresponds roughly to its present area. The physical expansion was mostly the result of annexation and land readjustment. Seoul has taken its present physical shape, in which there are roughly 5 million people inhabiting each side of the Han River bank.

The urban settlements were extended further into the remote and sparsely populated parts mainly along the existing railroads during the 1960's. It engulfed first the towns and cities clustered within the commuting distance from central Seoul. Seoul became a metropolis during the 1970's with the improved transportation network. It began with the refurbishment of Seoul-Incheon and Seoul-Suwon electrified railroads, followed by newly constructed Seoul-Pusan and Seoul-Incheon highways. Meanwhile, the extension of other directions except Seoul-Incheon and Seoul-Suwon corridors was limited by the greenbelt. The greenbelt strongly depressed the forces of stretching out further in all directions. It resulted in the implosive growth of Seoul during the 1980's. The five new towns constructed in the early 1990's proved that the greenbelt was not enough to control the forces of expanding metropolis and increasing functional and spatial interactions within the Capital Region. It is now evident in the emergence of the giant urban field.

Table 2.1. Population growth in Korea, 1960-1995

(unit: thousand person, %)

Year	Nation	Capital Region	Seoul
1960	24,989.0 (100)	-	2,445.0 (9.8)
1966	29,156.1 (100)	6,895.6 (23.7)	3,793.3 (13.0)
1970	30,882.4 (100)	8,730.1 (28.3)	5,433.2 (17.6)
1975	34,706.6 (100)	10,938.4 (31.5)	6,899.5 (19.9)
1980	37,436.3 (100)	13,298.2 (35.5)	8,364.4 (22.3)
1985	40,448.5 (100)	15,820.5 (39.1)	9,639.1 (23.8)
1990	43,410.9 (100)	18,136.2 (41.8)	10,162.6 (23.4)
1993	44,056.0 (100)	19,669.0 (44.6)	10,672.0 (24.2)
1995	44,608.7 (100)	20,266.5 (45.4)	10,231.2 (22.9)
	Annual Growth Rate		
66 ~ 70	1.48	6.65	10.81
70 ~ 80	2.12	5.23	5.39
80 ~ 90	1.60	3.64	2.15
90 ~ 93	0.50	2.82	1.67
93 ~ 95	0.63	1.52	-2.07

Source: Economic Planning Board. *Population Census*, 1966-1990; *Major Statistics of Korean Economy*, 1995

Figure 2.2 Population growth in Korea : 1960 - 1995

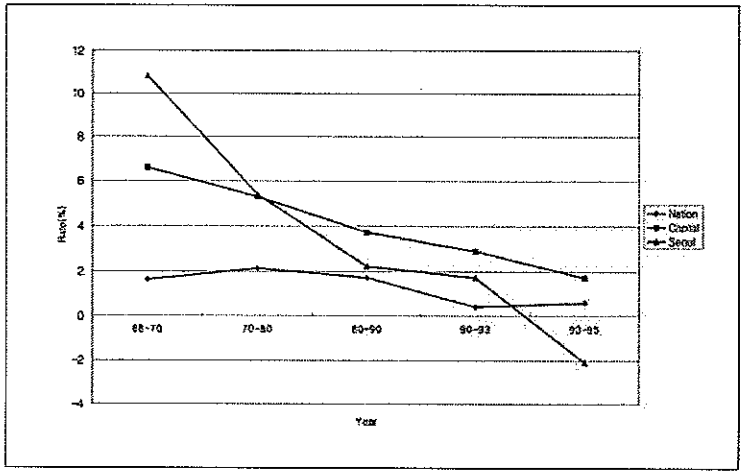
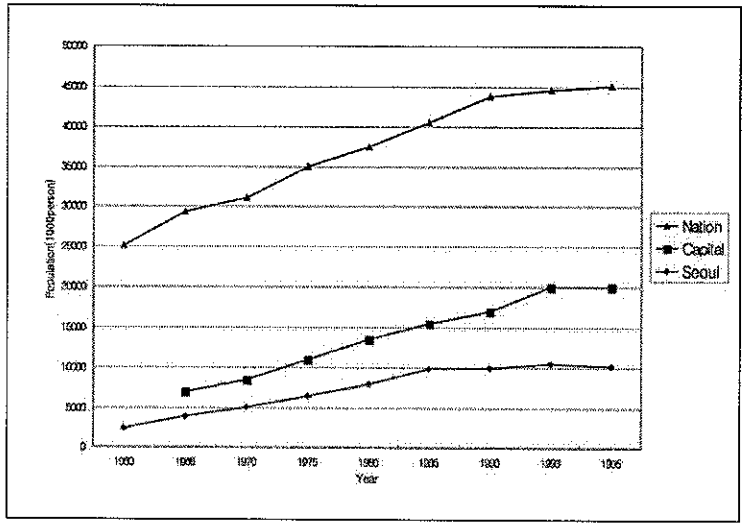


Figure 2.3 Annual growth rate of population in Korea : 1960 - 1995



Growth Management Policy Development

The Korean government has worked out a number of policies and implementation tools to manage the surging urbanization and metropolitanization of Seoul. Two lines of seemingly conflicting measures have been contrived: to accommodate the growth and to restrict it. However, the government has addressed itself consistently in the primary concern of the growth management policy is *'how to steer the location of people and industries away from the Seoul Metropolitan Area and to ultimately achieve a balanced development among regions in the nation.'*

In spite of the fact that the formal policy objective has been unchanged, strategies in practice have been changed over the past thirty-five years. They have evolved in roughly four stages. The first stage spans from the middle of the 1960's to the early 1970's. This phase marked the advent of public measures first setting the policy objective for managing the growth of Seoul. In the second stage covering the 1970's, policy objectives were more clearly defined and more sophisticated legal tools guaranteeing effective implementation were created. More systematic efforts to facilitate orderly spatial development of the SMA taken during the 1980's constitute the third stage. The entire Capital Region was delineated as a planning unit and the region wide land use control system, which still works in a slightly revised form, was newly introduced in the middle of the 1980's. Socio-politico changes since the end of 1980's have made the system vulnerable. Facing complex international social, political, and economic changes, many come to think of the importance of Seoul and the Capital Region's role in keeping the Korean economy to thrive and grow continuously. For them, the disparity between the Capital Region and other regions in the nation or Seoul and other cities is not very important. Rather the more important thing is to make Seoul or the Capital Region compete against other world cities or regions in a global economy. They criticize the old policies as inefficient ones that need to be abolished. Certainly, the growth management policy has entered a new and the fourth stage in its evolution. Descriptions on the somewhat detailed feature of each stage will follow.

Set Up of the Policy Direction for Managing the Growth of Seoul: 1960-1971

The surfaced metropolitan policy was the "Special Measures for the Restriction of Population Growth in Seoul" announced in 1964 (Kim, 1995: 59-60, Park, 1995: 218-219). The government clarified its intention to restrict the growth of Seoul via various measures: relocating government offices seated in Seoul to major cities, developing growth poles named garden cities or new industrial cities in selected strategic areas out of Seoul and restrictive control over the expansion of industrial establishments and facilities for high education in Seoul.

This policy had strong popular support due to two reasons: national security and the ideal of balanced development among regions in the nation. There was shared fear among the Korean people that Seoul seated only thirty miles away from the demilitarized zone, was too vulnerable to defend itself from the attack of the North. Many agreed on the necessity of relocating key strategic facilities away from the enemy's artillery. In addition, political leaders as well as technocrats and planners shared a proposition: the unrestrained growth of Seoul will hinder the efficient national resource allocation, and also threaten the social integrity; and hence it will undermine the ability of the national economy to thrive and grow.

Following this policy line, the government began to launch industrial park development projects mainly in southeastern part of the country and expanded the project to the other regions with the construction of highways connecting Seoul and Pusan. In the mean time, the government had to cope with the increasing demand on new urban spaces in Seoul Metropolitan Area. Many industrial parks were newly developed along the existing major roads and railways, especially Seoul-Incheon and Seoul-Suwon corridors. Urban spaces for housings and offices expanded across the Han River. Slums surrounding old city core were cleared partly for the expansion of CBD and partly for better housing, and urban poors, who moved into Seoul, in the slum areas adjacent to CBD were forced to move to the outskirts of Seoul.

There were no signs that the growth would be halted. Rather it accelerated year by year. In 1969, the government adopted a comprehensive decentralization policy prepared by the Ministry without a

portfolio. More restrictive policy measures were included in it: The prohibition of the construction of factories, the relocation of factories creating pollution or violating zoning regulation, the restriction on the construction and the expansion of education facilities for universities and colleges, the restrictions on the transfer of local students to the schools in Seoul, the relocation of government offices and headquarter offices of public organizations as well.

Greenbelt and New Town Strategy: 1972-1979

Several years of the early 1970's have a special meaning in the modern history of Korea. An extraordinary socio-political system, called the Yushin was created as a crisis management system. The government, endowed strong power with the Yushin, embarked on the institutional reform in every policy areas.

The first comprehensive National Physical Development Plan (1972-1981) was formulated. It addressed the imperatives of creation of large-scale industrial estates, expansion of power, water, roads, harbors, communications and other social overhead capital, infusing developmental impetus into the leading regions (Park, 1995: 219). The National Land Use Management Law (1972) enabling control over nationwide land use and the distribution of industrial estates, and the Industrial Estate Promotion Law (1973) assisting development of industrial estates in strategic locations other than the SMA were also legislated. The existing tax laws were brought into reexamination. Some were revised to discriminate against industries in urban centers. There was even a *"citizen tax"*, a poll tax that was introduced in 1973. It was administered in such a way to discriminate against residents in the SMA.

One of the most noticeable changes was the adoption of greenbelt strategy espoused with new town development (Kim, 1995: 60, 65). By designating a greenbelt around the city boundary of Seoul (1971), the government intended to limit the physical growth of Seoul. And by the development of long and short distance new towns from Seoul, it was expected to relocate population from Seoul and also absorb the population directing to Seoul. Several industrial new towns such as Changwon, Youchon, Kumi were constructed in remote provincial areas. During the mid 1970s, the government seriously considered the

construction of a new capital city. This bold plan was announced in 1977. It was to relocate the capital as a sure and final way to cope with the excess growth of Seoul. The relocation plan was carried through to a considerable detail. But the plan was dropped with the assassination of its chief proponent, President Park in 1979 who initiated the Yushin reform. In the Capital Region, two new towns were developed: Ansan aiming to relocate manufacturing establishments from Seoul and Kwachon to relocate government facilities seated in Seoul.

There was also a rising frustration with the existing policy tools as they were ineffective, unrealistic or counter-effective. They were brought into reexamination and made to gradually give ways to a new package from the middle of the 1970's. Tools were devised that could be more realistic and effective, with priority given to regulating manufacturing firms and education (particularly higher education) institutions that were identified as the primary attractions for immigrants. College enrollments were also subject to control. They were strictly rationed in Seoul, a measure that had been in effect for a considerable period of time already. Under the new regulation, virtually all college enrollment increments were banned in Seoul. They were forcefully encouraged more into outlying suburban areas and further into provincial cities.

In a much tighter form, the formerly loose regulations applied to manufacturing firms were written down into the Industry Distribution Law in 1977. The law introduced tax incentives and financial subsidies. They would be administered for firms lured into the Industrial Inducement Area, which would be designated by the Minister of Trade and Industry, along with the Industrial Relocation Area and the Limited Inducement Area. The Industrial Relocation Area would be designated to penalize on-site industries in various forms. Some would be physical and some others financial. To be specific, manufacturing firms would be subject to either compulsory relocation (within a prescribed period of time) or to limited expansion or conditional construction. In case of conditional expansion, firms would be subject to much higher rate of tax burden. Seoul and its immediate vicinity were classified as the Industrial Relocation Area. No factories were permitted for construction or expansion here, while the existing ones were required to move out.

Crippled Inter-regional Decentralization Policy and Implosive Growth of the SMA

The new administration, which took over offices after the assassination of the late president Park in the early 1980's, formulated new strategies. They were addressed in the Second National Physical Development Plan (1982-1991), which was made public in 1981, and the Capital Region Management Law enacted in 1982.

In the Second Plan, two key strategic concepts were suggested. One was the integrated living sphere strategy to mitigate the *intraregional* inequality and the other was the growth center strategy to handle the problem of interregional inequality. The former was to provide social and physical arrangements in which mutual contacts between major urban nodes (cities and towns) and surrounding rural areas could be maximized. It was expected that by linking the two areas together through improved transportation networks, urban services and job opportunities agglomerated in major urban nodes would be shared by rural as well as urban residents.

The key concept of the latter was the *concentrated decentralization.* It was expected that counter magnets, strong enough to curb the excessive concentration of national life in the SMA, would be created by allocating limited investment funds to intensify the growth potential of the selected 15 provincial cities. Urban centers across the country creating enough counter magnets to interrupt migration flow into the SMA.

The Capital Region Management Law was the most tightly written device to cope with the issue of decentralization. There were three specific, note-worthy features written into the law. The first was the Capital Region Management Plan. It would be prepared to ensure effective land use, desirable distribution of industrial population and harmonious placement of social overhead capital across the region. The plan would also set the guidelines and detailed directives for the lower-order local plans (urban plans) to refer to in their legally bound zoning, public facilities, urban renewal and land readjustment programs. The second was to create the Capital Region Management Committee (CRMC). The Committee chaired by the Prime Minister would deliberate on and coordinate regional planning and management issues. It would consist of cabinet members, a mayor and private

representatives. The third was to prepare the population impact statement. It would be required for development projects of certain categories to forestall adverse effect upon population growth within the region.

Acknowledging the poor performance exhibited by the public means employed so far and also the potency of market preference exhibited in the past in favor of the SMA, as well as the necessity of handling the set-in of rapid metropolitanization, the law intended to provide an over-all and effective management devices for physical developments, land uses, arrangement of infrastructures for the entire metropolitan area. It fixed the boundary of the unclearly marked, but rapidly expanding urbanized region officially as the Capital Region. It, 11,235km² in size, includes three upper-tier local governments: Seoul, Inchon and the Province of Kyonggi and 64 lower-tier local governments, with a population 16 million at that time. Recognizing the Region as an integrated urban living space glued to the city of Seoul by close economic, functional, and social interactions the Law required an integrated planning dealing with the entire region as a unit, while management considerations would be based on inter-governmental coordination.

The first Capital Region Plan was made public in 1984. The main feature of the Plan was the five zonal system giving development performance guidelines specific to each zone (Park, 1995 : 224-225). They are as follows:

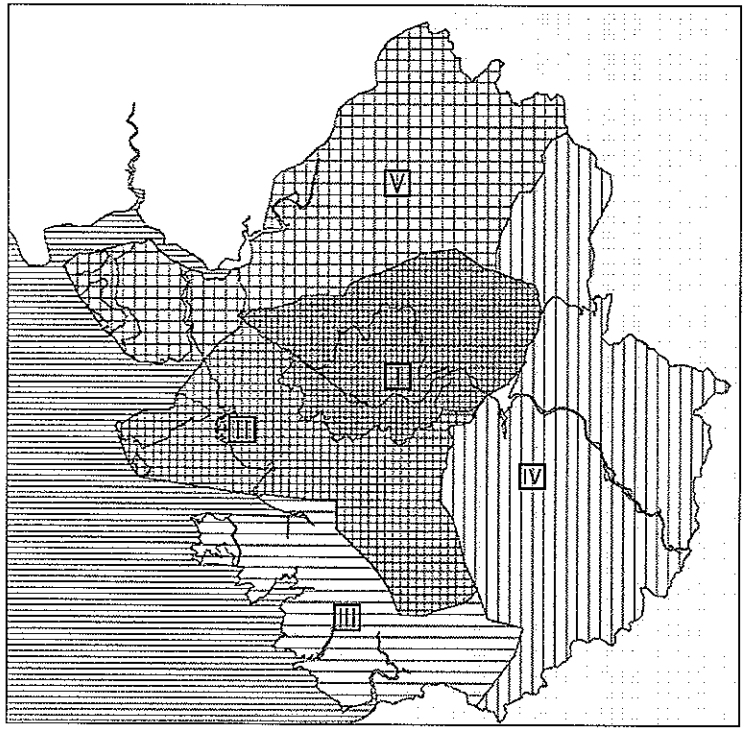
- *Relocation Promotion Zone* : where development projects contributing to population growth would be outright prohibited. Non-conforming land uses and manufacturing firms would be required to move out over a specific period of time on a selective basis. Seoul and its immediate suburban vicinities fell into this zone.
- *Restricted Rearrangement Zone* : where those establishments relocated from the Relocation Promotion Zone (except manufacturing firms) could be permitted for location and where the existing on-place establishments would be permitted for limited expansion. Major cities and rapidly urbanizing rural districts adjacent to Seoul within 30km in radius primarily fell into this zone.
- *Development Inducement Zone* : where industries and people would be encouraged to move in. Planned development of industrial estates, new towns and priority improvement of infrastructure would be encouraged. Most southwestern coastal districts and the adjacent inland towns fell into this zone, together with their hinterland some 40km to 60km away from Seoul.
- *Nature Preservation Zone* : where greener, farming land, river basins, scenic attractions, properties of historic value and sight-seeing values are in abundance and where urbanization and large-scale development would be restrained. This zone for the greater part encircles the northeastern districts of the Region where the Han River flows down through many tributaries.
- *Development Reservation Zone* : where for national security and for defense purpose urban development would be severely restricted. Those adjoining the demilitarized zone beyond which North Korea stretches fell into this zone.

These pragmatic strategies suggested to bring efficiency together with equality in the regional development were hailed as noble and promising ones. However, they proved to be miserably unworkable ideas. From the beginning, the attempt to realize the two key concepts presented in the Second Plan was thwarted by the failure to act on relevant legislation and raising funds. There were ensuing public apathy, political struggle and disregards on the part of decision-makers in the government. Most investment funds went into underdeveloped areas rather than into the selected growth centers during the 1980's.

The Capital Region Management Plan was implemented in a quite different way from its original intentions. It intended to manage the metropolitanization process through the deconcentration in the region and the restrictive control of the population and activities directing to the region. This double-sided strategy was crippled partly due to the failure of the Second Plan and partly due to the lack of governmental support for the intraregional deconcentration. The government did not take any measures to reorganize the socio-physical structure of the region to be an integrated urban complex. Rather it strengthened the control over the outgrowth of the SMA physically.

To prohibit the location of facilities inducing population into the capital, seven facilities or development projects were identified in the government decrees. They were: 1) colleges and universities, 2) college prefatory institutes, 3) manufacturing firms, 4) public office buildings,

Figure 2.4 The zonal division of the Capital Region



Note:I : Relocation Promotion Zone
II : Restricted Rearrangement Zone
III : Development Inducement Zone
IV : Nature Preservation Zone
V : Development Reservation Zone

5) large-scale private offices and commercial buildings, 6) research facilities, and 7) large-scale residential land clearance projects. A single or a combination of such projects was permitted, or conditionally permitted, prohibited, or conditionally prohibited or required to relocate

elsewhere, depending on the zone in which these projects were located. This scheme to urge construction to be kept to a minimum worked relatively well outside of the green belt, but it did not work in Seoul as well as Seoul-Inchon and Seoul-Suwon corridors. Large-scale development projects including *new towns in town* such as Mokdong and Sanggaedong and the 1988 Olympic-related projects had to be permitted in those areas. This resulted in an *implosive growth*. The situation of those areas suffering from over crowdedness and congestion exacerbated year by year, while uncontrolled small-scale developments prevailed in the suburban areas, and hence their living conditions and growth potentials rapidly degenerated.

New Town Development and the Revision of the Growth Management Policy: 1989 - Present

In April 1989, there was an event symbolizing the failure of the past policy to manage the growth of Seoul. It was the sudden announcement of the government to build new towns outside the green belt. Five new towns were to be built in five years: Bundang, Ilsan, Pyungchon, Sanbon and Joongdong. They would provide new homes for 1.2 million people of 300 thousand households.

The primary force of the new town decision of the government was the inflation of housing prices. Home prices in the Kangnam area in Seoul, the barometer of housing prices in the SMA, had increased by 30-50 percent in six months before the plan was announced. This frantic housing price inflation, coupled with labor dispute at that time threatened the social stability as well as the economy. The government was in urgent need to halt the inflation of housing prices. The government realized the major cause was the shortage of housing supply. While the demand of housing had sharply increased, owing to the economic boom during the past three years, the supply market had been frustrated due to the lack of available land in Seoul. The government had to decide to go outside the green belt, but not far from Seoul to find developable land. Three sites just beyond the green belt and two sites inside the green belt, but in same distance from the CBD of Seoul were selected. As this decision was made, the validity of the pending growth management policy had to be seriously examined. However, there was no serious effort of the government to search for

alternatives. Rather the government proclaimed that the policy direction would never be disturbed by the new town decision.

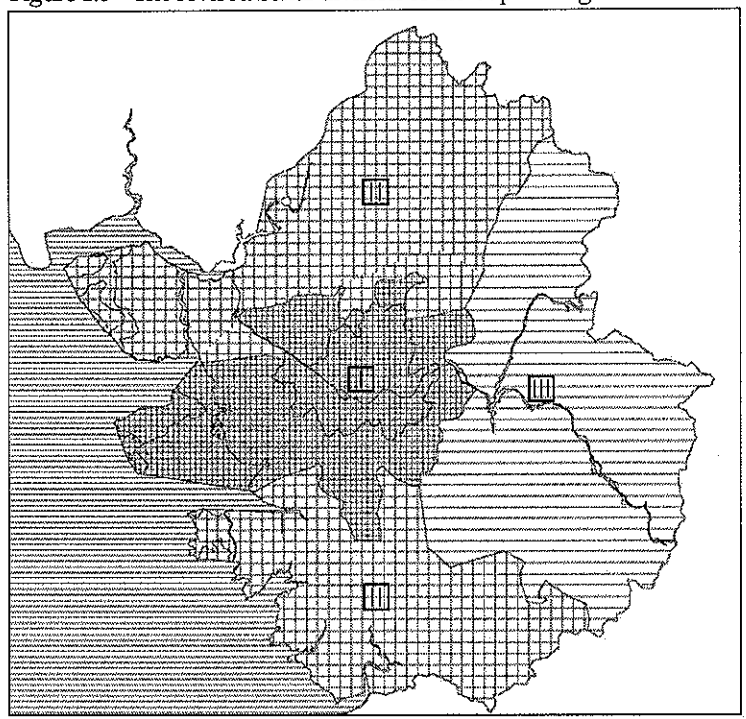
It was in 1992 when the old policy scheme was significantly changed. As an integral part of policy reform program launched by the civil government, the planning and management policy for the Capital Region was revised (Park, 1995: 227-228). The five categories of development subregions were streamlined into the following three zones;

- Overconcentration Restriction Zone: where further development would be discouraged through decentralizing population and industries. Establishment of firms, offices and other facilities would be granted only after meeting specified requirements instead of being approved by the Capital Region Management Committee. Seoul and its environs would be tightly regulated not to permit excess congestion.
- Growth Management Zone: where development would be permitted in principle. Factories would be permitted except for large-scale ones. Colleges, public offices, research facilities, industrial estates, residential land clearance projects would be permitted when meeting specified requirements. Those not meeting the requirements would be permitted only after being deliberated on by CRMC.
- Nature Preservation Zone: where development would be restricted in principle. The upper Han River basin would be placed in scrutiny not to contaminate the river. The former tight regulations on other types of development would be relaxed to allow more free-standing establishments.

Through the revision, the formerly strict regulations on private development and small foot-loose firms were relaxed and eased out. Two innovative systems were introduced. The first is the so-called total volume management system. By a pre-determined tolerable ceiling of different types of development, colleges, firms, offices, industrial estates, housing site developments would get limited freedom in their location choice. Another feature is the development charge system. It is a pecuniary and indirect control measure introduced in place of the formerly outright physical control directed against offices and

commercial buildings. Under the new system any office and commercial buildings are free to be built wherever they choose in Seoul, as far as they pay what is called the development charge, a type of congestion fee.

Figure 2.5 The revised zonal division of the Capital Region



Note: I : Overconcentration Restriction Zone
II : Growth Management Zone
III : Nature Preservation Zone

Criticisms on the Past Policies

The uncurbed growth of the SMA during the last thirty-five years has generated two kinds of problems which are different but related: one is the problem of growing inequality between the SMA and other regions, and another is overgrown metropolitan itself. In the early 1960's when the Korean government declared to fight against the growth of Seoul, various policy measures based on the greenbelt and new town strategy in the 1970's and *the concentrated decentralization strategy* in the 1980's to handle those problems have been formulated and implemented. In spite of the strenuous efforts of the government, there have been big gaps between the reality and policy intentions.

Many indices show that the SMA has been pressed with the *overgrown* problem such as housing shortage, traffic congestion, high land price, degrading quality of urban amenities and environmental pollution. The major problem was housing. The chronic housing price inflation mainly due to the chronic shortage of supply has annoyed non-homeowners in the SMA. Despite the government effort of investing 6 percent of the gross national product per year since the 1970's, the situation has not improved. The shortage rate of 42.5% in 1990 is unfavorably compared to 41.1% in 1980 and 42.1% in 1970 (Park, 1995: 215).

Traffic congestion is the second worst problem. The car registration in Seoul increased at an average rate of 31.5 percent per year since the 1970's. Over 1.7 million cars were registered in 1993 as contrasted to merely 76,303 in 1973. In the last two decades there was over a twenty-fold increase in car ownership in Seoul, while the road space only increased 22.1% percent. As a result, there are streets and highways packed with snarling traffic. The travel speed by car in Seoul at the peak hour has dropped to 19.5km/h in 1990 from 30.8km/h in 1980. The subway system could not ease the situation, in spite of the tremendous expansion since 1974. It currently carries only 32 percent of the daily trips with a total length of over 150km. Air pollution, noise, water contamination and other environmental issues have grown as many other serious problems. The loss of green areas is also serious.

On the other hand, the problem of *growing inequality* incurred other repercussions. The gap between the thriving metropolis and the

stagnant regions across the country in income and living standards have never been bridged, but rather widened. Except the southeastern coastal area that has been the primary beneficiary of the industrialization policy of the government since the 1960's, the rest of the country generally is lagging far behind. In terms of personal income, Seoul and leading industrialized areas have 10% to 30% more than the lagging areas. In terms of the health and social services there are more striking gaps. When it comes to rural areas, the picture is bleak. The rural income per household fell consistently behind the urban areas in general and the SMA in particular (Park, 1995: 213).

As a matter of fact, there have been many criticisms on the past policies. Two groups can be identified. One, which belongs to mostly idealist planners and politicians, are more concerned with the effectiveness of the policy and the problem of the growing inequality. The other group, consisting mostly of economists, is more concerned with the validity of the policy and the problem of overgrown metropolitan. The idealist planners and politicians attribute the failure of the policy to the government and also to developers and firms. In the past thirty-five years, many policies and plans have been suggested and proclaimed. However, very little has actually been realized. The attending distribution considerations and capital requirements for the lagging regions were irrelevant.

The critics also argue that in contrast to the abundance of the published plans, policies, laws and regulations, there were critical dearth in the government investments required for development of alternative locations where population and industries could be accommodated (Lim, 1994: 240-252). The government did not do its best to arouse political support to rally behind decentralization. Above all, there was no institutionalized coordination between the central and local governments in guiding private investments in the SMA. As a result, the containment policy against Seoul has been lamented and resisted, causing backfires and controversies. This made planning efforts void and unrealistic to address the problem. The policy proclaiming the development of the SMA to be minimal has never been respected. There were endless cases of expansionist schemes. Big projects such as urban renewals, high-tech plants, hospitals, residential complexes, intra-metropolitan highways, new towns, and a new international hub airport have come out in rapid succession. They raise doubts about the

government's real intention: the formally proclaimed policy objective is nothing but lip service, and the government has disguised its real intention by taking the regulative measures which are not critical but visible, easily available and freely disposable to the government.

They reject the market approach to cure the problem of inequality. It has been proved, theoretically and empirically, that market mechanism, without the aid of government intervention, does not work in a way to allocate resources equally among regions: the key issue is how to control it to move toward balanced development (Lim, 1994: 251). And they suggest policy alternatives focusing on the forced allocation of resources from the Capital Region to other depressed regions to make them grow (Kim, J. H., 1991: 9-12; Hong, 1991: 22-24).

Economists have quite different viewpoints. They are not interested in the effectiveness of the policy measures but in economic validity of them. They are trying to show that any market-critical intervention would be vulnerable to failure or would be very costly (Sohn, 1993: 87-112; Kim, J.H., 1996: 25-48). They argue that the problem of growing inequality between the SMA and other regions and that of overgrown metropolitan area are related but different, thus different approaches are needed. According to economists, the proposition that the containment against the growth of the SMA would lead to the growth of lagging regions and might be illusionary. It is a very natural process that the leading metropolitan area tends to aggrandize to itself a disproportionate part of the innovative impulses, thus attracting scarce capital and skilled labor as well as entrepreneurship. Any compulsory measures to curb or reverse the tendency would lead to social cost. They claim that, when it is inevitable to do that for political reasons, it would be better to use market-like system than to use direct and physical regulation incurring unnecessary transaction cost (Park S.W., 1992: 3-25; Han, 1992: 29-53). They argue that the past policy measures were too obligatory and rigid, and also there were too many regulations; they have choked private initiatives in the choice of optimum location. The green belt, among other compulsory measures, is the best example for them.

They also argue that although the mode of the intervention is changed from direct and physical regulations to indirect and economic ones by the revision of the Capital Region Management Plan, it is not enough. Furthermore, they argue that the intervention of the government in the metropolitanization process can be validated only when the negative externalities of agglomeration outweigh the gains. The arguments goes on: it may be a more sensible policy to let the leading city-region continue to grow, but try to guide so as to promote economic efficiency and to reduce negative externalities. They suggest policies guiding the deconcentration in the Capital Region, which tend to occur spontaneously, and claim the government to give up past policies that go against the trend.

Conclusion

Changing circumstances require more and more policies for orderly deconcentration of the SMA in place of long lasting containment policy. On the top is demanding needs for the new urban spaces in the SMA: demand for new homes cannot be met without continuing massive housing supply (developable sites are hardly found near the existing agglomeration). Although the population of Seoul has decreased, the Capital Region is growing faster than any other region in the nation: It might be the best place to attract scarce capital and skilled labor as well as entrepreneurship: circular and cumulative causation is still under working (Hall, 1987: 240). Facing complex international social, political, and economic changes, many come to think of the importance of the SMA in keeping the Korean economy thriving and growing continuously. Stimulated by the restoration of local-self government, the local governments in relatively deprived areas within the Capital Region choose prosperity with growth. These may accelerate the region-wide metropolitanization. If this is the case, we need more deliberate policies to guide the process. For this, we argue six propositions, as follows:

- Given the excessive growth of the central region, there are two main reasons to intervene in its metropolitanization process: the problem of large and growing inequality and overgrown metropolitan.
- These two problems are related, but different. The proposition that limiting the growth of the central urban region would result in the growth of lagging areas might be illusionary or false. In coping

with the problem of inequality, it would be better to put energy into the selective provincial center having growth potential.

- The growth itself might not be a problem. Rather it represents an opportunity. It would be better to find an appropriate way to facilitate the great urban agglomeration rather than waste energy for limiting the growth.
- The growth should be guided in a way to maximize the economic gains it can bring while minimize the negative externalities. The clue is to provide plenty of building land in the right place ahead of speculative pressures instead of limiting physical boundaries.
- In this process, a deliberate intraregional decentralization policies or ordered deconcentration would be required to give the entire metropolitan area a polycentric structure wherein some employment is available locally, and transit makes possible a wider range of jobs in other nodes.
- They might involve various measures to reduce the need for long and costly journeys, to reduce the degree of traffic congestion, and reduce the total volume of environmental pollution.

Notes

1. Definition of Seoul Metropolitan Area (SMA): Regarding the physical boundary of the Seoul Metropolitan Area, three areas have been delineated for the administrative purpose: Seoul City, Seoul Metropolitan Region and Capital Region. The first and narrowest one coincides with the jurisdiction of the Seoul Metropolitan Government. It, as a single urban entity, covers 605.33km² covering the north and the south of the Han River. Prior to the middle of the 1970's, it was regarded as the metropolis. The second covers 2,999.48km² including Seoul City, its adjacent jurisdictions and the Incheon City. It first appeared in a metropolitan population redistribution plan prepared by the central government in 1977. This area roughly makes up the Seoul metropolitan laborshed, where most of the overspill population from the congested Seoul has been accommodated. The third covers the entire Kyunggi Province in addition to Seoul and Incheon, 11, 686km². It acquired an official position as an administrative area in the early 1980's. This region where vast arrays of towns and cities and green belts intermingle with farmlands, mountains and villages has been entailing a host of problems to be tackled in relation to the growth of Seoul. One of the controversial issues among planners and policy makers is how to shape this region whose physical make-up and socio-economic fabrics are still fluid and volatile for the future (Park, 1995: 206-207).

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CHAPTER THREE

Spatial Patterns and Policy Issues of the Seoul Metropolitan Region

Moon-Hyun Kim and Hee-Yun Jung

Introduction

The Seoul Metropolitan Region (SMR) consists of the central city of Seoul, Inchon city and surrounding Kyonggi province. The conurbation, the total area of 11,753km², extends outwards over a radius of 70km from the center of Seoul. Number of population of the SMR in 2000 is 21.3 million which is 46.3% of the total national population within 11.8% of national land.

Since the early 1960's at the beginning of the industrialization of Korea, the SMR has been one of the most dynamic and rapidly growing region in the world. Particularly, Seoul has been played a major role as growth engine in the nation. Seoul rapidly grew from 11.9 percent of the national population in 1963 to 22.3 percent in 1980. Throughout the 1980's, even though the population growth of Seoul tapered off, the absolute size was further on the increase from 8.4 million in 1980 to 10.6 million in 1990. After 1992, the number of population of Seoul has continuously decreased from 10.9 million in 1992 to 9.9million in 2000.

A marked process of population de-concentration within the SMR emerged from the middle of the 1980's. Outlying fringe areas within the commuting distance from Seoul began to exhibit a strikingly high rate of growth, receiving overspill population and economic activities from the saturated central Seoul. The population of Inchon and Kyonggi province increased from 4.9 million in 1980 to 8 million in 1990. Supported by the improved transportation network of the SMR, the ensuing urban extention has taken place further into the remote

and sparsely populated outlying hinterland. The population of Inchon and Kyonggi grew to 11.4 million in 2000.

On the process of the excess concentration of population and socio-economic activities into the SMR, the SMR have suffered from intra-regional problems such as housing shortage and overcrowding, high land price and speculation, traffic congestion, air pollution and environmental disruption, urban sprawl, degrading quality of urban amenities and fiscal plight of local governments.

This paper is intended to study the spatial patterns of the SMR and to identify key policy issues. For the purpose, the first part of the paper analyzes the growth patterns of the SMR including physical growth patterns, population and industrial growth patterns as well as urban hierarchy system. The second part addresses traffic patterns and related problems of the SMR. This part includes analyses of intra- and inter-regional traffic patterns and major transportation corridors as well as traffic volume on the major arterial roads in the SMR. Based on these analyses, the paper suggests key policy issues that need to be addressed in the Seoul Metropolitan Strategic Plan.

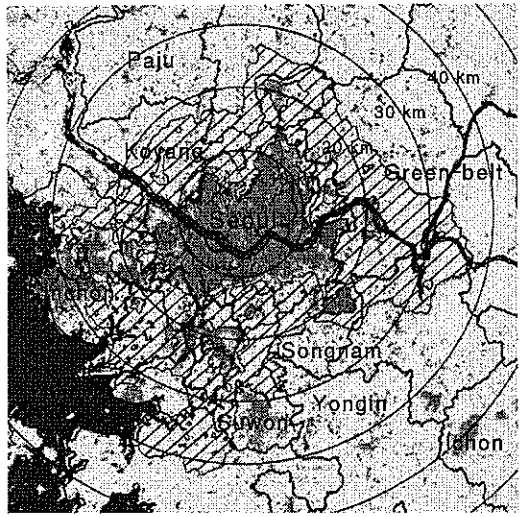
Growth Patterns of the SMR

Physical Growth Patterns

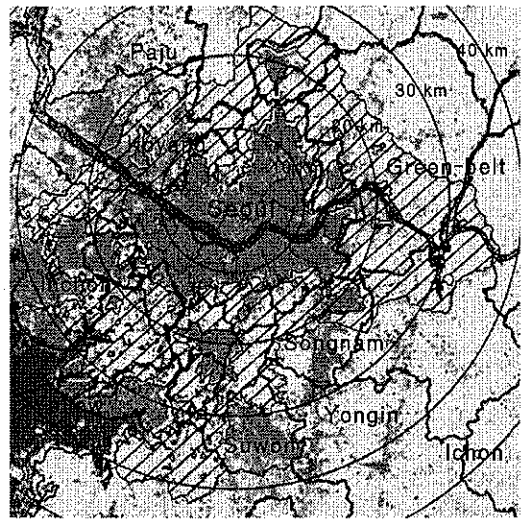
The satellite images of 1985 and 1997 give us a sense of how physical development patterns of the SMR have changed. First, the growth pattern of the built-up areas in the SMR clearly shows the process of metropolitanization. While the development of 1985 took placed mainly within 25km radial distance from the center of Seoul, recent development is extended to the 40km radial distance from Seoul.

Secondly, recent spatial structure of the SMR exhibits more dispersed development patterns along with new development corridors. In 1985, development activities were concentrated mainly on Seoul-Inchon corridor and Seoul-Suwon-Pyongteak corridor. Recent development activities show more dispersed patterns along with new development corridors such as Seoul-Songnam-Yongin, Seoul-Koyang-Paju and Seoul-Ichon-Yoju corridors as well as in the existing development corridors. Thirdly, housing land development has taken

Figure 3.1 Satellite image of SMR, 1985 and 1997



(1985)



(1997)

the form of leap-frogged type sprawl along major arterial roads beyond the Restricted Development Zone (RDZ, otherwise known as green-belt) around Seoul.

In the process of the metropolitanization of SMR, the conversion of agricultural land into urban use has increased significantly, and it has further expanded into the outlying hinterland. That is, the built-up area of the SMR increased from 777.7km² in 1985 to 1,172.6km² in 1998 (about 1.5 times). The built-up area of the Seoul, Inchon and Kyonggi province has been increased by 22%, 66%, 65%, respectively. In the same period of time, 444km² of green and open spaces have been disappeared in the SMR from 9,751km² in 1985 to 9,307km² in 1998. It is as much as 75% of Seoul's total administrative area (605km²).

About 2.9 million housing units increased between 1980 and 1999. Among them, about 1.5 million housing units have been provided through the designation of Housing Land Development Areas by the central government. These housing developments have been extended from existing built-up areas to Seoul metropolitan fringe areas at about 30-40km radial distance from the center of Seoul.

On the other hand, private housing developments overflowed into the areas classified as Semi-Agricultural-Forest Zone[1] beyond the RDZ. This was possible because, with the revision of the National Land Use and Management Law in 1993[2], urban development was allowed in dominantly agricultural areas to increase the supply of developable housing land. Many small-scaled private housing developments along the arterial roads in adjacent area of Seoul such as Yongin or Paju occurred in sporadic manner without the necessary provision of urban infrastructure and detailed zoning regulation. Consequently, the conversion of agricultural and forest land to urban uses began to burst out.

Population Growth Patterns of the SMR

The growth of the SMR has tended to coincide with industrialization of Korea since the early 1960's (S.Y.Park, 1995). The population of Seoul rapidly increased from 3.3 million in 1963 to 5.4 million in 1970 and 8.4 million in 1980 with an annual rate of increase of 9.6% between 1963 - 1970 and 5.4% between 1970 - 1980, while the annual growth rates of national population in the same periods were 2.2% and 1.9% respectively.

Throughout the 1980's, Seoul experienced a marked slow-down in in-migration and increase of outmigration into the outlying suburban areas near Seoul. Although the population growth rate of Seoul tapered off, the absolute size was further on the increase from 8.4 million in 1980 to 9.6 million in 1985 and 10.6 million in 1990. Accordingly, the national share of Seoul's population increased from 22.3% in 1980 to 24.4% in 1990, as contrasted to 18% in 1970 and merely 10% in 1963.

A marked population deconcentration within the SMR emerged from the middle of the 1980's. The outlying fringe areas began to rapidly grow through receiving over-spill population and economic activities from the saturated Seoul, while the trend of growth in Seoul subsequently leveled off. As more people began to move out of Seoul, the '90s witnessed a decline in the absolute size of population in Seoul for the first time; from 10.6 million in 1990 to 9.9 million in 2000. Seoul's share of the SMR's population also decreased from 62.9% in 1980 to 46.3% in 2000. However, population growth rates of Inchon city and Kyonggi province between 1990 and 2000 exhibit 36.2% and 45.9% respectively despite of the government efforts to decentralize the SMR. Especially, the share of the SMR's population in Kyonggi province was significantly increased from 29.0% in 1980 to 42.1% in 2000 (Figure 3.2 and 3.3).

According to the population growth patterns of the SMR between 1980 and 1990, major development corridors were located mainly within 30km radial distance from the center of Seoul. They were concentrated on Seoul-Inchon corridor and Seoul-Suwon corridor. However, major development corridors of 1990's are mainly outside of 30km radial distance from the center of Seoul with new development corridors such as Seoul-Songnam-Yongin, Seoul-Koyang-Paju and Seoul-Ichon-Yoju (Figure 3.4).

Recent migration pattern of the SMR shows that the number of inter-regional migration within the SMR is much more than that of the nation as a whole. Particularly, the number of inter-regional migration between Seoul and Kyonggi province mounted up to 3.96 million in the period of 1995 to 1999. This is quite an interesting phenomenon because internal migration has been dominated by the centripetal movement of population from all over the country towards Seoul and the SMR. The net out-migration from Seoul to Inchon (81 thousand)

Figure 3.2 No. of population by regions (Unit: 1,000)

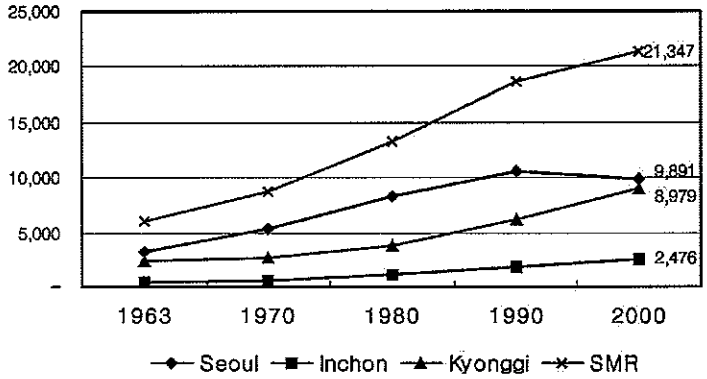
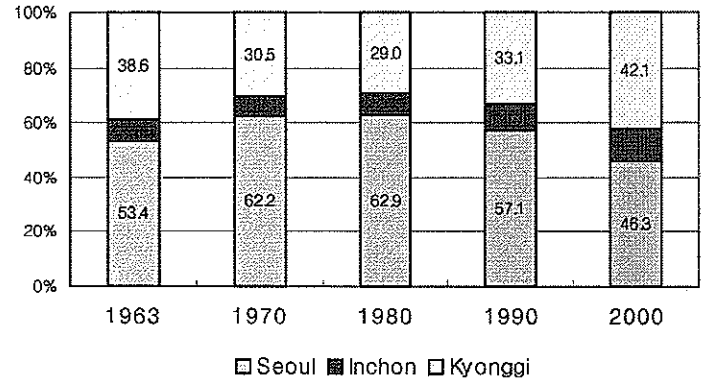
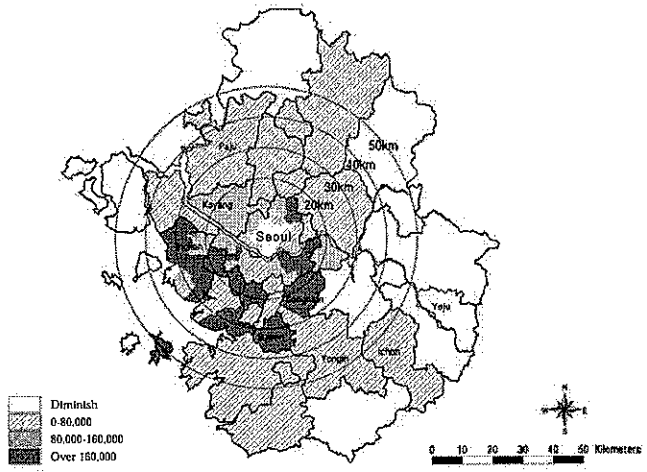


Figure 3.3 Population shares of the SMR by regions

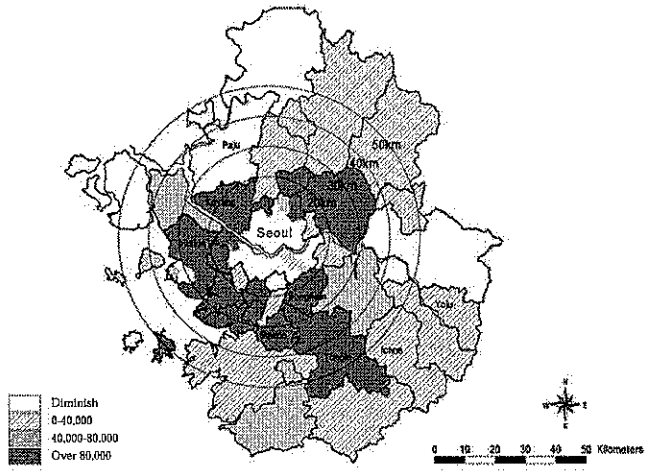


Sources: National Statistical Office, *Population and Housing Census Report*, 1970, 1980, 1990, 2000. Seoul Metropolitan Government, *Seoul Statistical Yearbook*, 1963. Government of Kyonggi Province, *Kyonggi Province Statistical Yearbook*, 1963.

Figure 3.4 Population growth patterns



('80 -'90)



('90 - 2000)

Sources: National Statistical Office, *Population and Housing Census Report*, 1980, 1990, 2000.

Figure 3.5 Inter-regional migration pattern (1995-1999) (Unit: 10,000)

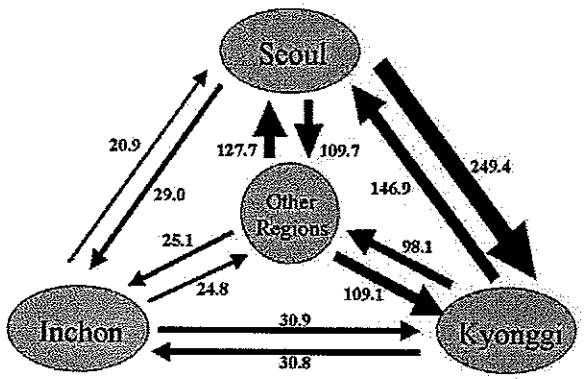
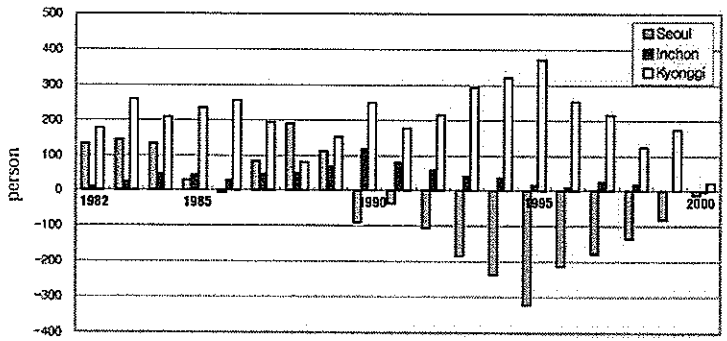


Figure 3.6 Net in-migration by regions (Unit: 1,000)



Sources: National Statistical Office, *Internal Migration Statistics*, 1982-2000.

and Kyonggi province (1.03million) reached 1.1 million between 1995 and 1999. While the number of in-migration to Inchon city is similar to that of out-migration from Inchon city, the net in-migration to Kyonggi province mounted up to 1.1 million during the same period of time.

Cities with large amount of net out-migration from Seoul are mainly found to be new towns and Housing Land Development Areas of Kyonggi province within 30km radial distance from the center of Seoul. While the number of out-migration from Seoul is still significant, the number of net in-migration has a decreasing tendency. Whereas the number of net in-migration to Inchon city has shown somewhat constant, that of net in-migration to Kyonggi province has an increasing tendency again in recent years (Figure 3.5 and 3.6).

As population has concentrated into the SMR, the population density of the SMR has consistently been increased. In 1999, the net population density, measured by the built-up areas of the SMR, is 245 persons/ha; 293 persons/ha in Seoul; 173 persons/ha in Inchon; and 225 persons/ha in Kyonggi province. While the net-population density of Seoul has a decreasing tendency, that of Inchon city and Kyonggi province show tendency to increase constantly since 1990.

Compared with the population density (based on the administrative area) of major cities in the world, that of Seoul in 1999 (170 persons/ha) was 1.3 times that of Tokyo (23 special districts) and twice the density of New York city. Considering 27.5% of Seoul's area is designated as the RDZ, it is clear that Seoul is relatively over-crowded. While the population density of the SMR (18.6 persons/ha) is much higher than those of the London(5.2 persons/ha), New York (6.1 persons/ha) and Paris (9.1 persons/ha) metropolitan areas, it is somewhat lower than the population density of Tokyo metropolitan area (24.8 persons/ha). This is largely because Tokyo metropolitan area is situated on the Kanto plain which is flatland areas.

Industrial Location Patterns of the SMR

The absolute size of business establishments and employment in Seoul showed an increasing tendency between 1981 and 1996 (i.e. 360,000 of business establishments and 2.4million of employment in 1981; 580,000 and 3.6million in 1991; and 700,000 and 4.1 million in 1996). In

Figure 3.7 No. of employment by regions (Unit: 1,000)

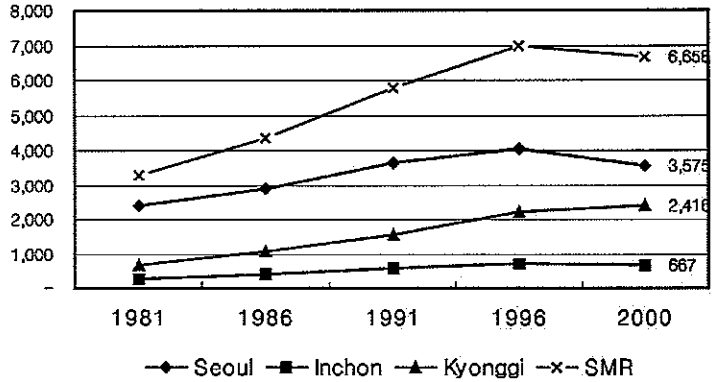
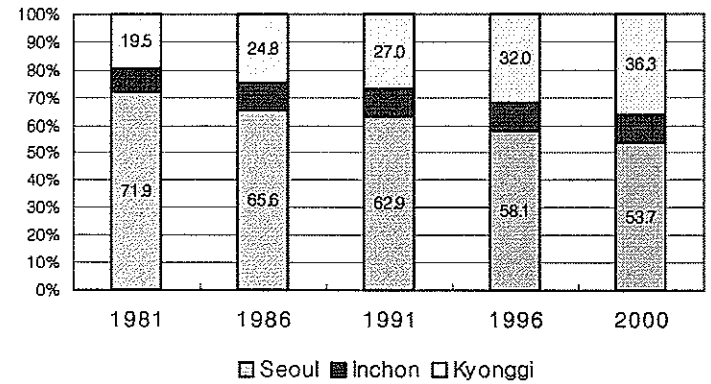


Figure 3.8 Employment shares of the SMR by regions



Sources: National Statistical Office, *Report on Business Establishments Census*, 1981, 1986, 1991, 1996, 2000.

1997 and 1998, however, Seoul experienced a dramatic decrease in the employment (10% to 20% decrease compared to the year 1996) due to foreign exchange crisis at the end of 1997. Currently, the number of business establishments and employment in Seoul is on the increase from 660,000 and 3.4 million in 1998 to 720,000 and 3.6 million in 2000. As the population of Inchon and Kyonggi province has rapidly increased, the employment of those regions has also rapidly grown. Especially, the employment of Kyonggi province has markedly increased with annual growth rates of 14% between 1981 - 1991 and 6.1% between 1991 - 2000. The share of employment in the SMR has maintained a half of national total since 1980, while the share of Seoul's employment to total employment in the SMR has been consistently decreased from 72% in 1981 to 63% in 1991 and 54% in 2000. On the other hand, the share of employment of Kyonggi province has increased from 22% in 1981 to 29% in 1991 and 36% in 2000 (Figure 3.7 and 3.8).

The employment shares of the SMR by major industries in 2000 are shown in Table 3.1. Construction, wholesale and retail trade, transport, storage & communication, producer service and business service are concentrated in Seoul. On the other hand, the major industries of Kyonggi province are identified such as manufacturing, electricity, gas & water supply, public administration service, and other social & personal service. Inchon is specialized on the industry of manufacturing, and electricity, gas & water supply.

While factories, assembly lines and branch offices have a decentralization tendency from Seoul, head offices of firms, regardless of industrial sectors, tend to agglomerate in Seoul. Considering the head office share of Seoul by employment, Seoul still functions as dominant job center of white-collar and location of head offices of business firms. These industrial structures indicate the spatial division of labor within the SMR.

Table 3.1 No. of employment by regions (2000)

	No. of employment (1,000 persons, %)				No. of employment at head office (person, %)			
	Seoul	Inchon	Kyonggi	SMR	Seoul	Inchon	Kyonggi	SMR
Total	3,575 (53.7)*	667 (10.0)*	2,416 (36.3)*	6,658 (48.9)**	451,089 (72.6)*	35,863 (5.8)*	134,701 (21.7)*	621,653 (72.6)**
Agriculture and Forestry	0.5 (15.8)	0.2 (6.1)	2.3 (78.1)	2.9 (11.7)	111 (22.2)	24 (4.8)	364 (72.9)	499 (51.5)
Fishing	0.3 (23.0)	0.1 (6.7)	0.8 (70.3)	1.2 (3.9)	117 (97.5)	0 (0.0)	3 (2.5)	120 (17.5)
Mining and Quarrying	1.2 (34.5)	0.6 (17.7)	1.7 (47.9)	3.5 (16.3)	938 (85.2)	78 (7.1)	85 (7.7)	1,101 (67.6)
Manufacturing	568 (34.5)	237 (14.4)	845 (51.2)	1,650 (49.5)	176,646 (59.4)	28,188 (9.5)	92,340 (31.1)	297,174 (69.5)
Electricity, Gas and Water supply	11 (48.6)	3 (13.4)	9 (38.0)	23 (40.4)	2,872 (66.8)	0 (0.0)	1,427 (33.2)	4,299 (65.7)
Construction	237 (71.6)	17 (5.2)	77 (23.2)	331 (51.6)	48,744 (88.1)	1,115 (2.0)	5,487 (9.9)	55,346 (69.2)
Wholesale and Retail trade	817 (64.2)	100 (7.9)	356 (28.0)	1,273 (51.0)	62,815 (89.2)	772 (1.1)	6,865 (9.7)	70,452 (81.0)
Hotels and Restaurants	363 (52.7)	70 (10.1)	256 (37.2)	688 (44.2)	6,732 (94.3)	137 (1.9)	272 (3.8)	7,141 (71.8)
Transport and Telecommunications	270 (61.6)	43 (9.8)	125 (28.6)	439 (48.9)	32,603 (77.7)	2,246 (5.4)	7,132 (17.0)	41,981 (71.9)
Financial institutions, Insurance and Real estate	309 (61.1)	40 (7.9)	157 (31.0)	505 (53.5)	57,007 (90.4)	1,171 (1.9)	4,856 (7.7)	63,034 (80.8)
Public, social work and Cultural activities	510 (51.3)	102 (10.3)	382 (38.4)	994 (44.2)	14,087 (68.1)	1,162 (5.6)	5,431 (26.3)	20,680 (67.0)
Other community, Repair and Personal service activities	169 (51.0)	37 (11.1)	125 (37.9)	331 (44.7)	7,806 (86.3)	219 (2.4)	1,025 (11.3)	9,050 (71.5)

Source: National Statistical office, *Report on Business Establishment Census*, 2000.
Note: * Employment shares of the SMR by regions
** Employment shares of the SMR to national total

Employment Base and Urban Hierarchy System of the SMR

Average employment share of population in the SMR was about 28% in 1998. That of Seoul was 33%; Inchon 23%; and Kyonggi province 23%. Seoul CBD and southeastern part of Seoul seem to have sustainable job base. In these areas, the employment share of population is more than 50% with high employment density. Western part of Inchon and southwestern region of Kyonggi province (i.e. Ansan, eastern part of Suwon, Kimpo etc.) also show relatively stable job base in terms of employment share to their populations. These regions are so-called employment centers of the SMR. However, most suburban areas located in inner-ring of the SMR near Seoul show shrinking job-base (Figure 3.9 and 3.10)

As shown in Table 3.2, the job-housing balance ratio of Seoul has a tendency to increase from 1.03 in 1980 to 1.15 in 1997. Particularly, the job-housing balance ratio of the Seoul's CBD (4.6) and southeastern region of Seoul (1.59) is comparatively high. However, the job-housing balance ratio of Kyonggi province has a tendency to decrease since 1980. Especially, the ratios of cities located within 30km radial distance from the center of Seoul exhibit less than 1, which means a lack of self-sufficiency or bed-towns. The job-housing balance ratio of Inchon city has been slightly less than 1 and there has been no visible change of the ratio since 1990.

Table 3.2 Job-housing balance by regions

Region	1980	1990	1995	1997
Seoul	1.03	1.09	1.12	1.15
Inchon	0.97	0.89	0.90	0.89
Kyonggi	0.92	0.85	0.86	0.84

Sources: National Statistical Office, *Population and Housing Census*, 1980, 1990, 1995
Government of Kyonggi Province, *Report on Household Travel Survey*, 1998.

Note: Job-housing balance = no. of employment by workplace/no. of employment by residence.

Figure 3.9 Employment share of population by sub-regions ('98)

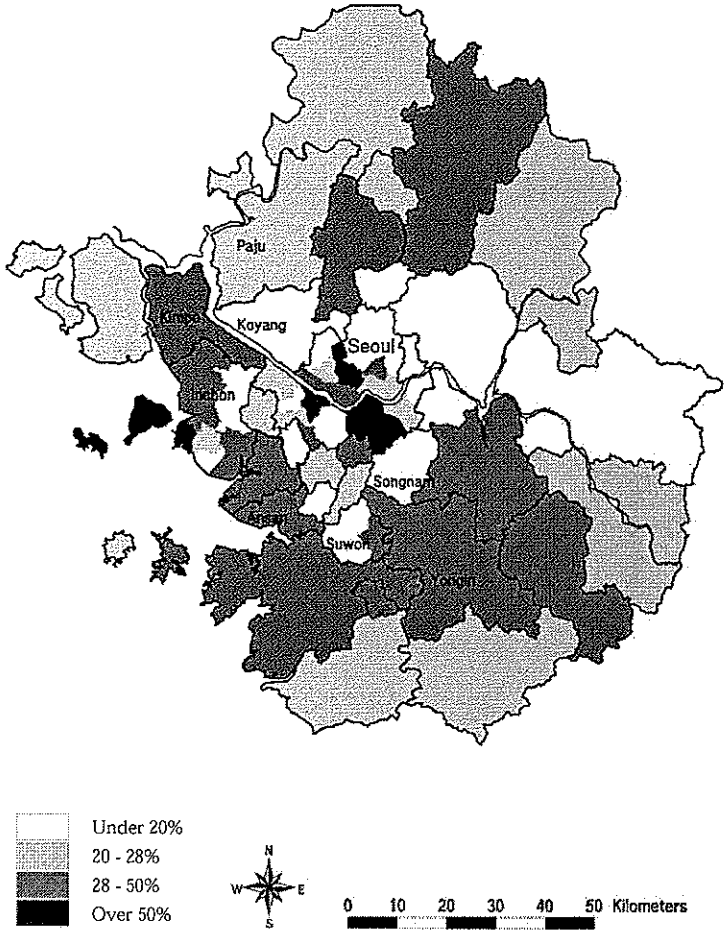
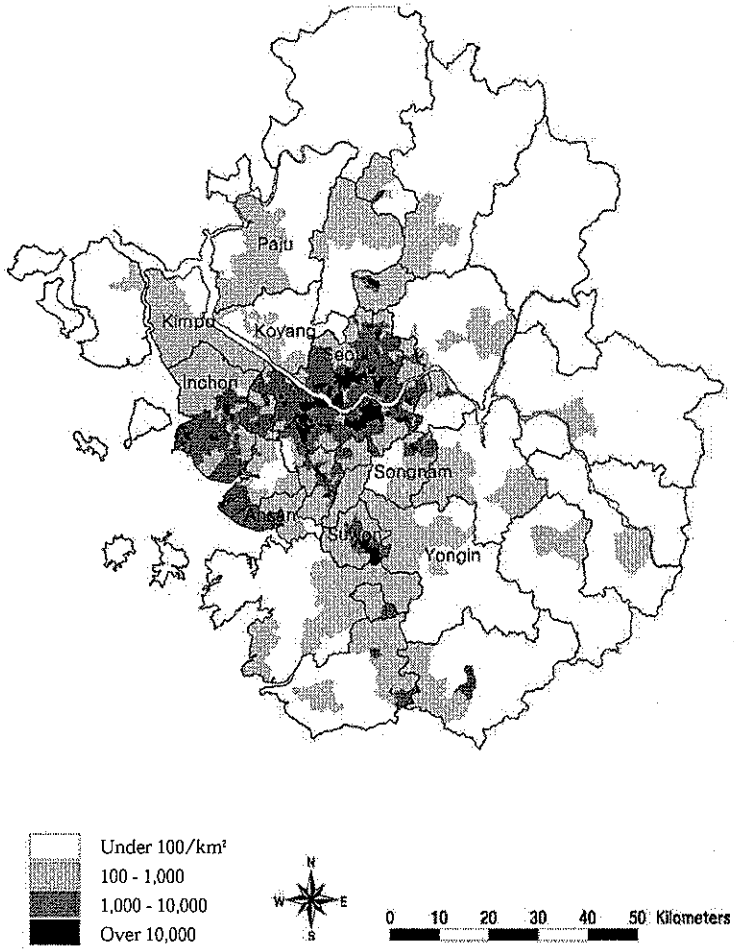
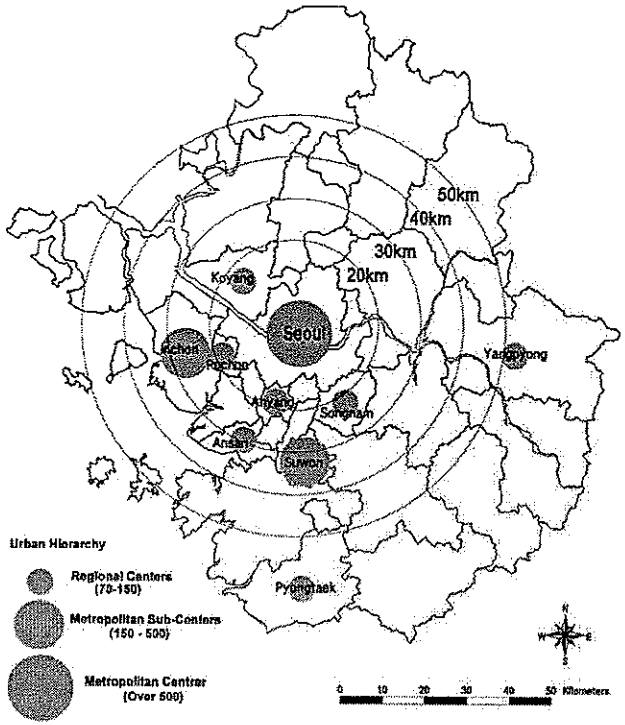


Figure 3.10 Employment density by sub-regions ('98)



The current urban hierarchy system of the SMR is analyzed by Benison's Method. The analysis shows that Seoul still plays a role of the national as well as metropolitan center with strikingly high primacy. The centrality index of Seoul (3,240) is about eight times as high as that of Inchon which has the second highest index(388). Inchon and Suwon (155 of the centrality index, respectively) could be classified as sub-centers of the SMR. Songnam, Puchon, Anyang, Ansan and Koyang within 30km radial distance from Seoul and Pyongtaek, Yangpyong outside of 50km radial distance are found to be regional centers according to their centrality indices (Figure 3.11).

Figure 3.11 Urban hierarchy by centrality index



Traffic Patterns of the Seoul Metropolitan Region

General Traffic Patterns of the SMR

In 1997, number of total trips for all purposes in the SMR was 43 million per weekday. Number of trips per capita is 2.16. 17.4% of the total trips is trips for commuting, 9.3% for business, 7.9% for personal matters, and 4.7% for entertainment and recreation. Number of interregional trips among Seoul, Inchon and Kyonggi province in the SMR reaches to 5.4 million. The proportion of these trips to total trips is about 12.6%. Of these trips, 19.5% is for commuting, 16.7% for business, 11.6% for personal matters, 7.1% for entertainment and recreation, and 5.9% for shopping (Figure 3.12 and 3.13).

Number of total trips by all modes in the SMR is about 48 million per weekday. Number of trips by modes per capita is 2.24. A traveler uses 1.12 modes per trip for a purpose. 28.5% of the trips is trips by bus, 26% by automobile, 11.1% by subway and suburban rail, and 8.9% by taxi, respectively. The proportion of interregional trips by modes to total trips is 12%. Of these trips, 43% is by automobile, 25% by bus, 21.6% by subway and suburban rail, and 4.5% by taxi. These statistics tell us automobile is still major traffic mode for the interregional trip in the SMR (Figure 3.14 and 3.15).

The number of vehicles in the SMR is enormously increased in the comparatively short period of time with rising per capita income. Between 1990 and 1998, the number of vehicle was increased from 1.8 million to 4.8 million which is an increase of 170%. In the same period, however, the length of pavement roads was increased 40% only (from 14,700km to 20,528km) and the area of roads was increased 29% (from 298km^2 to 385km^2). Also, the length of subway/rail was increased from 236km to 390km, which is an increase of 65%. Rapid increase of vehicle without proper infrastructure has brought about urban problems such as severe traffic congestion and air pollution. This trend is anticipated to continue in the near future, and is aggravating traffic condition.

The proportion of traffic volume at peak times (between 7:00 to 9:00 in the morning and between 5:00 to 8:00 in the afternoon) to the total volume takes up to 24.5% and 21.2%, respectively. Even, at times other than rush hours, the traffic volume is still consistently heavy; the

Figure 3.12 Proportion of trip purposes in the SMR

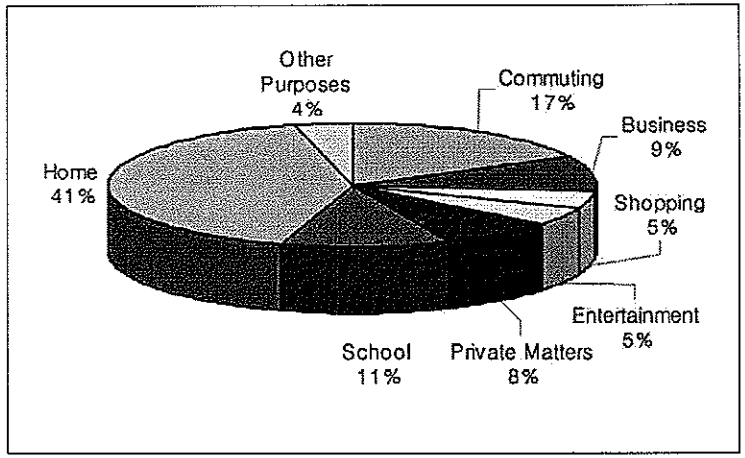
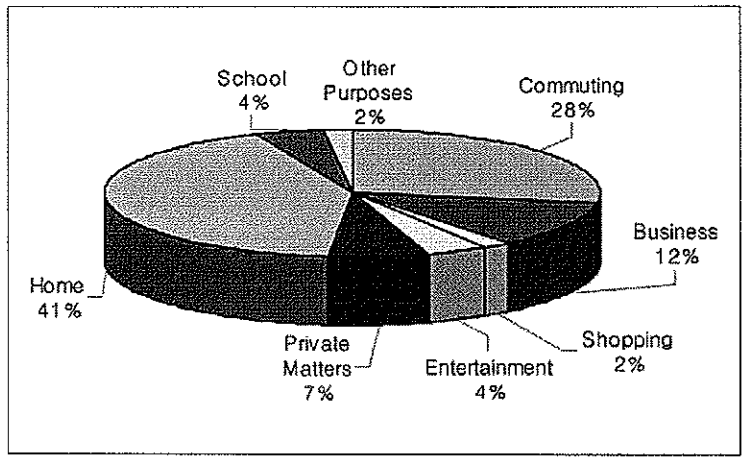


Figure 3.13 Proportion of interregional trip purposes in the SMR



Source: Government of Kyonggi Province, *Report on Household Travel Survey*, 1998.

Figure 3.14 Mode shares of trips in the SMR

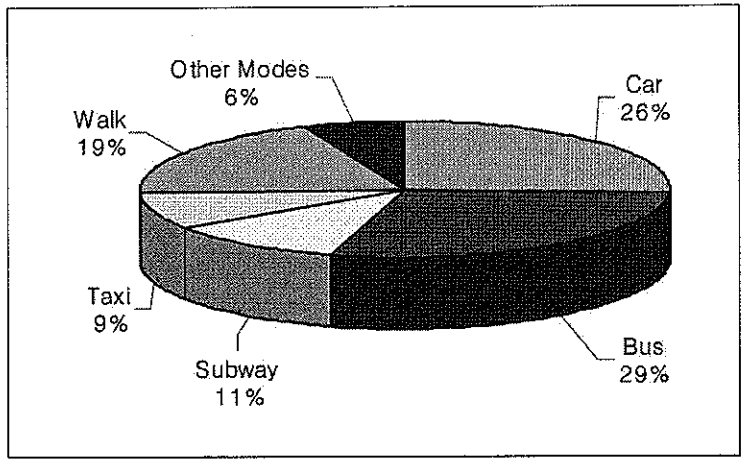
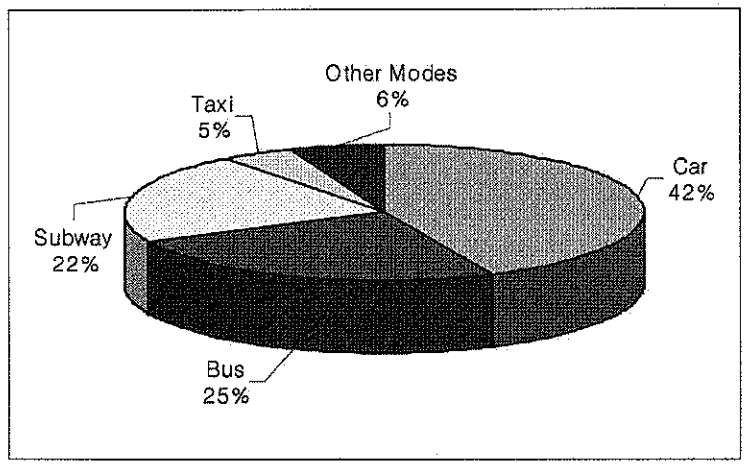


Figure 3.15 Mode shares of interregional trips in the SMR



Source: Government of Kyonggi Province, *Report on Household Travel survey*, 1998.

proportion of the traffic volume in each hour between 9:00 AM - 5:00 PM and 8:00 PM - 9:00 PM occupies 3.1% to 5.7%. There are many places, especially in the Seoul city and adjacent areas, showing traffic congestion for whole day.

Interregional Traffic Patterns in the SMR

Major transportation corridors and traffic volume in the SMR

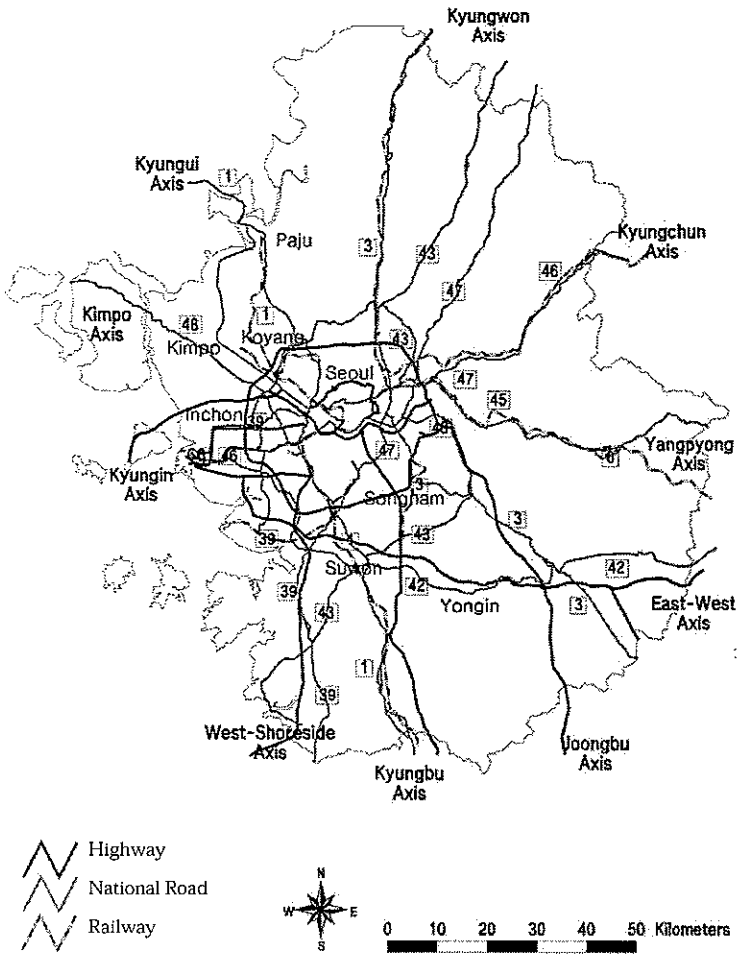
In regards to arterial roads and railroads, about 13 of major interregional transportation corridors can be identified in the SMR. They are shown in Table 3.3. Before 1980, Kyongin, Kyongbu, Kyongwon, Kyongchun and Kyongui axes were the main transportation corridors in the SMR. During the 1980s, East-west axis was added as a transportation corridor by the construction of Joongbu Expressway which directly connects Kangwon province and the city of Taejon. Kwachon-Ansan axis was also established by the construction of Ansan subway, together with the large-scale new town development in Kwachon and Ansan. Between the late 1980s and the early 1990s, many housing sites were developed within Seoul city and four more new towns were developed in surrounding areas of Seoul by central governments. Thus, the existing roads and subways/railroads on the main transportation corridors were rapidly expanded. Seoul- Songnam-Yongin axis was newly added as a major transportation corridor. To deal with through traffic of Seoul from cities nearby, construction of the Curcular Expressway in the outskirts of Seoul was also initiated (Table 3.3 and Figure 3.16).

Traffic volume of the SMR in 1997 was concentrated on the major transportation corridors. These roads play major roles in connecting Seoul and suburban areas mainly characterized as bed towns. Especially, traffic volume increases significantly on every road at the outskirts of Seoul's administrative boundary. This is because the largest number of trips to Seoul is accumulated at these points, bringing about severe traffic congestion. This traffic congestion in the SMR has mainly been caused by much leapfrog type housing developments along arterial roads to Seoul without proper investment of region-wide public transit system. Road-oriented investment system of the central government also seems to exacerbate congestion of the SMR.

Table 3.3 Main transportation corridors in the SMR

Transportation corridors	Name of roads and railroads
Circular expressway	Circular expressway outside Seoul
Kyongwon Axis (Seoul - Yonchon - Pochon)	General national roads No. 3, 43, 47, Kyongwon railroad
Kyongchun Axis (Seoul - Kapyong)	General national road No. 46, Kyongchun railroad
Yangpyong Axis (Seoul - Yangpyong)	General national road No. 6, Jungang railroad
Joongbu Axis (Seoul - Ichon and Yoju)	General national roads No. 3, Joongbu expressway
Kyongbu Axis (Seoul - Suwon - Pyongteak)	General national roads No. 1, Kyongbu expressway, Kyongbu railroad
West Shoreside Axis (Inchon - Pyongteak)	General national roads No. 39, 43, 47, West shoreside expressway
Kyongin Axis (Seoul - Inchon)	General national roads No. 6, 46, Kyongin expressway No. 1 and 2, Inchon new airport expressway, Kyongin expressway
Kimpo Axis (Seoul - Kimpo)	General national road No. 48
Kyongui Axis (Seoul - Koyang - Paju)	General national road No. 1, Freedom road, Kyongui railroad, Ilsan subway
East-west Axis (Inchon - Suwon - Yoju)	General national road No. 42, Yongdong expressway, Singal-Ansan expressway
Seoul-Songnam-Yongin Axis (Seoul - Bundang-Yongin)	Suso-Bundang expressway, Bundang subway
Kwachon-Ansan Axis(Seoul - Kwachon - Ansan)	General national road No. 47, Ansan subway

Figure 3.16 Main transportation corridors in the SMR



Interregional traffic patterns in the SMR

Considering interregional trips over 200 thousand per day in 1997, five major daily living areas of Seoul are found to have the strongest linkages to each other (Figure 3.17). It is also found that there are strong interregional travel linkages between Seoul and its adjacent suburban cities such as Koyang, Songnam, Puchon and Kwangmyong. These suburban cities in Kyonggi province are functioning as bed-towns for Seoul. On the other hand, Inchon seems to be a self-reliant city because of relatively weak connection to Seoul. As shown in the figure, three daily living areas of Inchon have strong travel linkages to each other.

Taking into account of the interregional trips of 100 thousand to 200 thousand, the influence of Seoul seems to reach even larger areas (Figure 3.18). Suwon, which has strong connections with Hwasong and Yongin, is also found to be a relatively self-reliant city in the SMR.

The rates of intraregional work trips within Seoul, Inchon and Kyonggi province have continuously decreased from 1980 to 1997, while the rate of interregional work trips among Seoul, Inchon and Kyonggi province increased rapidly. In most cities located within 35km radial distance from central Seoul, the rates of work trips to Seoul have enormously increased in the same period. However, no significant change in the rate of work trips to Seoul is found in most cities located outside 35km radius from central Seoul (Figure 3.19). As shown in Figure 3.21 and 3.22, commuting patterns to Seoul indicate that Seoul and most cities within the radius of 35km from central Seoul are actually functioning as a cohesive daily living sphere.

On the other hand, the average commuting time of interregional work trips has decreased since 1990. This is because many commuters seem to adapt to their commuting environment by choosing their residences near work places. It may be possible that a large amount of affordable housing units have been provided for commuters' choice in the SMR (Figure 3.20).

The number of total trips by all modes from Inchon and Kyonggi province to Seoul was 2.5 million in 1997. Most of these trips come from Kyonggi province. The trips from Kyonggi occupy 2.2million and those from Inchon 264 thousand.

Trips from Inchon to Seoul are found to be made mainly by automobile (45.5% in 1997) and interregional subway/rail (38.6%), while

Figure 3.17 No. of interregional trips in the SMR (over 200 thousand)

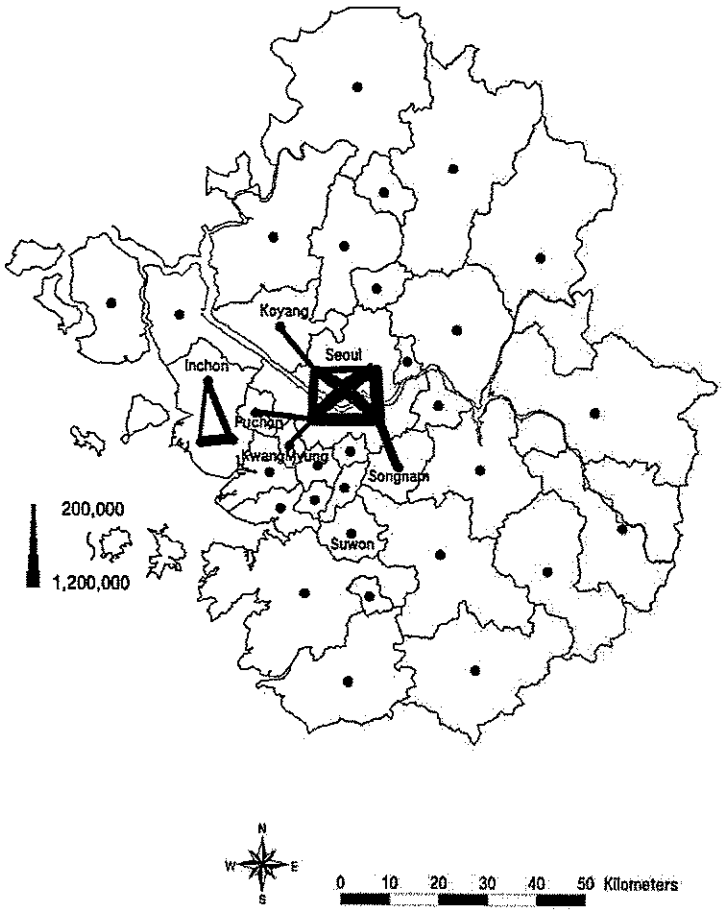
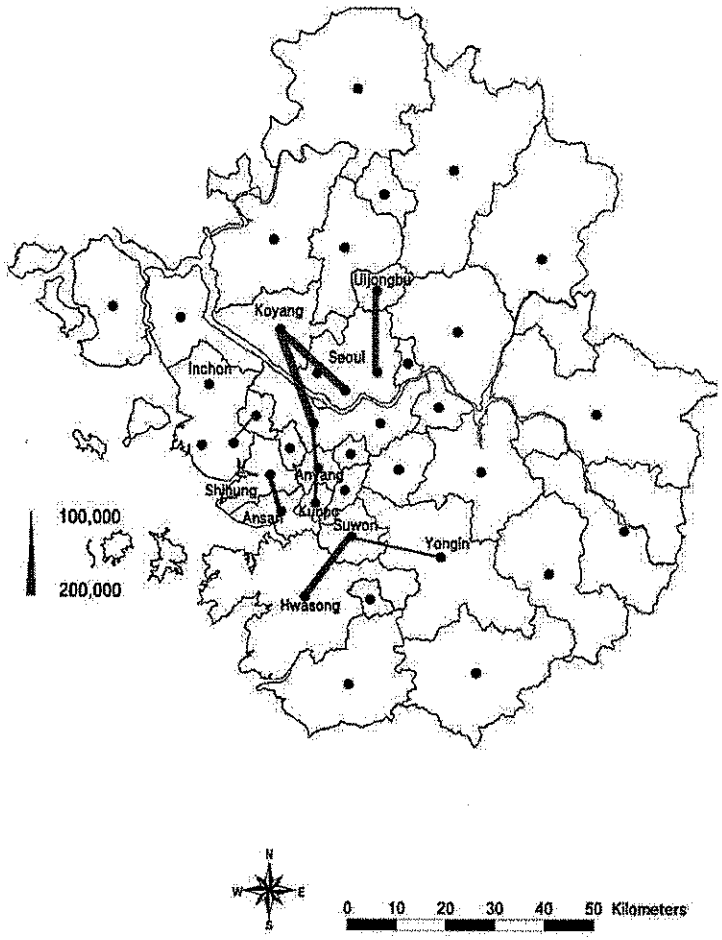


Figure 3.18 No. of interregional trips in the SMR (100-200 thousand)



Sources: National Statistical Office, *Population and Housing Census Report*, 1970, 1980, 1990, 2000. Government of Kyonggi Province, *Report on Household Travel Survey*, 1998.

Figure 3.19 The rate of commuting to Seoul by sub-regions

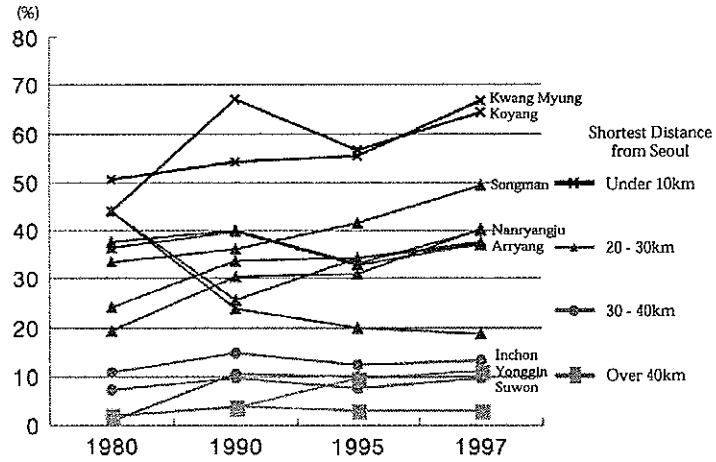
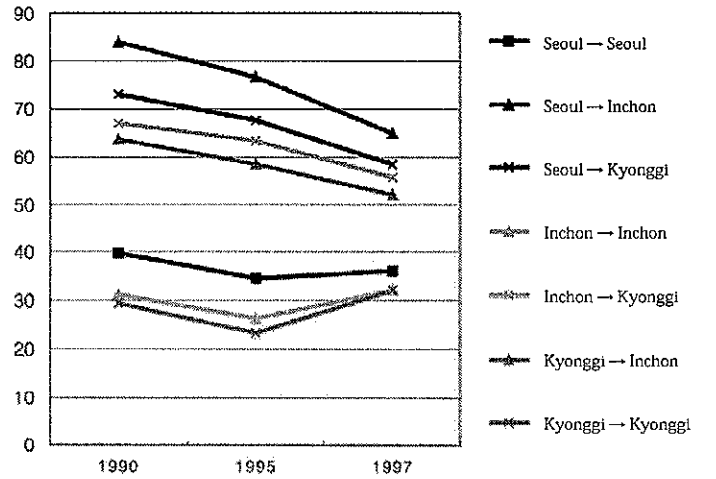


Figure 3.20 Commuting time between the regions (1990, 1995, 1997)

(Unit : Minutes)



Sources: National Statistical Office, *Population and Housing Census Report*, 1970, 1980, 1990, 2000 Government of Kyonggi Province, *Report on Household Travel Survey*, 1998

Figure 3.21 Interregional commuting trip ('97)

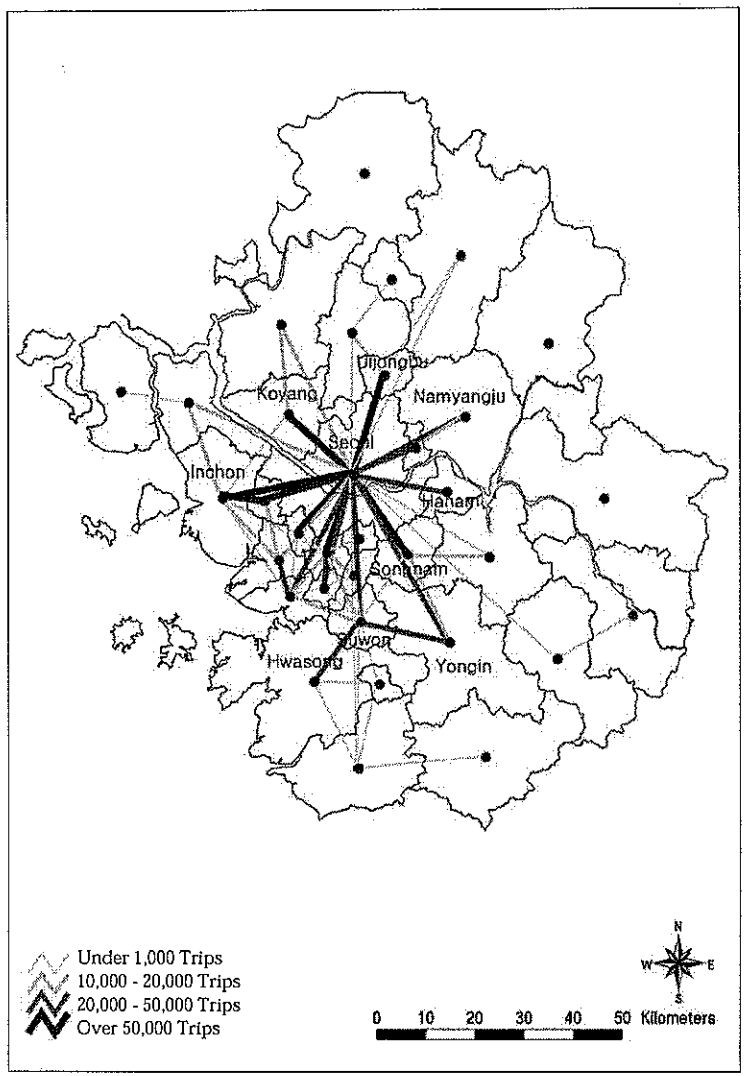
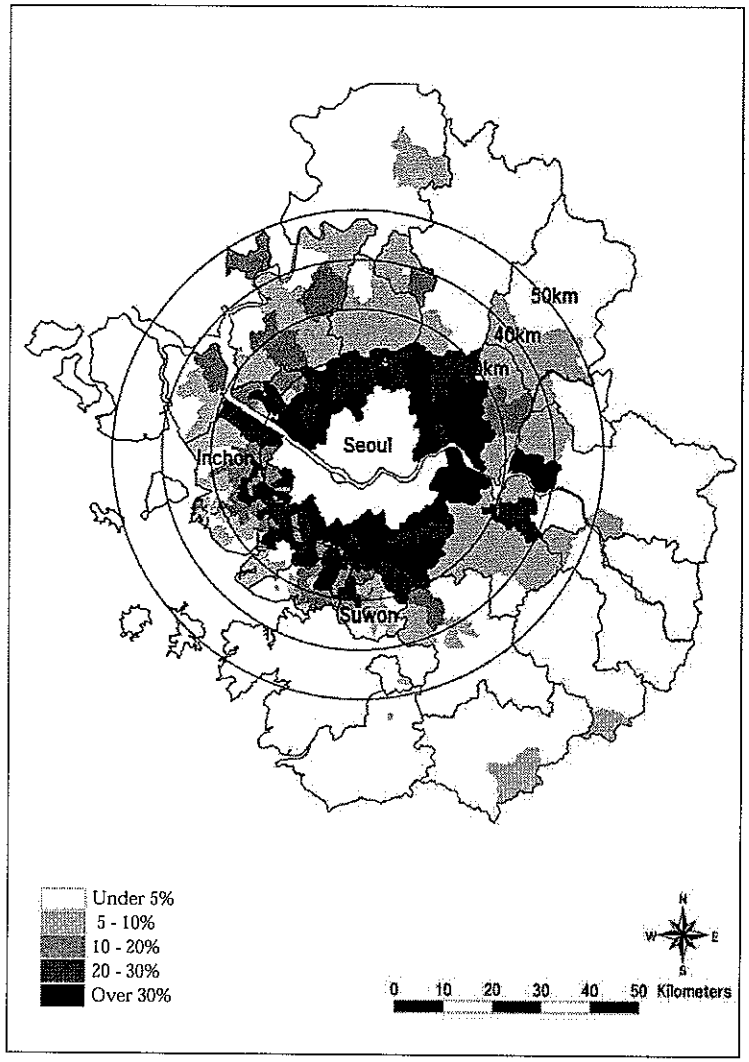


Figure 3.22 Commuting ratio to Seoul by sub-regions ('97)



Source: Government of Kyonggi Province, *Report on Household Travel Survey*, 1998.

Figure 3.23 Mode shares of intra-regional trips by regions ('97)

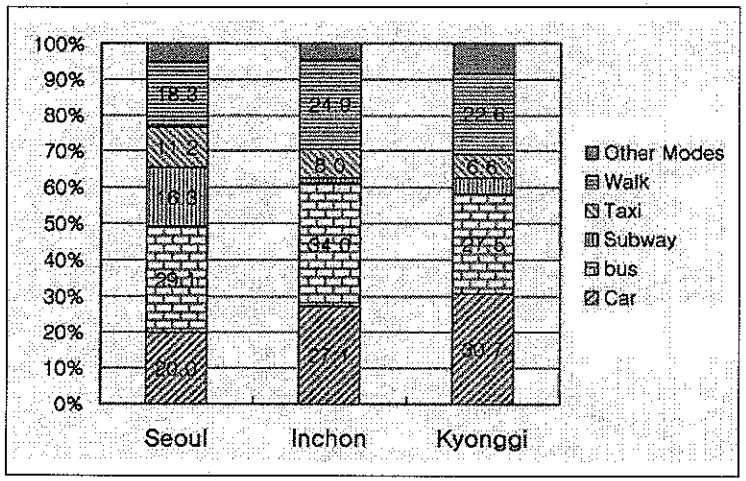
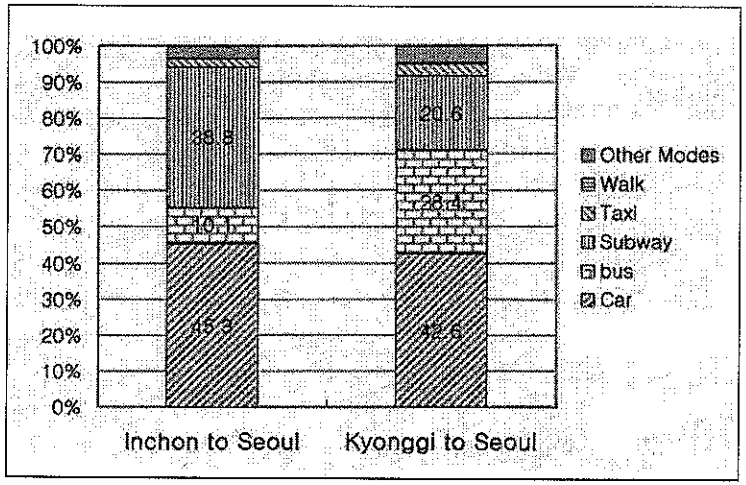


Figure 3.24 Mode shares of trips to Seoul by regions ('97)



Source: Government of Kyonggi Province, *Report on Household Travel Survey*, 1998.

bus and automobile seem to be major traffic modes for intra-city trips. On the other hand, modal shares of car, bus, and subway/rail from Kyonggi province to Seoul are found as 43%, 28%, and 21%, respectively (Figure 23 and 24). Compared to other regions in Kyonggi province, the modal share of subway to Seoul in Koyang, Songnam, Kwachon, Ansan, Puchon, Uijongbu appears to be quite high. This is because interregional subway system connecting Seoul with these regions is relatively well established. Except for these areas, the proportion of automobiles for interregional trips is anticipated to increase in the SMR. It is particularly true where region-wide public transit system is not sufficient.

Policy Issues related to Spatial Patterns of the SMR

In order to cope with the over-concentration of Seoul and the SMR, various policies, plans and control measures have been devised and implemented by the central government. They invariably shared one objective: to steer people and industries away from the SMR and to ultimately serve to bring forth a desirable pattern of national physical development. However, many claim that they were not quite effective in achieving their policy goals, although the regulative measures served in advancing the decentralization and management policy of the SMR. This is because they were too much obligatory and rigid and there were also too many regulations mitigating legitimacy without any institutionalized coordination between the central and local governments (W.Y. Kwon, 1995 ; S.Y. Park, 1995).

Faced with the shortcomings of previous policies and control measures, it is time to search for better approaches to growth management of the SMR. Currently, local governments of Seoul, Inchon and Kyonggi province, in coordination with the central government, are working out the Seoul Metropolitan Strategic Plan. Although this plan is mainly initiated with the intention of readjusting the Restricted Development Zone (so called Greenbelt), the main purpose of this plan is not just meant to set up strict growth control of the capital region by central government, but to provide a strategic guidance of growth management at the regional level. Based on the previous analysis of spatial patterns in the SMR, eight major policy issues are identified and suggested as planning research agenda for the Seoul Metropolitan Strategic Plan. These policy issues are summarized as follows:

Seoul-oriented and mono-centric spatial structure: Most cities located within 35km radial distance from the center of Seoul are under strong influence of Seoul in terms of interregional commuting patterns. Commuting shares to Seoul out of the total work trips generated in each city reach in the range of at least 10% up to 68%. Moreover, commuting shares to Seoul in these jurisdictions have been consistently increasing since 1980. These have especially been the case for five new towns developed within 25km radial distance from Seoul due to the job-housing mismatch. Also, current urban hierarchy system of the SMR shows that all metropolitan sub-centers and regional centers, except Yangpyong, Pyongtaek, are located within 30km radial distance from Seoul CBD.

Saturation of Seoul and over-population of suburban areas: The net population density of the SMR, measured by the built-up areas, was 245 persons per hectare in 1999. That of Seoul and its adjacent suburban areas reached 293 persons per hectare. Although the population density of Seoul has decreased recently, densities of Inchon and Kyonggi province have increased constantly since 1990. Compared with the population density of major cities in the world, Seoul has one of the highest average densities among large metropolitan areas. That of Seoul, based on the administrative area in 1999, was 1.3 times that of Tokyo and twice the density of New York city. Considering 27% of Seoul's area is designated as the RDZ, it is easy to understand that Seoul is over-crowded.

Urban sprawl along major arterial roads: Small scaled and leapfrog type housing development expands in noncontiguous way outward from the solidly built-up core of the SMR beyond the RDZ. Since large amount of housing units are constructed along major arterial roads, these linear and scattered developments are causing a shortage of adequate urban infrastructure such as streets, schools, community facilities etc. Also, the quota system and other rigid control measures for location of factories in the SMR have caused many factories and businesses to re-locate in preservation areas without proper legal permission. In addition, numerous small

lodgings and restaurants have developed sporadically without the necessary infrastructure.

The urban consumption of agricultural land and environmentally sensitive area: With the revision of the National Land Use and Management Law in 1993, private housing developments were allowed to expand into areas classified as Semi-Agricultural-Forest Zone beyond the RDZ. Thus, current patterns of development encroach on forest, prime farmlands and fragile natural habitats, and threaten native wildlife. The loss of abundant amounts of agricultural land to develop occurs because it often is the cheapest land available at the periphery of development in the SMR, while fragile environmental ecosystems are swallowed up because they are not adequately preserved institutionally.

Job-housing mismatch: According to the job-housing balance index, cities located within 40km radius from Seoul CBD, except Ansan, Shihung, Kwachon, exhibit a lack of self-containment. According to another indicator, the employment density of most cities within 30km radius from Seoul CBD are under half of the SMR's average (322employees/1,000person). These indicators suggest that most cities adjacent to Seoul are functioning as bed-towns for Seoul. Because of the spatial mismatch, a growing number of people are forced to commute farther from their residences, which is intensifying traffic congestion and air pollution.

Lack of interregion functional mix: The economic structure and industrial organization of the SMR indicate spatial division of labor within the SMR. However, functional integration efforts at the regional level are not established yet. The lack of interregional cooperation system brings about inefficient and redundant investments in the SMR. Moreover, various policy measures of the central government to restrict over-concentration of the SMR (e.g. quota system for location of factories etc) do not seem to be flexible enough to respond to market demands in the age of economic restructuring.

Automobile dependent traffic system and congestion: The number of cars in Seoul during the last 30 years has increased, from

61,900 in 1970 to 2.2 million in 1998 (about 35 times). Although the increase rate has slowed down since 1995, about 170,000 cars have increased every year between 1985 and 1995. As the number of cars have increased, its modal share has also increased. The modal share of the car in interregional trips is also expected to get higher in the near future. While Seoul oriented traffic volumes have been increasing significantly, the infrastructure of region-wide railroad system has not been keeping pace with increasing traffic volumes. Thus, traffic congestion has occurred at every road on the outskirts of Seoul's administrative boundary due to the accumulated work trips to Seoul.

Lack of inter-regional cooperative system: With a lack of effective interregional cooperative system, sporadic developments with local boosters have caused a large amount of green space and prime farmland to disappear in the SMR. Automobile dependant traffic system and urban sprawl have also caused high fossil energy usage and intensified air pollution in the SMR. Through smart growth management system, communities could reduce traffic congestion and the nation could save billions of dollars every year in spending for roads, sewers, water and other vital infrastructure. It will take a concerted effort to address Seoul oriented spatial structure, and to channel suburban development to the most efficient and easiest to serve locations. In order to address these policy issues, more efficient metropolitan wide cooperative system needs to be established institutionally. Implementing regional solution at the local level seems to be the key to creating competitive metropolitan economies and livable communities for the new century.

Notes

1. The Semi-Agricultural-Forest Zone is mainly designated for agricultural and forestry uses where planned urban development and necessary urban infrastructure provisions are not explicitly required.
2. Coming into late 1980s, the so-called housing crisis was paramount, being coupled with the shortage of affordable housing in terms of quality and price, an upturn of land price and spiraling land speculation which, by then, threatened the economic and social stability of the nation. Thus, the central government took a radical turn by developing of new towns and large residential estates

beyond the greenbelt around Seoul. However, the government soon realized that the National Land Use and Management Law was not permissive enough to develop a large scale urban development in the sub-urban areas of the SMR. The government had to revise the Law to allow urban development on dominantly agricultural areas, and also to increase the supply of developable land beyond the greenbelt.

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CHAPTER FOUR

Transportation Policy in Seoul

Kee-Yeon Hwang

Introduction

Seoul has earned a notorious reputation for its severe traffic congestion. In order to mitigate the congestion problem, the transportation policy of Seoul Metropolitan Government (SMG) has mainly focused on the supply of transportation systems such as the construction of new urban freeways and subway lines until the early 1990's. However, after 1993, the SMG has approached traffic problems from different angles in response to the limitation of the past transportation policy to solve the traffic congestion. These include transportation demand management (TDM) and the improvement of service quality of public transit systems in Seoul. The policy concern shifted from the transportation system to the users. In 1995, another important policy alternative was introduced in the policy items, namely, the green transportation, which places an emphasis on encouraging walking and cycling.

The purpose of this paper is to discuss the traffic problems and policy responses in Seoul. This paper consists of three parts. First, it will discuss the changes in transportation environment, which led to the current problems. In this part, the population and transportation characteristics in Seoul will be reviewed. Second, it introduces the policy goals and objectives of SMG. Third, it discusses the specific policy alternatives to solve the problems.

Transportation Environment in Seoul

Population and Daily Trips

Seoul, which is over 600 years old, is a very densely populated city. A population of 10.6 million resides within the area of 605 km², among which the area of 374.5 km² for human activities. The roadway system of Seoul has a radial structure and, therefore, induces heavy traffic congestion in the central part of Seoul. Over 25 percent of total trips commute toward the CBD. Around 6 percent of total trips is through-traffic, just passing through the central area.

The population of Seoul increased continuously over the last 25 years until it peaked in 1995 (Table 4.1). The number rose from 5.4 million in 1970 to 10 million in 1995. As people started to move out to newly built satellite cities in 1990, the residential population went down to 10.4 million in 1996. The Seoul Development Institute (SDI) predicts that the population will diminish to 9.8 million in 2006 (SDI, 1998). On the other hand, the rate of employment has been increasing continuously, which implies that the movers to satellite cities still commute to Seoul for work. SDI predicts that the number of employment in Seoul will grow up to 6.2 million in 2006 in spite of the decline in the residential population. This trend implies that Seoul will have more long-distance commuters in the future.

Table 4.1 The trends of residents and employment

	1970	1980	1985	1990	1995	1996	1997
City residents(in million)	5.4	8.3	9.6	10.7	10.59	10.4	10.3
Employment(in million)	-	-	2.9	4.5	5.0	5.07	-

Source: Seoul Metropolitan Government, 1998a

The number of daily trips increased over four times from 1970 to 1995 (Table 4.2). It jumped from 5.7 million in 1970 to 27 million in 1995. The number has been increasing steadily due to the continued growth of both vehicle ownership in the Seoul region and long-distance commuters from satellite cities. While the average daily trips per person were 2.29 in 1990, it jumped to 2.62 in 1997. This increase is related to both car-ownership increase and tripled household income during the period between 1985 and 1995.

Table 4.2 The trends of daily trips

	1970	1980	1990	1995	1996	1997
Daily trips(in million)	5.7	12.6	24.6	27	27.7	27.2

Source: Seoul Metropolitan Government, 1998d

Roadways and Traffic Conditions

Roadways

The total length of roadway in Seoul was 7,689 km in 1996 (Table 4.3). The length of two-way streets, where the width is wider than 12m, came to only 1,590km. It is only 20.5 percent of the total length. The street with over 12m width is 42.7 km2, 57% of the total, and the roadway ratio is about 20.42% in 1997 which is somewhat lower than those of the major cities in other countries.

Table 4.3 Roadways

Year	Length (km)	Area (km²)	Paved road ratio (%)
1990	7,427	69.3	18.5
1995	7,675	74.4	19.85
1996	7,689	75.6	20.19
1997	NA	NA	20.42

Source: Seoul Metropolitan Government, 1998a

The Olympic freeway, the Inner Circle Ringroad, the Riverside freeway and the Dongbu freeway are the backbone of roadway systems in Seoul. The total length of these four freeways is only 177km

out of 7,689km of total roadways in Seoul. Thus, they are heavily congested in all sections throughout the day. It seems that the current roadway network in Seoul is insufficient to sustain massive amounts of traffic volume. Because of insufficient land supply and high land prices, however, it is financially infeasible to build new roadways to the extent that completely mitigate the traffic congestion in Seoul. A signal operation system is essential to road efficiency. However, Seoul's signal operation system does not respond automatically to traffic volumes. Instead, it is actuated to predetermined cycles.

Road traffic conditions

Traffic conditions in Seoul were without serious congestion until the early 1980s, except during rush hour periods. The traffic patterns were changed from rush-hour peaks to all-day peaks by the end of the 1980s after the Seoul Olympics. The traffic speeds on major arterial roads continued to decline until 1996 and started to bounce back since 1997 (Table 4.4). This trend was the result of significant changes in Seoul's traffic environment. First, the economy started to slide in 1997 due to the national economic crisis; also, there was a 30 percent increase in oil price as of December 1997 (SMG, 1998b). Second, passenger vehicle drivers using Namsan 1 and 3 tunnels linked to the CBD have been charged 2,000 won (US $1.80) congestion fee since November 1996. As a result, the 1998 speed survey recorded a drastic improvement in the traffic speed on the roads. The sudden improvement is associated with the sharp increase of unemployment rate caused by the Korean financial crisis of 1997.

Table 4.4 The trend of travel speed changes (unit : km/hr)

		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Passenger cars	All	32.60	24.22	24.57	22.62	23.53	23.18	21.69	20.09	21.06	25.41
	CBD	18.70	16.40	17.66	19.28	19.97	20.04	18.25	16.44	16.85	17.72
	other	37.17	25.78	21.89	22.87	23.79	23.40	21.93	21.23	21.33	25.90
Bus		18.60	18.80	18.15	16.88	17.02	18.42	18.79	18.35	18.69	20.07

Source: Seoul Metropolitan Government, 1997b, 1998b, 1998c

The changes in road traffic speed are closely associated with the rapid increase in vehicle ownership and use. The traffic volumes on major arterials have increased continuously over the last ten years (Table 4.5). Especially, traffics crossing the administrative borderline of Seoul almost tripled during the period. The majority of them are long-distance trips, and therefore must have had a sizable negative impact on the traffic speed. Considering this tendency, the future transportation policy of Seoul Metropolitan Government should focus on dealing with these long-distant trips effectively.

Table 4.5 The trend of traffic volume on cordon lines (unit : 1,000 trips)

	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total	3,792	4,257	4,516	4,578	5,402	5,894	5,601	6,069	6,345
CBD	1,288	1,270	1,286	1,277	1,706	1,819	1,709	1,730	1,657
Han river bridges	1,394	1,562	1,541	1,611	1,721	1,763	1,804	1,906	1,927
Border-lines of Seoul	1,170	1,425	1,689	1,740	1,975	2,433	2,088	2,433	2,761

Source: Seoul Metropolitan Government, 1997a

Note: There is a slight difference in the amount of CBD trips in 1993 because we surveyed trips until 1992 from 06:00 hours to 22:00 hours but for 24 hours from 1993.

Main Travel Modes and Shares

Main travel modes

The trend of vehicle ownership was in line with the rapidly increasing trends of trips in Seoul. The number of vehicles increased from sixty thousand vehicles in 1970 to 207 thousand in 1980 (Table 4.6). There was a 3.5 times increase in vehicle ownership during the period. The number increased more rapidly since the late 1980s. They reached one million in January 1990. There was a 5.7 times increase in vehicle ownership in the last ten years. The yearly growth rate has been decreasing since 1990. However, the total number still keeps rising. In 1997, over 2.2 million vehicles were registered in Seoul. They quickly pushed us into the era of automobiles.

Table 4.6 The trend of vehicle ownership

	1970	1980	1990	1995	1996	1997
The total number of vehicles(in thousand)	60	207	1,193	2,043	2,168	2,249
Passenger cars(in thousand)	18	99	883	1,595	1,704	1,698
Vehicles per 1000 Population	10.9	24.7	109.4	192.8	-	216.5
Vehicles per 1000 hhold	54.7	112.4	358.4	592.5	-	642.7

Source: Seoul Metropolitan Government, 1998a
Note: In 1998, the number decreased by 50 per day because of the Korean financial crisis.

The city of Seoul includes two urban rail systems; subways and urban rails (Table 4.7). The Seoul Metropolitan Government is fully in charge of the subway system construction. The Seoul Metropolitan Subway Co. (SMSC) is in charge of #1-4 subway lines and the Seoul Metropolitan Rapid Transit Co. (SMRTC) operates #5-8 subway lines. In 1997, the Seoul subways consisted of 4 routes with 133km in length, while the Metro-rails were comprised of 3 routes, 83.5km in length. In addition to the subways, 57.3 km of Korea-Rails are served within the city boundary. They are constructed and operated by the Korea National Rail Company. The subway congestion during rush-hours reaches on average 207% of its capacity and the peak hour headways are set 3-5 minutes. The subway fares are bi-level by the sections, 450 won and 550 won per ride for each section, and about a 10% discount

Table 4.7 Subways and urban rails within Seoul (1997)

Seoul Subway	Korea-Rail company		
	SMSC	SMRTC	
Length(km)	133	83.5	57.3
Construction Period	'71 ~ '96	'90 ~ '96	Korea-Railswas
No. of Station	114	83	constructed by
No. of Train	1,944	83	Korea National Rail

Source: Seoul Metropolitan Government, 1998a

rate is applied for 5,000, 10,000, 20,000 won tickets. There exist no weekly, monthly, and daily free-use tickets.

Seoul's bus system consists of company buses and community buses (Table 4.8). The total 89 private bus companies operated 398 routes with 8,655 vehicles in 1997. The bus industry started declining from 1996 in size. In 1997, the company buses consisted of 3 different types: 6,399 regular buses, 1,960 deluxe buses, 296 city-circular buses. The fares per ride varied by the type; 450, 1,000, 450 won respectively. There were no periodic tickets and transfer discounts, but 5% discount was given when purchasing the Bus Card. While the company buses decreased, the community buses increased. In 1997, the total 232 community bus routes operated with 1,260 vehicles and the average route length was 7 km. The fare was 300 won per ride. For securing the right of way for buses, 242.8 km bus-only lanes have been implemented since 1992.

Table 4.8 Private bus operation system

		1985	1990	1995	1996	1997
Company Bus	No. of Route	348	379	460	448	398
	No. of Bus	8,301	8,283	8,725	8,725	8,655
	No. of Company	90	90	89	89	87
Community Bus	No. of Route	-	112	Na	na	232
	No. of Bus	-	446	Na	na	1,260
Bus-only lane (km)		-	-	161.4	228.5	242.8

Source: Seoul Metropolitan Government, 1997c, 1998a

There were 69,635 taxis in 1997, which consisted of 23,187 company taxis and 46,448 private taxis. The private taxis included 4,652 deluxe taxis. The supply of taxi was restricted to 70,000 vehicles. Currently, customer-in-taxi running ratio is 70% out of total running km on average. Therefore, it is still not easy to catch a taxi in Seoul. The fare of regular taxi is 1,300 won up to 2 km, and it increases by 100 won every 210m and increases 100 won per 51 seconds when running under 15km/h. On average, customers pay 3,500 won for a 6km ride.

The fare of deluxe taxis is 3,000 won up to 3km, and increases by 200 won every 250m and 60 seconds.

Mode share

Overall, the number of bus and taxi passengers is declining, in contrast to that of the subway and other passenger vehicles (Table 4.9). For the first time in 1997 the subway was found the most predominant travel mode in Seoul, accounting for 30.8 percent of the mode share. Until 1996, buses were the most frequently used travel mode in Seoul. The share of buses has kept declining because of both worsening road traffic congestion and expanding subway services. Taxis serve 10.1 percent of person trips in 1997, but the share has been decreasing continuously. Other vehicles include two-wheeled vehicles, rental vehicles, and passenger cars. A sharp increase of passenger car share between 1995 and 1996 was found by new O-D survey results conducted by the Seoul Development Institute in 1996. It is noticeable that in spite of the heavy investment on subway construction, it only contributed to the reduction of bus passengers without reducing auto vehicle uses.

Table 4.9 The trend of mode share changes

	1980	1985	1990	1995	1996	1997
Buses	66.0	58.0	43.3	36.7	30.1	29.5
Subways	7.0	14.0	18.8	29.8	29.4	30.8
Taxis	19.0	16.5	12.8	10.7	10.4	10.1
Others (Pass. Veh)	8.0(NA)	12.5(NA)	25.1(14.0)	22.8(14.5)	30.1(21.1)	29.7(20.6)

Source: Seoul Metropolitan Government, 1998d

Note: In subway case, transfers among different lines were counted as another independent travel.

Transportation Policy in Seoul

Goals and Objectives

Traffic conditions in Seoul will continue to become worse. The travel demand is expected to increase continuously, if the economic crisis is overcome successfully in the near future. The number of vehicles is expected to reach 3 million in the early 2000s, and the vehicle per one thousand household will reach 810 vehicles in the early 2000s from 593 vehicles in 1995.

The rates of trip generation will keep growing because economic, social, and leisure activities are expected to increase in the region. People will be more attracted to private transportation modes because they prefer more convenient and comfortable trips. Furthermore, they will prefer faster public transportation modes because time will become an increasingly important factor. The schedule of the second-phase subway construction was delayed until 1999 (planned in 1996). The plan for the third-phase subway construction is still in progress. Thus, the public transport capability will be insufficient in the near future.

To respond to future transportation problems in Seoul, SMG established policy objectives in five parts. They are; 1) promoting public transit use, 2) transportation demand management (TDM), 3) improving traffic flow and pedestrian environment, 4) solving parking problems, and 5) continuous investment on transportation infrastructure. Details for each part are summarized in table 10.

Ultimately, SMG targets to make transit modes in charge of 75 percent of total trips by 2001:

- Subway mode share : 29.8%('95) → 40.0%('98) → 42%(2001)
- Bus mode share : 36.7%('95) → 31.8%('98) → 31%(2001)

Also, SMG aims at decreasing the use of private cars by shifting automobile demand to public transit modes, and to guarantee a proper travel speed on street.

- Amount of trips by private autos: 60% of total trips ('95) → 50%('98)

- Travel speed of buses: 18.8 km/h ('95) → 20km/h ('2001)
- Travel speed of private autos: 18.25km/h ('95) → 22km/h('2001)

Table 4.10 Transportation policy objectives and directions

Policy Objective	Policy Direction
Public Transit Promotion	• Bus Service Quality Improvement
	• encouraging subway use & improve safety
	• upgrading taxi service
	• intermodality among public transit modes
Infrastructure Investment	• finish 2nd phase subway construction by 1999
	• start 3rd phase subway construction in 1999
	• finish 1st circular urban hwy by 1999
	• continued investment on arterial roads
Flow & Pedestrian Improvement	• TSM & ITS
	• pedestrian-first policy, improving bicycle use
Improving Parking Problem	• supplying Suburban Park & Ride facilities
	• reducing parking supply in congested area
	• reducing residential area parking problems
TDM	• reducing travel demand using pricing measures
	• goal-oriented TDM implementation
	• continuous public campaign

Source: Seoul Metropolitan Government, 1998e

Improving Mass Transit Systems

Subway expansion and service improvement

The SMG plans the second-phase subways with the length of 145km to be completed by 2001. At the end of 1997, 98.5km of the second phase subways were opened. The SMG is expected to spend 7.6 billion US dollars (based on 1998 foreign exchange rate) for building the 2nd phase subways. The third-phase will start from 2003. According to the plan, it will introduce new light rail transit system and express services. In terms of financing, SMG will seek for private fund from all over the world. For service improvement, SMG plans to provide more

accommodation facilities, user information system, escalators, and elevator guide system for the disabled. In order to increase the use of subways, the SMG will provide more Park & Ride facilities from the current 21 places, 4700 lots to 61 places, 28,700 lots, and ten multi-mode transfer centers.

Bus service reform

The SMG plans to keep current private bus system, but to reorganize the bus route systems, and to support private bus companies for securing better quality services. The support for bus companies include long-term loans for bus replacement, direct subsidies to deficit-ridden companies, the introduction of semi-public firms, and the sale of firms to a third party, etc.

In addition, SMG plans to reduce long-distance and curved bus routes, to increase the number of community buses and city circular buses, and to replace old buses with air-conditioned ones. To improve the carrying capacity and speed, exclusive bus lanes will be increased from 37 routes of 154km to 64 routes of 270km by 1998, and central exclusive bus lanes will be made on highly congested arterials.

To allow for convenient transfer between buses and subways, the SMG plans to integrate different fare collection systems into one by using smart card system. The use of a common stored value fare card for subways and buses can facilitate the use of public transport. For instance, this facilitates transfer between public transport modes and offers fare discounts when a commuter uses a combination of transport modes. Most integrated fare systems require a very high degree of organizational integration between the participants because the fare structure and fare levels need to be set centrally, and there is a degree of uncertainty in the allocation of revenue. The Integrated Fare Media will attract more customers from auto-vehicles. It will resolve the problem of over-charging on transfer passengers and inconvenience of purchasing new tickets for every transfer between bus and subway in Seoul. Also, if time-varying fares can be charged on the basis of in-vehicle congestion, it can easily distribute peak-hour demand to less congested periods and save the budget of purchasing more subway trains.

To improve customer services, a bus arrival information system was tested in 1997. To secure consistent high quality services, the city

is evaluating the service quality of each bus company based on the results of customer survey and service monitoring. Based on the evaluation, it plans to vary the amount of government support to be given to bus companies.

The reformation of taxi

To provide convenient and comfortable taxi services , the city plans to increase the deluxe taxis from 4,652 vehicles at present to 20,000 vehicles, and to keep increasing the fare of regular taxis, and expand the Call System to all the taxis. As a result, the share of passenger mileage is expected to drop from 70% in 1997 to 60% in the near future. In addition, to prevent illegal taxi stops and drops near subway station, and to improve subway station accessibility, the diverse taxi systems are under consideration, for instance, route taxis, van taxis, and so on. For keeping qualified drivers in the industry, SMG will invest on building a welfare center for taxi drivers. The taxi supply will be controlled below 70,000 vehicles. However, it is necessary that the call-only taxis be licensed unrestricted by the supply limit. They would have minor impacts on road congestion and serve citizens after the mass transit services stop.

Transportation Demand Management

In Seoul, the share of private autos accounts for 60 percent of the total volumes on streets, but they take charge of only 20 percent of the mode share. Because of the excessive private vehicle use, the total amount of social costs is estimated to be 2,400 billion won per year, consuming 2.9 billion liters of gasoline per year. The automobile use is responsible for 85 percent of the air pollution in Seoul. To encourage public transit use, the SMG considers that TDM should be combined with transit improvement simultaneously.

Namsan 1 & 3 tunnel congestion pricing

The SMG started charging, from November 1996, a 2,000 won congestion fee on 1-2 occupant private vehicles using Namsan 1and 3 tunnels, major arterials linking the southern part of the Han River with the CBD. The results of the year-long implementation show that the traffic volume has been reduced by 13.6%, and that the average vehicle speed has been improved by 38% from 21.6km/h to 29.8km/h

(Table 4.11).

Table 4.11 Traffic volume and speed changes in Namsan 1&3 Tunnel

	Daily Ave. during the tolled time period						
	before	Dec. 96	Change(%)	Jun. 97	change(%)	Nov. 97	change(%)
Volume	90,404	68,531	-24.0	77,377	-14.4	78,078	-13.6
Speed	21.6	33.6	55.6	35.5	64.8	29.8	38.0

Monitoring the situation of alternative routes , the congestion pricing scheme becomes more successful. While traffic volumes increased by 5.7%, the speed also increased by 15.5% (Table 4.12).

Table 4.12 Traffic volume speed changes in alternative routes

	Daily Ave. during the tolled time period						
	before	Dec. 96	Change(%)	Jun. 97	change(%)	Nov. 97	change(%)
Volume	13,059	13,912	6.5	15,215	16.5	13,798	5.7
Speed	24.5	27.4	11.8	28.5	16.3	28.3	15.5

Also, the number of carpools occupied by 3 or more persons (including the driver) during the peak periods increased remarkably. Before the congestion charge, the number of one or two passenger vehicles amounted to 68.5% of the total traffic volume of the two tunnels. However, they were drastically decreased to near 29%. According to the results disclosed thus far, the congestion pricing in Namsan 1and 3 tunnels is viewed as the most successful TDM measure conducted in Seoul thus far. Therefore, the city has plans to expand it in the other major congested arterials in the near future. For the expansion, the nonstop tollgate system was preconditioned. The technical proposals have already been submitted and evaluated. The selected systems have been tested since August 1996. This system will

not violate people's privacy, and it will be applied to the urban freeway ITS programs as well.

The employer-based TDM program

This program started in 1995, and its objective was to reduce Traffic Impact Fee (compulsory tax levied on large size building owners) by over 20%, if employers (or building owners) implement TDM programs, and reduce travel demand over 20%. It is similar to the Regulation XV program applied in Southern California, USA. The difference between the two programs is that Regulation XV imposes a penalty for the non-fulfillment, but the program in Seoul decreases traffic taxes for participating companies. The programs which can get discounts when implemented are paid-parking, 10 buje(reject parking when the late digit of number plate matches the date), 5 buje(reject parking on Monday when the number plates ends 1 or 2) , 2 buje (reject parking on odd number days when the last digit of number plate ends with the odd number), carpool, commute buses, staggering work hour, and transportation allowance for public transit users. For each program, a different discount rate is applied, for instance, paid-parking would receive a 20% discount.

Introduction of local oil tax

The City plans to increase local taxes on the use of oil to control the excessive use (22 thousand km per car per year) of private cars. It is estimated that a 30% increase in oil price leads to 7% reduction in traffic volume (SDI, 1998). It has been requested by the public, that when the government changes the oil tax, the tax level differences among different types of oil be properly adjusted. Especially since the level of gasoline tax is twice as high as diesel, people tend to buy diesel cars, which emit more air pollutants. To persuade those groups that oppose the oil tax increase, the city is considering either reducing the burden of Automobile Owner tax or varying the level of automobile insurance by the running mileage.

Traffic Management

The improvement of traffic flow through TSM and Access Management is another spectrum of SMG transportation policies. Transportation System Management (TSM) projects have been carried out in 23 congestion-prone areas. A total of 24 Electronic Enforcement

Cameras are operating over bus exclusive lanes to secure uninterrupted bus flow. In the near future, an automatic signal system will be introduced on major traffic corridors, and FTMS (freeway traffic management system) has been operating on the Olympic-Freeway to provide timely traffic information to drivers.

The travel information system helps improve traffic flow on streets. TBS (Transportation Broadcasting Service) has been established in Seoul since the early 1990s. This radio station broadcasts diverse transportation-related services, such as traffic situation in major corridors, expert interviews on a specific transportation policy, and public campaigns on public transit use. According to a study, 84% of the drivers in Seoul listen to TBS for checking traffic situations on major corridors

To improve traffic environment on residential streets, block-based STM (Site Traffic Management) projects have been carried out in many residential blocks. Construction site traffic management and truck traffic management are also important policy measures to achieve traffic flow improvement on streets. In addition, access management techniques are popularly adopted to prevent access traffic to a building from interrupting traffic flow on the streets.

Pedestrian-Friendly Street

The green transport is a newly introduced policy concern of SMG in 1995. To improve the pedestrian environment and reduce traffic accidents in narrow streets, all the elementary school areas are designated by law as safety-related traffic improvement sites. Several commercial streets were designated as pedestrian-only streets to encourage commercial and cultural activities. In recent years, many underpasses have been replaced by street-level pedestrian crossings, and the first pedestrian-right-of-way street is now under construction in the CBD. The city of Seoul has enacted the Pedestrian-Code to encourage pedestrian-friendly projects.

160.2km was designated as bicycle lanes by 1997. However, the high rate of traffic accidents hinders pleasant cycling on the streets. Until now, cycling has been considered a leisure or exercise mode but not a commuting mode in Seoul. In order to encourage the use of bicycles, the city plans not only to build bicycle-only streets, but also to

supply bicycle-parking facilities near subway stations.

Parking Policy

The city government introduced the Parking Ceiling system in 1997. It will reduce the existing parking supply requirement from 20 to 40 percent for new commercial and office buildings to be built in congested blocks in downtown area. Instead of building more parking structure, the city has increased parking fees for public facilities almost every year to discourage parking demand. The price of supplying one parking space in Seoul is over 40 million won on average.

However, the residential parking space requirement will be reinforced to 0.7 lots for each household. By introducing the Residential Parking Permit program, all the road parking spaces in residential areas will be charged and non-residential vehicles are prohibited to park on residential streets. The government will eventually introduce the regulation requiring citizens to reserve parking spaces before they purchase their cars. In addition, the city plans to vary the public parking fares by parking demands, and to reduce on-street parking space gradually, and to expand paid-parking for all public offices in Seoul.

Road Construction

Road building is a key element of transportation policy in Seoul. Since roads with the width of less than 12m make up 80% of the total length, their carrying capacity is very limited. Therefore, SMG focuses on building more urban freeways. According to its plan, the length of urban freeways will be extended to 218.7km by 2005 from 150km in 1997. In addition, 4 more bridges across Han-river will be built by 2005. Since through-traffic will mainly use these new freeways, the local streets and arterial will be redesigned for both access traffic-friendly and pedestrian-friendly streets.

In addition, networking among freeways and major traffic corridors will be another important aspect of road construction in Seoul in the coming age. We found that simply extending the length of roads would not guarantee easy traffic flow on a traffic corridor, and that convenient linkages among different levels of road systems can easily improve the road capacity with less costly investment.

Concluding Remarks

The old city of Seoul is not entirely planned, but it is a naturally formed city centering on the downtown area. Seoul's radiated structure is a hindrance to overcoming traffic problems. Since 1988, when the Seoul Olympic was held, the number of vehicles has increased rapidly. Consequently, the traffic condition has been continually worsened. Since the late 1980s, the city government has prepared comprehensive transportation plans. However, these were not sufficient. The traffic conditions will become worse until the subway and urban freeway construction planned for 2005 is completed.

Seoul is such a highly populated city with a large amount of daily traffic. The SMG has to focus more on encouraging the use of public transportation and TDM Policies. More infrastructure investment, control of urban sprawl, technology development and more citizen participation in policy development are necessary for Seoul to become the central city of Northeast Asia.

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CHAPTER FIVE

New Industrialization in Seoul: Industrial Restructuring and Strategic Responses

Chang-Ho Shin and Chang-Heum Byeon

Introduction

The Korean economy has been forced to change fundamentally in the last two decades. From an economic perspective, regional economic blocks such as the NAFTA and the EU were established, forming a 'new order of world trade.' From a technological point of view, the progress and diffusion of information and communication technology (ICT) has exerted pressure to restructure industrial organizations. Domestically, the 'three lows' favorable market conditions (low foreign exchange rate, low interest rate, and low oil prices) which began in 1986, the subsequent depression, and the labor movement that followed along with the democratic movement in 1987, made the restructuring of industrial structures inevitable. Therefore, the late 1980s was a transitional period, completely different from other periods in terms of industrial organizations and spatial landscapes.

The Seoul Metropolitan Area (SMA), consisting of Seoul, Incheon and Kyonggi, was heavily impacted by these changes. The characteristics of industry restructuring in the late 1980s include the acceleration of technological development and automation, growth of high-tech industries, decline of labor-intensive industries, and the trend toward the division of labor through subcontracts between large firms and small and medium-sized firms. Until recently, local governments in Korea were not able to actively participate and influence local economies as active agents. It was due to the fact that the central government had the exclusive authority to influence and make decisions regarding the national industrial policies. But as local autonomy

developed in the 1990s, local industrial policies have begun to emerge, aiming to revitalize regional economies and to recover the competitiveness of local industries. In the context of these changes, this paper evaluates the industrial restructuring and the policy responses of the Seoul Metropolitan Government (SMG) since the 1980s. On this basis, new issues for the industrial development of Seoul are raised.

Trends and Prospects for Industrial Structural Changes in Seoul

Industrial Restructuring since the 1980s

Since the 1980s, the world economy has been confronted with major changes including the development of ICT, intensification of global competition, and constantly changing consumer preferences. These new conditions imply both challenges to overcome and opportunities to be taken by all firms. Firms have responded by restructuring, in terms of industrial location, corporate organizations, and labor relationships. The regime of flexible accumulation of capital can be understood as an interpretation of the restructuring. (Scott, 1988)

Korean firms are restructuring to adapt to the new conditions of the global economic environment by increasing flexibility of the corporate structure. Diverse measures include increases in R&D investment, introduction of automation facilities, attraction of foreign investments and capital, specialization of corporate organizations, and increased utilization of part-time employees.

First of all, as technological development became an essential element to survive in the competitive global market, the size of investment and the number of related organizations are increasing rapidly. Fortunately, SMA has several advantages over other domestic regions in many aspects, such as availability of physical and social infrastructure to access high quality workforce and necessary information. As a result, SMA became a concentrated center of technology-intensive industries, and establishment of new, technology-intensive firms are far more active compared to other regions in Korea.

Both overseas investment and introduction of foreign capital have been increasing. Many firms in SMA have been turning their eyes

overseas to avoid high wages, strong labor unions, and regulation of location. The firms compelled to relocate their factories outside SMA by regulation tend to prefer China or Southeast Asia to other regions in Korea. On the other hand, the introduction of foreign capital intends to recover the international confidence of domestic capital, or to secure liquidity. SMA became a target area of foreign capital preferred over other regions in Korea.

After the fierce labor movements in late 1980s, firms in SMA have been utilizing labor force as a means of increasing flexibility. Subcontracting, use of temporal employment and dispatched workforce, and automation of manufacturing facilities are typical means to increase flexibility. Subcontracting was utilized to transfer the burden of external costs to subcontracting firms. Use of temporal employment and facility automation increased, particularly after the Foreign Exchange Crisis in the late 1990s, to reduce labor costs and to increase flexibility of corporate organization.

The most remarkable characteristic of the industrial restructuring in the SMA was the rapid growth of industries benefiting from the agglomeration economies of the metropolitan area. Even in the 1970s, it has been commonly regarded that in a metropolitan area, manufacturing is the primary industry and service is only a secondary industry. However, metropolitan area was not an ideal location for manufacturing, which caused externalities such as congestion, high land prices, and environmental pollution.

In the 1990s, ICT and cultural industries based on abundant human resources, infrastructure, and cultural facilities began to emerge as leading industries for metropolitan regions. Reflecting these changes, agglomerate economies of the metropolitan regions were reevaluated as generative powers that lead the national economy. It was during this period that the engine that sustains the prosperity of the American economy was believed to be ICT clusters, one of the leading examples being the Silicon Alley in New York.

Restructuring of Manufacturing Industries

As the leading region of the Korean economy, Seoul's industries have been most sensitively responding to changes in domestic and international economy. Accordingly, manufacturing industries in Seoul facili-

Table 5.1 Total number of establishments and employees, SMA

Industry Classification	1981		1991		1999	
	Number of establishments	Number of employees	Number of establishments	Number of employees	Number of stablishments	Numberof employees
Primary Industry	49 (0.0)	2,015 (0.1)	87 (0.0)	6,063 (0.2)	57 (0.01)	1,373 (0.04)
Secondary Industry	53,527 (14.9)	725,132 (30.5)	90,509 (15.5)	1,136,899 (30.8)	68,395 (9.9)	573,189 (17.0)
Tertiary Industry	303,059 (83.1)	1,243,677 (69.6)	486,943 (84.5)	2,200,564 (69.3)	621,753 (90.1)	2,793,090 (82.9)

Source: Korean National Statistical Office, *Census of Basic Characteristics of Establishments*, 1981, 1991, 2006.
Notes: Percent in parenthesis.

tate development of all Korean industries. During the last two decades the ratio of manufacturing in terms of the numbers of establishments and employees has substantially declined. The number of manufacturing establishments increased from 53,527 in 1981 to 68,395 in 1999, but its share in total industries in Seoul declined remarkably from 14.9% in 1981 to 9.9% in 1999. Meanwhile, the number of employees declined from 725,132 in 1981 to 573,189 in 1999. The ratio of manufacturing employees to all employees decreased from 30.5% in 1981 to 17.0% in 1999.

It is better to examine phases of manufacturing in Seoul in the larger context of different stages of Korean manufacturing industries. In the 1960s and early 1970s, Korea's manufacturing transformed its structure from export-driven light industry to heavy industry with emphasis on heavy chemical industry. During this period, industries in Seoul were focused on assembly manufacturing of electronic components and electric appliances with its technology and abundant labor force. The industrial center of Seoul was the Guro Export Industrial Complex.

During the 1980s, the focus shifted from heavy industry to hi-tech and other technology-intensive industries. Mass production with standardized technology has reached its limits, and a more flexible manufacturing method was required. While other regions in Korea adapted to these changes in the division of labor, Seoul's manufacturing failed to introduce new growth industries, and apparel, printing & publishing industries, meeting domestic demand, became key industries.

Industrial restructuring became more active in the 1990s, owing to the advance of ICT. Semiconductor, home appliances, and ICT equipment manufacturing industries gradually gained competitiveness in the global market, with Seoul playing the leading role. Seoul's manufacturing entered a new phase, with growth industries that were technology-driven, information-intensive, knowledge-based and composed of small-sized firms. On the other hand, traditional manufacturing industries, such as apparel manufacturing and printing & publishing industry, were seeking ways to adapt to the changing conditions brought by new technologies and demands with their complex production networks.

Today Seoul's manufacturing industry is facing both new crisis and opportunity. It is a crisis, in the sense that Seoul's leading manu-

facturing industries are still the traditional ones, - apparel manufacturing and printing & publishing industry - unprepared to face the global competition. In terms of the number of establishments and employees, the apparel and fur-article manufacturing industry made up 28.6% of total manufacturing in Seoul in 1999. Location quotients (which show that a region is specialized if higher than 1.0) of the number of establishments and employees were as high as 3.7 and 5.0, respectively. 73% of all printing & publishing industry establishments in Korea were located in Seoul, primarily composed of small and medium-sized firms located in Jung-Gu (district or borough), Jongno-Gu and Yongsan-Gu. Their share of the number of establishments and employees in total manufacturing were 18.1% and 19.7%. These two industries account for almost half of all manufacturing in Seoul, amounting to 46.7% of the number of establishments and 48.3% of the number of employees.

However, it is also an opportunity, since the number of new establishments in emerging growth industries based on ICT is increasing. Seoul is an ideal location for hi-tech industry, being the center of hi-tech research institutes, universities, and corporate headquarters.

Restructuring of Service Industries

While the manufacturing industry of Seoul has been declining, the service industry adapted to the new market conditions and grew continually. Table 5.1 shows that the number of service industry establishments in Seoul has increased from 303,000 to 622,000, a growth of 205% between 1981 and 1999, and the number of employees increased from 1,244,000 to 2,793,000, a 220% growth.

There are many reasons to this expansion of the service industry in Seoul. First, the demand for the service industry increased with rising income and demand for a higher quality of life. The growth of consumer services and social services fall in this category. Second, building a systematic, cooperative network among industries became more important, as the industrial structure became more complicated. The service industries encompassing finance, insurance, information, communication, distribution, and logistics, are responsible for this function. Third, the demand for service industries that sensitively respond to market demand newly emerged, as consumer preferences

diversified and became more complex. The functional differentiation of the manufacturing industry caused an increased demand for service industries, since firms began outsourcing functions that were formerly performed inside. Business service industries, such as management consulting, advertising, planning, engineering, and design belong in this category. These industries have even a stronger tendency to locate in Seoul.

The ratio of producer service in Seoul to the entire country is very high. In 2000, 80.1% of information processing and other computer related industries, 48.0% of professional, science and technical service industries, and 41.3% of finance and insurance service industries in terms of total number of employees were in Seoul.

Growth of New Industries

The most remarkable transformation in Seoul's industries took place during the Foreign Exchange Crisis in 1997, when only the firms with competitiveness survived and prospered, adopting new technologies and responding to consumers' demands. In particular, new "venture firms," supported by government policies, became synonymous with new industry. At the end of July 2001, 10,431 venture firms were registered at Korea Small & Medium Business Administration. The number grew rapidly from 2,042 in 1998, 4,934 in 1999, to 8,798 in 2000. 7,601 firms (72.9%) of all venture firms are concentrated in SMA, and 4,909 firms (47%), are located inside Seoul. The number of new venture firms in SMA, as well as their share, is increasing each year.

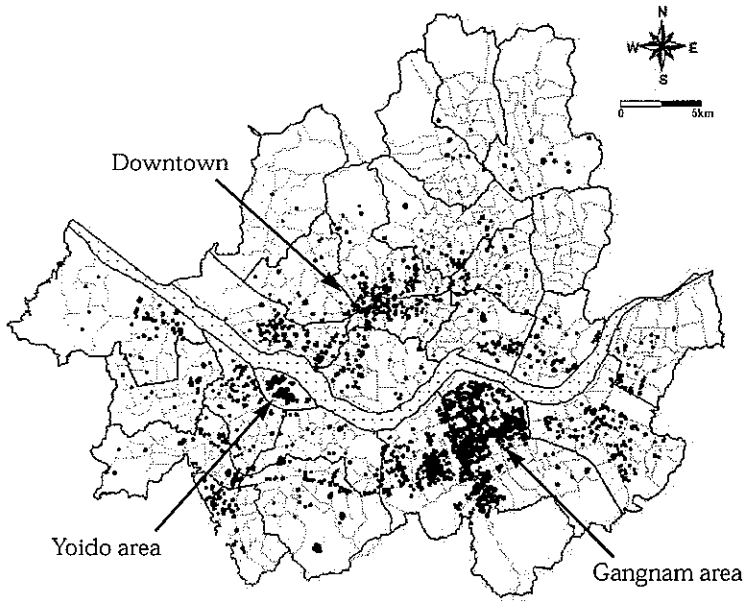
As for the types of venture firms in Seoul, general manufacturing, classified between "SIC21 (Standard Industrial Classification)" and "SIC29" accounts for only 36%, while information processing and other computer related industries, classified as "SIC34" are responsible for 57%. By districts, the southeast part of Seoul, including Gangnam-Gu, Seocho-Gu, Songpa-Gu, and Gangdong-Gu, accommodates 57%, whereas the southwest part containing the Guro Industrial Complex houses only 21%. This shows that the Gangnam (southeast part of Seoul) area is the incubator and center for new industries.

This fact is confirmed by start-up business statistics. According to the 1999 data, the number of newly established firms in southeast part of Seoul accounts for 46% of total, while only 15% located in the CBD.

In 1987, 23.8% of new firms were established in the CBD, and only 22.9% in the southeast area. It shows that Gangnam area grew rapidly as the center of new growth industries. Gangnam area offers sound communication infrastructure, access to convenient transportation networks, and presence of corporate headquarters, which are the major customers.

This locational disequilibrium can be observed in the new industry data. By 1999, the number of firms in the ICT industry was 30,596, and the number of employees reached 552,121. These firms tend to cluster in a few areas, with Yeoksam-dong and Seocho-dong being the most heavily concentrated area followed by Yoido, (center of broadcasting and financial institutions) Jongno & Jung-Gu(CBD), and Guro area (the traditional manufacturing area). Most firms in these clusters are service and contents based, except in Guro area, where ICT manufacturing firms are located. All of these areas are served by the Subway Line #2, and have easy access to office space, support services, and universities.

Figure 5.1 Spatial distribution of ICT enterprises & support facilities



Note: Each dot denotes an ICT enterprise or a support institution.

The cultural industry displays a similar distribution. It includes motion picture, broadcasting, performing arts, and entertainment industries. According to 1999 data, there were 32,499 firms employing 158,055 workers in cultural industries. Looking at the distribution by ward, Gangnam-Gu contains 7.8% of total number, followed by 6.9% in Jung-Gu, and 6.4% in Seocho-Gu.

Seoul's Policy Responses to Industrial Restructuring

Constraints to the Industrial Policies of Seoul Metropolitan Government

In the last four decades, the prosperity and decline of local industries have depended upon the policies of the central government. Local industrial policies have not been developed by local autonomies, but were regarded as a subset of the national industrial policies administrated by the central government. The central government considered the entire nation as a 'single production base', and believed that local industrial and spatial structures could be modified to increase the efficiency of production, regardless of the willingness of the local autonomies. Both the "Five-Year Economic Development Plan," which began in 1962, and the "Comprehensive National Territorial Plan," which began in 1972, can be understood as a means of restructuring strategies for industrial and spatial structures by the central government for the growth of Korean capitalism.

At the same time, population-control policies have been implemented in Seoul since the 1960s. Seoul has always been the dominant center of industrial activities, and it was regarded that the industries in Seoul should be relocated for a balanced development of all regions. Related policies include "Population Control Policies in the Metropolitan Area" in 1964, "Principal Regulation against Population

Increase in the Metropolitan Area," "Industrial Placement and Factory Construction Act" in 1977, and "Seoul Metropolitan Readjustment Plan," in 1984. In the 1990s, public policies shifted toward regulating 'total quantity,' instead of individual entities. All of the above policies discouraged new establishments that might induce population from locating in Seoul. Seoul's industrial policies are focused on overcoming two limitations mentioned above, adapting the central government's industrial policies to fit in the local context.

Expanding Support for Existing Small and Medium-Sized Firms

Korea's industrial policies in the past have focused on supporting large corporations that can develop world-class products and employ large numbers of workers. However, in today's economy, small and medium-sized firms play a much bigger role, both in terms of competitiveness and employment. Globalization and the development of ICT imply that enterprises have a more diverse choice of location, and the local governments have to make efforts to improve the business environment to retain firms in the local area and to attract outside firms. Diverse industrial policies to improve the business environment for small and medium-sized enterprises include support policies for industrial location, technical and management support, financial support, human resource support, and marketing support.

Support for industrial location

The policies supporting industrial location in Seoul can be categorized into ones that provide low-rent space for established manufacturing companies, and those that provide necessary office space for new start-ups. To secure more space for established manufacturing companies, SMG supports building apartment-type factories and remodeling of existing factories. Apartment-type factories were promoted to retain space for city-based factories without sacrificing city environment, and to provide employment opportunities for local residents. SMG aids facility improvement up to 75% of land and construction costs through the Small- and Medium-sized Enterprises Support Fund. In addition, 50% of acquisition and registration fee is waived for construction agencies, and 50% of property tax and comprehensive land tax is waived for new tenant companies.

New start-ups and venture companies utilizing new technologies require a different kind of workspace and support in different developmental phases. SMG responded by establishing the Seoul Business Incubator and Seoul Venture Town, providing differentiated office space and support. The Seoul Business Incubator assists potential entrepreneurs and new firms, who have ideas and technology but are having difficulties with commercialization. The center, a renovated city-owned building, was founded in 1995, and had been managed by Seoul National University. (From November 2001, it is managed by SIPRO, Seoul Industry Promotion Foundation) Many Gu (ward) governments are establishing similar business incubators. Since 1997, 14 out of 25 Gu governments have established and are managing business incubators.

The Seoul Venture Town was established to provide low price and convenient office space for new venture firms. It is located in the center of the Seoul Venture Valley in Gangnam-Gu, (also called Tehran Valley) where the largest number of venture firms is clustered. This building not only provides office space, but also attempts to maximize benefits from clustering through mutual competition and cooperation. The tenant companies produce synergy effect by resolving problems and developing technologies cooperatively.

Management and technology consulting for small and medium-sized firms

While large companies readily receive management consultation and necessary specialized technology, newly established small and medium-sized firms need public policy support. In addition, they need different types of support at each stage of development. SIPRO was established in 1998 by SMG to systematically support small and medium-sized firms. Seoul Industry Support Center (SISC), the key component of SIPRO, provides a total support system, combining management, technology, finance, and personnel services. In addition, SIPRO consists of many other affiliated organizations including the Seoul Animation Center, the Seoul Fashion Design Center, Seoul Venture Town, the Seoul Business Incubator, the Exhibition Center in Jamsil and Chang-dong, and the Seoul Printing Industry Support Center.

The Seoul Animation Center was established to provide comprehensive support for the cartoon and animation industry. It offers support for animation production, cartoon and animation art planners

and creators, expanding popular understanding of the cartoon and animation industry, and strengthening international competitiveness of the Korean cartoon and animation industry. The Seoul Fashion Design Center was established to support and promote the fashion industry as a high value-added industry with international competitiveness. Key departments include fashion information office, fashion planning office, design developing office, business consulting office, and exhibition hall. The Seoul Printing Industry Support Center will support publishing and printing industry firms. It will provide comprehensive services including space for information exchange and cooperative exhibition. This center is located in Jung-Gu, where related industries are agglomerated, and will be operated by the private sector.

SMG also supports the consortiums in which firms, universities, and research institutes participate cooperatively to share the risks in developing hi-tech products. The consortiums receive the support through matching fund. Small and Medium Business Administration provides 50%, Seoul Metropolitan Government 25%, and the member firms of the consortium invest the remaining 25%. SMG took the initiative in 2000 starting with four consortiums, and in 2001, thirteen consortiums are participating in the program.

Financial support for small and medium-sized enterprises

SMG provides public fund and credit guarantee to encourage development of new start-ups. Of the 492,800 million Won raised by the Small Business Support Fund between 1965 and 2001, 1,221,900 million Won was provided to 5,179 companies as operations fund and to 1,639 companies as facility fund. More recently, eligibility to receive this fund has been expanded to include fashion, software, animation, design, and traditional art & crafts industries.

The Seoul Credit Guarantee Foundation was founded in 1999 to supplement the small and medium-sized companies that did not fulfill conditions to qualify for mortgage loans. This foundation also provides management consultancy services for these firms.

Marketing support for small and medium-sized enterprises

With increasing competition, marketing is a critical factor for the success of a company. Yet, unlike large corporations, small and medium-sized companies have limited market outlets, and therefore need more

Table 5.2 Support system for strategic industries of seoul

Stages	Financing	Marketing	Technology and Information	Office Space
Start-up	Seoul Credit Guarantee Foundation	Run trade show centers for small business products	Seoul Business Incubator Seoul Incubator Support Center	Seoul Business Incubator Start-up Center operated by Ku(ward)Office
Venture	Small Business Support Fund Connect small business to angel and/or venture capitalists	Export assistance program Run trade show centers for small business products	Seoul Venture Network Seoul Business Network	Seoul Venture Town Venture company cluster district
Matured	Seoul Credit Cyber Market Guarantee Foundation Small Business Support Fund	Cyber Market Mall Carry out trade mission Hold international exhibitions	Support Joint Technology Development by Industry and Academia Seoul Business Network	Quasi-Industrial Complexes

Source: Seoul Metropolitan Government, *The Economy of Seoul*, 2001.

diverse marketing routes. SMG provides following marketing supports for small and medium sized companies.

First, showrooms for exhibition of small and medium-sized company products are now in operation. These showrooms display and promote products manufactured by the small and medium-sized companies. SMG manages showrooms in Jamsil, Yoido, and Chang-dong.

Secondly, SMG supports developing and sustaining new markets abroad. Such support includes partially financing business trips which small and medium-sized companies make to participate in international exhibitions and to dispatch pioneering teams to create international marketing connections. In addition, training trade techniques, producing product catalogs, developing product designs, and market-

ing are few of the assistance services that SMG provides for small and medium-sized enterprises.

Thirdly, an up-to-date database of industries in Seoul is constructed to promote the small and medium-sized company products and to stimulate foreign capital investment. Such support is expected to provide information on industries in Seoul and accelerate trade of small and medium-sized company products through e-commerce.

The following table shows Seoul's industry support strategies.

Nurturing New Industries and Establishment of Strategic Industrial Area

Culture, multimedia, entertainment, and ICT in Seoul experienced rapid growth since 1990. The growth of these industries was due to benefits from Seoul's urbanization economies, as well as strategic assistance of SMG. SMG has made efforts to nurture new ICT industries in a systematic manner, in response to the declining manufacturing industries. One of the efforts was to nurture specialized local industries of Seoul, classified as Seoul's strategic industries. These industries are urban in nature, and are currently growing industries in Seoul.

A variety of policy measures to support Seoul's strategic industries are implemented through the Seoul Industry Promotion Foundation (SIPRO), assisting firms in different stages of growth and in different industries. The services include personnel training, financial & marketing support, as well as management consulting. The Seoul Business Incubator and Seoul Industry Support Center provide support services to firms in different stages of growth. Seoul Animation Center, Seoul Fashion Design Center, and Seoul Printing Industry Support Center provide industry-specific assistance.

Providing space is at the core of this plan. Most policies of the central government focused on tax incentives and exemption from local regulations, by designating venture company-clustered office buildings as a 'cluster facility'. In 2000, 70% of 159 venture company cluster facilities is in Seoul and 70% of those is located in Gangnam-Gu and Seocho-Gu. The area designated by SMG to promote networking through clustering venture companies is called a 'venture-company promotion district'. Currently there are three 'cluster districts' in Seoul.

SMG's policies to support new industries in the past focused on assisting companies in naturally formed industry clusters, or by establishing supporting institutions. However, the Digital Media City (DMC) under construction is an exception, designed to become a planned hi-tech cluster.

The Limitations and Future Issues of Seoul's Industrial Policy

SMG's industrial policies in the 1990s increased in number and became more diverse, compared to previous periods when the central government controlled industrial policies. SMG has been trying to ease industrial location regulations in the metropolitan area that the central government has been enforcing for a balanced regional development, and to execute industrial policies reflecting regional characteristics of Seoul. However, the effectiveness of industrial policies has its limitations in changing the economic environment, and as industrial competitiveness and economic efficiency were over-emphasized, social, economic, and spatial equity became the key issues in Seoul. As the autonomy of local governments further develops, SMG's involvement in its regional industrial policy is expected to expand extensively. In this context, the limitations and prospects of SMG's industrial policy are presented below.

From Government-Initiative to Public-Private Partnership

In the past, most industrial policies were initiated by the government sector, with little, if any, by the private sector. However, local governments, in fact, do not have the capability to produce industrial policies. One of the main reasons is that as the central government performed this function exclusively in the past, there is no pool of necessary professional human resources. Since the mid-1990s, local governments' supporting programs for firms have been concentrated on establishing supporting organizations. Although there are many agents related to the regional economy such as firms, local governments, associations, research institutes, and universities, most of the supporting organizations were taking the form of foundations or associations affiliated or supported by SMG (Table 5.2). These organiza-

Table 5.3 Types and characteristics of industrial supporting organizations

Function	Organization	Time of Establishment	Type of Organization
General Industrial Support	Seoul Industry Promotion Foundation	1998. 3	Foundation
	Seoul Industrial Support Center	2001. 3	Organization affiliated to Foundation
Support for Individual Industry	Seoul Animation Center	1999. 5	Organization affiliated to Foundation
	Seoul Fashion Design Center	2000. 7	Organization affiliated to Foundation
	Seoul Printing Industry Support Center	2001.12	
Support for Start-up Firms	Seoul Venture Town	1999. 6	Organization affiliated to Foundation
	Seoul Business Incubator	1995. 9	
Marketing Support	Exhibition and Shopping Mall - Jamsil - Chang-Dong - Yoido	 1993.10 1998. 5 1996. 8	Organization affiliated to Foundation
Financial Support	Seoul Credit Guarantee Foundation	1999. 6	Foundation
Attraction of Foreign Investments	Seoul Investment Trade Service Center	1988	Organization affiliated to Seoul Metropolitan Government
	East Asia Business Center	To be opened	Not decided

tions are legally unaffiliated with SMG, but they were under strong influence of SMG, there being no private sector participation. In addition, as workforce in these organizations was mostly composed of former government officials who lacked professional capability, many of these organizations lost their effectiveness.

Recently, a number of regional economists have suggested the regional innovation system as an alternative paradigm to adapt to the new industrial environment (Cooke et. al., 1997). The regional innovation system denotes economic space in which innovation is regionally embedded. In this context, close and cooperative network among firms, universities, research institutes, vocational training centers, and industrial associations are considered important (Chung, 2001). In this regard, the industrial policy of SMG needs to change from hardware-oriented policies to enhancing networks among related agents to amplify regional innovation capabilities.

Balanced Development of the North and South of the Han River

The downtown area, which includes Jung-Gu, Jongno-Gu and Yongsan-Gu, was the center of employment until the 1980s, as well as the center of government, finance, and office functions. The southwest part, which contains the Guro Export Industrial Complex, was the second largest employment center with clusters of manufacturing firms. In 1981, the downtown area provided 965,000 jobs, which was 40.5% of the total employment of Seoul. In 1998, on the contrary, only 682,000 were employed in this area, accounting for only 20.0% of total employment. The southeast part of Seoul, which previously provided 216,000 jobs in 1981, or only 16.8% of total employment, became the largest employment center of Seoul, providing 27.2% of all jobs in 1998.

Although the downtown area performs core government functions and has convenient access, there were limitations in altering its spatial structure to accommodate new industries. There were too many property owners and fragmented lots to modify land use plan for systematic re-development. As development was centered on the southeast part of Seoul, the gap between Gangnam area, the south of the river, and Gangbuk area, the north of the river including downtown, increased and is incurring external social costs.

First, an excessive concentration of employment in the Gangnam area causes overburden on road and communication infrastructure as well as congestion. Second, the concentration of industrial activities in the Gangnam area is causing a shortage of office space and higher rent, leading to lower productivity of firms. Third, as the firms are clustered in the Gangnam area, it encourages an urban sprawl to the south of Seoul, creating bedtowns primarily composed of residential areas in cities including Seongnam and Yongin in Kyunggi Province.

Table 5.4 Change in the number of employees by area

	Number of Employees	Ratio of Employees		Increments of Employees		Rate of increase in Employees	
	1998	1981	1998	1981-91	1991-98	1981-91	1991-98
SMA	6,002,081	(100.0)	(100.0)	2,462,401	229,609	74.4	4.0
Seoul	3,378,615	(72.0) 100.0	(56.3) 100.0	1,249,897	-250,821	52.5	-6.9
Downtown	682,463	40.5	20.2	36,052	-318,320	3.7	-31.8
Northeast	633,951	20.2	18.8	193,671	-41,026	40.2	-6.1
Northwest	271,768	6.8	8.0	110,728	-1,185	68.3	-0.4
Southeast	871,501	23.3	25.8	352,345	-36,111	63.5	-4.0
Southwest	918,932	9.1	27.2	557,101	145,825	257.9	18.9

Source: Korean National Statistical Office, *Report on the Census on Basic Characteristics of Establishments*, 1981, 1991, 2000

Note: number in brackets represents the ratio in the metropolitan area

As a result, job-housing unbalance and increase in commuting distance have become major issues. It is necessary to relocate industries for a more balanced development of Seoul, by improving infrastructure and promoting redevelopment in the downtown area, to create an environment for development of SMG's strategic industries including information technology and cultural industries. In this regard, the construction of the Digital Media City in Sangam is expected to have a positive impact in bringing about a balanced development between Gangnam and Gangbuk area.

Overcoming Polarization of Employment and Training Workforce for New Growth Industries

The rapid change in industrial structure required re-allocation of workforce. In the 1990s, the labor market polarized into professionals and unskilled workers with the decline of manufacturing. This implies that flexible use of labor force to cope with the industrial environment changes exacerbated the stability of employment. This strategy intended to reduce the ratio of regular workers by increasing non-regular workers, such as part-time and temporal employees. As a result, the ratio of full-time employees declined while the ratio of part-time employees increased greatly. The number of full-time workers in Seoul decreased from 1,602,000 in 1991 to 1,291,000 in 1999 (a decrease of 311,000), while the number of part-time and temporal employees increased from 1,660,000 in 1991 to 1,796,000 (an increase of 136,000).

Workers who did not have employment opportunities in the regular labor market were either unemployed, or started their own businesses. The rate of unemployment increased substantially from 3.4% in 1991 to 6.8% in 1999. Also, the ratio of non-wage workers in economically active population, including employers, business owners, and family workers, increased from 28.6% in 1991 to 30.9% in 1999. On the contrary, the ratio of wage workers dropped from 71.4% in 1991 to 69.2% in 1999.

SMG needs to make efforts to cope with these changes. First, it is necessary to reinforce vocational training for the unemployed and the current workforce in order to supply skilled workers for the new industries. Second, SMG should aggressively increase job search programs for the unemployed. Third, SMG needs to enhance its capability to provide financing, management, and technology consulting services to the unemployed to make starting their own businesses easier.

Networking Problems of Industries in the Seoul Metropolitan Area

One of the key characteristics of new growth industries is that their competitiveness and development depend on the quantity and quality of accessible knowledge and information. New hi-tech industries are always ready to move to another location where they can utilize innovative technology and more information. However, past industrial policies in the SMA have been primarily focused on regulations to prevent overcrowding in the SMA, with no concerns for sharing and diffusing information, or improving the quality of business environment by making establishment of new business, relocation, and cooperation easier. To make things worse, after local autonomy was re-introduced, almost all the local governments set out to pursue industrial development strategies competitively with near-sighted policies. These strategies prevented each region and the local industry from working together to build a cooperative network.

Cooperation across administrative districts can be regarded as an important prerequisite for the long-term development of the metro-

politan area. Currently, 62.6% of all companies in the electronics, information, and communication industries, 57.9% of their employees, and 60.2% of their value added are in SMA. Seoul and Kyonggi Province have the structure of a division of labor specialized in services and manufacturing, respectively. Recently Kyonggi Province has been trying to construct a regional innovation system focused on electronics, information, and communications equipment industries, though with limited success not extending beyond Kyonggi Province.

Therefore, cooperative industrial governance is expected to form over the entire SMA for a construction of metropolitan innovation system. Examples of cooperative governance include strategic partnership for technological development, job training and international trade support, joint-purchase of hi-tech products and formation of information networks.

Concluding Remarks

For the past 30 years, Seoul's industry has experienced rapid restructuring. The manufacturing industry is attempting to transform itself, dealing with the problems of site shortage and the growth of service industries with increasing start-ups in the hi-tech field. Meanwhile, service industries have not only increased their share, but are becoming more specialized. The specialized services, formerly provided in-house, are now outsourced to professional service firms. The number of establishment of firms based on specialized technology is increasing as well. The new venture firms established in Seoul are mostly such service firms with specialized technology.

Seoul has developmental potentiality for industry as can be seen in the revitalization of the city through the establishment of new firms. Seoul is becoming a center of venture firms, cultural industries and information technology industries, which are called new growth industries, leading the growth of the city. SMG is providing various supporting policies to strategically promote these industries. Designation of venture-clustered building, establishment of supporting organizations and designation of strategic zones for new industries are some examples of such policies.

However, there still exists a darker side to Seoul's industry. It is

the traditional industries, or apparels, publishing & printing industry, which still account for the largest employment in Seoul's manufacturing today. In spite of many attempts to adapt to the new industrial environment, these industries have not yet transformed themselves to lead the industrial development of Seoul. Another issue for SMG to resolve is the problems of polarization: a gap between new and traditional industries, and between Gangbuk and Gangnam area.

In the future, SMG's industrial policies need to pursue two objectives. First, Seoul should strategically promote new growth industries such as information technology and cultural industries to make Seoul a central city in Northeast Asia. Second, supporting programs for traditional industries, the Gangbuk area, and the unemployed need to be reinforced in order to help them to adapt to technological changes.

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