



Global Lab on Metropolitan Strategic Planning, Seoul Global Exchange

Apr 28 ~ May 1 2014
Seoul Global Center Building & Seoul Institute, Republic of Korea

[Seoul's Experiences]



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Program

Apr 29 (Tue) - Venue: Seoul Global Center Building Open Sessions

7:50	Depart hotel to event venue
<Opening Ceremony> Opening Remarks & Keynote Speech	
8:00-8:30	Registration
8:30-8:50	Opening Remarks <ul style="list-style-type: none"> • Sameh Wahba, Acting Director, World Bank • Kim Sang Bum, Vice Mayor, Seoul Metropolitan Government (SMG) • Kyung Hwan Kim, President, Korea Research Institute for Human Settlements (KRIHS)
8:50-9:20	Keynote Speech: Managing the Unmanageable: Seoul's Experience of Urban Transformation <ul style="list-style-type: none"> • Kwang-Joong Kim, Professor, Seoul National University
9:20-9:25	Group photo
9:25-9:40	Coffee break
<Policy Session #1> Metropolitan Planning, Development and Urban Transformations	
	Description: How do metropolitan cities handle rapid urbanization and prepare their cities for future urban growth? Experiences of metropolitan urbanization planning, land readjustment, and historic neighborhood regeneration focusing on planning, policy, regulation, finance, governance, private sector involvement and others.
9:40-10:30	Moderator: Kyung Hwan Kim, President, KRIHS Discussants: <ul style="list-style-type: none"> • Hon Didas Massaburi, Mayor, Dar es Salaam City Council • Kwang-Joong Kim, Professor, Seoul National University • Vijay Jagannathan, Secretary General, CityNet Rapporteur: <ul style="list-style-type: none"> • Jon Kher Kaw, World Bank Presentations (15' each) <ol style="list-style-type: none"> 1. Seoul: Seoul's Sustainable Urbanization Planning and Land Readjustment: Myounggu Kang, Director General, International Urban Development Collaboration, SMG 2. Addis Ababa: Mathewos Asfaw Bekele, Surrounding Oromia Integrated Development Plan Project Officer, Addis Ababa 3. Paris: Julie Nouvion, Member of the Paris Region Parliament
10:30-11:00	Discussion, questions and answers

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11:10-12:00	<p>Presentations (15' each)</p> <ol style="list-style-type: none"> 4. Seoul: Bukchon Conservation Project: Hyun-Suk Min, Research Fellow, Seoul Institute 5. Karachi: Development Initiatives in Karachi and Urban Issues: Muhammad Hussain Syed, Principal Secretary to Governor Sindh, and Mumtaz Ali, Director general (technical service) K.M.C. 6. Barcelona: Vicente Guallart, Chief Architect, Barcelona City Council
12:00-12:30	Discussion, questions and answers
12:30-13:30	Lunch break
<p><Service Delivery #1> Metropolitan Transport and Land Use</p>	
	Description: Policy responses to challenges around metropolitan transport and urban expansion
13:40-14:30	<p>Moderator: Sameh Wahba, Acting Director, World Bank</p> <p>Discussants:</p> <ul style="list-style-type: none"> • Hon Mochamad Ridwan Kamil, Mayor, Bandung • Kwang Sik Kim, Professor, Sungkyunkwan University <p>Rapporteur:</p> <ul style="list-style-type: none"> • Roger Gorham, World Bank <p>Presentations (15' each)</p> <ol style="list-style-type: none"> 1. Sao Paulo: Marcelo Ignatios, Superintendent of Structuring Projects at São Paulo Urbanismo 2. Seoul: A Driving Force for Sustainable Development and Remarkable Change, Seoul Metropolitan Subway: Seungjun Kim, Research Fellow, Seoul Institute 3. Nairobi: Martha Muthoni, Urban Planner, Forward Planning and Secretariat Member for the Nairobi Integrated Urban Development Master Plan
14:30-15:00	Discussion, questions and answers
15:10-16:00	<p>Presentations (15' each)</p> <ol style="list-style-type: none"> 4. Seoul: Seoul Public Transportation Reform: Joonho Ko, Director of Megacity Research Center, Seoul Institute 5. Dar es Salaam: Challenges for Service Delivery in Dar es Salaam: Eng Mussa B. Natty, Municipal Director, Kinondoni Municipal Council
16:00-16:30	Discussion, questions and answers
16:40	Bus pick-up at Seoul Global Center Building
16:50	Arrive at Bukchon Hanok Maeul
17:00-18:15	Site briefing
18:15	Move to dinner via bus
18:30-20:30	Dinner hosted by Seoul Metropolitan Government at Samcheonggak
20:30	Return to hotel

Program

Apr 30 (Wed) - Venue: Seoul Institute Closed Sessions

7:20	Depart hotel to event venue
8:30-8:40	Welcoming Remarks <ul style="list-style-type: none"> Chang Hyun Lee, President of Seoul Institute
<Urban Systems #1> City e-Government	
	Description: Integrated Smart Urban Management (iSUM) using ICT for accountability, efficiency and better service.
8:40-9:40	Moderator: Hyoung Gun Wang, Senior Economist, World Bank Discussants: <ul style="list-style-type: none"> Representative from Addis Ababa (TBC) Nicolas Ronderos, Director, Regional Planning Association, NYC Rapporteur: <ul style="list-style-type: none"> Sangmoo Kim, World Bank Presentations (10'-15' each) <ol style="list-style-type: none"> Seoul: Seoul e-Government toward Smart City: Sang Ok Choi, Professor, Korea University; Jong Geun Kim, Director of Information System Planning, SMG WB-WeGO: WB-WeGO city e-Government toolkit: Suzin Ahn, Program Director, Secretariat of WeGO Dar es Salaam: Towards e government - the case of Dar : Hon Yusuph Juma Mwenda, Mayor, Kinondoni Municipal Council Ulaanbaatar: Baasanjav Sanjaa, Specialist in charge of information technology in Chief of mayor's office of Ulaanbaatar
9:40-10:10	Discussion, questions and answers
10:10-10:30	Coffee break
<Policy Session #2> Metropolitan Economy	
	Description: Metropolitan economic development and restructuring – from planning to implementation
10:30-11:50	Moderator: Songsu Choi, Senior Advisor, KRIHS Discussants: <ul style="list-style-type: none"> Uma Adusumilli, Chief Planner, Mumbai, India Hyoung Gun Wang, Senior Economist, World Bank Rapporteur: <ul style="list-style-type: none"> Parul Agarwala, World Bank Presentations (15' each) <ol style="list-style-type: none"> Accra: Samuel Aryee, Director of Finance, City of Accra Ulaanbaatar: Temuulin Enkhmunkh, Head of economic development agency

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	<ol style="list-style-type: none"> 3. Bandung: Name & Title of Presenter(TBC) 4. Paris: Andre Durbec, International Vice-president of the competitiveness cluster Advancity (Sustainable City), Paris 5. Seoul: Beonwook Kim, Senior Research Fellow, Incheon Development Institute; Sangdae Lee, Director, Gyeonggi Research Institute
12:00-12:30	Discussion, questions and answers
12:30-13:30	Lunch hosted by the President of Seoul Institute
<Urban Systems #2> Inter-Jurisdictional Coordination	
	Description: Examples of inter-jurisdictional coordination and governance at a metropolitan level
13:40-15:00	<p>Moderator: Julie Nouvion, Member of the Paris Region Parliament</p> <p>Discussants:</p> <ul style="list-style-type: none"> • Hon Mayor Jerry Silaa, Mayor Ilala Municipal Council • Peter Ellis, Lead Urban Specialist, World Bank <p>Rapporteur:</p> <ul style="list-style-type: none"> • Augustin Maria , World Bank <p>Presentations (10'-15' each)</p> <ol style="list-style-type: none"> 1. Dar es Salaam: Institution setup in Dar es Salaam: Hon Jerry Silaa, Mayor, Ilala Municipal Council 2. Nairobi: Eng Kinyua Wamugunda, Assistant Country Engineer, and Nairobi Metropolitan Services Improvement Project Liason Officer 3. Paris: Bertrand Lemoine, Director of Research, National Centre for Scientific Research 4. Seoul, Case 1: WoonSoo Kim, Senior Research Fellow, Seoul Institute 5. Seoul, Case 2: Metropolitan Governance - Administration and Finance: Hyeon-ho Kim, Director of Regional Development, Korea Research Institute for Human Settlements
15:10-15:40	Discussion, questions and answers
15:40-16:00	Coffee break
<Policy Session #3> Urban Think-Tanks	
	Description: The role and function of urban think-tanks in planning and policy implementation
16:00-17:20	<p>Moderator: Yeong Hee Jang, Vice President, Seoul Institute</p> <p>Discussants:</p> <ul style="list-style-type: none"> • Peter Ellis, Lead Urban Specialist, World Bank • Bat-Erdene Batzolboo, Economic Development Agency, Ulaanbaatar(TBC) <p>Rapporteur:</p> <ul style="list-style-type: none"> • Sangmoo Kim, World Bank <p>Presentations (15' each)</p> <ol style="list-style-type: none"> 1. KRIHS: Jincheol Jo, Research Fellow, Korea Research Institute for Human Settlements 2. Guadalajara: Luis Felipe Siqueiros, Technical Director, Guadalajara 2020 3. SI: Inhee Kim, Director of Planning and Coordination, Seoul Institute 4. GRI: Taekyung Kim, Research Fellow, Gyeonggi Research Institute

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	5. RPA: Nicolas Ronderos, Director, Regional Planning Association, NYC
17:30-18:00	Discussion, questions and answers
18:10	Move to dinner site via bus
18:30-20:30	Dinner hosted by the President of KRIHS
20:30	Back to hotel

Program

May 1 (Thu) - Venue: Seoul Global Center Building

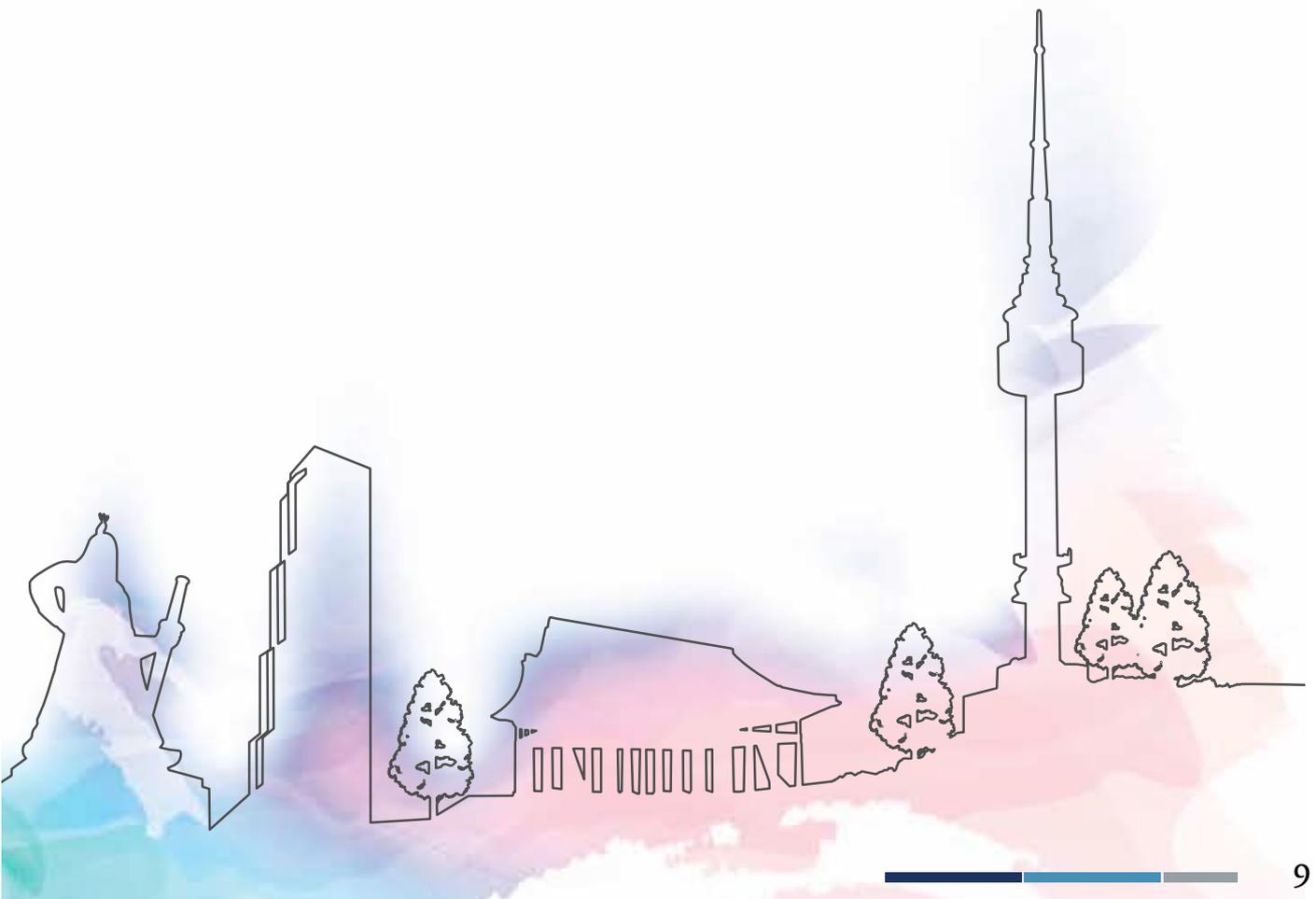
8:10	Depart hotel to event venue
<Service Delivery #2> Metropolitan Water and Waste Management	
	Description: Examples of sustainable water supply, sewage treatment, and solid waste management
8:30-9:20	<p>Moderator: Ellen Hamilton, Lead Urban Specialist, World Bank</p> <p>Discussants:</p> <ul style="list-style-type: none"> • Kap Soo Kim, Vice Chairman, ISAN Corporation • Nairobi, Name and Title of Presenter(TBC) <p>Rapporteur:</p> <ul style="list-style-type: none"> • Jon Kher Kaw, World Bank <p>Presentations (10'-15' each)</p> <ol style="list-style-type: none"> 1. Nairobi: Isaac Muraya, Deputy Director, Department of Environment 2. Seoul, Water: Sustainable water supply of Seoul: Efficient management with the Revenued Water Ratio and quantity/quality control: Young-june Choi, Director of Bureau of R&D for Water, Waterworks Research Institute 3. Seoul, Waste: Smart Waste Management in Seoul : From Waste to Resource: Jae Min Song, Professor, University of Seoul
10:20-10:40	Discussion, questions and answers
10:40-11:00	Coffee Break
11:00-12:00	<p>Panel discussion on next steps by region</p> <p>Moderator: Victor Vergara, Lead Urban Specialist, World Bank</p> <ul style="list-style-type: none"> • EAP: Bandung, Ulaanbaatar and <i>Ellen Hamilton</i> • SAR: Mumbai, Karachi and <i>Peter Ellis</i> • AFR: Accra, Addis Ababa, Dar es Salaam, Nairobi and <i>Roger Gorham</i> • LAC: Brazil, Mexico and <i>Victor Vergara</i> • WRD: Barcelona, Paris, RPA and <i>Sameh Wahba</i>
12:00-12:15	<p>Wrap-up and closing remarks</p> <ul style="list-style-type: none"> • Sameh Wahba, Acting Director, the World Bank • Yeonsik Yoo, Director General, International Relations Bureau, SMG
12:20	Walk to farewell lunch site
12:30-14:00	Farewell lunch hosted by the World Bank

〈Day 2〉

Apr 29 (Tue)

[Keynote]

- Managing the Unmanageable
: Seoul's Experience of Urban Transformation





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Biography

Kwang-Joong Kim is Associate Professor of Urban Planning and Design at Graduate School of Environmental Studies, Seoul National University. His teaching subject includes general urban planning, urban regeneration and urban form. Before coming to academia, Dr. Kim worked at Seoul Development Institute (now Seoul Institute) where he conducted research and practices on the issues of urban renewal, downtown planning, and urban design while directing the Department of Urban Planning and Design. He edited books on Seoul's urban history (Seoul Twentieth Century: Growth and Change of the Last 100 Years, 2003) and urban management (Urban Management in Seoul: Policy Issues and Responses, 2001, with W-Y Kwon) both published by Seoul Development Institute.

Title Managing the Unmanageable: Seoul's Experience of Urban Transformation

Keynote speech at Global Lab on Metropolitan Strategic Planning, **Seoul Global Exchange**
April 29, 2014. Seoul, Korea

Managing the Unmanageable: Seoul's Experience of Urban Transformation

Kwang-Joong Kim (Seoul National University)

A century ago, Seoul was under colonial ruling (1910-1945) without any ability of self-control. Some half century ago, Seoul was devastated by Korean War (1950-1953) and its daily survival was much dependent on foreign aid. Korea was one of the poorest countries with some \$80 GNP/capita. Slums were rampant in the city center. People drank polluted water from neighborhood wells and rivers. Smelly sewage from houses and factories was discharged to the Han River. Bad air, overcrowding and congestion were normal life. Seoul was hardly a manageable city.

From the 1960s and on, Seoul underwent an abrupt and phenomenal growth. The city hall was overwhelmed by intractable pressing problems virtually in every front of administration. Housing, sanitation, infrastructure, transportation, environment, social welfare and other public services – all desperately demanded a priority of public actions. The problems were so intense. It was as if Seoul had embodied one of the most acute contemporary urban challenges. Seoul tested the city hall – its ability to manage the unmanageable.

Now, in daily routine, a 10-million mega city runs smoothly without noticeable interruption. No matter how persistent its unsolved problems may be, Seoul's achievement is no small. No matter how pervasive its unintended consequences may be, Seoul's transformation is a listenable story. How did Seoul do it? How did Seoul do it with a limited knowledge and scarce resources? What made once an unmanageable city turn around into a livable city? What are the secrets?

Many different views are possible. But I think of: 1) leadership, 2) hardworking, 3) forward looking, 4) learning attitude, 5) institutional setting, 6) resource attraction, and 7) economic growth.

LEADERSHIP

It was a leadership from the top – top of the central government and top of the city hall. The president and city mayors were the leaders who charted the course of Seoul's transformation. Throughout three decades of the 1960s-80s, South Korea was a highly centralized developmental state. The military-background authoritarian presidents appointed Seoul mayors who were supposed to execute national development agenda. The vertical clarity of decision-making power was evident from the top down.

While being reported on a regular basis, the president paid an annual visit to the city hall in an obvious effort to maintain the efficacy of this nation-centric order. The Seoul comprehensive plans at that time began with President's annual address, stating eloquently that the country must not be afraid any hardships and barriers to open new chapters of modernized history. They viewed Seoul to be an economic engine as well as an icon of national growth. Seoul's policy agenda was a local version of national counterpart. The avid followers of the president together with the appointed mayors made sure that any project of national importance must be completed.

Within the city hall, the mayor's power was absolute. Since local legislative body was non-existent until 1995, the mayor exercised the full power of city administration from personnel to budget. It was mayoral leadership that set a crystal-clear priority for bold actions. They rerouted the natural flow of the mighty Han River. They even lifted the elevation of whole Yeoido Island. Infrastructure building, slum clearance and urban renewal, development of housing complexes – all was realized under the 'commando construction' catchphrase and the getting-things-done mentality that the mayor called for.

It was far from democratic, participatory governance. Rather, the vision, philosophy and political views of the country's leader and the mayor largely determined the nature and speed of urban management during this time. Under the national economic development agenda, their vision was clear, focused and directive. Seoul city governance has now become much more independent, democratic and participatory, yet it seems this leadership tradition is still at work.

HARDWORKING

It was a hardworking of public servants in the city hall who tamed Seoul's phenomenal growth. Some two million people in 1960 reached ten million in 1988. It was like adding another city of Boston (some 600,000) every other year. The edge of the city was at constant expansion, mostly unplanned and without infrastructure. The city hall had to take care of daily lives of the enormous influx of people, battling against such miserable problems as shelter, water and sanitation, fire-fighting and disaster prevention. In coping with these challenges, according to an urban historian, the city hall was like a war room. The city officials worked day and night, without distinction between working days and free days. The city officials knew Mayor also would sleep on the military field bed in his office.

It was through a hardworking of the city officials that the leadership was in motion to accomplish the national developmental agenda. Seoul's technocrats crafted various city policies and drafted project plans in accordance with the direction of top decision makers and then implemented them amid pressing difficulties. Once top-down mission was delivered to the city hall, the tasks were planned, approved and completed at an astonishing quick-pace. Large-scale housing complexes, highways, bridges, tunnels, subways, roads and many other monumental constructions were realized in this way.

This aggressive city making was marred by project accidents and corruption scandals. Due to these dark sides, only a few mayors served longer than two years during the developmental decades. Yet it is hard not to think of hardworking as a main cause of Seoul's transformation. To change the city, Seoul never slept, from the top to lower technocrats.

FORWARD LOOKING

Even amid poverty and mounting problems, Seoul was always far-sighted. It planned ahead with think-big, visionary mind. This attitude is another cause of Seoul's achievement.

As mentioned, the 1960s was an era of extreme poverty and formidable urbanization. Yet, Seoul did not lose the hope for the better future. The recent study let us know that the 1960 Seoul City Administration Plan and 1966 Seoul Comprehensive Plan already envisioned Seoul as a modern metropolis. Some downplay the impact of these plans in the sense that it lacked the specific guidance and thus left much room for the subsequent political arbitrariness. Further, the critics see that appointed mayors were more concerned with each one's outputs rather than the continuity and consistency of the plans his predecessors devised.

Nonetheless, it is true that Seoul's forward-looking comprehensive plans played a guiding role in land use and infrastructure planning. Seoul comprehensive plans in the 1960s and 1970s show the remarkable consistencies with the current spatial structure and development patterns. The comprehensive plans envisioned Seoul 20 years ahead, laying out city-wide transportation networks, multi-centered growth and pre-planned outer expansions. It is noteworthy that the 1966 comprehensive plan set aside a large suburban land for the Olympic venue, eventually becoming a 1988 Olympic Park in the southeastern Seoul.

Rapidly urbanizing metropolis like Seoul would not be fully guided by a long-range comprehensive planning approach. Comprehensive plans were at constant revision, as its 20-year population estimation turned out wrong within far-shorter time spans. The comprehensive plans alone were not able to guide the urbanizing Seoul. Indeed, according to a noted urban planner, the plan followed Seoul, not leading it. Yet, the comprehensive planning approach was at work in maneuvering the turbulent period of rapid population influx and territorial expansion. It was a forward-looking planning through which an explosive urban growth was kept in foreseeable order.

LEARNING ATTITUDE

After Independence in 1945, Seoul had little planning skills and capacity. Seoul's urban planning was temporarily in halt during the 1950s, allowing the formation of unplanned slums and residential quarters. Technocratic capabilities and professional expertise were in utmost needs in controlling unleashed urban growth. Seoul cannot help but relying on the assistance from advanced countries. The willingness to learn from others was the main impetus of Seoul's modern transformation.

During the 1960s, Seoul discarded the colonial planning system and began to formulate its own. Modern urban planning methods were introduced by the foreign expertise mainly from the US. Their advices were subject to local adaptations and sometimes simply not worked. However, their in-site help was enough to inspire the government to realize the necessity of professional urban management. The founding members of Korea planning profession testify that the presidential order created the first planning schools at college and graduate levels in 1968. In the coming years, a number of Korean

professionals adventured to study in foreign countries for the advanced knowledge of city planning, many of them under the US aid programs. City officials were also enthusiastic in learning from others. They made a frequent foreign visit to learn new ideas and techniques for their urgent projects in charge. They went to Japan, the US and European countries for whatever they might think helpful and applied what they learned to Seoul context. Vertical property right exchange technique was learned from Japan. Impact fees were from the US, and Greenbelt from the UK, to name a few. Their trip reports were circulated to share the new knowledge with their colleagues.

Some might think many of them were no better than the superficial copy, albeit not entirely so. However, the willingness and enthusiasm to learn was a vital asset for turning the unmanageable Seoul into a modern metropolis. It was through learning that planning capabilities and technical expertise were secured and embedded in daily practices. Now, more than 40 universities in Korea offer planning programs. Professional societies are also indispensable - sizable consulting industries on urban planning and engineering provide home-grown know-hows.

INSTITUTIONAL SETTING

Seoul's sustained hardworking was supported institutionally. Since the early 1960s, legal bases were laid out to support city planning and implementation. In 1962, the first Urban Planning Act was formulated to secure the public planning power on the issues of land use, infrastructure, communal facilities and urban development. Building Law was also enacted in the same year to introduce uniform building standards and permit system. The 1967 Land Readjustment Act replaced a colonial version to lay out new subdivision standards and process. The 1976 Urban Renewal Act supported the slum-clearance program of the city hall. Other laws regarding park, housing, transportation, infrastructure and land development followed. It was these legal bases that the city hall was able to overcome numerous legal challenges that they encountered throughout aggressive city-making years. Their plans and actions were justified and protected by these legislative back-ups.

Another institutional setting was administrative support. Planning functions in the city hall have been increasingly refined and subdivided as Seoul changed quantitatively and qualitatively. Architecture, housing, urban renewal and development, park and open space, transportation, air, water, sewage, environment – all took their own units in so much as inter-departmental coordination became crucial for successful city governance. Yet, specialization and expertise tell only a half story of Seoul's achievement. What seems also matter is flexibility. During the rapid growth decades of the 1960s-80s, the project-oriented, on-site special executive offices were often favored for the focused, maximized efficiency. Especially, since the 1995 local autonomy, the city organization has been under constant regrouping and renaming according to new mayor's agenda. Mayoral task force and team-based organization also reflect this flexible institutional setting.

These legal and administrative institutional supports were the ground on which the leadership and hardworking were at work in their full swings. Without legal bases and effective implementation units, any vision would have had a slim chance of realization especially in the turbulent policy environment.

RESOURCE ATTRACTION

Resource attraction is another important aspect of Seoul's achievement. Post-Korean War foreign aid, mainly from the United Nations and the US, supplied daily necessities for the survival of Seoullites and helped funding infrastructure and housing projects. However, Korea desperately needed more sizable financial resources for its planned growth towards a modern industrial nation. It is still a national memory that the government sent miners, nurses, farmers and even soldiers overseas to secure foreign loans and aid in order to fund highways and factories deemed essential for economic development.

As economy grew, however, this initial reliance on foreign resources had been replaced by domestic funding. Still due to its meager public finance, Seoul was savvy to devise various measures to induce private investment. Through zoning change, volume incentives and tax benefits, Seoul mobilized private capital to finance the projects of land readjustment, urban renewal and housing development. From the 1980s, the city was able to mobilize the property owners and construction company to redevelop substandard residential quarters on their own self-financing formulae. A variety of public facilities, including terminals, tunnels and underground passages, were constructed by private money by offering the commercial use of space within a certain period of time. This type of public-private partnership has been a vital funding strategy to date. Pre-sale system of housing development is a unique Korean way of projects finance, which was only possible by the existence of the middle class with enough spending power. As financial commitment from the central government dwindled, the city budget plays an increasingly important role to finance the local projects. Seoul now takes virtually a full responsibility for its financial matters. Local taxes, impact fees and other incomes are main sources for the city expenses and debt payments.

Relying too much on private interest generated criticism as to sacrificing environmental quality in favor of the developmental agenda. Nonetheless, this approach was clearly the driving force behind Seoul's remarkable transformation in such a short period of time with scarce public resources.

ECONOMIC GROWTH

Finally, economic growth played a foundational role for Seoul's transformation. Over the course of the last half a century, Korea was able to develop from foreign aid recipient to one of the international donors. Without economic growth, the central government could not have funded Seoul's subways, infrastructures and cultural venues. Without a burgeoning middle class, Seoul's massive land conversion and housing construction would not have been possible. Without growing city revenues, the city hall would not have been able to sustain ambitious urban projects.

One the other hand, Seoul's achievement is an outcome of a free market as much as that of public planning and management. In the poor years, the government and city hall led the urban change, but, as the economy grows, the private sector has taken a part to participating in the urban process. With its own resources to serve its interest, the private sector proposed various urban development projects, and they often put them into practice by securing property rights on their own. It was also the private

sector that guided consumer taste and offered a variety of choices in the real estate market. At numerous individual plots and commercial properties, the incremental transformation took place over the recent decades, making Seoul as it is today.

It was economic growth that created a mutually-reinforcing relationship between public actions and urban outcomes.

CONCLUSION

In retrospect, what made Seoul's achievement possible seems the aspiration of Korean people - aspiration to escape the poverty, aspiration to lift their living standards up to the satisfactory level, and aspiration to realize their full potentials so that they are a part of engaging global members. It seems this aspiration that motivated and energized Seoul city hall to manage the unmanageable.

True, Seoul is not free from failures and regrets. Seoul's hurried growth entailed the poor constructions, unjustifiable takings and irresponsible gentrification that caused the irrevocable sorrows and despairs of many people. Seoul's historical legacies, cultural assets and environmental resources were often sacrificed by development-first strategies. Human values and the sense of place were overshadowed by modernist betterment. These experiences are two sides of a coin. Seoul thus can provide the lessons to rapidly growing world cities.

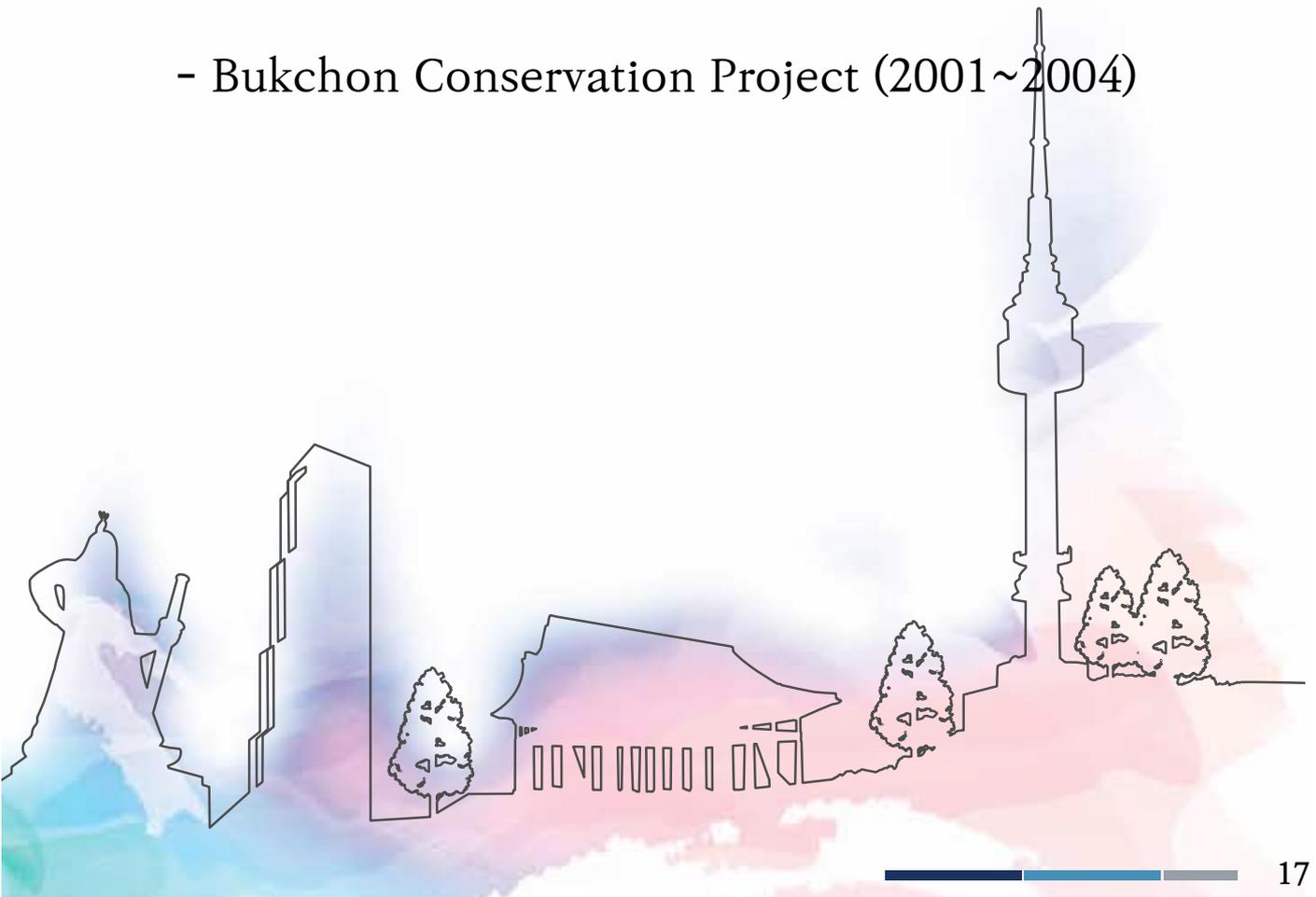
We know, however, that we are talking about city planning and management, a deeply culture-bounded local practice. Given the unique societal and urban context of each city, Seoul's story should have different implications accordingly.

〈Day 2〉

Apr 29 (Tue)

[Policy Session #1] Metropolitan Development

- Seoul's Sustainable Urbanization Planning and Land Readjustment
- Bukchon Conservation Project (2001~2004)





Myounggu Kang

Company/Organization Seoul Metropolitan Government

Position Director-General of International Urban Development
Collaboration

E-mail Address kang1116@seoul.go.kr

Biography

Myounggu Kang, a professor of Urban and Regional Planning at University of Seoul, is currently serving as Director-General of International Urban Development Collaboration in Seoul Metropolitan Government. He is leading the International Urban Development Collaboration (IUDC) of Seoul.

At Boston Metro Area Planning Council, he was a leading member of a team developing a master plan called 'MetroFuture 2030' to vision the future of the Boston metropolitan area and to unfold implementation strategies. Along the MetroFuture 2030, he led the development of 'Regional Data Repository' which is a data and map sharing on-line tool for collaborative planning.

Dr. Kang studied Civil and Environmental Engineering (Urban major) at the Seoul National University, and holds Master of City Planning and Ph. D. in Urban and Regional Planning from MIT, USA.

Title Seoul's Sustainable Urbanization Planning and Land
Readjustment

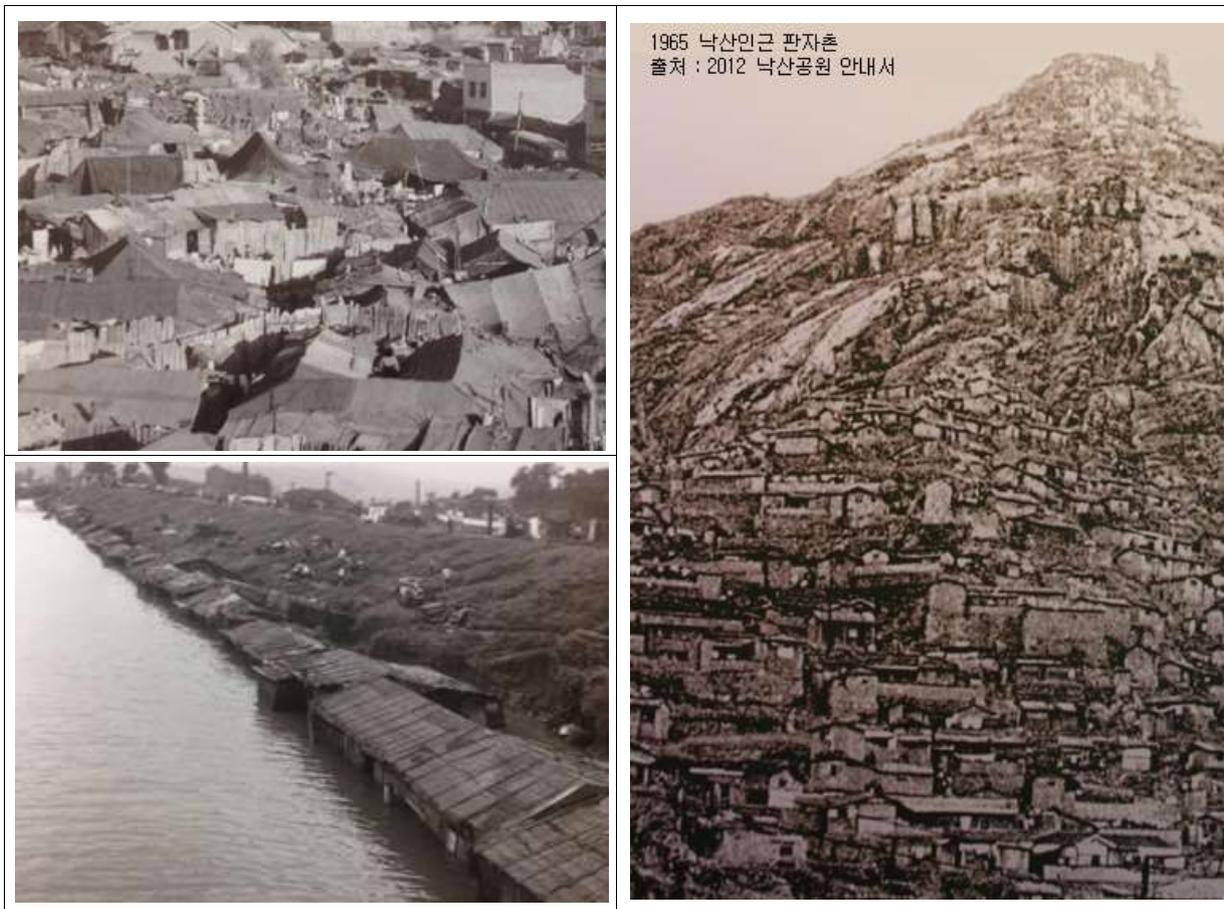
Seoul's Sustainable Urbanization Planning and Land Readjustment

Myounggu Kang (Seoul Metropolitan Government)

ISSUES

Rapid urbanization was threatening both life and nature

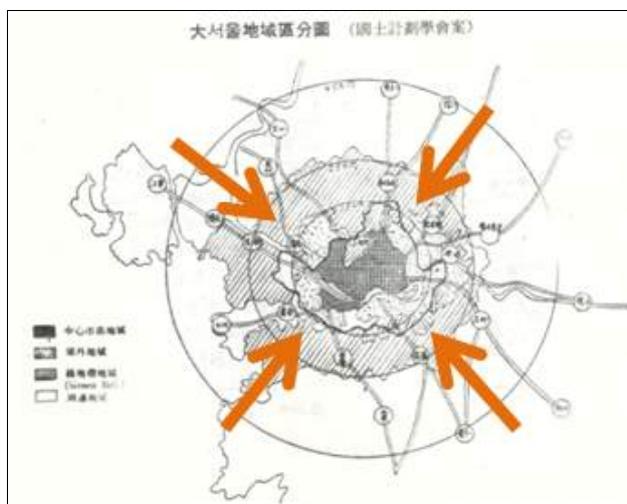
Since the 1960s, due to the rapid urbanization and industrialization that took place in the City, a massive influx of population migrated to Seoul. At the time when existing infrastructure was insufficient, the average annual population growth of 270 thousand (22,000 persons per month) only worsened the situation of the livability of Seoul. The incoming population had no place to stay, so they could not help settling in the mountainside and by the streams. This led to the proliferation of substandard living environments which were also vulnerable to natural disasters such as floods and landslides. Also, this sort of settlement posed a greater problem: uncontrolled sprawl that destroyed the natural environment. These slums were causing serious deforestation of mountains and contamination of the streams



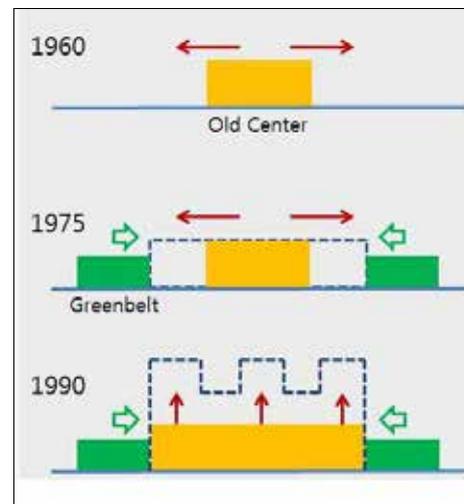
SOLUTIONS

Set an order in land use; then build together benefit together

Subsequently, the need to establish a spatial order arose, especially to control the uncontrolled sprawl that was destroying sustainability of Seoul. Thus, the Seoul Metropolitan Government announced a preemptive spatial framework for the sustainable development – the Seoul Metro Area Master Plan (1966), which was inspired by Greater London Plan (1944). This Master Plan aimed a compact, transit-oriented, and eco-friendly city. Seoul did not confine its plan to the administration boundary of those time. It tried to encompass the lives of future potential citizens (considering the growth), who will live, work, and commute beyond the City’s administrative boundary.



<Figure 1> Seoul Metro Area Master Plan(1966)



Sustainable Urban Development

What made Seoul different from other cities is implementation. Planning itself is important, but what makes it substantive is the very act of realizing the plan: implementation is more crucial than a good plan. A plan should be accompanied with a sturdy implementation system which should include financial considerations, and the process of persuading citizens and relevant stakeholders.

In the initial stage of urbanization, land readjustment served as the major implementation tool, which laid the foundation for the city’s forthcoming smart and sustainable development. The purpose of land readjustment was 1) to set a spatial framework for sustainable development, 2) to secure urban land with public space including roads, school sites, parks, and so forth, and 3) provide public services including water, sewage, energy, and so forth. Securing public space was the first step toward smart, sustainable, and resilient urbanization.

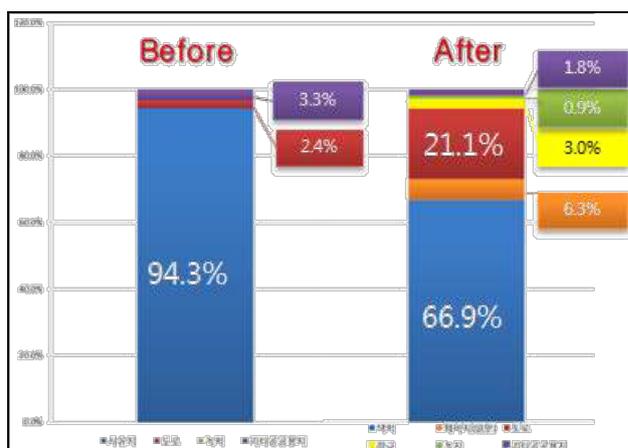
Land readjustment enabled the Seoul Metropolitan Government to put a grid pattern urban structure and secure much needed public space (e.g. percentage of roads was 8% in 1960) by receiving land contributions from citizens. At first, Seoul asked as little contribution as she could, for fear of citizen complaints. However, minimum contribution yields problems before the projects finished. For example, the roads were still insufficient and narrow so that many plots remained without accessibility of emergency services. The area confronted the necessity to re-expand public space.

Thus, from the late 1960s Seoul developed bold plans in order to embrace a long-term demand of public spaces and infrastructure for smart and sustainable development.

Roads deserve mention. Although roads make up the highest percentage of land use in public space, they do not only refer to the surface lanes for automobiles. Roads, not only provide space for ground transportation, but also their underground space serve as the city's artery, or blood vessel, for citizens' life and work, delivering water and sewage, electricity, gas, telecommunication, and heating & cooling to every part of a city. Roads are also crucial infrastructure for resiliency providing access for rescue to emergency spots and place for people to escape. Accordingly, securing road space can be regarded as securing a network of necessary public space for the quality of citizens' lives and the sustainable and resilient urban community.



<Figure 2> Sooyu Land Readjustment: Spatial Reframing



- Land Use after Sooyu LR
- 66.9% Residential Area
 - 6.3% Land contributed by owners to finance LR
 - 23.1% Road
 - 3.0% School
 - 1.7% Green
 - 1.8% Other Public Space

<Figure 3> Sooyu Land Readjustment: Land Use Change

Although residents contributed their land, in return, their land — which was previously unusable — would be developed into an urbanized land equipped with proper infrastructure, resultantly rising in land value that benefitted the owners. In other words, residents and the city would ‘build the city together,’ and then ‘benefit together’ the development gain that comes from building a well developed city.

In the initial stage of land readjustment in the early ‘60s, most of the project finance relied on public budget from national subsidy and municipal bond issuance. After the late ‘60s, almost 100% for the project finance was covered by the sales of the portion of owners’ land contribution, instead of public budget.



<Figure 4> Securing public space by citizens’ contribution Road : Artery and Lifeline

ACHIEVEMENT

Sustainable Metro Area Planning

- established a land use framework as a guide for future growth.
- secured public space for public services (e.g., transit, water, energy, internet, etc.) and resiliency (e.g., emergency access and escape space, etc.)
- set a growth limit to protect nature from sprawl and citizens from disasters (e.g., flood, land slide, etc.)

Land Readjustment

- was the key implementation tool to realize the plan.
- laid the ultimate foundation for Seoul’s smart and sustainable development as 40% of Seoul (140km²) became urbanized through this tool.
- provided urban land and infrastructure for citizens’ life, work, learn, play, and move.



Hyun-Suk Min

Company/Organization Seoul Institute (SI)

Position Research Fellow

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Biography

Hyun-Suk Min, Dr.-Ing. is a research fellow in the Seoul Institute, the think tank of Seoul Metropolitan Government (SMG), South Korea. In the institute, he actively studies in the field of urban design and planning, focusing on conservation of heritages, citizens' participation and design of cultural facilities, etc. He has also published numerous research reports and academic journal papers on his filed. Recently, he successfully led the conservation project for future heritages with SMG. He earned his M.E. in Urban Design and Housing from Korea University, South Korea and Dr.-Ing. in Urban Design and Regional Planning from University Karlsruhe, Germany. He was a guest researcher at the Institute for the Foundations of Planning, University Stuttgart, Germany and is an adjunct professor at Korea University, South Korea from 2012.

Title Bukchon Conservation Project (2001~2004)

Bukchon Conservation Project (2001~2004)

Hyun-Suk Min (Seoul Institute)

ISSUE

Up to the 1980s, all developments in Bukchon had been strictly regulated by the robust Hanok (traditional Korean housing) preservation policy. However, a casualty caused by the collapse of a Hanok amidst the flood in the summer of 1990 brought about fierce opposition of residents against the existing Hanok preservation policy. As a response, the City (Seoul Metropolitan Government) eased building height restrictions in the area. This de-regulation served as a momentum for a series of multi-family housing developments, thus accelerating the destruction of Bukchon's landscape.



<Figure 1> Bukchon: Location & Landscape

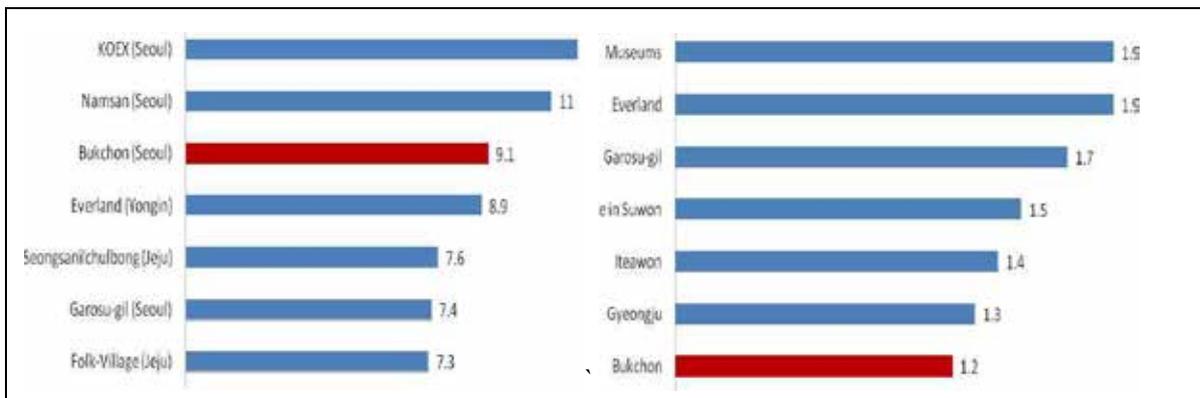
SOLUTIONS

With Hanoks renovating into multi-family houses, the de-regulation brought the destruction of uniqueness in Bukchon's traditional landscape. The new developments with high density burdened the old narrow alleys and aging infrastructure. At last, a community organization, 'Bukchon Preservation Group' requested a solution for Bukchon's debilitating circumstances through the 'Saturday Date with the Mayor of Seoul' on Sep. 4, 1999. This marked the beginning of the collaborative process involving residents, experts, and the City to solve the problem of Bukchon.

First, relevant government officials and resident representatives created 'Bukchon Taskforce,' a public-private consultative group and the City's Housing Bureau formed the 'Bukchon Project Team' dedicated to the project. The Bukchon Project Team served as the project manager, collaborating with Jongro-Gu (borough) and the SH Corporation. After the creation of the Bukchon Taskforce, Seoul Institute provided a road map for the Bukchon Conservation Project and the City formed a general consensus by opening policy meetings and community hearings. Finally the City announced the

mayoral order No. 1002 (October, 2000) for the conservation of Bukchon.

Following the mayoral order No. 1002, the City pursued the 'Hanok Registration Program' to motivate residents' participation for the Bukchon Project. This policy was to support the conservation activities just for Hanoks, through a voluntary registration system by Hanok owners. The City also revised the City's Building & Construction Ordinance in order to create a legal basis for the project. The City opened the 'Field Office for the Bukchon Project' to inform residents of possible administrative support in connection with the Bukchon Project. Furthermore, the City purchased several Hanoks in danger of being destroyed at market price and made use of them as a cultural center, museum, etc. These efforts, in conjunction with streetscape improvement projects on Bukchon's major alleys, contributed to making Bukchon one of the most favorite tourists' attractions in the City of Seoul.



<Figure 2> Most Favorite Tourists' Attractions in Korea

ACHEIVEMENT

In the 1990s, due to the de-regulation policy, the number of Bukchon's Hanoks rapidly dropped from 2,000 to 900. However, the Bukchon Conservation Project decreased the speed of Hanoks' destruction, improved the conditions of Hanoks, and rejuvenated the traditional streetscape of Bukchon.

The Bukchon Project, not only improved the physical environment of Hanoks and the alleys in the neighborhood, but also elevated the area's economic, social, and cultural value. Bukchon received the UNESCO Asia-Pacific Heritage Award for Culture Heritage Conservation (Award of Distinction among 5 Categories) in 2009.



<Figure 3> Improved Conditions

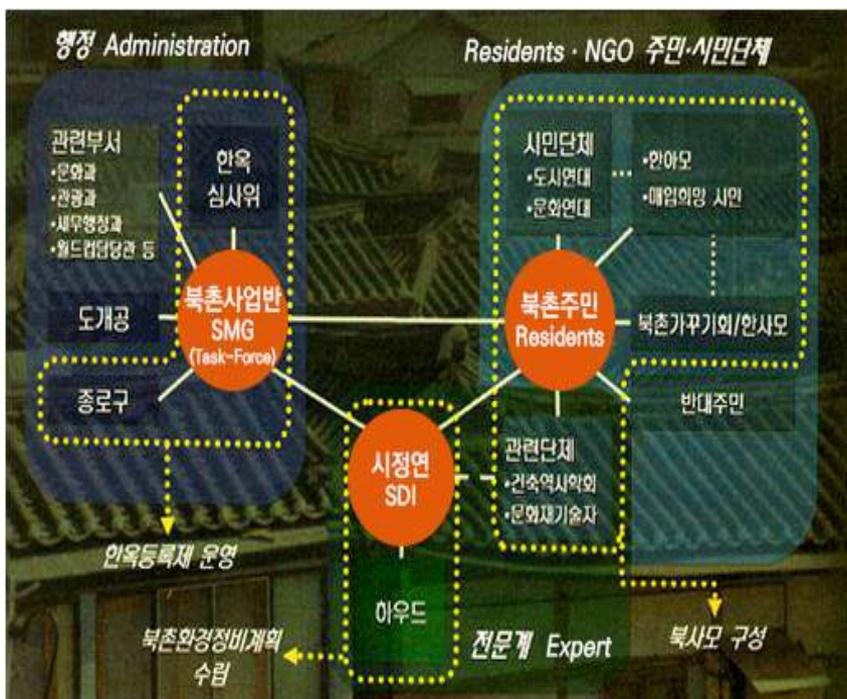


<Figure 4> Rejuvenated Landscape

Undoubtedly, the area has been recognized as a valuable attraction with the continuous flow of visitors. Non-governmental organizations are also visibly carrying out community activities to preserve the unique environment, recognizing the historic and cultural value of Bukchon. The real estate value has climbed from 5.5million KRW per 3.3m² in 2001, to 20~40 million KRW by year 2014.

SYSTEM of IMPLEMENTATION

The Bukchon Project was executed with the collaboration with the City, residents, and experts. Bukchon Project Team supported the renovation and purchase of Hanoks with Jongro-Gu and the SH Corporation; residents led tour programs with NGO; and Seoul Institute established the Bukchon Conservation Master Plan with the City, reflecting residents' opinions



<Figure 5> Governance of Implementation

BUDGET

Following the City's Hanok Conservation Ordinance, the City subsidized up to 30million KRW and loaned 20million KRW. 358 Hanoks were registered in 2001~2005. The City subsidized 6.7billion KRW for 224 cases and loaned 2.2billion KRW for 116 cases. In 2001~2005 the City spent 7.7billion KRW to purchase 12 Hanoks and 6 non-Hanoks.

Streetscape improvement projects were carried out in Bukchon's major alleys where Hanoks were concentrated. 2.3billion KRW was spent to reorganize the sewerage system, remove utility poles and wires, and repave the roads in Gahoe-dong 31 and 11. It cost 5.3billion KRW to improve the streets of Bukchon-gil (road) and Gyedong-gil.

CONFLICT MANAGEMENT

After the Saturday Date with the Mayor of Seoul in 1999, numerous discussions and debates took place before the start of Bukchon Project in 2000. Bukchon Taskforce, a public-private consultative group held 3 official meetings to discuss the underlying issues for the project. The results were reported to the mayor three times. In the meanwhile, Jongro-Gu office also held 2 official meetings to identify the needs in the area. Especially, the mayor held two meetings to persuade the residents against the Bukchon Project. 3 public meetings were scheduled, yet 2 were cancelled due to opposition. To motivate residents to voluntarily participate in the Bukchon Project, the City suggested the Hanok Registration Program and opened a Field Office in Bukchon. Furthermore, the City purchased several Hanoks in danger of being destroyed at market price.



<Figure 6> Communications with residents

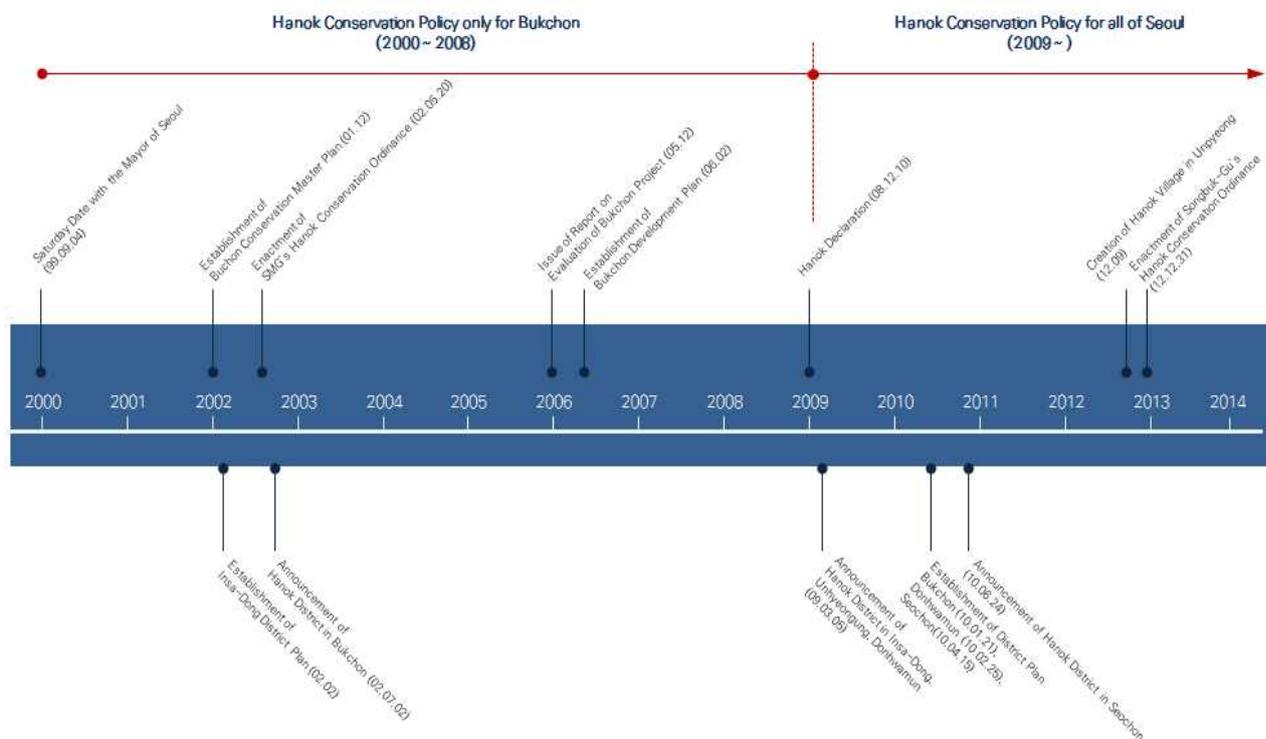
SUMMARY

The Bukchon Project significantly proved that preserving Hanoks, instead of destroying them for immediate profits, can bring much more benefits by elevating the area's future value. Even though there was a number of both supporters and opposers regarding the project, the City could gain the trust of the residents through continuous dialogue and persuasion. Also, the execution of the project based on voluntary participation contributed to minimizing opposition from residents.

The success of the Bukchon Project was followed by the Hanok Declaration in 2008. It paved the way for the expansion of Hanok conservation policies to all areas of Seoul. In 2012, Seongbuk-Gu's Hanok Conservation Ordinance was adopted and spurred the Hanok conservation movement at an area-specific level. The Bukchon Project also influenced the nation-wide Hanok preservation and fosterage policy by the central government. The National Hanok Center was established in 2010 and the Hanok Promotion Law is being drafted.

TIMELINE

This timeline shows the development of the Bukchon and Hanok Conservation Policy starting with the 'Saturday Date with the Mayor of Seoul' in September 1999, the 2008 Hanok Declaration, and up to now.



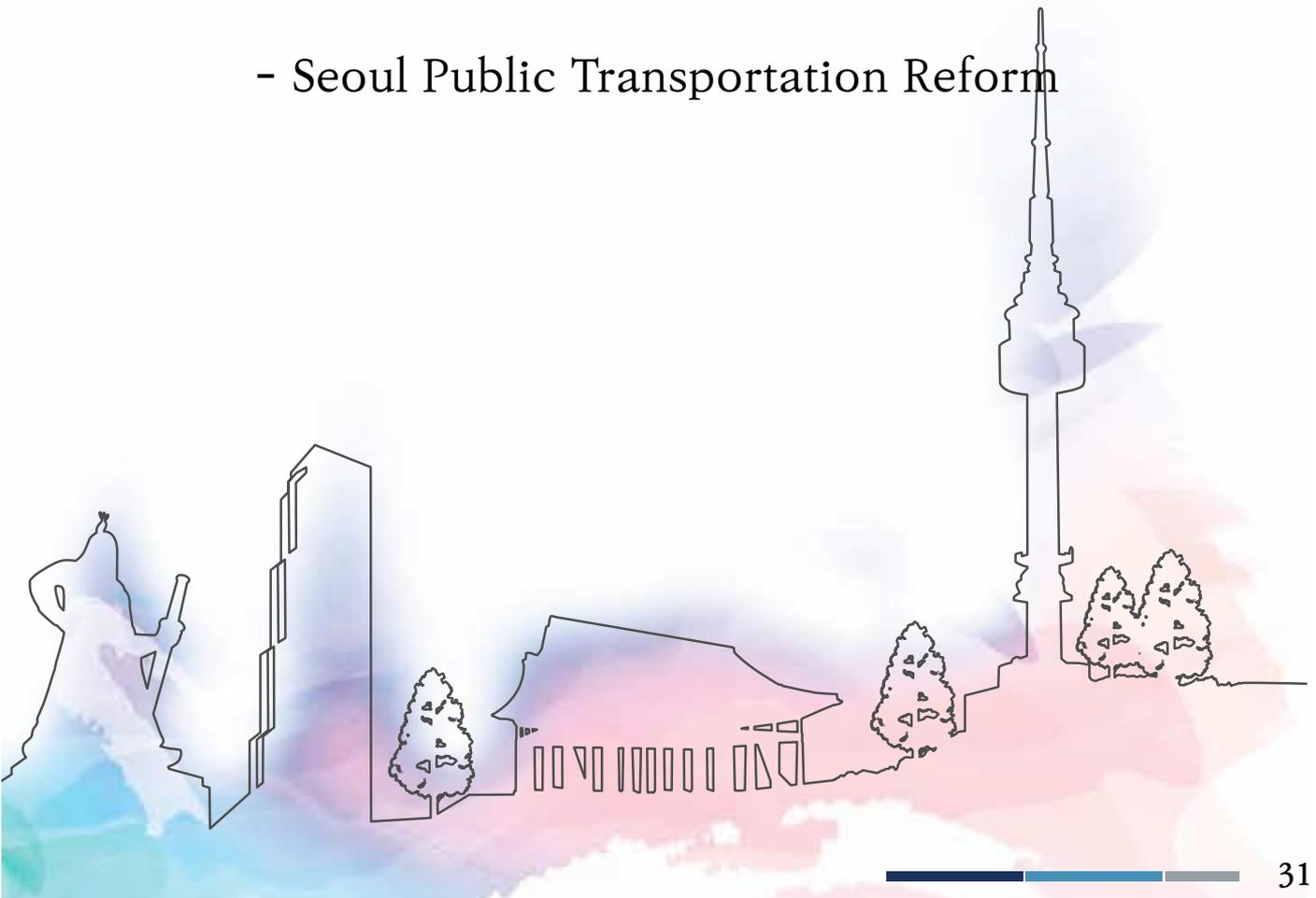


〈Day 2〉

Apr 29 (Tue)

[Service Delivery #1] Metropolitan Transport and Land Use

- A Driving Force for Sustainable Development and Remarkable Change, Seoul Metropolitan Subway
- Seoul Public Transportation Reform





Seungjun Kim

Company/Organization	Seoul Institute (SI)
Position	Research Fellow
E-mail Address	sjkim@si.re.kr
Biography	<p>Seungjun Kim, Ph.D. is a research fellow of Transport System Lab. in the Seoul Institute (SI), where he joined in 2007. He was a decade of transportation research and consulting experience on projects involving feasibility study, railway planning and operation and public transport. Recently he and his group focus on human-centered and eco-friendly transport, public transport service for the weak, and efficient operation of existing transportation facilities. He currently serves as a member of editorial board of Korea society of road engineers (KSRE) and of traffic impact assessment board of ministry of land, infrastructure, and transport of Korea (MOLIT).</p>
Title	A Driving Force for Sustainable Development and Remarkable Change, Seoul Metropolitan Subway

A Driving Force for Sustainable Development and Remarkable Change, Seoul Metropolitan Subway

Seungjun Kim (Seoul Institute)

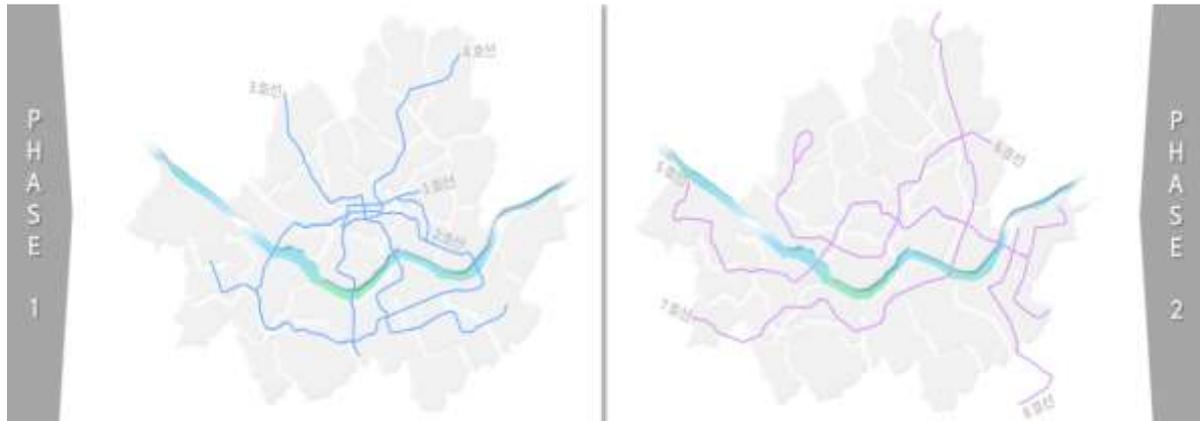
ISSUES

Surface tram played a more pivotal role in urban transport for the first seven decades since Korea opened its ports to foreign trade. It entailed a direct shift from walking to rail travel, transcending the days of carriage. Since the 1950~1960s, the supply of buses and taxis as well as jeeps and trucks used during the Korean War led to increased surface traffic. Slow trams occupied road space at ground level and caused speed reduction for other transport modes which is more flexible in dealing with urbanization. As a consequence buses replaced the role of surface tram as they did in other major cities in the world. Buses then became the only mode of public transportation but they alone did not have the capacity to cope with fast urbanization, leading to growing demands for new transport schemes by the late 1970s.

From the 1960s, the Korean government began a national development scheme which promoted industrialization in the vicinity of Seoul. This meant Seoul had to find space to accommodate the massive influx of population into the city and prepare public transport modes for people to travel to their workplace. The drastic population growth (increased more than three times from 2.45 million in 1960 to 10 million in 1990) created a rapid rise in traffic demand, a higher share of car use, and an increased travel distance, attracting more investments in the transport sector.

SOLUTION

Based on the judgment that expanding road network alone could not alleviate traffic congestion, Seoul Metropolitan Government (SMG) gave positive consideration to the use of underground space in the urban environment. A decade before the construction, the first plan for a subway project was laid out, followed by several revisions and in-depth researches to determine the best routes and the project's feasibility. The construction of the Line 1 launched after an agreement between Korea and Japan on providing loans and technological assistance for the project. While the first line was intended to serve mainly single central area, Seoul's newly revised master plan was based on the idea of having three urban cores to resolve the concentration of population in the Northern region and this led to the decision of building a new subway line that links the three cores. Line 2 brought about a great impact in Seoul's spatial structure, creating a corridor of business centers and universities locating along its route, all within a short period of time. As one of the most heavily used metro lines in the world, it serves more than 1.5 million people on a daily basis, contributing to environmentally friendly and sustainable growth of Seoul. Phase 1 of Seoul Metropolitan Subway project continued to the mid '80s, including the building of two lines that pass through main metropolitan corridors joining each other crosswise. Although other projects came to a halt due to financial difficulties after adding Line 3&4, it has left a substantial impact on today's structure of Seoul by laying out a spatial framework that still remains solid to this day.



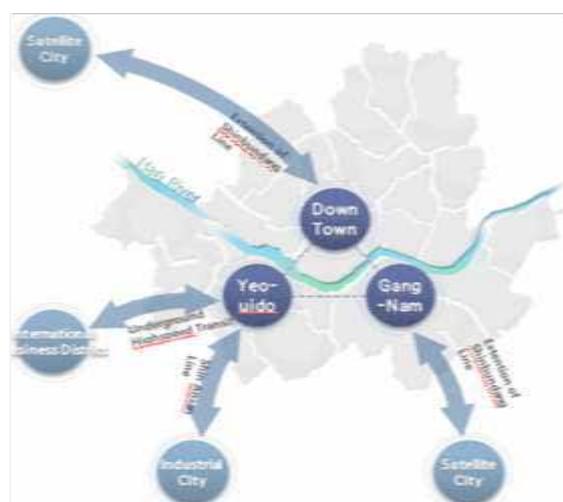
<Figure 1> Seoul's Subway Network

Due to constant overcrowding in Seoul, the capacity of Line 1~4 soon hit their limits. The ridership of Seoul Metropolitan subway was increasing 9~16% every year and the load factor was reaching 300%. When a development boom was accompanied by inflation, congestion was becoming a serious social problem. Against this background, the city government promoted Phase 2 construction consisting of the extension of Phase 1 network and additional new lines and thereby established a rail-based public transport system. As of late, the city is working on underground high-speed railway network which would link the greater Seoul metropolitan area and its inner-city cores, as well as Light Rapid Transit (LRT) that would reach out to unserved areas to foster balanced development throughout Seoul.

In the early stage, local opposition to subway construction from people who live nearby arose due to poor understanding of the project. After the opening, the competition ensued because of easy access to subway stations and profit returns from property development. In some cases political pressure was a determining factor in the design of subway routes and surplus stations or stations within walking distance from another station were built. Now hailed as "Super Highway" or "Best Subway System", Seoul's subway has evolved throughout the city's growth by establishing smart user environments and technological innovation.



<Figure 2> Light Rapid Transit (LRT) Plan



<Figure 3> High-Speed Railway Plan

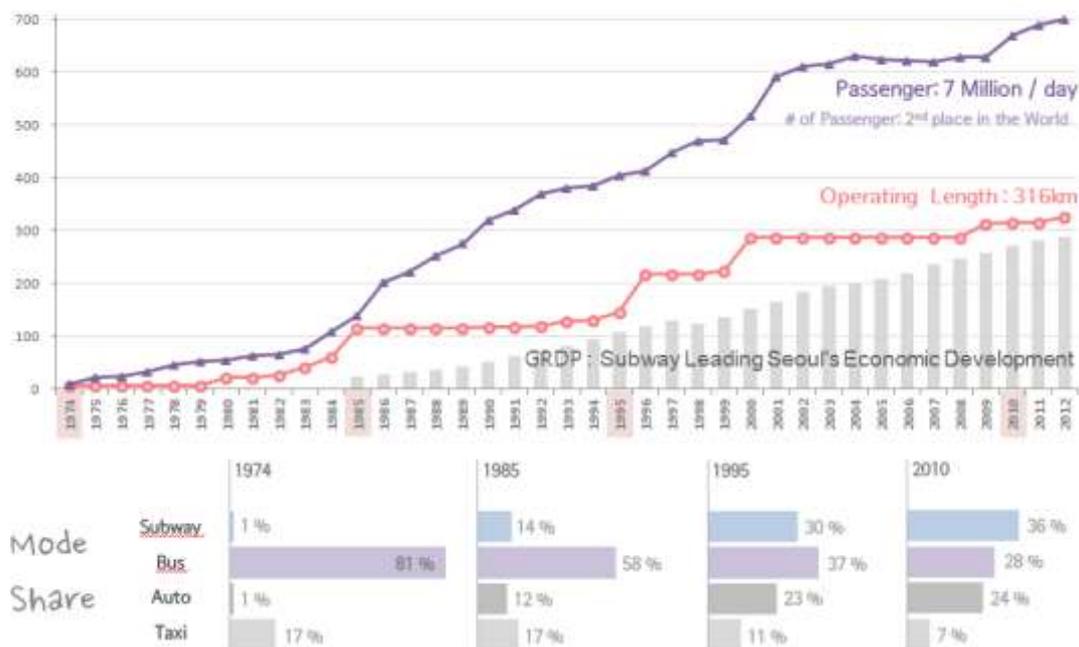
Key success factors for Seoul Metropolitan Subway are as follows:

- Seeking technological assistance from foreign countries based on exhaustive assessment on local technology
- The government's full support, implementing at national level
- Saving construction costs through timely execution from planning to execution
- Full-fledged administrative support involving traffic restrictions in the center for timely and efficient construction.
- Strategic investments in facility based on a future-oriented outlook
- Ensuring affordability in the fare system

RESULTS

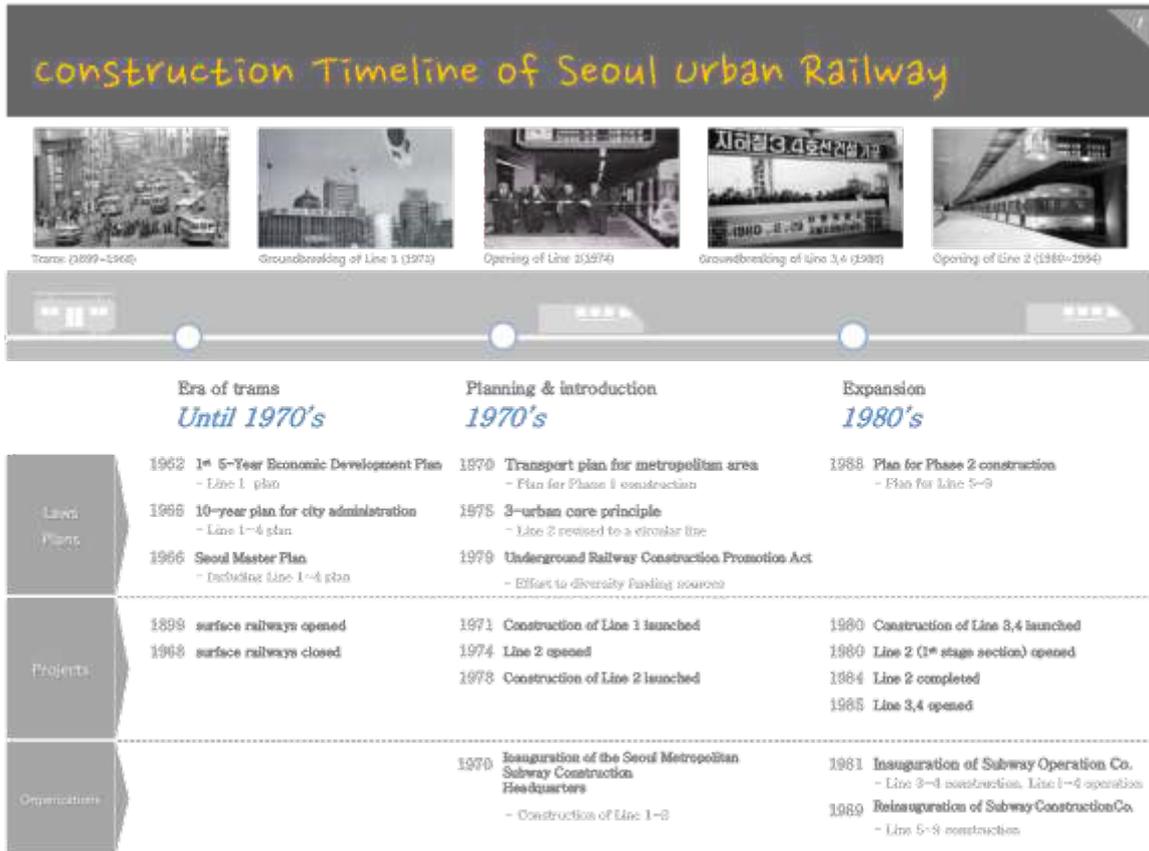
Although struggling under the burden of high initial construction cost, Seoul Metropolitan Subway functions as a driving force behind the city's sustainable development and remarkable change leading economic activities as well as providing opportunities for high-density office and commercial development around subway stations. Recently Seoul Metropolitan Subway is upgraded by one notch not only delivering a vital transport service for its citizens but also providing primary public spaces for cultural and social activities. With establishment of comprehensive and innovative management system through years of cumulative experience and technology, the network ensures timely and safe service and convenience for every passenger. The result of such efforts is shown the average daily ridership reaching 7 million and the modal share of 36%.

Established to tackle congestion and overcrowding of population and functions, Seoul's subway network has 40 years of history today. Boasting the world-class urban railway system, Seoul is now passing on its knowledge and technology in developing countries by offering consultation and engaging in projects.



<Figure 4> Modal Share Change in Seoul

TIMELINE







Joonho Ko

Company/Organization Seoul Institute (SI)

Position Director of Megacity Research Center

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Biography

Joonho Ko, Ph.D., is a research fellow and the director of Megacity Research Center (MRC) in the Seoul Institute, the think tank of Seoul Metropolitan Government, Korea. As the director of MRC, he takes the lead for collaborating with other cities abroad to share Seoul's urban development experience. In the institute, he is actively conducting various transportation studies, including public transportation, green car deployment plans and congestion mitigation strategies. Recently, he successfully completed a transportation master plan, called "Seoul Transport Vision 2030" as a project team leader. He has served on various committees charged with the assessment of traffic and environmental impacts from transportation projects. He earned his Ph.D. in transportation systems engineering from the Georgia Institute of Technology, USA.

Title Seoul Public Transportation Reform

Seoul Public Transportation Reform

Joonho Ko (Seoul Institute)

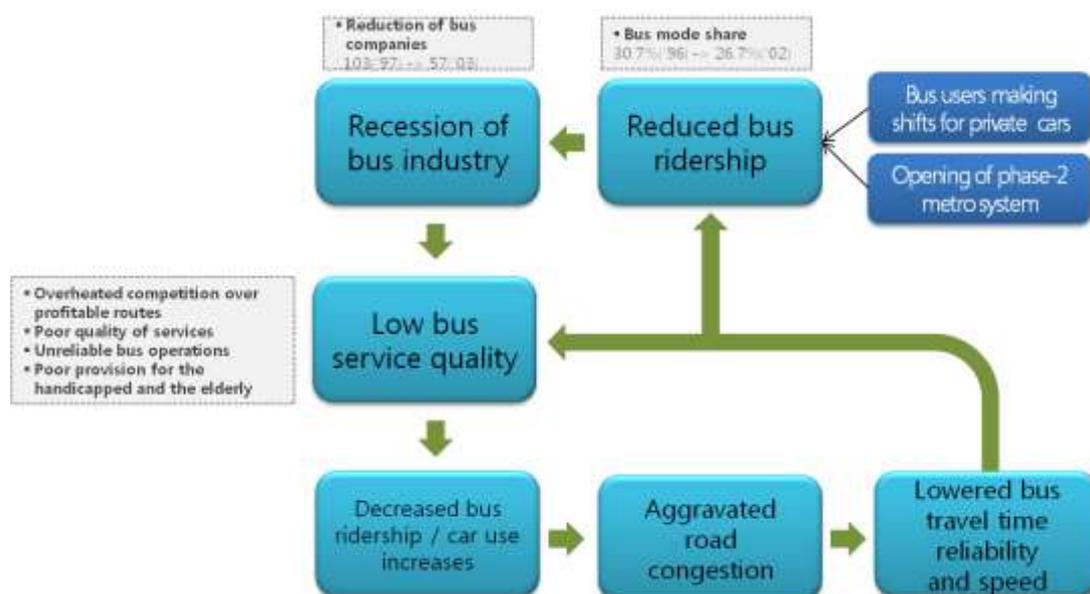
OVERVIEW

Commenced in July 2004, Seoul's public transportation reform has drastically improved the systems of bus route, fare and management. It has drawn attention and gained appreciation worldwide from other cities and international organizations such as UITP. Seoul has had a number of domestic and international visitors coming to Seoul to learn from lessons and knowledge behind its successful transportation reform.

The implementation of the 2004 transportation reform helped Seoul establish a human-oriented transportation system as shown in the modal split of its public transport reaching 64.3%(2010), stepping up the city's transportation and global competitiveness.

ISSUES

Before the reform, Seoul used to suffer from serious transport-related problems induced by the increasing number of registered automobiles including single occupancy vehicles and the scarcity of parking space. Majority of citizens, though, did not expect the city government to find an effective cure for the chronic distress. In addition to the heavy traffic, overheated competition among bus operators combined with the opening of urban rail network affected bus ridership negatively, putting the bus industry on a downslide. However, authorities' early actions were mainly ad-hoc measures that turned out unsuccessful and further worsened the problems in the long run.



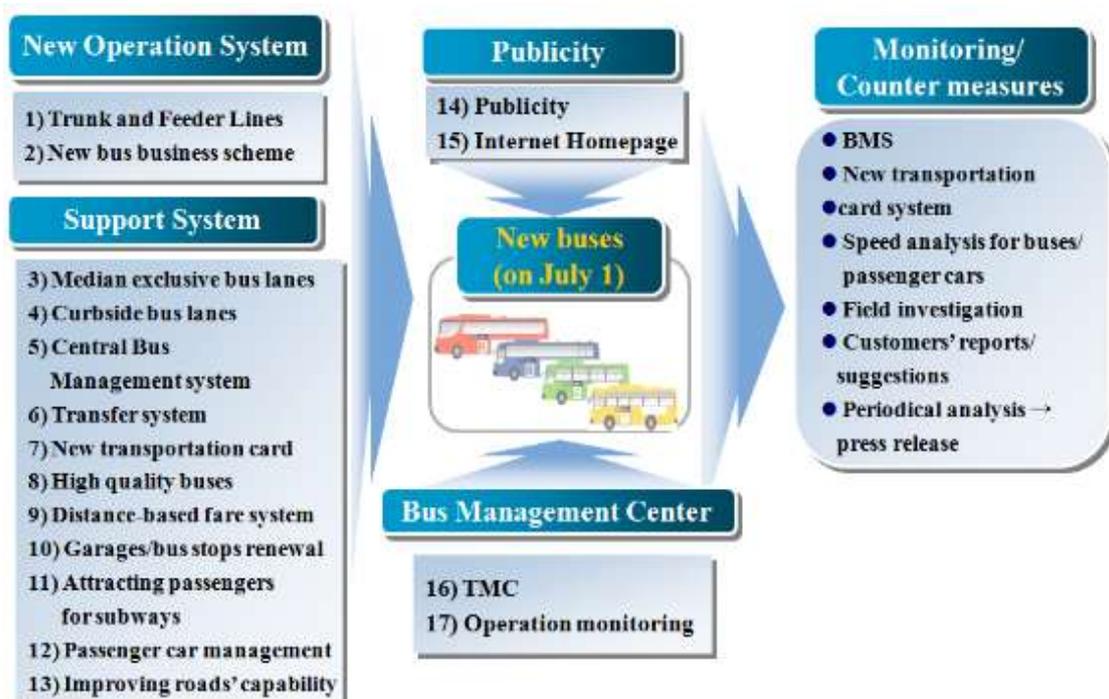
<Figure 1> Conditions of Bus Industry before the Public Transportation Reform

GOALS AND OBJECTIVES

Against this backdrop, the bus reform schemes aimed at mitigating urban traffic congestion and reinforcing Seoul's global competitiveness through the promotion of public transportation use with a new city bus system.

Key goals of the reform include:

- restructuring of routes: demand-oriented route designing centered on trunk and branch routes
- reforming fare system: a shift to distance-based fare system from the previous independent and flat fare system, establishment of a fair fare system by making intermodal transfers free, promotion of transportation card use,
- reorganizing bus operation: Route redesigning with the introduction of the semi-public bus operation system, securing financial transparency with joint revenue management, reducing profit disparity between bus operators, provision of employment security for bus drivers, introduction of a route bidding system to improve bus service
- ensuring bus-centric road operation: improvement of reliability and speed, enhancement of carrying capacity
- enhancing user support: establishment of democratic governance, encouraging civic participation in decision-making, building a scientific bus operation system, upgrading bus fleet



<Figure 2> Highlights of Bus Service Reform

CONSTRAINTS AND OBSTACLES

Ahead of July 2004 reform, Seoul's transport authority had sought to implement a pilot project in the Northeast region of Seoul to handle prospective congestion following the removal of the Cheonggye

elevated highway. However, the ambitious attempt did not take off because of opposition particularly from bus companies. It took about one year for the reform to fully resume after conducting negotiations with stakeholders. The table below summarizes main interests of different stakeholder groups.

Stakeholder Groups	Main Issues
Bus operators	<ul style="list-style-type: none"> • Property right (route patent) infringement, inconsistency in the city's policies (often revised with a new political period) • Preference to the current system
Bus drivers	<ul style="list-style-type: none"> • Job safety (anxiety over unemployment from route adjustment and less buses in operation)
Citizens	<ul style="list-style-type: none"> • Impact on their businesses from relocation of bus stops from the street side to median lanes
District authorities	<ul style="list-style-type: none"> • Lack of administrative guidelines in response to civil appeals
Police Agency	<ul style="list-style-type: none"> • Safety of using median bus lanes and related complaints from citizens
Transit operators	<ul style="list-style-type: none"> • Impact on the profitability of neighboring cities' metro operators caused by the new integrated fare system
MPs, city and district councilors	<ul style="list-style-type: none"> • Complaints from bus companies, bus drivers and citizens from their constituencies

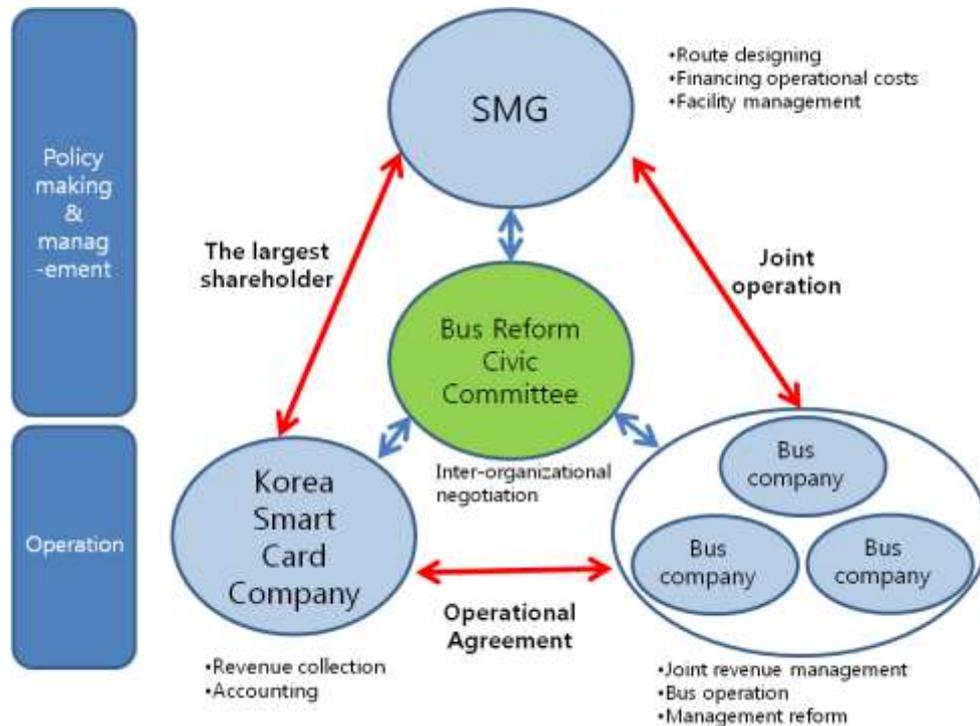
ACTION

To coordinate the reform, a civic expert was assigned as the Director for Transportation Policy and the entire workforce of Seoul Metropolitan Government (SMG) was involved under the supervision of Transport Improvement Taskforce. Also established was "Transport System Reform Support Taskforce", a research support team consisting of researchers of Seoul Development Institute among others.

Meanwhile after the unsuccessful Northeast area pilot project, SMG formed "Bus Reform Civic Committee" to encourage active civic participation after gathering citizens' opinion on the delay in the reform process. Established in August 2003, the committee, made up of 4 members from civil organizations, 3 from bus companies, 8 from transport-related academics and 5 from city council and other related entities, was an independent organization that comprised the most important of interested parties in the bus reform. Through these discussions, SMG devised measures to restructure the bus routes with citizens' convenience and financial stability of bus companies in mind.

SMG made persistent efforts to come to terms with interested parties. During negotiations with bus companies, it held workshops with representatives from bus companies, academics and local officials. Measures taken in the negotiation process also included official letters to 16,000 bus drivers to make a case for the bus reform and 27 special training sessions for drivers. Finally, SMG settled an agreement through the cooperation with police agency, Ministry of Land, Infrastructure and Transport, Incheon city government and urban railway operators.

Passenger Automobile Operation Business Act was revised to secure legal ground for the joint management of revenues, a key part of the quasi-public operation system. As for some of the contested routes, it was decided to limit the validity of operation license for each operator up to six years along with the introduction of route bidding system. To stabilize the operation of bus companies, subsidies are provided by SMG.



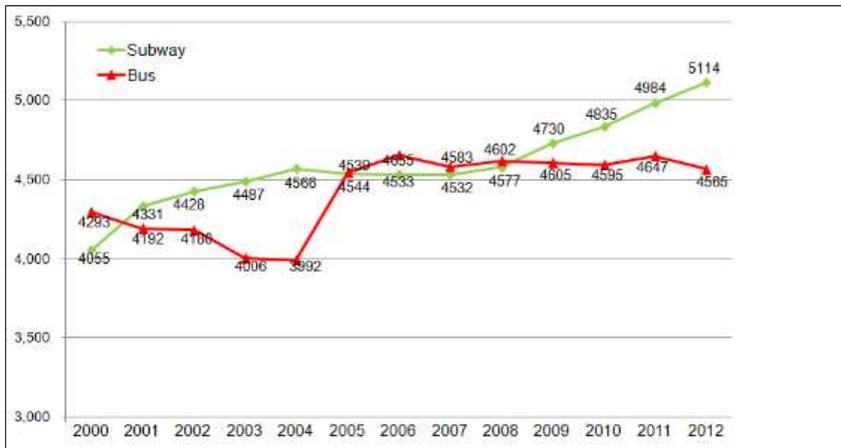
<Figure 3> Organizational Structure and Roles for the Bus Reform

RESULTS AND EVALUATION

With the implementation of quasi-public operation system, the city bus network has transformed to a passenger-oriented mode of transport that offers stable and pleasant bus travel environment. Also, the installation of median bus lanes led to a significant improvement in bus travel speed. The introduction of transportation card allowed scientific management of public transit. These achievements resulted in the increased passenger satisfaction level, ending a drop in the ridership that was in constant decline prior to the reform. In addition to these achievements, a distance-based fare system, which imposes incremental fares in accordance with travelled distance, was introduced contributing to the equity and efficiency of transport service.

Route	Before reform (km/h)	After reform (km/h)	Change (km/h)
Hansung Univ.→ Hyehwan R (Donong-Mia)	9.0	30.8	+ 21.8 (242%)
Jungsangyo→Moraenaegoga (Susake-Sungsan)	7.5	20.2	+ 12.7 (169%)
Gangnam Sta.→Kyobo Tower (Gangnamdaero)	9.1	17.4	+ 8.3 (91%)

<Table 1> Bus Travel Speed Before & After the Reform

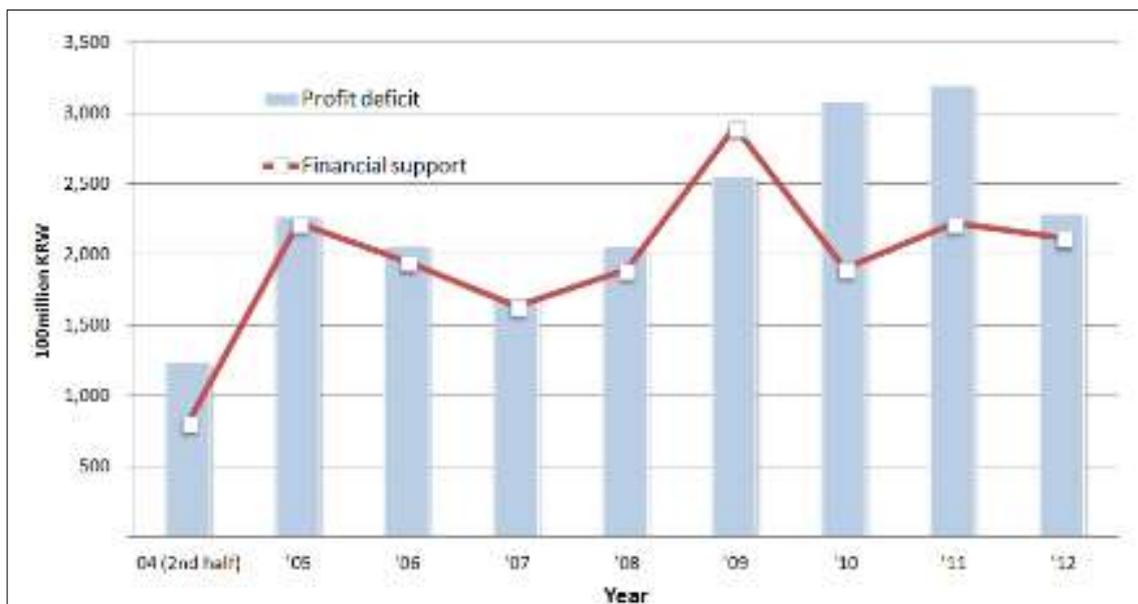


<Figure 4> Public Transport Ridership (1,000 passengers/day)

FINANCING AND COST

To provide financial support for the project, private investments were encouraged to minimize the public financial burden. For example, costs for developing transportation information system (₩124.9 billion) and construction of major transfer centers (₩5 billion) including the ones in Yeouido and Cheongryangri were entirely sourced from the private sector.

SMG provides subsidies for bus companies to make up for their profit shortfall from quasi-public operation and free transfers. The financial aid from the city government totaled ₩80 billion in 2004 and ₩200~300 billion every year onward.



<Figure 5> Trends in Bus Operation Deficit and Financial Support

TIMELINE

Reform groundwork

- Jul 2002: Announced the intent to reform the public transportation
- Aug 2002: Organized Seoul Public Transportation Taskforce
- Oct 2002: Established "Transport System Reform Support Taskforce", a research support team at Seoul Development Institute
- Jan 2003: Conducted benchmarking studies on international transport system including U.S. and Brazil

The North-east area pilot project and failures

- Mar 2003: Announced the Northeast Area pilot project
- May 2003: the Northeast Area project suspended

Making adjustments and reaching agreement

- Aug 2003: inauguration of the "Bus Reform Civic Committee"
- Aug 2003 ~ June 2004: discussion with stakeholders and accommodated their opinions
- Oct 2003: Establishment of Korea Smart Card Corporation
- Feb 2004: reached an agreement on joint revenue management between SMG and bus companies

Public Transport Transform

- Jul 1 2004: launch of the reform
- Jul 4 2004: Mayor's release of public apology for unsatisfactory arrangements
- Aug 2004~now: ongoing upgrades of the reform including policy revisions to stabilize the operation

LESSONS LEARNED

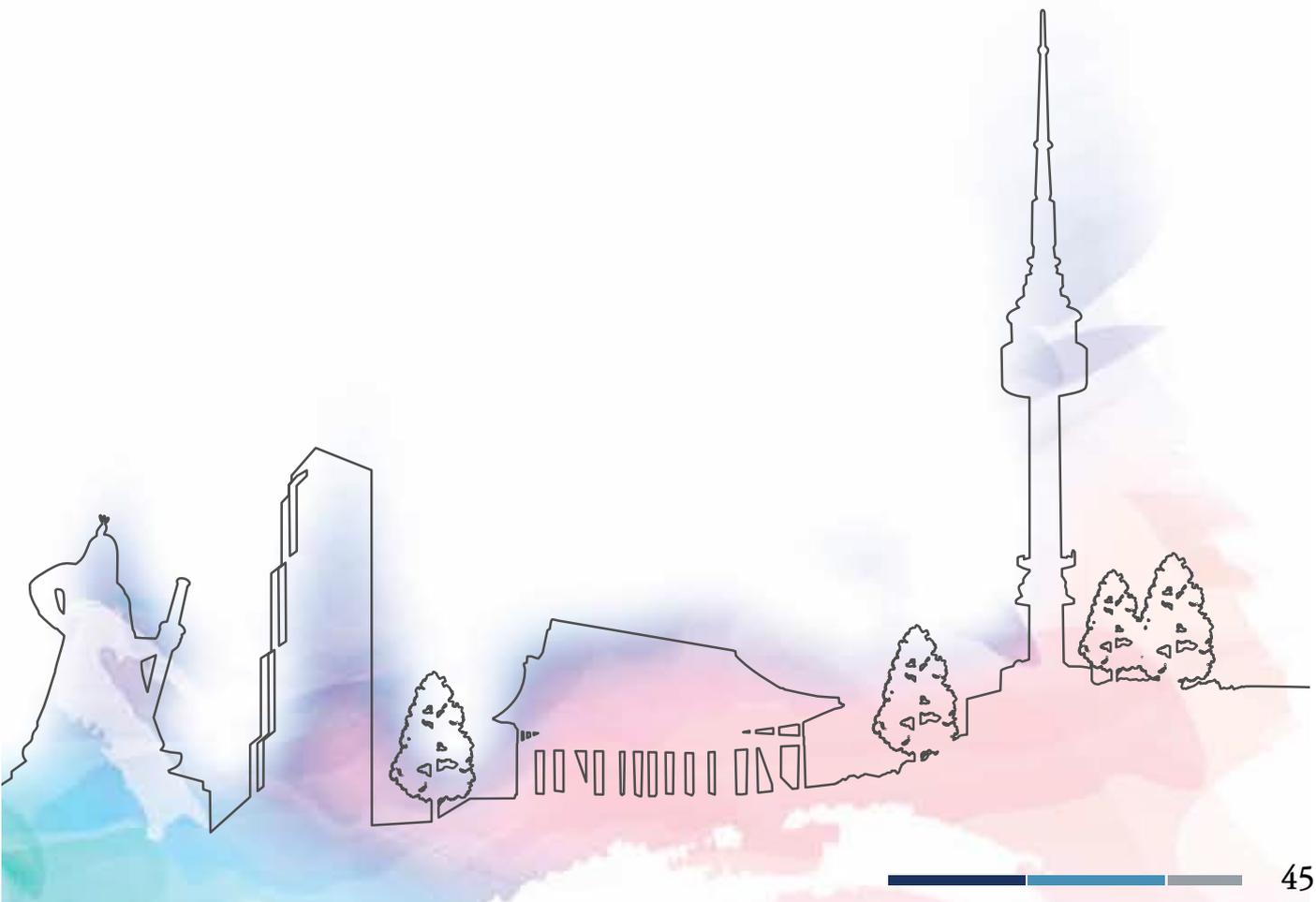
Without such endeavors made to reach a social consensus among stakeholders by organizations built on public-private partnership such as "Bus Reform Civic Committee", results would have been different from what we see today. Particularly, directing policy revisions based on compromises between the city's realistic choices and researchers' ideal vision laid the framework for Seoul's successful transport system. As demonstrated by Seoul's experience, collective planning and consensus building among stakeholders is instrumental to the establishment of the new structural arrangements. In addition, experience from the early pilot operation in the Northeast region tells us that depending on the issues, a full-fledged systemic reform can turn out to be more effective as it can produce a significant synergetic effect.

〈Day 3〉

Apr 30 (Wed)

[Urban Systems #1] City e-Government

- Seoul e-Government toward Smart City





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Position Professor

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Biography

Sang Ok Choi is professor in the Department of Public Administration and the Science Technology Program at Korea University, Seoul, Korea. Prior to joining faculty of Korea University in 2011, he was on the faculty at the Department of Public Administration of Virginia Tech and California State University-Dominguez Hills, U.S.A. His current research focuses on the study of information technology, science and technology policy, and social network analysis. His work has appeared in Public Administration Review, American Review of Public Administration, State and Local Government Review, Administration & Society, International Journal of Public Sector Management, and Journal of Homeland Security and Emergency Management. Professor Choi has consulted widely on IT & science technology, performance evaluation and management issues with government and NGOs, and served as an editorial board member for academic journals.

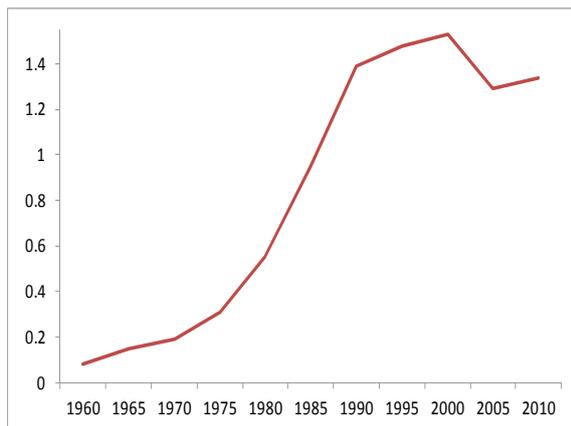
Title Seoul e-Government toward Smart City

Seoul e-Government toward Smart City

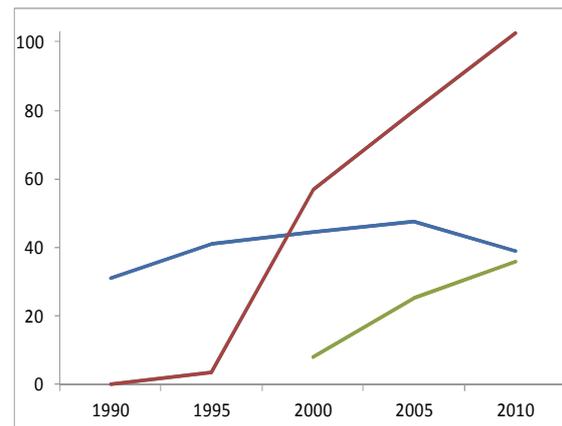
Sang Ok Choi (Korea University)

ISSUES

Since 1985, the supply rate of personal computers has been increased 17.6 times from 5% in 1985 to 86% in 2009. Until the mid 1960s one every ten households had a phone subscription, but increased to 0.54 person per household in 1997, then to 1.56 in 1997, and finally by 2007 1.34 persons per household had phone connection. This can be attributed to the increasing mobile phone use since the 1990s. It is shown in the fact that the number of phone subscriptions was 0.2 per every 100 in 1990 before it became 105.5 as of 2011. In regards to the broadband internet subscription, the number of subscription moved from 8.2 in 2000 to be radically increased to 35.9 as of 2011, multiplying 4.4 times.



<Figure1> Number of Phone Subscription Per Household



<Figure2> Trends in Landline Phone/Mobile Phone/Broadband Subscriptions

As a means to achieve governmental efficiency and innovation, transparency and accountability, accessibility of government and civic participation, Seoul's e-government policy tried to encourage the active engagement of citizens in ICT, while building a cooperative relationship between the Seoul Metropolitan Government and citizens.

SOLUTIONS

Solution 1: Government-driven promotion and Seoul's compliance

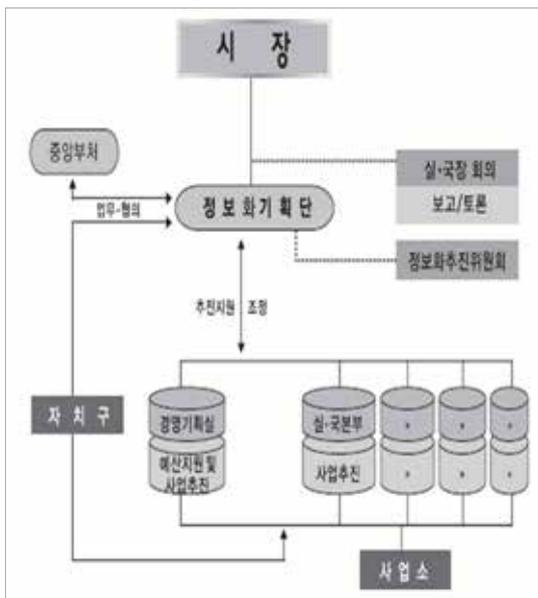
Since 1978 when the first Basic Plan for Administrative Computerization was laid out, introducing ICT technology to public administration became a main agenda. Computerization, a preceding step to informatization, promotes use of computers in managing large data. During this era computing practices was of the punched card computing level, so the range of computerization was limited to

simple tasks and compiling or processing databases. The focus was on developing inter-governmental network and thereby increasing work efficiency. The major policies and projects undertaken by the central government since 1978 to promote e-government included the first and second Administrative Task Computerization Plans, Rule of Administrative Task Computerization, National Basic Computing Network Project and Administrative Computing Network Project Plan. Despite such endeavors, however, very few investors were willing to get involved because of the low level of technology and uncertainties. Seeing the benefits of computerization projects and e-government, SMG was not discouraged to continue its investment and collaboration with the central government, allocating financial and institutional supports on e-government projects from the early stage. For example, Information System Planning Bureau provided a critical assistance in gathering the citywide compliance.

Solution 2: Coordination and Directing via the SMG Information System Planning Bureau

The informatization project incrementally expanded in scope and scale since the city's early efforts in 1971 to computerize main administrative tasks such as budgeting, accounting and personnel affairs. In compliance with such national plans as Basic Plan for Administrative Computerization and Act on Promotion & Usage of Computer Network in 1987, SMG took an initiative for e-government transformation through its own plans.

Incomplete implementation in the early days of digitalization projects, contrary to the expectations, created extra workload at the city hall. While sharing of administrative information was partially made possible, data management by individual agencies was still scattered. As a response to the calling for a full integration of e-government services across different administrative divisions, Information System Planning Bureau (ISPB) was launched in pursuit of administrative efficiency. ISPB serves as the main implementation body that directs comprehensive planning and coordination of e-government projects. As of now, it consists of 4 directors, 23 teams and 4 divisions housing 989 staffs in total.



<Figure3> Creation of Informatization Planning Division (1999)



<Figure4> Organization of Information System Planning Bureau (2013)

Solution 3: Enhanced Paradigm: From efficiency to transparency and citizen participation

Following the early efficiency-driven approach towards e-government, Seoul has moved its focus since the 2000s to digitalization and disclosure of administrative information to promote the citizens' participation and transparency in the administrative process. Measures taken to foster administrative efficiency include “Seoul e-Tax System”, “120 Dasan Call Center”. Innovative measures are in operation for the transparency in the city administration, for instance “Seoul Child Care portal” and “Oasis,” an online policy suggestion system.



<Figure5> Online Tax Site



<Figure6> Online Citizen Participation Site

ACHIEVEMENTS

Number 1 in Global E-Governance Survey Ranks for five consecutive years

A research study conducted by Rutgers University has identified Seoul as the top city in the field of e-government. Seoul was ranked number 1 in terms of usability, service, and citizen participation, making Seoul's municipal e-governance one of the best among cities in OECD countries.

Ranking	City	Score
1	Seoul	84.74
2	Prague	72.84
3	Hong Kong	62.83
4	New York	61.1
5	Singapore	58.81
6	Shanghai	57.41
7	Madrid	55.59
8	Vienna	55.48
9	Auckland	55.28
10	Toronto	52.87

<Table 1> Rutgers' Global E-Governance Survey Ranking (2009)

Disclosure of Public Information

“Open Government 2.0” is built to push forward civil administrative services based on participation from the citizens, disclosing city documents and extensive public database.

The system is expected to leverage the mutual understanding between the citizens and the SGM staffs along with the prospective growth of the industry which would benefit from public data, establishing Seoul as one of the most advanced smart cities in the world.



<Figure7> Open Government Systems: SMG Document Center/ Open data Center

Another facet of e-government’s achievements is demonstrated by online government information access, document issuance, tax administration, and welfare service.

Improvement in ICT Work Environments and Realization of Smart City

Upgrades are ongoing in ICT facilities to ensure sustainability in smart governance. SMG is working on setting up the groundwork for smart administrative service to meet a variety of administrative demands through its enhanced administrative support and integrated management. For example, the management of U-work Center boasts its world-class ICT facilities to improve employee’s productivity and help tackle low fertility rate.

SUCCESS FACTORS

There are factors both within and outside the SMG behind the success of e-government in Seoul. Some key external factors in Seoul’s rise as an e-government powerhouse include the central government’s ambitious promotion and supply-driven strategies in the ‘80s. Also instrumental was the cooperative implementation between the central government and SMG. As for the internal factors, institutionalization of controlling body played a vital part. Collaborating with the staff on ideas and resolutions, Mayor’s strong commitment and keen interest in the open and smart administration was another crucial factor.

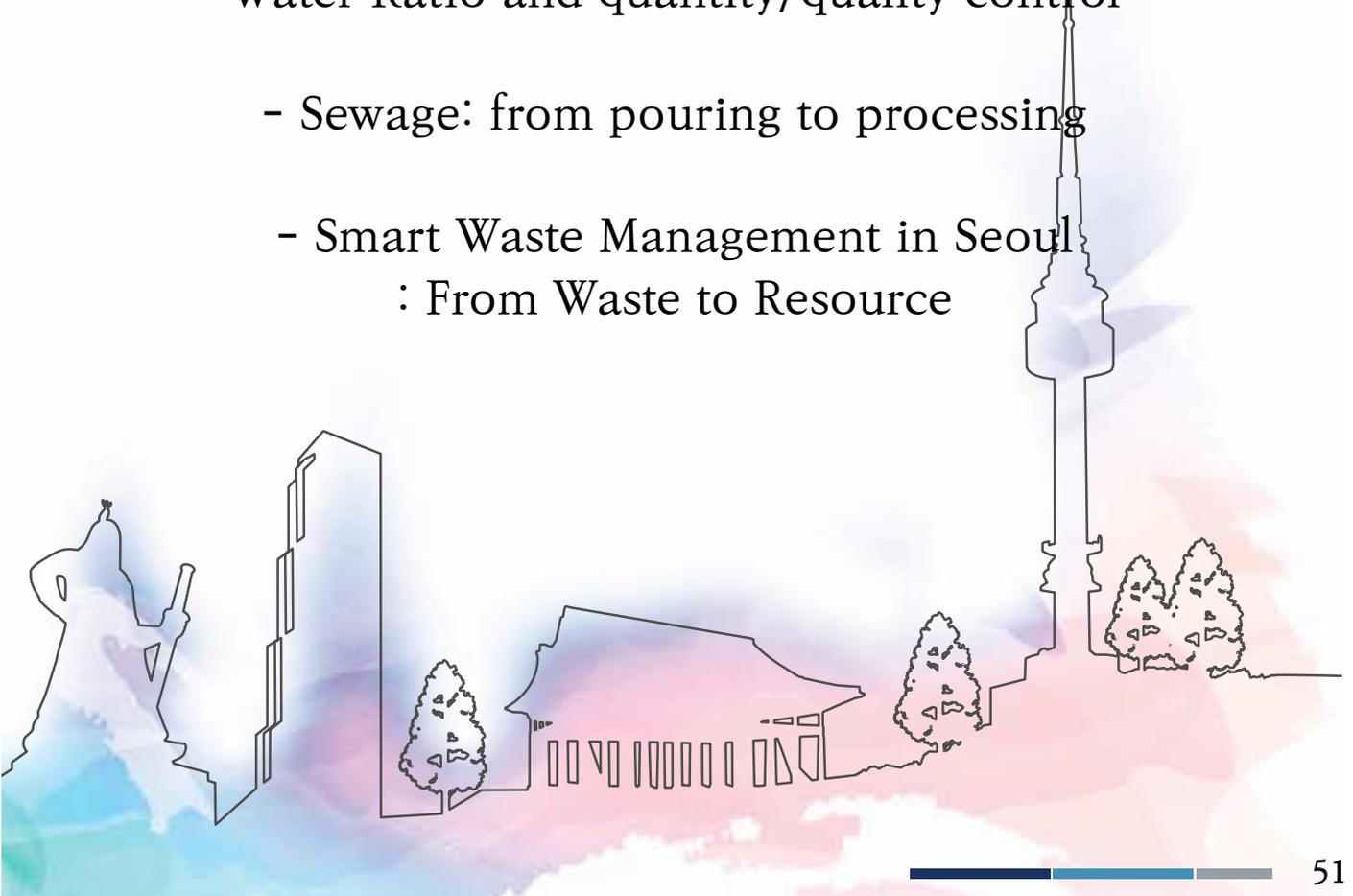
〈Day 4〉

May 1 (Thu)

[Service Delivery #2]

Metropolitan Water and Waste Management

- Sustainable water supply of Seoul
: Efficient management with the Revenued Water Ratio and quantity/quality control
- Sewage: from pouring to processing
- Smart Waste Management in Seoul
: From Waste to Resource





Young-june Choi

Company/Organization	Waterworks Research Institute
Position	Director of Bureau of R&D for Water
E-mail Address	youngjune@seoul.go.kr
Biography	<p>Young-june Choi Ph.D. is an engineer, scientist and director of Waterworks Research Institute. He has been leading the Bureau of R&D for Water and responsible for all the research projects on water issues of Seoul, including drinking water treatment technologies, supply system, monitoring system, wastewater treatment processes, urban drainage system, and strategic planning of R&D.</p> <p>He is an expert in membrane filtration technology and has carried out one of the largest R&D projects on membrane filtration in Korea. He is the directors of 5 academic societies related with water and environmental engineering.</p> <p>He has been working as an expert reviewer for IPCC AR5 report which will be disclosed at the end of 2014. He and his team got “Project Innovation Award” from International Water Association for the “Integrated remote metering system” in 2012.</p>
Title	Sustainable water supply of Seoul: Efficient management with the Revenued Water Ratio and quantity/quality control

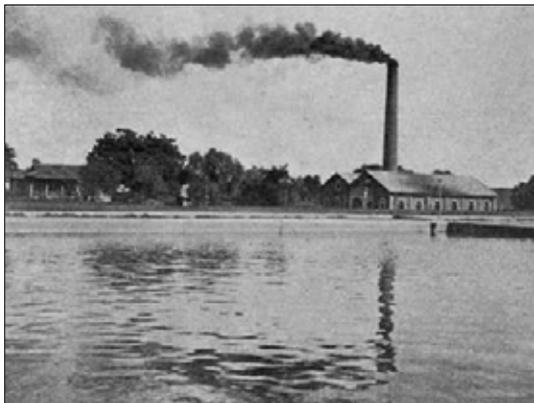
Sustainable water supply of Seoul:

Efficient management with the Revenued Water Ratio and quantity/quality control

Young-june Choi (Waterworks Research Institute)

CHALLENGE

The modern water supply in Seoul started in 1908. However, over the course of Korean War after the Japanese colonial period, most of the waterworks in Seoul was severely damaged or destroyed. After the ceasefire in 1954 for the subsequent five years, restoration project of waterworks was launched with the help of UN aids and state funds. During the 1960~70s, demand for water increased exponentially with the drivers such as fast urbanization and industrialization following the five-year economic development plan of Korea. At this point, necessity of expanding water facilities became evident.



<Figure1> 1908 Tukdo Water Treatment Plant



<Figure2> Noryangjin WTP during the Korean War

Since the amount of water supply in Seoul at that time was insufficient, majority of citizens had to suffer a shortage of drinking water. In particular, extra administrative support was needed in vulnerable regions with lower water pressure such as highlands and extremity of the water supply line. Under these circumstances Seoul Metropolitan Government sought to secure funds through foreign aids, issuing municipal bonds and state subsidies. This effort allowed a full commitment in investing on water production facilities along with water supplying facilities and auxiliary water treatment plants.

Thanks to the steady expansion of production facilities and the slowing of population growth, water supply began to stabilize. By 1988, the service rate reached 98.8%, risen from 59.8% in 1960. As for the unstable supply on hillsides, 122 pressure booster stations were built by 1989 to mitigate the weak water pressure, along with the installation of 11 major water reservoirs completed during the three years from 1985 to 1987. Owing to such investments, the water storage capacity as increased to 648,000 m³, doubling the previous capacity.



<Figure3> Facility Capacity and Service Rates in Seoul

Thanks to the large facility investments and extra support in underserved areas, the service rate in Seoul reached 99% in 1989. Following the establishment of the groundwork for reliable supply system, there was a transition in the policy agenda for waterworks, to "improvement of waterworks management via control of water quality and increase of revenue water rate(RWR)."

RWR is an indicator to measure the percentage of billed water as a share of net water produced. Higher RWR means reduced tap water loss, positively affecting financial viability of water utilities by increasing water sales and cutting unnecessary operating costs. As more citizens began to consider the quality of tap water rather than its quantity, technological and administrative means were devised to address these demands.

SOLUTION

Higher RWR means higher efficiency in water production and supply, besides the financial benefits in utility management. Thus, improvement in quality/quantity of water is attainable by enhancing RWR. For this reason, Seoul Metropolitan Government (SMG) arranged both administrative and technical support to increase RWR. Among the technical support made by SMG were:

- Construction of reservoirs for balanced water pressure
- Replacement of old pipes
- Leakage monitoring via small-scale block system and measurement of minimum night flow
- Leakage surveillance
- Prioritized management of regions with pressurized water supply
- Establishment of GIS with database on locations and materials of pipes

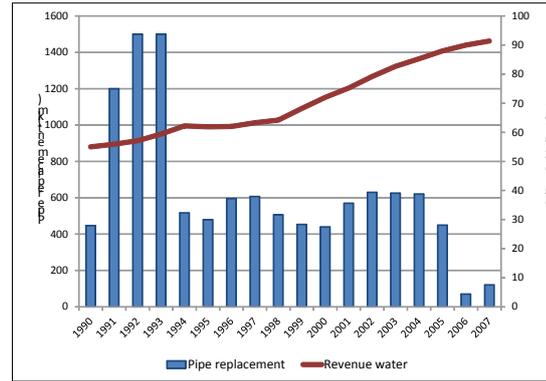
The administrative side of improvements includes:

- Inauguration of a special organization for the RWR improvement project.
- Meticulous evaluation scheme for institutional performance based on RWR
- Detection of fraudulent activity such as faulty metering and illegal connections

To reduce the amount of non-revenue water by cutting water leakage and quality improvement, Seoul was divided into 2,037 small blocks. It was based on these block systems that pipe network was designed, old pipes were replaced or repaired and leakage detection was carried out. This facilitated relentless monitoring and repairs of leakage as well as intensive repairs of deteriorating pipes and maintenance of unused pipes, helping to reduce water loss in regions with lower RWR.

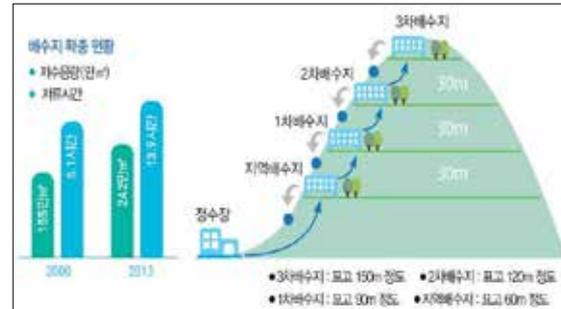
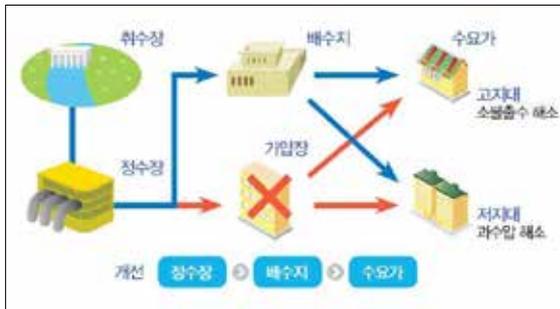


<Figure4> Block System



<Figure5> Pipe Replacement and RWR

The deteriorating infrastructure such as grey cast iron, steel, and PVC pipes installed before 1984 was the cause of frequent water leakage. As a solution to this problem, the old pipe network was replaced with more durable material such as stainless steel or ductile cast iron, which in turn helped to increase RWR.

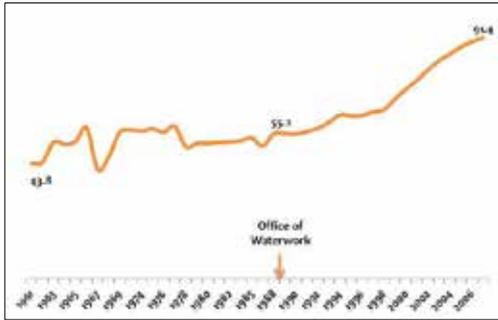


<Figure6> Indirect Water Supply System Using Water Reservoirs

In the past, pressure boosting was the method of choice for facilitating water supply to highlands. However it was responsible for water hammer and leakage due to the unreliable water pressure. As a solution to this issue SMG transformed its plan for water supply to a passive delivery system, undertaking an expansion of service reservoirs that involved the construction of 104 new reservoirs (2,420,000 m³ in total). Such commitment paid off, as shown in the increased RWR from the reduced leakage and reliable supply.

RESULTS

The result of such dedication against water losses was a significant improvement RWR of Seoul, currently at 94.5% (2013), increased from 55.2% of back in 1989 when Office of Waterworks was established. Following the downsizing of production since 2000, SMG transformed old water treatment plants into recreational space for citizens such as Seonyudo Park. As one of the benefits from the establishment of efficient management system and cost reduction, the water tariffs remained the same between 2001 and 2009. The reduction of water losses ultimately led to the improvement in water quality, as it requires facility upgrades and efficient management of waterworks.



<Figure7> Trends in RWR



<Figure8> Monitored Items and Water Quality

TIMELINE

	1950	1960	1965	1970	1989	
	Han River as water Source		rationing	supply regulation	Emergency supply trucks	Office of Waterworks
	1960s		1970s		1980s	
Technical means	1961 5-year plan for water leakage prevention 1st facility expansion plan		1970 Multi-regional Water Supply Project launched 1971 replaced pipes older than 35 years		1982 Intake Stations constructed 1985 large reservoirs constructed	
Administrative means	1962 5-year plan for filtration plant expansion 1964 2nd facility expansion plan		1972 Waterworks Expansion Project launched 1976 Jungang Sewage Plant constructed 1979 Metropolitan Waterworks Construction Project		1985 Waterworks Modernization Project 1989 Office of Waterworks inaugurated	
Key historical events	1961 May 16 coup Supply and Waterworks Installation Act 1962 1st 5-year Economic Development Plan 1963 anti-pollution laws enacted		1976 Jungang Sewage Plant constructed 1979 Metropolitan Waterworks Construction Project		1986 '86 Seoul Asian Games 1988 '88 Seoul Olympics	

	1996	2001	2008
	Opening of Bukak Tunnel	Production of Arisu Bottled Water	The 100th anniversary of Seoul Waterworks
	1990s		2000s
Technical means	1990 district flowmeters installed 1991 old pipes repaired 1996 measurement of RWR 1998 Small Block System launched		2000 reservoir expansion 2004 middle block system 2005 leakage detection system
Administrative means	1992 comprehensive plan for water storage 1998 Water Assessment Team 1999 Special Project for RWR improvement intensive management of redevelopment sites		2003 special department inaugurated 2001 water improvement project in apartment complexes filed for the Arisu Trademark for Seoul Metropolitan Tap Water 2005 plan to make Arisu a high-end brand
Key historical events	1994 Act on the Special Measures for Development of Agricultural and Fishing Villages		





Kap Soo Kim

Company/Organization Isan Corporation

Position Vice Chairman

E-mail Address sportskim@hanmail.net

Biography

Kap Soo Kim is currently Vice Chairman of ISAN Corporation which provides engineering services related to water, environment and civil infrastructure sector. His specialized field is Sewage and Wastewater Treatment, and he is highly interested in sludge treatment and disposal.

He worked at many different institutes, such as Korea Institute of Construction Technology, Korea Water Works Institute, and Seoul Institute. As his wide range of experiences and knowledge background, Dr. Kim served as an advisor to SMG's and central government's water and sewage treatment committees. He also led an academic community, Korean Society of Environmental Engineers for many years. He was awarded a national citation. He holds a Master of Environmental Engineering and Ph. D. in Kanto Gakuin University, Japan.

Title Sewage: from pouring to processing

Sewage: from pouring to processing

Kap Soo Kim (Isan Corporation), Young Ran Kim (Seoul Institute)

ISSUES

The Han River, once so fouled by industry and sewage that dead fish lined its banks. The river fell victim to rapid industrialization as textile mills, chocolate factories and city sewer systems poured waste into its waters. In the early 1960s, Seoul with a population of 3million, was experiencing serious water pollution in the Han River. Swimming was banned in the lower streams of the Han River Bridge and fish with deformed spine started to appear. BOD figures surveyed in 1963 showed 241ppm at Cheonggyecheon Stream and 124 ppm at Jungnangcheon Stream. Moreover, regions around these rivers and streams were subject to frequent floods during the monsoon season.



<Figure 1> Seoul's Water Pollution in the early '60s

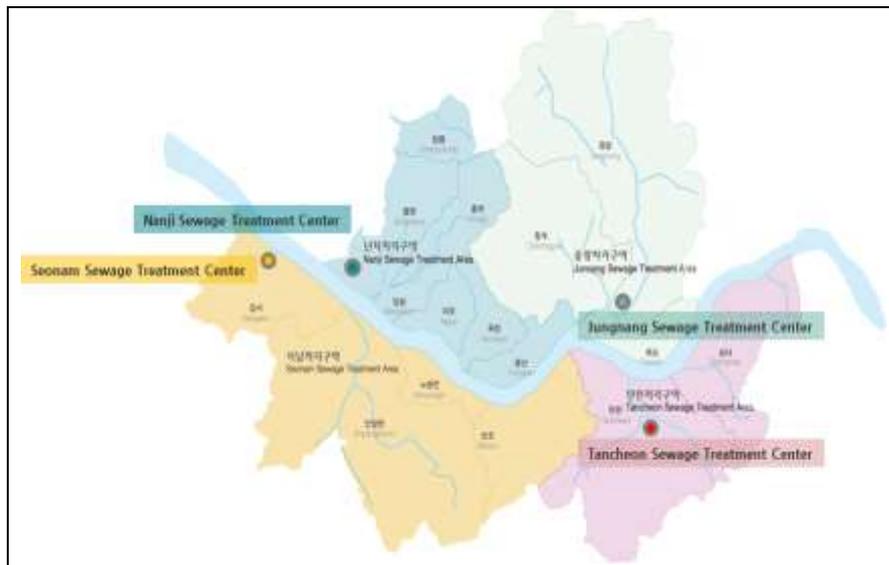
SOLUTIONS: WASTEWATER TREATMENT AND CONDUITS

The issue of building a wastewater treatment facility in Seoul materialized in 1962. Since the country had neither the money nor the technology to construct a large-scale sewage treatment facility, foreign credit was brought in: AID (Agency for International Development) provided the credit and D.M.J.M(Daniel Mann Johnson & Mendenhell) provided the technology. First and foremost, plans for the construction of Cheonggyecheon Sewage Treatment Plant was drawn up in 1962, a credit request plan was submitted to the Ministry of Construction in August 1964, and a request for government-guaranteed credit was handed in to USOM in Korea. When a credit payment guarantee bill was passed at the National Assembly in April 1966, a credit agreement worth \$3.5 million was signed with the Agency for International Development in July 1967, and in September the same year, a technical service agreement was signed with D.M.J.M. The main design for the plant, completed 2 years later in 1969, was approved by USAID in Korea in November 1969, and ground was broken in June 5, 1970. Inflation, however, brought about shortages in funds, and a credit agreement of additional \$2.8 million was signed in 1974, increasing the total amount of foreign loans to \$6.139 million.

Construction of the Cheonggyecheon Sewage Treatment Plant was completed in September 21, 1976, after 6 years and 3 months of breaking grounds. The opening of the first end-point sewage treatment facility in the country brought in a new era of sewage treatment, servicing an area of 362,670m² in Seongdong-gu, Gunja-dong and Songjeong-dong regions. The facility had a capacity of 150,000 m³/day, which was equivalent to the ability to treat sewage generated by 1.3 million people in 5,600ha of Cheonggyecheon Stream watershed area. The facility employed activated sludge process to reduce the average BOD from 330ppm to 19ppm or lower, and the average SS from 330ppm to 30ppm or lower, before wastewater is discharged into Han River.

The next end-point treatment facility to be set up was Jungnangcheon Sewage Treatment Facility, and construction began in December 27, 1975. A total of 10.15 billion won, \$4 billion in foreign credit from Gradley Brandt Bank and 6.15 billion won from domestic sources, was put into the construction of the plant with a sewage processing capacity of 210,000 m³/day. The plant also employed activated sludge process to treat sewage.

The difference between Cheonggyecheon and Cheonggyecheon Plants was that the latter plant was able to take care of 60% of its electricity requirement with 1,400KW of electricity produced using gas generated during sewage treatment. Construction of Jungnangcheon Plant, capable of reducing BOD from 250ppm to 20ppm or less, and SS from 300ppm to 30ppm or less, was completed in September 10, 1979.



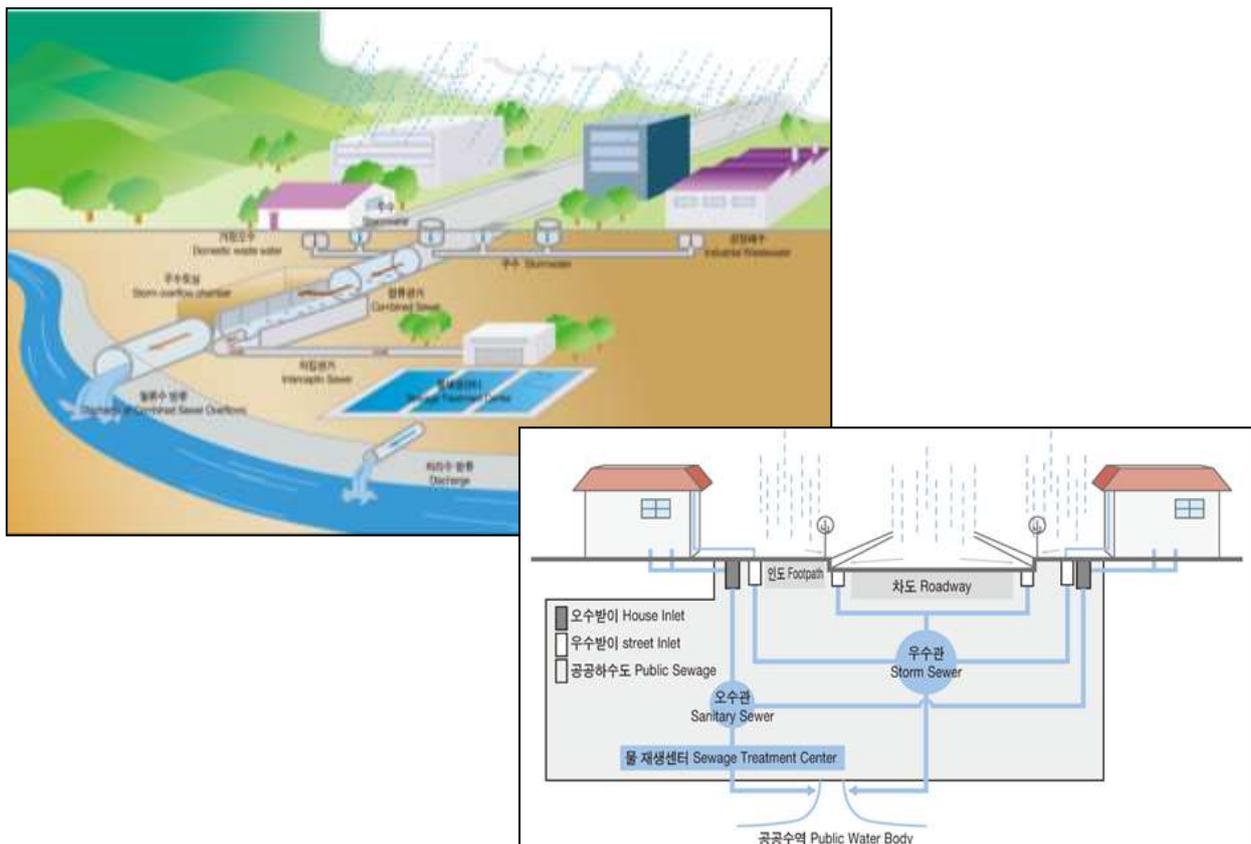
<Figure 2> Four Major Treatment Centers

As it became mandatory for local autonomies to establish master plans for sewer system improvement with the revision of the law in 1982, Seoul came up with its Master Plan in 1983. The Master Plan was different from plans of the 1970s in that it was legally binding, one of the very important changes of the 1980s. The City's 1983 Master Plan for Sewer System Improvement called for wholesale extension of sewers, based on the estimation that the population would grow to 10.417million by 2001. The plan was to increase the total length of conduits to 9,582,188m by 2001, by adding 1,967,249m of combined sewer, and 555,289m of sanitary sewer to the 7,059,650m of sewer already in place. Meanwhile, the plan would also have the existing 612,300m of round culverts and 117,477m of box culverts repaired.

Conservation of Han River entered a new era in the latter half of the 1970s with the construction of Cheonggye and Jungnang Sewage Treatment Facilities. But their capacity to process was far behind demand and required continuous efforts for improvement.

After reviewing the benefits of regional and area-wide approaches to building treatment facilities, the City decided to divide the entire drainage area into four zones, namely, Jungnang, Tancheon, Gayang and Nanji, to build four sewage treatment facilities.

One of the most urgent tasks for the City throughout 1980s and 1990s along with construction of new end-point treatment plants was the improvement of the sewage conduits that intertwined the city like a spider web. The Sewer Conduit Improvement Plan was designed to install 403Km of new conduits, repair 574Km of existing conduits and bury 250Km of separate conduit lines from 1984 to 1987. There had been efforts to improve sewage conduits in the previous decades, but projects in the 1990s were much more advanced in technical terms. Most conduits are hume pipes. These pipes, although strong enough to withstand time, have problems of ground water seeping into the conduits or wastewater leaking out of them due to bad connection with main pipes or other pipes blocking the insides of these pipes, causing soil pollution. Although the more desirable way would be to do away with septic tanks altogether and send wastewater directly to treatment plants through conduits, the tanks are still in use for lack of a complete conduit system to enable such a process.



<Figure 3> Sewer System of Seoul City

Though once considered aversive and unpleasant, sewage treatment centers as well as retarding basins can serve as eco-friendly public space. They can provide recreational areas for citizens, by constructing a covering structure and the park on it. Tancheon Eco-Park is just one example.

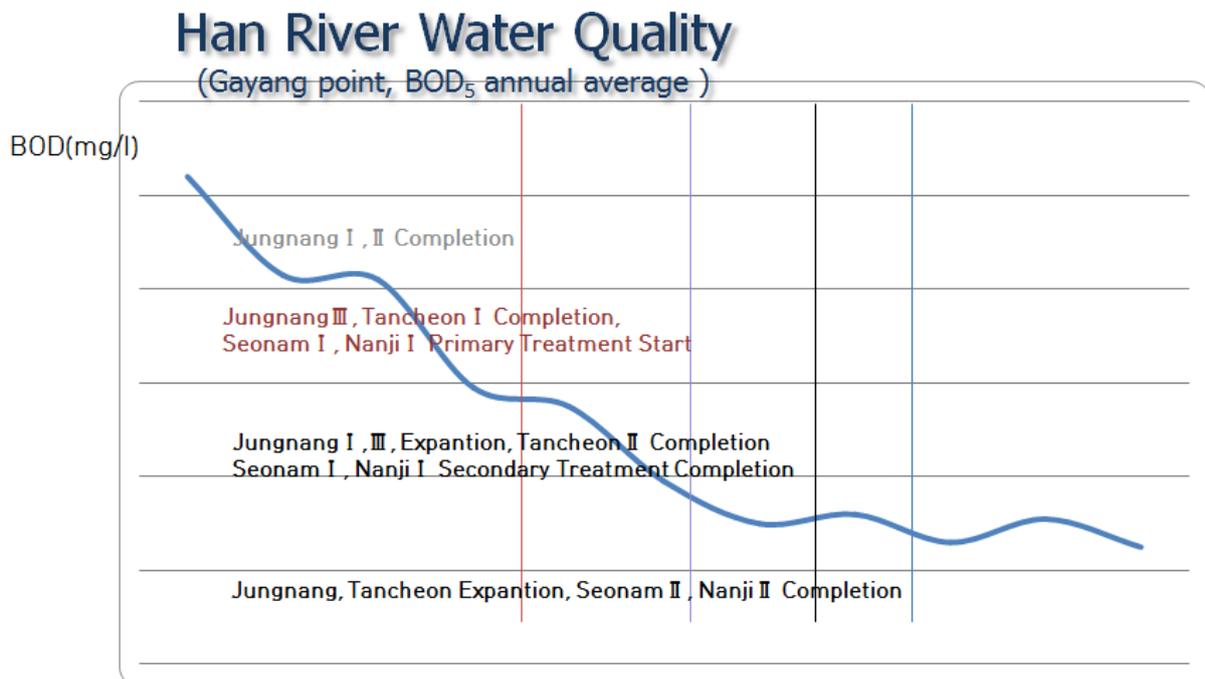


<Figure 4> Conversion of Water Treatment Plants into Parks

ACHIEVEMENT:

Now the City boasts 100 percent conduit coverage, near 100 percent excreta treatment through the sewage system, and near 100 percent sewage treatment capacity.

Thanks to the aforementioned efforts by the City, water pollution of the Han River improved dramatically in the late 20th century. BOD figures for water at Paldang, in comparison to the environmental standard of 1ppm, went down from 1.4ppm in 1981 and 1985 to 1.0ppm in 1990, and up again to 1.5ppm in 1998. Figures for Noryangjin, vis-a-vis its standard BOD of 3ppm, is now improving after going from 3.92ppm in 1981 to 4.7ppm in 1985. BOD for Gayang is also improving. The figure for 1998 went below the environmental standard of 6ppm at 4.8ppm, after going up to 11.4ppm in 1985 from 10.41ppm in 1981.



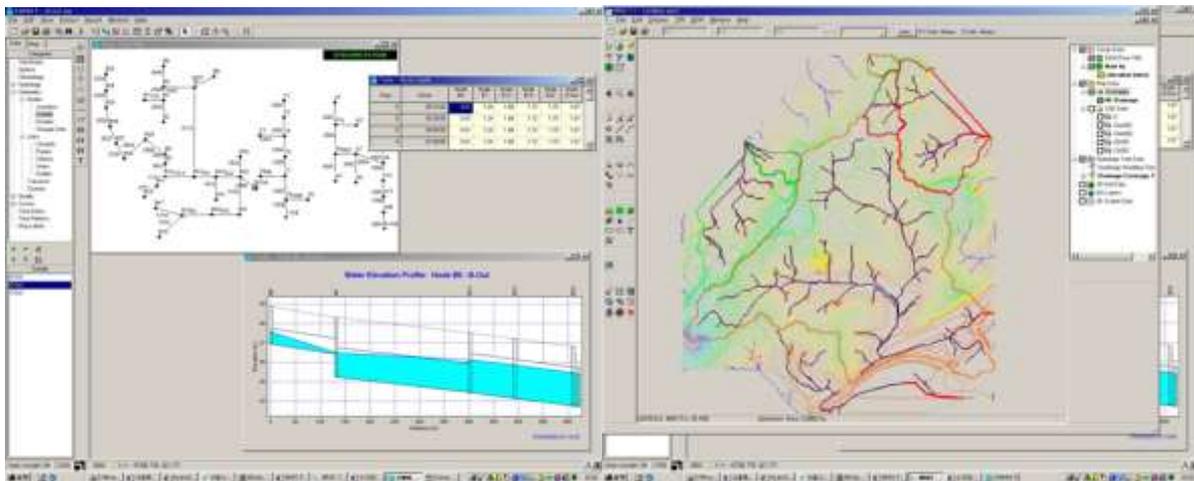
<Figure 5> Han River Water Quality

REGULATION, ORGANIZATION, FINANCE, AND SMART WATER SYSTEM

Basic laws specifically pertaining to the sewer system were first enacted in August 30, 1966 under the title, Wastewater Act. And the Wastewater Service Department under the Bureau of Construction was upgraded in December 31, 1976 to the Bureau of Wastewater Service including the newly established Wastewater Administration Department and the Flood Control Department.

The City drew up the first phase plan slated for completion in 1986, 5 years after the project's initiation in 1982, with the 1986 Asian Games and the 1988 Olympiad in mind. Knowing the two international events would draw the world's attention to Seoul, the City could not afford to host the games with the smelly sewage flowing into mainstream Han River through Tancheon Stream near the Sports Complex. The plan, incorporated as part of the Comprehensive Han River Development Program, was designed to increase processing capacity from 360,000 m³/day in 1981 to 2.60M m³/day, by increasing complete treatment and primary treatment capacities to 1.2M m³/day and 1.4M m³/day respectively by 1986.

With the revision of the law, the City of Seoul enacted the Ordinance on the Use of Sewer System in December 31, 1983, and started levying usage charges beginning October 1, 1983, which has become the main source of budget for the sewer system, as annual revenue from the sewerage charges increased from 49.5billion won in 1985 to 132.2billion won in 1998.



<Figure 6> Sewage Information System

VISION

Envisioning ever-pleasant and safe living environments for its citizens, the SMG is striving to build a future-oriented sewerage network. It is ultimately to increase benefits of water resources and safety of urban water infrastructure bearing in mind conservation of the ecosystem, introduction of advanced technology and realization of circular economy.



Jae Min Song

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Biography	<p>Jae Min Song, an assistant professor in Dep. of Urban Planning and Design at University of Seoul, specializes in climate change policy and planning. Her areas of interests include climate change resilient city, low carbon city and sustainable urban development in developing countries. Her interest in climate change agenda first started when she participated in the World Summit on Sustainable Development in 2002 as a government delegate. Since then, she has built strong academic and professional capacity in the climate change field, working as a research assistant at MIT Joint Program on the Science and Policy of Global Change and a climate change specialist at the World Bank. She holds a BS and MS from Seoul National University in Korea, and a Ph.D from Massachusetts Institute of Technology in the US.</p>
Title	Smart Waste Management in Seoul: From Waste to Resource

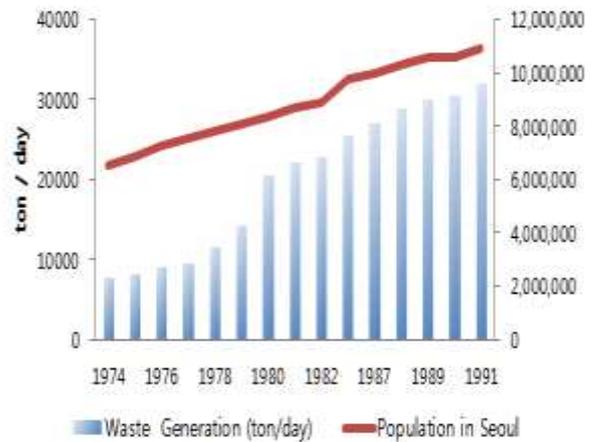
Smart Waste Management in Seoul: From Waste to Resource

Jae Min Song (University of Seoul)

ISSUES

The dramatic growth of waste generation in Seoul, fueled by its rapid urbanization and economic growth, posed a serious public concern. Thus securing proper waste management system became the city's priority agenda.

For example, Nanjido, the biggest landfill site at that time on which the most of the city's waste was dumped since 1978, went beyond capacity. Ninety two million tons of waste during its lifespan of 15 years until late 1992 resulted in two massive mountains of garbage measuring about 100 meters in height.



<Figure 1 > Trends in Waste Generation and Seoul's Population

The landfill method of those days was open dumping, vulnerable to harmful leachate and other pollutions. Not only was it a serious threat to the environment, it also had significant health impact on residents. The waste in the landfill also often ignited and claimed lives, causing 1,390 fire incidents in total during the 15 years, including one big blaze which lasted for 45 days. The exhaustion of landfills and its negative impact on the environment and sanitation necessitated a new scheme for managing waste, however, securing sites for waste processing facilities would be met with local resistance.



<Figure 2> Nanjido Landfill before the Closure

SOLUTIONS

Steps to waste management include waste avoidance, reduction, recycle, recovery and final treatment. Recognizing waste as a resource, shifting away from simply focusing on its treatment as in the '70s, Seoul's waste management policy aims at maximizing eco-efficiency of waste management and achieving a sustainable economy. Various measures have been introduced for sustainable waste treatment as shown below.

Reduction	<ul style="list-style-type: none"> • Volume-based Waste Fee System • Restrictions on disposable products and excessive packaging
Recycling	<ul style="list-style-type: none"> • Separation from sources • Recycling of waste appliances, waste metal, construction wastes etc.
Reuse	<ul style="list-style-type: none"> • Secondhand markets for sharing • Recycling Center
Recovery	<ul style="list-style-type: none"> • Production of heat and power from combustible waste • Landfill gas to power, food waste to energy resources

<Figure 3> Major Waste Policies of Seoul

Solution 1: Volume-based Waste Fee System: VWFS



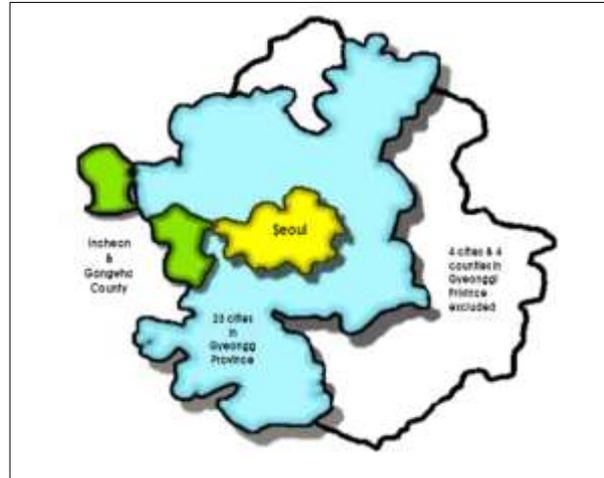
<Figure 4> Standard Garbage Bag

Introduced in 1995, Volume-based Waste Fee System was the first market-based incentive system to be introduced in the environment sector. It made a huge contribution in reducing Seoul's waste and promoting recycling. Based on the "polluter pays" principle, it charges according to the amount of waste discharge through pre-paid standard bag. The implementation of the system changed public awareness toward waste disposal, drawing attention to such issues as the urgency of waste reduction and the costs of waste treatment. Increased perception of the system changed people's behavior and resulted in support from citizens.

Solution 2: Sudokwon Landfill Site

Pressed with the increase in waste generation in the late '80s and the limited capacity of the landfill in Nanjido, Seoul had to secure additional space and come up with a long-term plan.

In order to tackle these issues, Sudokwon Landfill was built to treat waste from Seoul and adjacent area. Being the biggest dump site in the world as well as the first sanitary landfill to be built in Korea, it takes care of 13,400t (as of May 2013) of household and industrial waste from 24-million population every day since its opening in 1992. Operated by Sudokwon Landfill Site Management Corporation (SLC), Sudokwon Landfill is an exemplary case of regional cooperation. For its reliable management system and energy recovery project it is praised for its endeavor to ensure the safe treatment of waste and to create a circular economy in waste management.

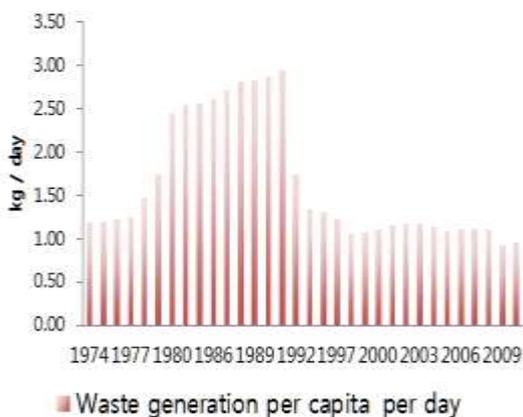


<Figure 5> Regions of Waste Source for Sudokwon Landfill Site

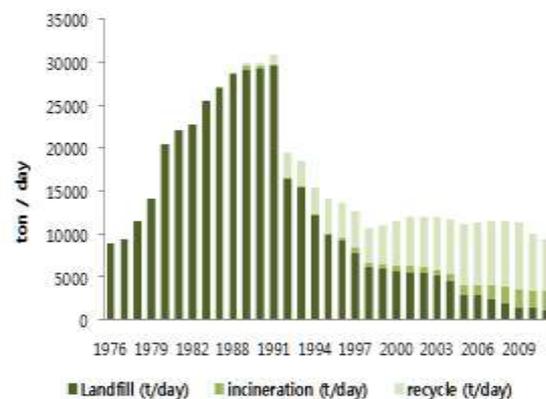
ACHIEVEMENTS

Decreased waste disposal & increased recycling:

Compared to that of 1990, per capita trash disposal in 2010 was decreased 57%. Recycling was increased 1850%. Such a change spawned economic and environmental benefits, including 26-year increase in landfill lifespan and lowered of treatment costs.



<Figure6> Daily Waste Generation Per Capita

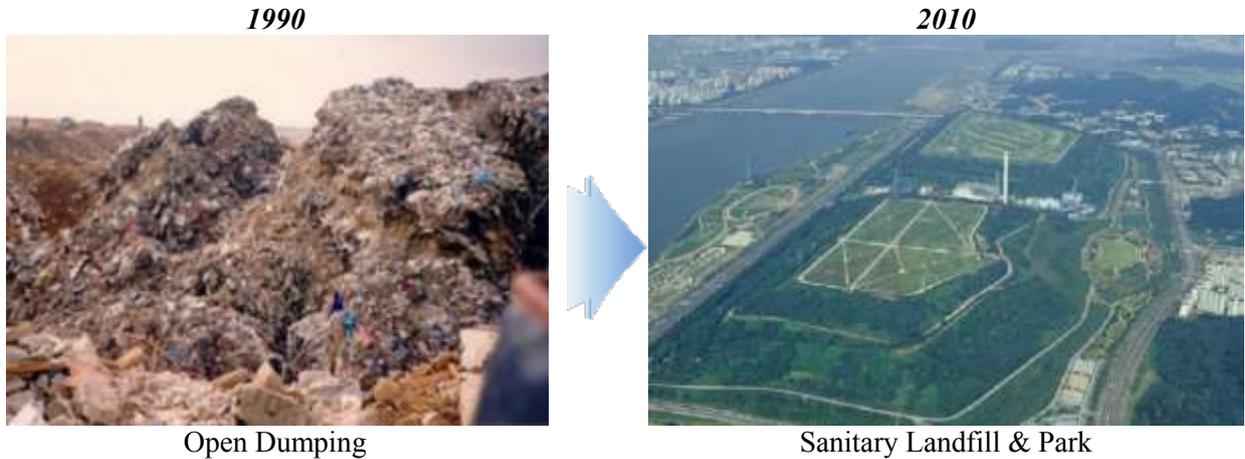


<Figure7> Trends in Types of Waste Treatment

Constructing city of circular economy:

Seoul city has been encouraging waste-energy technologies recently and thus have been actively promoting innovative use of waste such as production of refuse-derived fuel (RDF) with inflammable

waste, landfill gas utilization and biogas generation from food waste. Sudokwon Landfill Gas Electricity Generation Project 950MW, registered as a Clean Development Mechanism project, is an exemplary case of this. It saves 1,210,000 T of CO₂ every year, expected to create future economic profit from sales of carbon credits.



<Figure 8> Nanjido: Then & Now

Eco tourism:

Formerly a massive dump site, Nanjido has been transformed into eco-friendly outdoor space featuring cultural and educational facilities. After a process of restoration works, five different theme parks were created, attracting 9.8 million visitors every year. The landfill gas is recycled to provide heating for the local community. In addition, Sudokwon Landfill site is also going through construction to build an eco-themed park, called Dream Park.

TIMELINE

