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The Seoul Institute Research Abstracts 2019

Chang Yi

서울연구원
The Seoul Institute

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Editor's Note

As the editor of this book, I present "The Seoul Institute Research Abstracts 2019", a collection of English summaries for all the research studies published in 2019. As the Seoul Institute covers a variety of urban planning disciplines, this book includes brief explanations of our policy solutions on many types of urban problems.

The Seoul Institute (SI) was established in 1992 (as the Seoul Development Institute) to formulate long-term growth plans and provide policy solutions for various problems in Seoul. For more than 20 years, the institute has provided guidance and pointed towards a sustainable future. The SI, as a prominent think tank with about 80 PhDs on staff, has conducted comprehensive policy research in a range of different areas.

For each study, this book provides a short background so that international readers can understand the research context. Its purpose is to bring your attention to the research we have conducted here at the SI. I believe that our expertise on urban planning can help city governments around the world resolve problems common to many cities. If any part of this book intrigues you and your colleagues, we have achieved the aim of this publication.

I appreciate the opportunity to share our research outcomes with you, and sincerely hope that our knowledge will assist cities all over the world as we all strive for a sustainable future. This book will also provide potential opportunities for collaborative research with you and your institution. For further information, please do not hesitate to contact me at changyi@si.re.kr.

Best regards,

Chang Yi
Research Fellow
The Seoul Institute

01 Urban Planning

Improving Housing Lease Laws and Policies for Tenant Housing Rights

Finding decent yet affordable housing is a major issue for Seoulites, and especially for low-income households. In other words, housing affordability has become a cause of concern for those who do not already own a home. The central government and the Seoul Metropolitan Government are working towards enhancing housing stability through institutional measures like the Civil Act and the Housing Lease Protection Act. Having said that, under the current system, there are limitations in what can be done to help households facing housing stress. **Improving Housing Lease Laws and Policies for Tenant Housing Rights** examines the current state of the rental housing market and policies. The authors point out loopholes in the present system and propose ways on how to close them.

Eun-Cheol Park · Su-Kyoung Kim

Tenant housing rights are not entirely guaranteed under the Civil Act and Housing Lease Protection Act in the current housing lease market, where we have increased monthly residential leases in Seoul. A tenant's housing rights are not guaranteed under the Civil Act owing to tenants' inability to officially register for the *jeonse* right or lease registration without the landlord's consent. Neither Act restricts the lessor's right to terminate a contract or refuse to renew a contract, which works against security of tenure. According to the Housing Lease Protection Act, a lease shall take effect against a third party a day after the lessee completes the resident registration. This means that the lessee no longer has the ability to object if he or she loses occupancy or transfers the resident registration. Although the lessee pays a huge deposit to rent a residence, he or she is not allowed to officially register as an occupant. This can cause problems such as those related to repayment of the deposit after the contract ends if the lessor wants to sign a new contract with another party for a higher rate of increase (such as five percent) than legally allowed for an existing lessee. Therefore, housing lease laws and policies must be revised so that tenant housing rights can be better protected.

First, this study suggests that the Housing Lease Protection Act be renamed the

Housing Lease Act and revised so that it provides a balance between the rights and responsibilities of both lessor and lessee. The revised Act should contain provisions protecting tenants such as on ① tenure security, ② affordability, and ③ ability to object and legal obligations for lessors to repay deposits. A rental housing registration system also needs to be established to improve management of private housing leases. Registrations in the system would include all general information, physical conditions, and location of the rental housing, as well as the housing lease agreement. The Seoul Metropolitan Government (SMG) will then be able to create an organized database through such information. Ultimately, this will also assist the central government in developing guidelines for rent regulations and collection of taxes on rental income.

This research paper also proposes legal and institutional improvements in the housing lease contract for each stage. First, when setting up a tenancy, the housing lease terms should be extended from two years to three years. Additionally, a lessee should hold the ability to object and a priority right to repayment of his/her deposit when he or she obtains a fixed date on the lease contract document and moves into the residence. Second, several suggestions have been made to resolve disputes during tenancy. The Civil Act should clarify in detail the lessors' responsibilities for rental housing repairs and maintenance. The central government should offer tenure security for lessees about to be evicted for failing to pay their rent. Third, a lessee's right to contract renewal should be accepted at the end of the tenancy to ensure that he or she can continue to live in the same residence for a given amount of time. The rate of rent increase needs a regular limit whenever a lease is signed or renewed. Rents will eventually be managed by region using a standard table of rents. Lastly, the Act needs to include a provision that prohibits the lessor from evicting a lessee arbitrarily at the end of the tenancy in order to protect the tenant's right to housing. In addition, the law should have a provision that the lessor shall return the tenant's deposit within a month after the contract ends. In the long run, the lessee would also be allowed to register the lease without the lessor's consent.

Evaluating the Publicness of Public Spaces

Both the public and private sectors can create public spaces open to all people. Public spaces such as parks and plazas are meant to serve the public interest. However, it is questionable that the publicness of existing public spaces is ensured. In some cases, the public has limited access or the spaces are hidden behind buildings. There is a need to protect the publicness of public spaces. To that end, it is crucial to assess their publicness as the first step. Moreover, the public's perception of "publicness" has changed from how accessible the spaces are to the public to whether people are able to enjoy social benefits with others. With an aim to improve the publicness of public spaces, **Evaluating the Publicness of Public Spaces** offers an assessment of today's public spaces. The authors give policy recommendations based on identification of problems with existing public spaces in a bid to reclaim their publicness.

Hyun-Suk Min

Amid the growing public interest in the quality of urban life, the perspective on the publicness of space is gradually changing from being open to the public, rather than a closed space for private and individual purposes, into sharing the societal benefits it provides with people as users of those public spaces. Danish architect, Jan Gehl, defined the societal benefits of public spaces as those that promote various forms of social interaction and relaxation for enjoyment of urban life rather than activities that are in line with achieving a specific objective.

For this study, evaluation indicators were developed to assess the publicness of space, based on physical conditions which elicit various forms of societal interaction and relaxation for enjoying urban life. To develop these indicators, a field study was conducted on 100 of the most pedestrian-friendly public spaces located throughout Seoul. Prior to the field study, the checklist entries were selected from prior studies which evaluated the physical environment and psychological convenience of the public spaces. Based on the functional connection with Seoul Public Map, developed by the Seoul Metropolitan Government (SMG), the checklist entries were composed using actual measurement items to apply to any sort of public space and generate consistent data regardless of researcher judgment or onsite conditions at the time of investigation.

Based on the field study, evaluation indicators which influence promotion of

various activities among people were derived through structural equation modeling in view of comfort, attractiveness and accessibility. The evaluation indicators were mapped using GIS (Geo-spatial Information Service) to aid analysis and comparison between individual public spaces. These individual public spaces were then categorized into 8 types, following a comprehensive evaluation using these indicators. Suggestions were made to enhance the various social interactions through appropriate application of directions for improvement to each type of public space.

Regenerating Neighborhoods through Understanding and Management of Empty Homes in Seoul

In the early 2000s, the Seoul Metropolitan Government carried out a number of New Town and redevelopment projects to balance development between northern and southern Seoul. Through the projects, deteriorated housing was demolished. However, with the onset of the U.S. financial crisis in 2008, many such projects were stopped. This included cancellation of New Town redevelopment plans for some areas. Since then, the Seoul Metropolitan Government has focused on urban regeneration. The issue here is that the number of vacant housing units has increased during the process. What is more, the current state of empty housing has not been accurately nor fully understood. **Regenerating Neighborhoods through Understanding and Management of Empty Homes in Seoul** proposes ways to assess the current situation in terms of empty housing. In this study, the authors offer policy suggestions to tackle the issue of vacant houses.

Nam-Jong Jang · Su-Youn Seong

Recently, the number of empty homes has increased in areas where New Town and redevelopment projects have been cancelled in Seoul. In general, the presence of empty homes in cities is caused by societal aging, housing damage, and decline of the original city center, but these empty homes in Seoul are the result of the lifting of the New Town and redevelopment projects. According to the National Statistical Office, the number of empty homes in Seoul stood at 9.5 million in 2016 (accounting for more than 3% of total housing).

With passage of the Act on Special Cases Concerning Support for Empty Homes Management, the policy conditions for regeneration of low-rise residential areas are changing. The Act defines an empty home as one “that is not occupied nor used for at least one year from the date when the mayor or district director confirms whether it is occupied or used”.

There are an estimated 3,000 such empty homes in Seoul, which need to be managed according to some policy, but it is difficult to grasp the exact number. It is thus necessary to identify the number of empty homes through an empty homes survey, and when investigating this number, local characteristics and usability should be considered as well. In particular, a detailed review is needed of areas where redevelopment or New Town projects have been cancelled.

According to our analysis, there are empty homes in some project cancellation areas in Seoul, with 76% of these being old and deteriorated, unsafe structures that could collapse; 79% of lots were exposed to roads having a narrow width fewer than two meters; and at least 70% of empty homes are left unattended for over a long period of time, which can negatively affect the surrounding area.

To improve this situation, methods are necessary that differ by home type and that take into account their distribution, ownership, and the availability of building permits. In addition, guidelines for establishing an empty homes management plan need to be specific, taking into account the characteristics of the empty homes and the urgency of improvement in each area.

For the sake of community regeneration, the issue of empty homes needs to be addressed. For example, there is a need to provide affordable housing for young people and facilities that residents need and that will bring greater vitality to communities. Empty homes and vacant lots can partially fulfill these needs.

In addition, the formulation requires the establishment of a business structure that is operated and managed by the Neighborhood Regeneration Corporation (NRC). For example, the owner of an empty home may lease land to the NRC for a long period of time, while the NRC pays the owner a monthly land use fee.

Meanwhile, statistics alone can lead to a limited understanding of the status of empty homes, and it is difficult to closely examine how to manage and make use of them. Thus statistical data shall be reviewed in conjunction with the building register to bring greater clarity to the estimated number of empty homes and turn that estimation into a confirmed number by checking the actual empty home sites and their surroundings.

Finally, the SMG should provide information on empty homes through “Seoul’s Empty Home Bank” and increase the transaction volumes of empty homes.

Direction for Evolving Superblock Residential Areas in Seoul

A superblock is a commercial or residential block bound by arterial roads. Half of the residential areas in Seoul are superblocks. Residential areas that are superblocks lack sufficient parking and green spaces. They are also gated communities with high population densities. **Direction for Evolving Superblock Residential Areas in Seoul** identifies characteristics of superblocks in Seoul and suggests ways to improve them.

Hee-Ji Lim · Eun-Jung Yang

Fifty-eight percent of the total city area of Seoul is made up by residential areas, with a large proportion of the city area planned as the city expanded rapidly. Superblock residential areas account for about 60% of all residential areas, with 364 superblocks in total: 92 small residential superblocks (25%), 140 apartment complex superblocks (40%), and 132 complex superblocks (35%).

Superblocks in Seoul are different than the Radburn system and Perry's superblock residential model. The 92 small residential area superblocks are superblocks in form only, and little planning has been done in terms of complexity such as green spaces, walking areas, and separation of roads. In apartment complex superblocks developed at appropriate densities for high-density residential apartment areas, the concept of road separation was adopted, centering on road networks that do not allow through traffic within walking distance. However, they have been found to have been planned without sufficient consideration of urban life, such as connection with surrounding areas and formation of a center. It is necessary to examine the characteristics of mixed areas where small residential and apartment complex superblocks coexist by determining the mixture of small residential areas and apartment complexes.

A Study on the Key Issues and Policy Direction of Apartment Remodeling Projects in Seoul

Of the various ways to address dilapidated housing, the Seoul Metropolitan Government opted for redeveloping or reconstructing areas, which entails total destruction of buildings. However, redevelopment and reconstruction have limitations and produce adverse effects. For efficient use of resources and to preserve existing environments, remodeling began to be implemented. **A Study on the Key Issues and Policy Direction of Apartment Remodeling Projects in Seoul** analyzes completed or ongoing apartment remodeling projects in Seoul. The authors propose policy directions to the Seoul Metropolitan Government concerning apartment remodeling projects. Ways to systematically run and encourage remodeling of deteriorated houses, as well as long-term policy tasks, are also presented.

Da-Mi Maeng · Inhee Kim · Ja Yun Heo · Bokyung Lee · Jaewuk Lim

Apartment remodeling projects are a way to slow down the aging of a building or repairing a part of it to enhance its functionality. Remodeling projects were introduced to improve the residential environment and the performance of existing old housing and facilitate the efficient use of resources. In December 2013, the revised Housing Act allowed vertical enlargement and remodeling to an increased number of households to revitalize remodeling efforts. Additionally, relaxed building regulations plays a positive role in promoting remodeling, but it is expected to adversely affect the residential environment and infrastructure, such as by increasing density due to the increased number of households.

An analysis of actual status of remodeling projects indicated that most were carried out on small, high-density, aging apartment complexes. Moreover, it was promoted more in areas where feasibility was guaranteed but at a high price. However, there is a lack of connectivity with the urban management system for a project based on the Housing Act. Moreover, with introduction of vertical expansion remodeling, the number of households has increased and the implementation process has become complicated, resulting in delays.

Considering how the specifics of remodeling projects differ from new construction, remodeling projects are incorporated into the urban management system while taking into consideration the publicness of urban space, compatibility

with the urban management system, quality of the residential environment, and equity with other similar projects. This facilitates improvement of the housing environment of deteriorated, high-rise apartment complexes and manages the negative effects of increasing the number of households involved and the introduction of vertical expansion. To this end, it is necessary to revise related laws such as the Housing Act, reorganize the Seoul City Remodeling Master Plan, and maintain related administrative procedures.

Remodeling projects are mainly promoted in areas with high potential in accordance with market logic. However, some small, densely-populated, old apartment complexes are in need of remodeling to improve their residential environments, but instead face great difficulty due to the high costs involved and low feasibility. To improve the residential environment and housing performance of these apartment complexes, it is necessary to develop a business model for low-cost remodeling projects and formulate the appropriate public financial support so as to prevent their continued deterioration.

Demand for today's remodeling projects is concentrated in apartment complexes constructed in the 1990s. Those completed since the 2000s still perform well in terms of housing function and facilities, and structural safety. These apartments need proper maintenance rather than full-scale replacement. The demand for large-scale remodeling projects is expected to decrease in the long term. In the future, remodeling projects are expected to change, requiring the establishment of a new concept of and role for remodeling.

As the population of Seoul declines, the supply of new housing has decreased while the need to maintain existing apartment buildings throughout their lifecycle is increasing. It is necessary to establish the direction for management policy according to the lifecycle of the apartment and the management system to implement the policy. Remodeling projects should also be promoted to improve living environment quality in terms of lifecycle management.

Assessment of Urban Regeneration Projects with Historical and Cultural Resources in Downtown Seoul

There is an array of methods available to regenerate deteriorating areas in cities, one of which is to tap into historical and cultural resources. The Seoul Metropolitan Government is working to enhance its residential environments and strengthen its employment base through the introduction of new urban functions for areas well past their prime. It has used historical and cultural resources to raise the value of areas and quality of life, along with restoring communities that have disappeared. **Assessment of Urban Regeneration Projects with Historical and Cultural Resources in Downtown Seoul** evaluates the outcomes of ongoing urban regeneration projects in Seoul. The study suggests measures to boost project performance.

Hyun-Suk Min · Ji-Yeon Oh

This study assesses urban regeneration projects in downtown Seoul. In particular, due to their location, it is quite natural to use historical and cultural resources representing the city's identity in urban regeneration efforts.

Through a review of literature on similar plans and previous studies, nine items were identified to evaluate current urban regeneration projects with historical and cultural resources. Additionally, interviews were conducted with civil servants, employees at urban regeneration support centers and local residents. The interviewees have been involved in urban regeneration projects.

① Discovering historical and cultural resources and identifying their value: Instead of approaching issues related to local development directly, the local community was identified and its value shared with local residents. This process reduced the distrust held by local residents in the public sector and encouraged further understanding and cooperation on public projects.

② Promoting urban regeneration projects with historical and cultural resources to local residents: Even though it took some time, project officials continued to visit local residents in person and explained public projects in an easy-to-understand way. This helped to build trust with local residents and enhanced their understanding, gradually changing their perception of public projects.

③ Educating local residents on urban regeneration projects with historical and cultural resources: Along with theoretical education on urban regeneration projects, cultural education programs were provided for topics directly and indirectly related to daily life such as house repairs, barista skills, and calligraphy. As a result, the participation of local residents who were not initially interested in urban regeneration education programs has increased. This also provided an opportunity for local residents to substantially increase their interaction with each other, and communicate and cooperate in urban generation projects.

④ Improving deteriorated facilities and promoting cultural content with historical and cultural resources: The top-down approach needed to be supplemented with a bottom-up approach. Experts and administrators should present a broad direction to ensure public value of projects, while local residents suggest specific project action plans through workshops.

Meanwhile, there was an issue with maintaining consistency in urban regeneration projects throughout planning, implementing, managing and operating, because ward officials were excluded from planning. Urban regeneration projects should be planned together with ward officials, who are responsible for project implementation, management and operation.

⑤ Offering contests with historical and cultural resources to local residents: Contests played a huge role in increasing local resident interest and participation in urban regeneration projects, and supplemented those projects. They also facilitated local residents in improving their potential as servants of the local community, as they were provided with the chance to plan and operate independent activities for urban regeneration with historical and cultural resources. This has contributed to increasing the sense of community among local residents.

⑥ Organizing resident associations and operating related programs: Various resident organizations in the local community have been involved in creating resident associations for urban regeneration projects with historical and

cultural resources. Additionally, to bring greater efficiency to resident association activities, individual local issues have been discussed at the local division level.

⑦ Incorporating and sharing feedback from local residents through public-private partnership organizations, such as urban regeneration support centers: Various types of public-private partnership organizations were established and operated according to local conditions. Most public-private partnership organizations included a chief coordinator and sub-coordinators in each field overseeing and coordinating the project as a whole. Occasionally organizations comprising multiple professional public-private partnerships formed a cooperative organizational system. However, in different cases, local residents communicated directly with the public sector instead.

⑧ Ensuring public value through urban regeneration projects as well as external and internal changes: Urban regeneration projects centered on local residents clearly demonstrated successful outcomes, especially in regards to the relationships between people. Local residents, who had been at odds with one another over development issues, realized the value of their local area. They implemented changes in their neighborhoods, opened up, and reconciled with each other through the urban regeneration projects with historical and cultural resources.

⑨ Ensuring the sustainability of urban regeneration projects: Urban regeneration cooperatives operate public facilities initiated by the urban regeneration projects with historical and cultural resources, for local residents to keep urban regeneration activities independently in their local community. However, the sustainability of urban regeneration cooperatives is limited. Because they must be private organizations, such cooperatives have no choice but to compete with local store owners to ensure a self-sustaining profit structure. In addition to establishing urban regeneration cooperatives, it is necessary to explore various strategies to ensure the sustainability of urban regeneration, according to the social, cultural, and economic conditions in the local community.

A Study on Activation of and an Efficient Implementation Strategy for Cityscape Programs & Agreements

Cityscape programs are run by the public sector in areas included in a cityscape plan, aimed at improving their landscape. A cityscape agreement is a resident-led plan through which enhancement of an area's landscape is done via consensus and commitment of area residents. Since formulation of the first cityscape plan for Seoul in 2009, the Seoul Metropolitan Government has carried out several cityscape programs and agreements. However, a comprehensive assessment of their effectiveness has not been done. **A Study on Activation of and an Efficient Implementation Strategy for Cityscape Programs & Agreements** examines how the Seoul Metropolitan Government implements these programs and agreements. The study presents ways to increase their effectiveness and demonstrate the efficiency of cityscape programs.

Hyun-Chan Bahk · Ji-Yeon Oh

The Seoul Metropolitan Government (SMG) has been steadily pushing for cityscape programs and agreements since 2009, based on the Landscape Act. Nevertheless, the program budget has remained low and the SMG's administrative organization unskilled, leading to small-scale programs only, such as improving residential alleys and streetscapes. As a result, the program has not made any significant differences. Therefore, it is necessary to present strategies for activating the cityscape program and agreements and improving their efficiency.

The objective of this study is to analyze the performance and limitations of the cityscape programs and agreements that have been implemented and to suggest improvement schemes. Implementation of cityscape programs and agreements were analyzed and improvement tasks drawn through surveys of users and government employees. In addition, implications were derived through an advanced case analysis.

The suggestions for improvement were presented separately and involved expanding the scope of the program, creating a system for efficient implementation, improving awareness, and strengthening management.

Major Issues and Tasks of Urban Planning Facilities according to the Change of Conditions in Seoul

Urban planning facilities refer to public facilities needed to support economic/social activities and ensure safety or proper functioning of a city, and include such things as roadways and sewage systems. The public sector is responsible for providing such facilities. Past the rapid-growth stage, Seoul has entered the maturity stage. When Seoul was rapidly expanding, it was necessary for the Seoul Metropolitan Government to supply a huge number of urban planning facilities. The Seoul Metropolitan Government should reform its current framework for urban planning facilities, including size and type, in response to changing conditions. **Major Issues and Tasks of Urban Planning Facilities according to the Change of Conditions in Seoul** identifies key issues concerning supply and management of the urban planning facilities in Seoul under varying conditions. The authors aim to present policy recommendations and tasks for the Seoul Metropolitan Government to successfully provide and manage these facilities.

Da-Mi Maeng · Joo-Il Lee · Ce-Na Baik

There are 52 types of urban planning facilities in Korea. As of December 2017, 37 urban planning facility types were in Seoul and the number of such facilities was 62,897, covering an area of 370.64km². Facilities for performing urban functions such as roads, water supply networks, heat and gas supply facilities, and sewage systems were provided on a massive scale during the high-growth period. In addition to supporting the basic needs of residents, facilities related to improving convenience and quality of life and safety have been on a steady increase over the last decade. A majority of urban planning facilities in Seoul are located near subway stations for easy resident access. When these facilities deteriorate and remain unutilized, additional uses and functions can be added to revitalize them.

Changes in the supply and management of urban planning facilities in Seoul are expected due to various changes such as in population and household structures, lifestyles, the urban growth stage, resident demands, the decentralization of local government, and scarcity in public funds and available land. Therefore, there will be a need to increase such facilities as well as reduce their number. The other issue, related to the provision of urban planning facilities, will be the limited ability to provide and manage numerous facilities in the future. As the demand and supply of

facilities increase, the role of municipalities in managing and operating them becomes even more critical.

In regards to the changing conditions, three issues need to be addressed in order to provide and manage urban planning facilities in Seoul: related standards and laws, supply, and management methods.

First, systems and standards for establishing urban planning facilities should be improved so they reflect the changes in local conditions and characteristics. Urban planning facility standards should be revised fully to conform to the current and future stages of urban growth. The system should be structured so that it comprises facility type and scope, criteria for decision, standards for structure and installation and adjustment and modification of existing facilities. To improve public service quality, the quality standards for such facilities need to be established. The method used to define facility type should be changed to bring greater flexibility to application of the urban planning facility system and rules in accordance to the local conditions. Where there is insufficient land within Seoul for development, it is important to prepare standards so that existing facilities can be maintained or reused as urban planning facilities in the future.

Second, it is necessary to diversify the supply of and methods of operation for urban planning facilities through private sector participation. It is necessary to ease the restrictions on the private sector when providing mixed-use urban planning facilities. As the private sector supplies such facilities, it needs to provide administrative support to ensure feasibility. Additionally, there is a need to identify some urban planning facilities and establish a policy foundation to facilitate improvements to public service quality and reduce public financing by utilizing private sector expertise.

Third, greater efficiency and effectiveness are needed for the urban planning management system in Seoul. Towards better provision, use and management, the SMG should first conduct a survey on urban planning facilities in Seoul and subsequently build a basic database. It also needs a vision for the future and strategic plans for readjustment and utilization of those facilities. Clear division of

operations and management between Seoul and the autonomous *Gu*-district offices is required. The Seoul Metropolitan Facility Planning Department should be the main body that presents and leads the strategic use of and vision for the city's overall urban planning facilities. On the other hand, *Gu*-district offices need to implement decisions on urban planning facilities and management and ensure their continuous monitoring.

The Seoul Metropolitan Government's Smart City Vision and Strategy in the Fourth Industrial Revolution

The convergence of Information and Communication Technology (ICT) and innovative technologies such as robotics, automated driving systems and the harnessing of renewable energy will allow cities to solve urban problems. A "smart city" refers to a city that integrates ICT into its operation. As a platform for new industries, the smart city is mentioned as a new model that will transform the future of large urban areas. **The Seoul Metropolitan Government's Smart City Vision and Strategy in the Fourth Industrial Revolution** assesses the smart city model's potential for developing future growth engines for Seoul. Mid- and long-term strategies are presented.

Hee-Ji Lim · Sang-Il Kim · Wonho Kim · Hang-Moon Cho · Mook-Han Kim · Suk-Min Lee · Hong, Sang Yeon · Seo-Yeon Yoon · Su-Kyoung Kim · Ha-Young Kim · Hwa-Yon Jin

The Direction of Smart City Progress and Strategy in the Seoul Metropolitan Area

This study proposes three ways to create smart city models that suit the regional characteristics of Seoul: 1) convergence with existing traditional industries in preparation for the era of augmented reality; 2) step-by-step approaches as technology develops; 3) widespread projects from public to private areas.

Major Tasks and Detailed Plans for "Smart City, Seoul"

One of the major tasks is to provide ICT-based public services for citizens in the fields of transportation, safety, and energy. To achieve this, the current systems in transportation and safety fields should be improved through big data linking and integration. Second, the Internet of Things (IoT) is a major technology to apply throughout the city for efficient urban monitoring and operation. Third, a smart infrastructure needs to be constructed if a "smart city" is to be realized.

Another major task is fostering new industries for urban regeneration. This would include development of new industries related to smart cities, expansion of innovative spaces for startups, and designation of innovation districts for new industries.

Policy Suggestions

First, the SMG will need to establish an organization with overall responsibility for development of "Smart City, Seoul" to develop comprehensive mid- to

long-term visions and strategies so the city is ready for the Fourth Industrial Revolution.

Second, it is desirable to plan smart city projects separately from information service systems deploying all over the city. Each smart city project can be gradually expanded once the required technologies are successfully verified. Nationally, it is essential to designate a “National Model City” to facilitate creation of jobs related to new technology.

Third, a new industrial cluster is needed that converges with the declining industry of manufacturing towards economic vitality and youth employment in Seoul. This will help the city establish an economic base for the future.

Fourth, the SMG should actively support projects which are not harmful to the environment: financing the creation of eco-friendly energy infrastructure in response to fine dust and heat waves; building ICT-integrated energy storage and exchange systems; and trying out various pilot projects.

Finally, it is more important to create a platform through which smart technologies can be applied than to make a smart city itself. The platform will gradually develop and integrate into an evolving city like Seoul. As test-beds and living labs, each pilot project should be considered part of a new urban model.

Functional Diagnosis of Metropolitan Centers in Seoul and Promoting Related Policies

The Seoul Metropolitan Government aims to strategically promote certain areas as growth hubs. This has been laid out in its master plans such as the 2030 Seoul Plan. These hubs are classified into global centers, metropolitan centers and regional centers according to the level of expectations regarding urban growth. A metropolitan center is a node where a variety of central functions are concentrated. As a city center located around the Seoul metropolitan area, the metropolitan centers absorb some traffic volume and link the area to a global center or regional center. While the concept of metropolitan centers was advanced in the 2030 Seoul Plan, the current state of designated metropolitan centers has not been thoroughly examined. A lack of broad framework and direction for fostering and managing such centers is another issue. For these reasons, they have been developed on an individual project basis, rather than consistently managed within the spatial structure of the Seoul metropolitan area. **Functional Diagnosis of Metropolitan Centers in Seoul and Promoting Related Policies** explores the current status of metropolitan centers in a comprehensive manner. Criteria concerning their designation and purposes are explicitly defined and management direction provided.

Sun-Wung Kim · Sang-Il Kim · Su-Youn Seong

Through the 2030 Seoul Plan in 2014, the Seoul Metropolitan Government has released its concept of an urban spatial structure with 3 global centers, 7 metropolitan centers, and 12 regional centers. Through this, it aims to improve quality of life, mitigate regional imbalance, and deal with further metropolitanization of the Seoul Metropolitan Area.

The present study aims to define the roles and functions of metropolitan centers, to provide the policies and strategies for promoting the centers to perform their expected roles in their respective metropolitan sub-regions. Thus, we ask a few important questions on which roles and functions metropolitan centers normally have and which policy directions and strategies will lead to effective promotion and management of these centers.

This study suggests, first, that the policy directions for promoting and managing the metropolitan centers should be set up and consider the realities of the present low-growth era. Second, policy must be appropriate to improve urban centrality and metropolitanization. Third, potential metropolitan centers such as Sadang, Isu and Mangwoo regional centers are recommended for inclusion into metropolitan centers.

02 Transportation Planning

Improvements to the Regulation and Operation of Transportation Impact Fees in Seoul

With the aim of easing traffic congestion, the Seoul Metropolitan Government has imposed "transportation impact fees" on facilities such as skyscrapers causing traffic jams. The fees are identical in all areas in Seoul, regardless of the level of traffic congestion. This has raised questions about fairness. **Improvements to the Regulation and Operation of Transportation Impact Fees in Seoul** seeks to understand issues concerning the transportation impact fee scheme. Areas of the scheme in need of improvement are also discussed.

Soon-Gwan Kim · Jee Eun Jang

One of the most important travel demand management policies in Seoul are transportation impact fees enacted in 1990. Impact fees are based on building floor area, unit fees, and a multiplier factor by land use group. Because the multiplier factor has not changed since 1996, it was announced that there would be revisions in the ordinance in a way that reflects changes to the urban environment. The objective of this study is to improve existing regulations in law and operation of transportation impact fees focusing on the multiplier factor.

One way to reflect changes in the urban environment is to introduce a zoning factor of CBD (central business district) and non-CBD. This study focuses on a difference analysis of transportation impacts on buildings and areas classified in this way. Table 1 shows that there are a larger number of unit trips by passenger cars and taxis arriving at non-CBD buildings than at CBD buildings.

[Table 1] Destination Trips by Passenger Cars & Taxis Per Unit Area by Location

(Unit: trips/1,000㎡/day)

Location	Destination Trips	
	(Passenger Cars+Taxis)/Building Area	(Passenger Cars+Taxis)/Floor Area
CBD	204.55	24.99
Non-CBD	144.23	26.85

Just like destination unit trips, the unit traffic volume generated at non-CBD locations is larger than at CBD areas ([Table 2]). These findings are opposite to the expectation of a higher zoning factor at CBD areas.

[Table 2] Traffic Generation Per Unit Area by Building Size and Location

(Unit: Volume/1,000㎡)

Building Size (Floor Area)	Location			
	CBD		Non-CBD	
	Traffic Volume /Building Area	Traffic Volume /Floor Area	Traffic Volume /Building Area	Traffic Volume /Floor Area
Up to 3,000㎡	-	-	-	-
Above 3,000㎡, Less than 30,000㎡	232.6	23.2	233.1	27.6
30,000㎡ and above	560.1	51.7	479.4	52.4
Total	538.6	49.9	462.2	50.8

[Table 3] shows an increasing trend in the yearly unit impact fee index. From 2020, the unit impact fee index for large buildings (30,000㎡ and above) is scheduled to increase 2.86 times over pre-2014 levels. On the other hand, 68.1% of large buildings are located in CBD areas. This means that a higher zoning factor at CBD areas will impose a severely heavy burden on the large group of buildings there. Therefore, adjusting upward the objective of travel demand management is a recommended prerequisite to a higher zoning factor at CBD areas.

[Table 3] Yearly Unit Impact Fee Index by Building Size

Building Size (Floor Area)	Year						
	2014	2015	2016	2017	2018	2019	2020 and on
Up to 3,000㎡	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Above 3,000㎡, Less than 30,000㎡	1.00	1.14	1.29	1.43	1.57	1.71	2.00
30,000㎡ and above	1.14	1.43	1.71	2.00	2.29	2.57	2.86

[Table 4] Number of Buildings with Transportation Impact Fee Imposed, by Building Size and Location

(Units: number, %)

Building Size (Floor Area)	Location		Total
	CBD	Non-CBD	
Up to 3,000㎡	8,033	9,739	17,772
	(45.2)	(54.8)	(100.0)
Above 3,000㎡, Less than 30,000㎡	3,928	2,827	6,755
	(58.1)	(41.9)	(100.0)
30,000㎡ and above	631	296	927
	(68.1)	(31.9)	(100.0)
Total	12,592	12,862	25,454
	(49.5)	(50.5)	(100.0)

If previous difference analyses of transportation impacts on buildings and areas are specified by land use group, than the unit traffic volume for shopping facilities and destination shopping trips by passenger cars and taxis are larger at CBDs than at non-CBDs. Even though a generally higher zoning factor is not recommended for CBDs overall, it can be applied to large shopping facilities there.

[Table 5] Traffic Generation Per Unit Area by Land Use Category and Location

Land Use Category	CBD			Non-CBD		
	Number of Facilities	Traffic Volume /Building Area (Veh/1,000㎡)	Traffic Volume /Floor Area (Veh/1,000㎡)	Number of Facilities	Traffic Volume /Building Area (Veh/1,000㎡)	Traffic Volume /Floor Area (Veh/1,000㎡)
Office	13	381.7	13.4	14	378.0	25.6
Hospital	5	373.2	53.9	8	303.0	41.7
Department Store	14	610.6	70.6	17	538.9	51.4
Wholesale Shopping	3	824.4	99.7	15	689.9	95.0
Hotel	2	144.7	14.1	2	255.7	27.0
Total	37	538.6	49.9	56	462.2	50.8

[Table 6] Destination Shopping Trips by Passenger Cars/Taxis Per Unit Area by Location

(Unit: trip/1,000㎡/day)

Location	(Passenger Cars+Taxis) /Building Area	(Passenger Cars+Taxis) /Floor Area
CBD	256.66	29.84
Non-CBD	196.20	25.70

Narrow alleyways of less than 12 meters in width make up 77.2% of all roads in Seoul, and these include community roads. Pedestrians and vehicles should coexist on community roads by their nature. For provision of space and access is regarded more important than enhancement of mobility on the roads, conflicts between pedestrians and vehicle drivers occur more often than other types of roads.

Accordingly, both pedestrians and parking space need to be considered when securing walk space and operating community roads.

Introduction of MaaS (Mobility as a Service) to Seoul

New transport modes such as self-driving cars and personal mobility vehicles have been developed and mobility services diversified. With this shift in mobility options, public demand has become increasingly complicated. The new concept of MaaS (Mobility as a Service) has been advanced to cater to these complex needs. MaaS encompasses a variety of transport modes on a single platform. This platform provides an array of transport services including trip planning, booking and payment. **Introduction of MaaS (Mobility as a Service) to Seoul** looks into the existing public transport system as well as the current mobility services and predicts changes within them. It explores the perception of MaaS among Seoulites. Based on understanding the new mobility services that the public needs, plans for introducing a tailored-to-Seoul MaaS platform are presented.

Hyukryul Yun · Gyeong-sang Yoo · Hong, Sang Yeon · Hyeongyun Ki · Sehyun Park

Recently, automobile technology has developed in new ways and a variety of new transportation modes are appearing. Demand is increasing due to changes in traffic conditions. MaaS (Mobility as a Service) began in Europe as a way of addressing the changing needs of citizens.

The SMG (Seoul Metropolitan Government) provides a variety of traffic mode information and the integrated public transport fare system. The public transport infrastructure is well established. MaaS-Seoul should provide information based on public transportation in a way that reflects the characteristics of Seoul.

The role of the SMG is to create a personal information management system using block chain technology and data standardization. Services need to be provided to disadvantaged groups and areas with poor public transportation services. It is essential to establish a transportation system that can maximize social benefits. Finally, it will need to play a part in creation and implementation of a MaaS Korea platform.

A Study on Risk Assessment Techniques for Preventing Traffic Accidents

The Seoul Metropolitan Government has continued to work towards improving traffic safety. Such efforts include installing traffic safety facilities and overhauling the system for traffic signal operations in areas plagued by frequent traffic accidents. Besides traffic systems, the complex relationship between nearby land use and travel patterns also contribute to such accidents. When it comes to evaluating the potential risk of these accidents, it is essential to comprehend them within their broader social environment. **A Study on Risk Assessment Techniques for Preventing Traffic Accidents** proposes a risk assessment model which deviates from the traditional traffic accident analysis. The model in this study links traffic systems, social environment and human activities. The authors suggest data on traffic accidents that needs to be collected and ways to enhance the current assessment model with new data.

Hong, Sang Yeon · Chung, Jae Hoon

Current traffic accident mitigation projects have involved suggesting measures for improvement, such as installing traffic safety facilities and adjusting signal operations at traffic accident "black spots". However, the suggested measures are fundamentally retroactive since the input is data on traffic accidents that have already occurred.

To determine the potential risk of traffic accidents, it is essential to understand them within the social environment context. Traffic accidents are not only influenced by the traffic system, but also by the complex relationship between land use and the activities of people on that land. Even if there are few actual traffic accidents, proactive measures remain necessary against accidents where they are likely to take place, taking into consideration the traffic conditions and social environment as well.

In this study, we present a traffic accident risk assessment model which takes into account the traffic system, social environment and human activity together.

Our research identified that the effect of the factors of traffic accidents differed by administrative region. It was also found to be influenced by traffic systems, the social environment and human activity.

How Autonomous Vehicle Technology Changes Urban Transportation Policy

One of the most frequently cited topics in science and technology in the 21st century is autonomous driving. An autonomous car refers to a vehicle that can safely and efficiently travel between destinations, without a human operator and on a traditional road in any climatic environment. Many changes need to follow from developing autonomous vehicles. One such change will be regarding parking programs and policies tailored to autonomous vehicles. **How Autonomous Vehicle Technology Changes Urban Transportation Policy** forecasts parking demand for and travel patterns of autonomous cars. The authors suggest ways to provide appropriate parking spaces. The ripple effects that autonomous cars will have on urban spatial structures and transportation policy and the viability of offering services suitable for each level of automation.

Wonho Kim · Kwanghoon Lee · Seung-Hyun Min · Sangmi Jeong · Youngbum Kim

This study summarizes the changes in urban traffic caused by autonomous driving technology. In particular, we analyze changes in parking behavior and parking facilities, which are most sensitive to changes from AVs (autonomous vehicles). When AVs are parked in an existing parking facility, the capacity of that parking facility increases by 30 ~ 60%. An AV exclusive parking garage can lead to a further 70% efficiency in land use. In particular, the combination of mechanical parking lot and autonomous driving technology can increase parking capacity by at least 75% and land utilization by more than 14%.

AVs avoid crowded and expensive urban parking lots, or moving to nearby cheaper parking lots. In a recent opinion poll, 83.7% of existing passenger car drivers responded that they would switch to autonomous vehicles. This was also true for 58.2% of users of public transportation. In a poll on selection of a parking lot when going to the city center in an AV, choosing to go to one outside the city center was the most common among passenger car users and public transportation users. It was also found that 21 ~ 27% of respondents chose a parking lot in the city center, while 8 ~ 12% answered that they would return their car to their home. Due to the demand for AV parking, an additional VKT (Vehicle kilometers travelled) of up to 4.7 million vehicles / km occurred, which is about 30.0% of the total driving

distance of Seoul (53,426,401 vehicles / km in 2014). In scenarios where a single fare is charged at a rate lower than the city center, a VKT of about 18.9 million vehicles / km, which is about 35% of the total driving distance of Seoul, is added, with an increased travel distance of 31.9km per vehicle as well.

Therefore, the scope and characteristics of existing traffic demand management policy were diagnosed to envision a demand management policy that reflects the characteristics of autonomous vehicles. This study proposes a demand management zoning system that selectively applies existing traffic management policies that are appropriate for each region's traffic characteristics.

The principle of "zoning" for traffic demand management that considers the characteristics of autonomous vehicles is as follows. As one enters the city center, it adopts a strong demand management policy and encourages the transfer from AVs to public transportation in a variety of ways, including strengthening transfer facilities between modes. Area 1 of Jongno-*Gu*, Jung-*Gu*, Yeongdeungpo, and Jongno-*Gu*, which are the targets of Zone 1, will be designated as special management zones, and a strong demand management policy will be implemented therein, using congestion tolls to limit vehicle entry. In Zone 2, the "Kiss & Ride" method will help reduce the demand for AVs to enter the city center, which will instead drop passengers off and return to a low-cost parking lot or back home, and people then use public transportation. Zone 3 refers to the area coping with wide-area traffic demand. Vehicles park in AV-exclusive parking lots for lower rates at the outskirts of the city, and drivers then use public transportation to get to their destinations.

Seoul Environment Changes and Seoul Citizen Mobility

The share of elderly and single-person households is forecasted to increase. It is expected that such demographic shifts will inevitably affect patterns of transport use and travel behavior. However, transportation policies have targeted traditional three- to four-person households - also known as "average" households - thus far. This means that the changing travel patterns of Seoulites are not adequately reflected. **Seoul Environment Changes and Seoul Citizen Mobility** identifies shifts in the social environment occurring over the last decade, including in demographics and household structures. The authors analyze changes in household travel patterns, including for elderly and single-person households. Recommendations are offered regarding transportation policy direction for the Seoul Metropolitan Government.

Gyeong-sang Yoo · Hyukrul Yoon · Wonho kim · Shinhae Lee · Seungjun Kim
Hong, Sang Yeon · Miri Byun · Sangmi Jeong · Junhyoung Yeon

Seoul has already become an aging society due to low fertility and decreased number of marriages, with the number of single-person households soaring to about 30% of all households. Changes in the social, economic and cultural environment such as increased youth unemployment, growing income disparity, and reduced working hours have inevitably affected the travel behavior of Seoulites. In this study, we analyzed this change of travel behavior from 2006 to 2016, and identified the following policy implications that can be referred to when preparing and implementing relevant transportation policies in the future.

First, the number of passenger trips by senior citizens increased by 1.01 million a day during 2006~2016, of which about 0.87 million trips were on foot/bicycle. Therefore, improving the pedestrian infrastructure is urgent to protect safety and support mobility among this demographic. In addition, the number of traffic accidents caused by older drivers also surged during this period due to the 82.4% increase in their being behind the wheel. Reducing this cause of traffic accidents requires developing and implementing a variety of policies such as stricter aptitude testing and license management for senior citizens wanting to drive, improving public transportation and road facilities, establishing a platform for mobility support, and creating a public transportation voucher program.

Second, during this period, the number of trips by elderly single-person

households increased more than twice over, with a majority of these trips involving members of low-income households with monthly incomes of less than 1 million won. Therefore, it is necessary to support their mobility in terms of traffic welfare. For example, a new platform linking taxis and volunteer groups can be considered, as well as providing special transportation modes and public transit welfare cards.

Third, young single-person households tend to have a passenger vehicle and drive themselves, even with low incomes. Most such trips are for work and business, with short-distance trips (less than 5km) accounting for 22%. In addition, there is a similar distribution between residential areas and areas where activities are conducted for these households, and it is found that the short distance trip less than 5km is generated more frequently than the entire young-person group. These characteristics need to be considered, as this demographic makes up a large part of the population, when any car demand management policy is implemented.

Lastly, despite the fact that young, female single-person households have a higher rate of public transportation use than their male counterparts, women remain quite concerned about their safety at public transport facilities. Therefore, such facilities need to be improved in terms of physical safety and security to create an environment in which women feel more comfortable to use public transportation.

Adoption of Smart Mobility Services in Seoul

A wide selection of countries across the globe are keenly interested in building smart cities. Similar to this, “smart mobility” has come into the spotlight in the transport sector. A key aspect of smart cities, smart mobility uses innovative technologies to improve the movement of goods and people. It is something the Seoul Metropolitan Government strives to embrace. **Adoption of Smart Mobility Services in Seoul** predicts changes in transportation systems It aims to uncover the potential of such services in providing solutions to the current traffic issues in Seoul. Strategies and policies are presented towards successful introduction of smart mobility into Seoul.

Hong, Sang Yeon · Wonho Kim · Gyeong-sang Yoo · Se-Hyun Park

Populations around the world are moving to cities at a rapid pace. In 2015, the UN predicted that 68% of the world’s population will live in cities by 2050. Megacities such as Tokyo, New York, and Seoul are expected to face overpopulation and the immense associated problems. Smart Cities are key to preempting such issues in these cities. Transportation is another significant issue in such cities and one solution can be “smart mobility”.

Smart mobility will change the transportation system in Seoul through the use of IoT, big data, AI, and the 5G network. New mobility services created by the private sector (including startups) will change the manner in which we commute. In a smart mobility society, people will remain connected, everything will be shared, and transportation will be multi-modal. There will be ways to resolve heavy traffic, first and last mile problems, and parking issues.

A list of smart mobility services was evaluated in this study. Platform services were evaluated as highly effective and strategies for these services suggested. Finally, the authors make several suggestions towards successful adoption of smart mobility in Seoul.

Utilization of Behavioral Economics in Policy Implementation

As a new tool for investigating social phenomena, behavioral economics has become a hot topic in many countries. The reason is that it is seen as a promising tool for influencing behavior on the basis of psychology. **Utilization of Behavioral Economics in Policy Implementation** explores the possibilities of applying behavioral economics solutions to Seoul Metropolitan Government policies. The authors present the findings of several behavioral experiments on such policies regarding transportation, welfare, energy and public utility rates. Several implications regarding formulating and implementing policies are proposed for Seoul.

Kijung Ahn · Jinhak Lee

Behavioral economics, which analyzes economic phenomena based on psychology, has received worldwide attention since psychologist Daniel Kahneman and economist Richard Thaler won Nobel prizes in economics, in 2002 and 2017, respectively. Furthermore, many developed countries, such as the US and the UK, have been adopting behavioral economics in establishing and enacting policy.

In this study, we conducted experiments to identify ways to apply behavioral economics theories to Seoul Metropolitan Government policy. There were several noteworthy findings from this study.

First, poor social proof may act as an obstacle rather than an incentive in invoking participation in public policy. Social proof may be a powerful tool when pluralistic ignorance exists for most people.

Second, loss aversion should be an instrument to promote municipal policy and invoke public participation. As declared in the prospect theory, people are more sensitive to potential loss (cost) than to potential gain (benefit).

Third, the frame effect (which refers to people's choices depending on context) can also be a powerful policy instrument when it is related to personal financial gain or loss, but may not be effective when it is related to social gains or losses.

Fourth, policy instruments based on behavioral economics may be more cost effective than those based on standard neo-classical economics. This study shows that there are better results from benefit-cost (B/C) analysis for the former than for the latter.

Fifth, people consider fairness in judging whether a policy is acceptable or not, especially when goods and service are provided by the public sector. Thus when those services require increased fees or other adjustments, public providers should be open with information on the cost of providing those services and emphasize the necessity for the adjustment or increase.

Finally, policymakers should bear in mind that policy prescriptions based on behavioral economics are heuristic rather than algorithms. Thus many experiments should be conducted to improve a policy before it is advanced, as done by the UK's Behavioral Insight Team. Greater support will be needed in terms of funding and personnel for such experiments.

03 Environmental Planning

A Study on the Emergency Dispatching Systems in Seoul

These days, a great number of emergency calls come from cell phones, posing several problems for dispatchers in rendering immediate assistance. For instance, cell phones do not provide an emergency caller's exact location. Emergency services can efficiently respond to emergencies when accurate information on the caller's location and situation is offered. **A Study on the Emergency Dispatching Systems in Seoul** examines the current state of such systems as well as the use and trends of information systems in Seoul. The authors interview persons concerned and analyze cases to present ways to improve the emergency dispatching systems in Seoul.

Jong-Seok Won · Sang-Gyoon Kim

Recently, there has been an increase in emergency calls made in Seoul. Accurate information about location in emergency situations can help reduce the number of victims and incidence of property damage. The Seoul Emergency Operation Center (SEOC) has helped protect citizens but many changes are needed in terms of information capacity for more effective response to emergency calls.

Effecting rescues in a metropolitan city such as Seoul may be difficult due to the number of detached homes, small roads, green spaces and riverside areas. Significant time is required for rescues in emergencies such as building collapses, natural disasters and floods. The number of injured and dead is often high in traffic accidents. The process of asking for location takes up 2.7% of each emergency call time. This seems insignificant but when it is a matter of life and death, every moment is important. Time required for ambulance dispatch varies by location. Unclear information on location results in more time before dispatch.

In this study, a survey was conducted that revealed that "eradicating blind spots" are important to 32% of respondents. It was also felt that the vulnerable needed more protection. According to emergency call dispatchers, information systems that are very important in dispatching and obtaining location information in the SEOC are also very old.

New technologies are required for SEOC information systems. The use of advanced systems in other parts of the world integrate and share emergency as well as strategic location information.

Thus, the Seoul Metropolitan Government (SMG) must implement a plan of directions and proposals to strengthen the SEOC. Regions falling under "blind spots" should be given the first priority. In this study, we propose solutions to SEOC problems. We examine the current state of dispatching, including an analysis of times and regions by discussing persons in charge of the SEOC. Then we hear from dispatchers, emergency management professionals and citizens who participated in any training courses on emergency response.

The results of this study led us to the following conclusions:

ⅰ) There is a need to formulate detailed policies concerning emergency dispatch in view of program setting and strategic information planning;

ⅱ) The SEOC must use an intelligent information system to respond effectively to blind spots in emergency dispatch;

ⅲ) The SEOC needs to improve their systems and partner with the general public in responding to emergencies.

A Study on the Feasibility of New Urban Access Regulations in Seoul: Policy Design, Public Acceptance, and Expected Effects

Particulate Matter (PM2.5), or fine dust particles, is classified as a carcinogen by the World Health Organization. Studies have shown that PM2.5 is a major risk factor for respiratory problems, cardiovascular diseases and premature death. The number of days with high PM2.5 concentrations has increased in Seoul, arousing interest and concern among the public. Emissions from vehicles are a key source of fine dust pollution, making it necessary to devise effective policies aimed at decreasing fine dust levels. **A Study on the Feasibility of New Urban Access Regulations in Seoul: Policy Design, Public Acceptance, and Expected Effects** suggests environmentally-friendly ways to decrease the negative impact on air quality from the transportation sector in Seoul.

In Chang Hwang · Jin-Seok Han

In recent years, concerns have been increasing about the management of particulate matter (PM) in Seoul. The annual mean concentration of PM2.5 (particles with a diameter of 2.5 μm or less) in Seoul is 2.5 times higher than the level outlined by WHO guidelines. In addition, premature deaths attributed to PM2.5 amounted to 1,762 people in 2015. Urban access regulations are one effective policy measure put in place to address air pollution. Although Seoul introduced Low Emission Zones (designated areas where the most polluting vehicles are regulated) in 2010, the program's impact on urban air pollution is limited because it covers only heavy-duty, diesel-powered freight vehicles.

For this reason, we propose new urban access regulations for Seoul. The proposal covers all kinds of vehicles (passenger, gasoline/LPG, light-duty, foreign makes), with emission level 5 or more according to national air quality certification (ROK Ministry of Environment). Detailed policy designs including designating areas, issuing exceptions, enforcement systems, penalties, incentives, and long-term plans have also been proposed, with a majority of the general public supporting such schemes (77% of survey respondents) and many citizens (more than half) of the opinion that more stringent application of the scheme is necessary.

Once operational, it is expected that such a scheme can reduce total PM2.5 emissions by Seoul's transport sector by up to 27%, according to application of the EMME 2 transportation demand model.

Current Conditions and Measures for Managing Road Puddles in Seoul

When pavement, drainage systems, nearby landforms and road structures are in poor condition, rain and melting snow result in road puddles. So far, the Seoul Metropolitan Government has focused on alleviating flooding during or after intense rain. There is a need to direct attention to road puddles that people frequently encounter in daily life. **Current Conditions and Measures for Managing Road Puddles in Seoul** analyzes the current state of puddles on roadways in Seoul and presents ways to minimize the inconvenience and damage they cause.

Sang-Young Shin · Sang-Gyoon Kim · Jong-Rak Baek

Road puddles often create hazards for vehicles and pedestrians. According to road accident data in Seoul, they can lead to fatal accidents. Under wet road surface conditions, they are responsible for 8.2% of accidents and 12.2% of fatalities. The fatality rate under wet road surface conditions is 1.6 times higher than under dry road surface conditions. This study analyzes the problems related to road puddles and suggests a policy framework for better management of roads in Seoul.

The study first reviews concepts, existing research, institutional frameworks and management as it relates to road puddles.

The study then uses recent road accident data to analyze the relation between road accidents, weather and road surface conditions in Seoul to draw implications of the potentially fatal hazards caused by road puddles.

The authors next analyze current problems related to road puddles in Seoul. Based on several survey data items on road pavement conditions and puddles from the Seoul Metropolitan Government (SMG), a desktop GIS analysis was carried out using a high-resolution digital terrain model and field surveys before, during, and after rain. Road puddles occur mainly on road pavement, road drainage facilities, and on surrounding topographic features. According to a questionnaire, civil servants responsible for road management see road puddles as caused mainly by deformation and subsidence of road pavement, roadside gutters and inlets.

In January 2018, there were 487,364 street inlets, with significant difference in installation by *Gu*-district. Inlets deteriorate by an average of 63.2% over 30 years. This study examines the hydrological suitability of inlets with respect to road

puddle areas in Seoul. The results imply that careful installation of street inlets considering the possibility of road puddle formation is needed.

The authors then suggest ways to improve management of road puddles in Seoul. Since they can occur at any place and at any time due to rainfall, the SMG needs to focus on road sections, like areas of pedestrian concentration (bus stops, subway stations, etc.), areas surrounding large-scale construction sites, highways and arterial roads where vehicle speeds are high.

This study then suggests several strategies with respect to road pavement and drainage systems for improvement of management of road puddles. One example would be integrating pavement maintenance and road drainage into one agency or department, instead of the current situation where different agencies and departments are responsible.

Since it is difficult to anticipate the formation of road puddles with respect to time and place, policies need to focus on rapid response systems while strengthening active prevention. The study suggests several actions for response and prevention, including routine surveys, citizen report systems, uses of road surface survey data and social media.

A Study on Road Cleaning to Reduce Resuspension of Road Dust

Fugitive dust from roads is emitted in the air without any vent. Emissions from vehicle exhaust is expected to decrease continuously thorough a variety of efforts such as introducing "green" vehicles and tightening standards for car pollutants. On the other hand, fugitive dust from roads, relatively lacking attention and control, is predicted to rise. While such dust contains soil components, it also consists of hazardous chemicals, requiring better management. **A Study on Road Cleaning to Reduce Resuspension of Road Dust** examines efforts to curtail fugitive dust in Korea and overseas. The authors assess the effectiveness of several road cleaning methods. The study proposes ways to decrease fugitive dust emissions from roads in Seoul and the direction for an overhaul of laws.

Yu-Jin Choi · Young-Eun Kim · Hye-Jin Lee

The increased occurrence of high PM (particulate matter) episodes in the Seoul metropolitan area is a major concern to the general public. The major urban sources of PM include vehicle exhaust, fossil fuel combustion for heating buildings, and fugitive dust such as that around roads, construction areas and that generated by tire and brake wear. According to the National Air Pollutant Emission Inventory for 2015, road dust makes up for 24% of all PM10 emissions in Seoul, making it the second-largest source in Seoul behind construction dust, and is 11% higher than on- and off-road vehicle emissions. Even though the data on road dust emissions is known to be highly unreliable, road dust is a source that needs critical control due to the significant hazard such particles may pose to health for people living near locations of heavy traffic.

In general, road dust management can be divided into two categories: preventing such emissions to begin with (preventive actions), and reducing resuspension of road dust already deposited on the road (post-management actions

In this study, we evaluate the effectiveness of the road cleaning method currently in use by the Seoul Metropolitan Government and suggest effective post-management actions for reducing resuspension of road dust.

Establishing a Smart and Safe City in Seoul

Efforts are in motion to make Seoul a smart, safe city, and these include diverse activities aimed at building a "smart" city combined with ICT-based platforms and information services. Such a city would be a changed urban environment where citizens have access to safety services and preventive risk management is possible. **Establishing a Smart and Safe City in Seoul** examines cases concerning creating smart, safe cities along with trends in technology. The study also looks at the current status of safety services and Seoulites' new demands for safety. They Then, the authors analyze elements that are essential to develop a smart, safe city, and set out the tasks that should be carried out in stages by the Seoul Metropolitan Government.

Suk-Min Lee · Hyung-Mi Yoon

The possibility of unpredictable natural disasters has increased in Seoul. As well, the possibility of damage caused by manmade disasters such as fire and structural collapse is escalated by current land use and facility aging. The city has also been exposed to various social disasters and risks due to aging and the increasing number of single-person households. Accordingly, the level of public awareness regarding such disasters and safety management is higher today than in the past, and the public sector's role in management of safety has become increasingly critical.

Recently, the need has increased to build smart, safe cities incorporating advances in information and communication technology to address disaster and safety management issues. Singapore and many countries in Europe and North America have addressed the need for smart, safe cities as their main policy agenda. The Seoul Metropolitan Government has also been forming a strategy to develop urban safety services using fourth-generation industrial revolution technologies such as the Internet of Things (IoT), big data and technology platforms in an effort to build smart, safe cities, and develop a platform for public services.

To improve the safety functions in Seoul and improve overall public safety, appropriate case studies have highlighted the principles of "smart safety", technology trends, analysis of safety services, and public demand surveys. Based on the findings from these case studies, the basic direction for smart, safe cities and the necessary components for their implementation are presented, along with each step

of the project.

The basic direction of Seoul as a smart, safe city has been to develop the requisite infrastructure, such as IoT-based urban safety management, customized services to protect vulnerable populations, disaster response using big data analysis, and improved public platforms to enhance safety management.

The core component of Seoul as a smart city includes information systems necessary to construct an integrated platform based on big data and urban safety services, the latter of which includes management of safety facilities, appropriate response to climate and weather changes, enhanced administrative capabilities for crisis management, and protection of vulnerable groups. In addition, smart, safe city teams needed for logistics should be given an institutional basis via amendment of the SMG Ordinance on the Establishment of an IoT City.

The establishment of a smart city consists of three stages: planning, implementation, and operations.

The planning stage includes a basic information strategy plan (ISP) for the implementation of smart and safe cities. Also necessary is improvement of the system to support creation of a new organization and council for safety measures.

The implementation stage includes development and dissemination of IoT-based urban safety services, building information infrastructure, big data-based warehouses and data marts, and a safe integration platform.

The operation stage involves operations and logistics, entailing pilot projects and demonstrations to properly implement urban safety services.

A Study on Developing an Integrated Air Quality (Ozone and PM2.5) Management Framework in Seoul

Ground-level ozone and particulate matter (PM2.5) are similar in process of formation and contributors. Thus far, the Seoul Metropolitan Government's control policies for these two air pollutants have been established separately. Towards reducing sources contributing to ground-level ozone and PM2.5 formation, an integrated air quality management framework is needed. Such systems have been adopted by major cities in other countries so as to lessen health hazards for the public, posed by air pollution, in a cost-effective manner. **A Study on Developing an Integrated Air Quality (Ozone and PM2.5) Management Framework in Seoul** proposes ways to develop a management framework for ground-level ozone and PM2.5 in Seoul.

WoonSoo Kim · Sang-Young Shin · Jeong-Ah Kim

Two of the dominant air pollutants affecting public health are ozone (O_3) at ground level and fine particulate matter (PM2.5) concentrations, based on air quality monitoring statistics from the air quality network in Seoul up to 2017. In Seoul, these major air pollutants exert significant impact on human health and will not be easy to reduce, despite outstanding implementation of related policy options. Analysis shows that the city of Seoul now encounters difficulties in dealing with four hazards including the increasing pattern of average O_3 concentrations, spatially hot spot episodes, and additive impacts of urban climate change. In addition, as the concentrations of fine PM increase, visibility decreases, making the control of fine PM a crucial component of haze reduction programs in Seoul.

The objective of this study is to provide an overall process for the Seoul Metropolitan Government (SMG) to develop an integrated air quality (ozone and PM2.5) management framework. Developing such strategies for air quality management will be a difficult task in Seoul because the formation of air pollutants is interdependent and air quality at different locations may respond differently to emissions from common sources. Hence, to prepare an integrated strategy for air quality management, empirical analysis was conducted to determine the mechanisms behind the formation of O_3 and PM2.5 in Seoul using air quality monitoring data. Moreover, to suggest policy options, the authors propose an

integrated management system based on a conceptual model.

An empirical analysis was done to test a strategy of integrated, simultaneous management of O_3 and PM2.5. Reduction of VOCs (volatile organic compounds) and NOx (nitrous oxide) pollutants from various emission sources separately is also examined, which means there may be a decrease in average concentration of ozone. Considering the interaction of O_3 and PM2.5 compound air pollution within airshed, it is important to consider quantification of the enhanced effectiveness of NOx control from simultaneous reduction of VOC pollutants from the air in Seoul.

Finally, with a view to alleviating the negative impact to health from O_3 and PM2.5 pollution, the following multi-pollutant planning directions are required in handling O_3 and PM2.5 episodes: 1) Preparation of a document guiding the SMG on developing an integrated air quality management system for O_3 and PM2.5; 2) Modification of the integrated system for air quality management leading to installation and operation of O_3 and PM2.5 monitoring stations to observe the formation of pollution concentration, as well as conducting surveys on health risks and establishing a micro-level emissions inventory; 3) Provision for an O_3 and PM2.5 episode alert/warning system, following multi-pollutant planning strategies; 4) Establishment of a governance system to effectively control Ozone and PM2.5. Consideration should be given on ways to consult key stakeholders so that their input and interests are included in the current status assessment, and engaging them in creating solutions to the problems and participating in the process of developing an O_3 and PM2.5 management plan.

Evaluation of the Effect of Green Infrastructure on Reducing Particulate Matter and Plans for Expansion

A variety of methods are being used to lower the levels of airborne particulate matter (PM), such as restricting vehicles to specific areas, encouraging the use of clean energy and providing urban green spaces. Urban parks are known to have lower air temperatures and greater humidity levels than their surroundings. Thus, they are deemed effective in sinking particulate matter. In recent years, studies have been done on the PM-adsorption capabilities of plant species and the PM-reduction capacity of urban forests. However, there is insufficient research around the effectiveness of green infrastructure in this area. **Evaluation of the Effect of Green Infrastructure on Reducing Particulate Matter and Plans for Expansion** analyzes the PM-adsorption capacity of trees in Seoul. Using the findings of their analysis, the authors present plans for expansion of green infrastructure including selection of optimal tree species and tree arrangements to effectively improve air quality.

Won-Ju Kim · Su-Young Woo · Cho-Rong Yoon · Myeong-Ja Kwak

Outdoor activities have recently been restricted due to particulate matter (PM), whose proliferation has increased public concerns of the impact on health. After identifying this proliferation as an emergency, the Seoul Metropolitan Government is taking measures to limit the number of vehicles on the road and the related pollution during the issuance of emergency reduction actions. This is done towards reducing both emissions and public exposure to those emissions. However, a variety of other measures besides preventive ones should be put in place to reduce the resuspension of PM that has already been generated. In this respect, the importance of “green infrastructure”, such as trees, parks, and green spaces in urban areas, is increasing as one of the ways to reduce public exposure to PM. To understand the impact of trees on PM in the city, their adsorption was analyzed through field measurements that targeted the street trees along the major roadsides in Seoul. This study proposes plans for expansion of efforts to increase such green infrastructure, such as through the selection of the optimum species to reduce PM and the best methods of arranging the trees. The main ideas are categorized into an analysis of trends related to green infrastructure, a review of green infrastructure in Korea and abroad as it relates to air pollution, an analysis of the effect that green infrastructure has on reducing PM incidence, and a proposal on plans to expand

green infrastructure as a way of better managing particulate matter.

In the analysis of trends related to green infrastructure, the infrastructure of green spaces and street trees were selected as they relate to reducing particulate matter in Seoul. Previous studies on green infrastructure designed to reduce particulate matter were also reviewed.

In the review of the impact on air pollution of green infrastructure in Korea and overseas, the authors also reviewed green infrastructure policy. This review included the city forest in Stuttgart, Germany (taking into consideration wind path), green walls in other places in Europe and cases in Korea, such as the composition of urban forests to reduce particulate matter, greening activities, and PM-reducing benches.

The analysis in this study of the effect that green infrastructure has on reducing PM incidence included an analysis of the current tree species in Seoul: Ginkgo biloba L., Platanus occidentalis L., Zelkova serrata (Thunb.) Makino, Prunus yedoensis Matsum, and Pinus densiflora Siebold & Zucc. in Seoul Forest and Yangjae Citizen's Forest. Our analysis revealed that the most effective species in PM adsorption per unit area were Zelkova serrata (Thunb.) Makino and Platanus occidentalis L. The amount of particulate matter adsorption by leaf area index (LAI) was 1.4~2.5g/㎡ for the Zelkova serrata (Thunb.)Makino, 0.8g/㎡ for Platanus occidentalis L., 0.4~0.9g/㎡ for Pinus densiflora Siebold & Zucc., 0.5~0.7g/㎡ for Prunus yedoensis Matsum, and 0.2~0.4g/㎡ for Ginkgo biloba L. The amount of particulate matter adsorption per tree within the range of DBH (diameter at breast height) for the target trees was 66.6g on average for Zelkova serrata (Thunb.) Makino, showing that it had a relatively higher PM adsorption (37~96g/tree). There was no statistically significant difference in air pollution tolerance index per tree between Seoul Forest and Yangjae Citizen's Forest. However, the air pollution resistance index for the Platanus occidentalis L., Pinus densiflora Siebold & Zucc., and Prunus yedoensis Matsum. were higher than other trees. However, similar figures could be found in all five species in these two parks.

Adsorption varied by location and pruning of the target trees. We conducted analyses of absorption only a limited number of times with a focus on a certain

season. As a result, the estimated amount of PM adsorption per tree may deviate. In the future, repeat measurements are required in all seasons for more accurate results. A complex review of a variety of variables is required, and an optimal planting method should also be developed.

Results of our analysis of the distribution of particulate matter and green infrastructure in Seoul show that there was a lower concentration of large green areas than small areas. The connectivity of this green infrastructure was analyzed towards proposing ways to expand it, targeting built-up areas with relatively high PM concentrations, as well as Yeongdeungpo-*Gu* and Dongdaemun-*Gu* with their low incidence of green areas. Previous studies were used in producing the proposal to reduce particulate matter through certain green infrastructure elements.

Finally, these proposed plans are based on urban characteristics and given the limited green space in Seoul, include utilizing plant species with high PM-adsorption characteristics. Trees with a high total leaf area or area index and a high per unit adsorption area, and the Zelkova serrata (Thunb.) Makino is the most efficient. However, since deciduous trees do not have leaves in autumn or winter, this reduces their total annual adsorption, making evergreen needle-leaf trees more effective in winter and early spring. Planting evergreen trees will complement the seasonal characteristics of high-adsorption deciduous trees. The key to deployment of green infrastructure to reduce particulate matter is that trees and greenery help to block the build-up of particulate matter and filter it out of the air, so multi-layered planting is important. The same multi-layer planting method of mixing arbor, arborescent, shrub and herb is applied to residential areas. However, they are vulnerable to vertical spread of particulate matter, a dense and stepped arrangement is effective. Meanwhile, for areas where smooth dust emission is required, a composite arrangement is effective such that polluted air flows outside the city through a constant gap between the trees. However, since there is little room in Seoul for green space, it is desirable to consider stereoscopic greening, such as wall greening and rooftop greening. This study also proposes ways to significantly involve the general public in this expansion, in the interest of greater efficiency.

Benefits of Management Policy of Seoul on Airborne Particulate Matter

The feasibility of public policies that require a significant amount of funding is studied through evaluation of social and economic benefits. As PM2.5 has recently worsened, the amount of funds budgeted for schemes to reduce the air pollutant has increased. Although researchers have focused their efforts on the health impact of fine particles, few studies have been conducted on the economic feasibility of PM2.5 control policies in Korea. There have not been enough that comprehensively examine the health and macroeconomic effects of fine particles. **Benefits of Management Policy of Seoul on Airborne Particulate Matter** evaluates the socio-economic advantages of the Seoul Metropolitan Government's PM2.5 management policies.

In Chang Hwang

Air pollution is a major environmental health hazard, responsible for illnesses and deaths worldwide. Particulate matter (PM) with a diameter of 2.5 microns (PM2.5) or less has the greatest negative impact on health of all sources of air pollution. The Seoul Metropolitan Government (SMG) has made a variety of efforts to reduce particulate matter, including Ten Measures for Fine Particles, which were established following an open forum in June 2017.

Since the management of fine particles will require massive funding, a legitimate assessment of the expected socioeconomic benefits is required.

There is also a need for economic analysis of matters related to fine particles in order to cooperate with other municipalities and neighboring countries such as China. This study aims to evaluate the socioeconomic benefits of management policy of the Seoul Metropolitan government for airborne particulate matter.

This study estimates willingness-to-pay (WTP) in Seoul's airborne PM management policy using the contingent valuation method. Annual WTP was estimated to be KRW 138,107 per household in Seoul (95% confidence interval of KRW 125,376 to KRW 150,839). The total estimated benefit of the management policy was valued at KRW 540.7 billion (95% confidence interval of KRW 490.8 billion to KRW 590.5 billion).

Applying a computable general equilibrium model, the maximum annual benefit of the management policy is estimated at KRW 26.6 billion, while the estimated

annual health benefit is valued at KRW 413.9 billion over the next 5 years.

The budgeted funds used for airborne PM management in Seoul averaged KRW 160 billion annually. A simple comparison shows that the benefits of this management for Seoul citizens is 3~4 times more than the cost.

The results of this study are an important basis for establishment and administration of the management policies on airborne particulate matter in Seoul. For effective administration of the management policies, additional economic analyses are necessary to study the economic cost and the marginal abatement cost of airborne particulate matter.

Establishment and Utilization of an Ecosystem Service Assessment in Seoul

The concept of ecosystem services was advanced to illustrate an array of benefits humans gain from the natural environment. However, the problems of biodiversity loss and environmental degradation from rapid urbanization have become severe. For this reason, the need to understand the benefits to human wellbeing from nature has never been greater. In terms of sustainable management of ecosystems, the value and importance of ecosystem services has also been highlighted. Policymakers both at home and abroad have been forming strategies. **Establishment and Utilization of an Ecosystem Service Assessment in Seoul** identifies ecological assets in Seoul and evaluates ecosystem services. The authors assess each type of ecosystem service and construct a map from the outcomes. Ways to use assessment information and the map as baseline data for ecological urban management - including preserving ecological assets - are explored.

In-Ju Song · Cho-Rong Yoon

Ecosystem services are benefits to humans from ecosystems. The main ecological assets that provide ecosystem services to people are forests, rivers, and small greenbelts in downtown areas of metropolitan cities such as Seoul. As a city becomes more advanced and public demands for a pleasant urban environment increase, the value of urban ecosystem services rise.

This study aimed to investigate the ecosystem assets in Seoul considering the characteristics of its downtown area and assess the evaluation system of ecosystem services upon its establishment. Assessment of ecosystem services in Seoul was performed, focusing on biotopes in Seoul (2015) to be able to obtain the results by small area. Three items under ‘provision’ services, five under ‘regulating’ services, five under ‘habitat and support’ services, and four under ‘culture and amenities’ services were identified and a comprehensive evaluation system established by item and service. Upon assessment of the ecosystem services, it was found that those in suburban areas with forests rated relatively high, as did those in areas with larger green belts such as green lot for parks within the city and planting sites for landscaping trees etc.

Improvement of Forest Management in Neighborhood Parks

Neighborhood parks offer a pleasant environment as well as aesthetic and cultural benefits to citizens. Recently, due to fine particulate matter and heatwaves, the significance of neighborhood parks in cities has been underscored. Unlike facilities, trees grow over time and change in response to external conditions. Accordingly, it takes effort to keep them well-maintained. **Improvement of Forest Management in Neighborhood Parks** examines the current overall state of forest management systems for neighborhood parks in Seoul. The authors propose planting and density management methods tailored to the functions of each tree. Plans for assessing and reducing the risks from these trees as well as training arborists are put forward.

Won-Ju Kim · Jee-Ah Kang · Jae-Hyeong Kim · Woo-Chan Kim · Jin-Hae Chae

There is a lack of consideration of the growth and habitat conditions of trees in neighborhood parks. There is also a risk of accidents from unmaintained trees. Of the 250 neighborhood parks built by the Seoul Metropolitan Government (SMG), more than half have been in existence for more than 20 years, and they have deteriorated significantly. Many of the trees in these parks are old.

The quality of the greenery is also very poor. The parks are managed mainly to complement the installation and maintenance of facilities for users. On the other hand, the trees have weakened as they have been allowed to decline, and some pose a hazard from falling branches or tree fall.

In the absence of a system of directly-related laws, even if there are related similar laws, there will be insufficient accountability for the management department to fulfill their obligation to manage trees and check their conditions. I

Even when establishing parks, the SMG only has plans on their creation, not management.

Four aging parks adjacent to a residential area were selected for the aging, and the four items of tree characteristics, tree planting purpose, tree relation, and foundation environment were investigated. The target parks were Sulbot neighborhood park in Gangnam-*Gu*, Hot-water neighborhood park in Nowon-*Gu*, and Intermediate neighborhood park and Garon neighborhood park in Songpa-*Gu*.

We interviewed the civil servants involved to find out the cause of the

tree-related problems in the parks. Most were aware of the importance of tree management, but their time was taken up dealing with complaints, leaving no time to carry out planned management. It manages in the form of a maneuvering group, and manages it by circulating various parks.

The management problems in the neighborhood parks fall into two categories, with three types in each category. First, from a tree management aspect, ① incomplete or absent management considerations of the growth of trees according to the environment of neighboring parks, ② lack of professional management, ③ insufficient manpower for the management area. Second, from a parks-related legislative system aspect ① unplanned expenditures in the tree management budget, ② absence of standards for tree management, ③ inadequate guideline details and systems applicable for on-site management of neighborhood parks.

In order to improve tree management, the following three tasks should be pursued.

First, it is necessary to create a management system for neighborhood park trees. A detailed GIS (Geo-spatial Information Service) for the trees in the neighborhood park needs to be constructed, and the growth and health of the individual trees identified. Parks also need to be divided into zones and individual forests for management.

Second, an infrastructure for tree management needs to be established, such as by supplementing the existing manpower. The participation of local residents and nurturing experts is vital, as is cooperation with local professional organizations. Sufficient funds should be secured for tree management. Lastly, guidelines need to be prepared for tree management and distributed to establishments and municipalities that manage neighborhood parks. At that time, it will be necessary to put forward monthly and annual plans for tree management, and to set the management direction for short, mid- and long term management.

Third, the legislative system related to neighborhood parks should be improved. For this we propose establishing an obligation to create a park tree management plan, supplementing the SMG's Ordinance on Urban Greening etc. and creating a detailed manual for tree management.

Strengthening International Urban Cooperation on Regional Air Pollution in East Asia

Various studies conducted in Korea and other countries have demonstrated that approximately half the fine dust particles in the air of Seoul come from outside Korea. Thus, international cooperation is essential to resolving this problem. The central government and the Seoul Metropolitan Government have run a range of international cooperative programs regarding the issue. While their focus has been on joint research and information exchange, nothing specific has followed in terms of policies from partner countries (or cities) on reducing this air pollution. **Strengthening International Urban Cooperation on Regional Air Pollution in East Asia** sheds light on what the Seoul Metropolitan Government can do as a city government on this issue. The authors aim at the development of international cooperation strategies and plans to lower fine dust levels.

In Chang Hwang · Jong-Rak Baek

Urban air pollution is one of the top policy priorities in East Asia. It is well known that Earth's atmosphere is an integrated system that transcends national boundaries and therefore, cannot be protected without international cooperation. Studies have investigated the effectiveness of regional cooperation on air pollution mainly from a national perspective. Environmental cooperation, however, is not the sole responsibility of national authorities. Cities and sub-regions play an important role in strengthening the cooperation on regional air pollution. This study examines the potential for regional cooperation between local governments and makes policy recommendations. We have identified the two pillars of successful environmental cooperation: 1) political leadership; and 2) knowledge based on social learning. Political leadership is determined by stringent local efforts to reduce emissions. Strengthening the domestic inter-city network of environmental cooperation is also crucial for international leadership. Leading by example together with appropriate financial contributions can set the agenda for cooperation and persuade other parties to collaborate. Cities and sub-regions have access to their own resources, such as research institutions and local governments for scientific research and international collaboration. These resources should be fully utilized to develop knowledge based on social learning.

Improvement of Spatial Information Policy of the Seoul Metropolitan Government

The Seoul Metropolitan Government manages infrastructure such as roadways and sewage systems using the Spatial Data Warehouse and the Geo-spatial Information Service. The issue is that the Seoul Metropolitan Government lacks a systematic approach to managing spatial information. Moreover, it has not sufficiently allowed for consumers' needs when providing spatial data and services. **Improvement of Spatial Information Policy of the Seoul Metropolitan Government** identifies concerning policy and technology trends regarding spatial information. The authors analyze key issues and the current status of the Seoul Metropolitan Government's spatial information services, and propose ways to enhance policy.

Suk-Min Lee · Hyung-Mi Yoon

The Seoul Metropolitan Government's spatial information improves the efficiency of various administrative tasks and helps in policy decisions. However, the systematic maintenance of data and systems of spatial information, and the provision of user-centered spatial information data and services are insufficient. In addition, spatial information data of Seoul is not up to date or coherent, and it is insufficiently utilized. Recently, there have been a lot of changes in the field of spatial information in accordance with the construction of a "smart" city. Therefore, a policy improvement plan is needed for greater utilization of spatial information in Seoul.

The policy tasks and plan for implementation of policy improvements are as follows. In terms of data, it is necessary to establish a renewal system, manage quality through standardization, and establish a basic spatial information database. To improve citizen services, it is necessary to enhance management of spatial information system, integrate administrative information and spatial information, and integrate map portal of Seoul. Towards sharing spatial information and establishing a cooperative system, it is necessary to link each system, revise ordinances and operate a spatial information council. In line with the establishment of smart cities for digital twin construction, the construction, sharing, and updating of 3D spatial information needs to be enhanced.

Setting Up a List of Indicators of Urban Sustainable Development Goals (SDGs) in the Seoul Metropolitan Area

In 2015, UN member states adopted 17 Sustainable Development Goals (SDGs) as a new global development framework. Since then, SDGs have been reflected in urban policies but there is a need to evaluate the progress made towards them. Accordingly, city governments around the world are developing assessment indicators, taking into account regional conditions. After formulating a master plan, the Seoul Metropolitan Government has unveiled 30 indicators to be used to monitor implementation of the SDGs. But an evaluation framework has yet to be formed. **Setting Up a List of Indicators of Urban Sustainable Development Goals (SDGs) in the Seoul Metropolitan Area** selects indicators from the master plan based on principles established by the Seoul Metropolitan Government. The authors present ways to evaluate progress toward achieving the SDGs as set out in the plan.

KoUn Kim · Inchol Shin · Yoon-Hye Yi · Mook-Han Kim · Sang-Il Kim
Miree Byun · Shinhae Lee · Kwonjoong Cho · Hang-Moon Cho

This paper creates a list of indicators for achievement of the Sustainable Development Goals (SDGs). The selected indicators aim to assist the Seoul Metropolitan Government (SMG) by depicting the progress of its policies and projects and, as a result, inform the general public and policy communities about implementation of the SDGs in Seoul. Case studies and documentary analysis are presented as key methodologies to frame the strategy for listing up a set of Seoul's SDG indicators. The set of criteria for selecting those indicators are: 1) their relevance to the 2017 targets; 2) data-related criteria including integrity, usability and comparability; and 3) SDG-related criteria including localization, coordination with the UN framework and linkage with the current and future urban and national policies.

There are four stages in indicator development: 1) an analysis of goals and localized targets of Seoul SDGs 2030; 2) a pooling of indicator candidates, recommended by experts; 3) a marking of indicator candidates through an expert delphi analysis; and 4) a final review of the indicator list led by the research team with three consultation meetings. This paper presents suggestions for 126 Seoul SDG indicators. Details on follow-up and utilization of the proposed list of SDG indicators complete the paper.

04 Social Policy

Community Cooperation Strategy for Afterschool Care in Seoul

The growth of female participation in the labor force has raised the demand for afterschool care for school-age children, but public assistance in providing service has been insufficient. Despite efforts to create a variety of afterschool care programs, the Seoul Metropolitan Government has not been successful in flexibly accommodating the diverse demands for childcare services. The need for care services during vacations, weekends and emergencies cannot be met. If schools and local communities cooperate with one another, it will be possible to remove blind spots in the current public childcare system and offer a variety of childcare services. **Community Cooperation Strategy for Afterschool Care in Seoul** proposes strategies and plans to foster collaboration with local communities in expanding afterschool care services.

Hyesook Lee · Youngjoo Lee

The Moon Jae-In Administration actively promotes an ‘All-day Daycare policy’. To create a flexible and compact form of care that meets local conditions, the government has called on local governments and communities to join its efforts in providing afterschool care. The Seoul Metropolitan Government has also proposed the establishment of a care system as a core task for the Minseon 7th Ministry. In response, the purpose of this study is to establish a system for afterschool care in Seoul and provide support strategies and tasks for enhancing public support so that afterschool care can be activated.

To identify the current status of afterschool care services, we analyzed data concerning “A Care Class in Elementary School”, “Community Child Center” and “Youth After School Academy” in Seoul. To understand actual conditions and operational needs, we conducted interviews with persons working for afterschool care organizations. In addition, case studies were gathered from regions and institutions where afterschool care was run relatively well. We analyzed each case and drew implications.

Based on the results of this study, we recommend policy directions, strategies

and tasks for vitalizing afterschool care. We also propose a “systematization of care”, “normalization of care” and “universalization of care” as a basic direction for policy. To strengthen public support for afterschool care, we suggest the following key policy tasks: (1) promote establishment of a foundation for support; (2) establish a legal institutional basis; (3) run a cooperative afterschool care model in Seoul; (4) build a mobile linkage system; and (5) support and manage afterschool care programs. This report can contribute to establishment of a framework for reconstructing Seoul’s afterschool care system.

Restructuring the Seoul Basic Livelihood Security Scheme: Plans for Reform of the Family Support Obligation

The Seoul Metropolitan Government has endeavored to eliminate blind spots in the National Basic Livelihood Security Scheme by implementing the Seoul Basic Livelihood Security Scheme.

Notwithstanding its continued efforts to identify households living at or below the national poverty line, the number of recipients has hardly increased. **Restructuring the Seoul Basic Livelihood Security Scheme: Plans for Reform of the Family Support Obligation** predicts changes in the eligibility status of Seoulites following the central government's move to relax eligibility criteria for obligatory providers. Several models for varying the eligibility requirements of obligatory providers are constructed. With these models, the authors empirically analyze how many people will become new recipients, with the resulting required funding.

Seung-Yun Kim · Hye-Rim Lee · Jin-Young Moon · Kyoung-Hoon Han

The objective of this report was to suggest plans for reform of the Seoul Basic Livelihood Security Scheme (SBLS): specifically, its criteria of rules regarding the family support obligation. SBLS operates with the National Basic Livelihood Security (NBLS) scheme and offers cash benefits for the low-income families living in Seoul who do not qualify for benefits under NBLS, so they have no access to the extra welfare support. Since the NBLS's criteria of rules regarding the family support obligation were adjusted this year, it is inevitable that the Seoul Metropolitan Government will need to restructure the qualifying criteria for the SBLS.

This report suggests a wide range of options to amend the criteria of rules of the SBLS family support obligation. We considered three models: one which does not obligate family members to support those in vulnerable social groups; one which eases the restrictions on qualifications for supporting family to receive benefits; and one which abolishes the family support obligation for SBLS recipients. If the third model is adopted, the authors estimate an additional 6.9 billion won per year in government spending.

A Study on the Current Status and Future Direction for Management of Dementia in Seoul

South Korea is on the brink of becoming a super-aging society. It is important to have effective policies concerning dementia management. **A Study on the Current Status and Future Direction for Management of Dementia in Seoul** examines the current framework of dementia management in Seoul. The state of the resources available to local communities in relation to dementia is also examined. The authors present policy support measures designed to assist those who suffer from mild or severe dementia, thereby enabling them to live in their local communities with dignity.

Chang-Woo Shon · Jung-Ah Kim

The prevalence of dementia and mild cognitive impairment among seniors over 65 has increased 24% in the past 5 years. An explosion in the number of dementia patients is expected after 2026 when the elderly population is projected to exceed 20% of Seoul's total population. In September 2017, the central government announced a "National Responsibility Policy for Dementia Care" which sets up District Dementia Support Centers in public health centers in cities and towns throughout the country. However, this plan simply expands on the dementia management projects in Seoul, where the Seoul Metropolitan Government (SMG) runs District Dementia Support Centers in each of its 25 *Gu*-districts. Against this backdrop, this study identifies the needs of those with dementia for healthcare and convalescence services, the needs of their guardians for more information, and the need of education and training programs for workers handling persons with dementia, all in a bid to suggest future directions for existing dementia management in Seoul. The authors conducted surveys and in-depth interviews with dementia patients, their guardians, workers caring for those with dementia at District Dementia Support Centers, personnel at Elderly Daycare Centers certified by the SMG, Elderly Care Facilities, and beds designated for those with dementia in healthcare facilities. Given the stigma against those suffering from dementia, the unmet needs of those with dementia and their guardians, and the needs of workers caring for those with dementia for education programs, policies are essential to

improving dementia awareness in the community, systemizing educational programs for workers, setting up dementia consulting call centers and an information sharing system among institutions.

Diagnosis of Health Problems and Suggestions from a Public Health Perspective

Medical care aims to provide treatment for diseases. In contrast, the concept of public health is rather broad, encompassing health promotion, chronic disease management, access to primary care and social well-being. However, in Korea 'public health' is not clearly differentiated from 'medical care'. Koreans have a tendency to depend on medical care rather than health promotion or disease prevention programs. There is a lack of discussion about the role of the Seoul Metropolitan Government regarding problems that need to be addressed concerning public health. **Diagnosis of Health Problems and Suggestions from a Public Health Perspective** assesses the public health crises facing Seoul and the autonomous *Gu*-districts. The authors examine current public health activities and present recommendations for the Seoul Metropolitan Government.

Chang-Woo Shon · Jung-Ah Kim

A score of standardized projects and other public health activities have been staged without analysis to determine first priority health problems for intervention in Seoul and each of its 25 autonomous *Gu*-districts. Against this backdrop, this study tries to diagnose the city's health problems and check whether public health activities are properly provided. To grasp these health problems, we collected health indicators and categorized them under two criteria, the trend for the past 5 years, and the disparities between them. We also developed a "Seoul Urban Health Index" that reflects the County Health Rankings & Roadmap model which emphasizes the importance of the environment and a variety of health determinants. Based on the results, we compared each index group's spending for public health centers and formulated some suggestions. First, the interventions to solve health problems should be staged by priority. Second, when establishing local health care plans, both health outcomes and equity need to be considered. Third, to resolve the discord between health problems and spending, a system is needed which would allow Seoul to monitor the present status of health projects and the spending of each the 25 autonomous *Gu*-districts. Moreover, the feasibility and effectiveness of public health projects staged at public health centers need to be figured out.

Improved Designation and Operation of Care Workers Education Centers

A care worker is someone at a nursing facility who provides personal or household assistance for those who have difficulty with the tasks of daily living. The nation has obliged care workers to obtain national licenses in order to enhance their skills and their level of service, but that has turned out to be not enough. The main culprit behind the problem appears to be insufficient management of training institutes and training systems. **Improved Designation and Operation of Care Workers Education Centers** examines how training institutes for care workers in Seoul are managed. The authors propose ways to optimize their management efficiency.

Min-Suk Yoon · Jin-Young Moon

Care Workers Education Centers operate under a designated system based on specific qualification criteria, and are designated and supervised by the governors. We analyzed the current status of education center designation and operation and suggest plans for improvement based on a review of previous studies, case studies, opinions of practitioners and experts, and a survey of the education centers and care-givers.

Many education centers are run by private companies (73.8%). It is difficult to continue operating the centers all year round because the criteria for designation are ambiguous and without an adequate evaluation system. Therefore, this study proposes specific criteria for designation of a new education center by estimating the demand for care workers compared to the number who are actually employed.

In addition, the training guidelines proposed by the central government reflect conditions in Seoul alone, suggesting the need for improved guidelines for the diversification of classroom use, realization of teaching tools and tuition standards, and establishment of a substantial curriculum.

However, there is no system for the evaluation of Care Workers Education Centers. Evaluation is generally based on the assessment of social welfare facilities under the Social Welfare Act. Otherwise, the designated renewal system of long-term care institutions can be considered and in the long run certification systems may be contemplated. Currently, it is appropriate to set up an evaluation

agency such as the Seoul Welfare Foundation or the Korean Accreditation Board of Nursing Education.

In the long run, the legal basis related to education centers is transferred to the Long-Term Care Insurance Act. As a more realistic alternative, an acting principal may be considered or management entrusted to the Social Public Agency for Social Service, which is a public organization that provides care services entrusted to the private sector. A portion of the work may also be transferred to the education centers themselves and autonomous *Gu*-districts with geographical accessibility. Management of the education centers may also be assigned to the Seoul Metropolitan Office of Education.

Social Issues in the Smart City Era and Tasks for the Seoul Metropolitan Government

A smart city aims at improving urban systems and the well-being of its citizens through the use of information along with communication technology. Cities in Korea and around the world are moving towards becoming smart cities. But technology has been their main focus. For smart cities to have an impact on all facets of society such as labor, education and jobs, it is necessary to examine social issues as well. **Social Issues in the Smart City Era and Tasks for the Seoul Metropolitan Government** explores social issues and policy demands in smart cities. The authors recommend policies that respond to the social needs of smart cities.

Miree Byun · Mook-Han Kim · Chang Yi · Minjin Park

Seoul is in the process of becoming a "smart city" through citizen participation and a combination of new changes related to artificial intelligence, big data, the Internet of Things, and other forms of technology, and changes in city services

The Fourth Industrial Revolution, which emerged as a new concept at the World Economic Forum, is a term describing current technological changes and the resulting social changes. New technological changes such as AI, big data, and the IoT, are currently being combined with urban services, driving a rapid shift to smart cities. Smart cities are defined in a variety of ways, so the following definition is presented based on common criteria: urban planning or an urban vision that aims to improve city systems by applying the latest information and communication technology (ICT) such as IoT, AI, and big data to urban spaces and enhance quality of life and happiness. Smart cities are urban systems that respond intelligently and efficiently to a variety of demands. Changes in a city's appearance due to technological advances affect more than just the technology and industry of that city. Such changes are expected to have an impact on infrastructure as a whole, including labor, education, occupations, which will in turn lead to significant changes in daily life.

Current smart city projects, in contrast to U-City programs, emphasize various forms of participation from the public. In these projects, citizens share their ideas for creating a smart city and the importance of establishing a vision and strategy

with their input, tailored to the environment of each city, is emphasized. Europe is currently promoting a "Smart Citizen Project", which emphasizes that people should participate as key actors in policy-making based on utilizing the high-quality technical infrastructure of the city.

We must take notice of changes in the life and social values in the process of building a smart city in Seoul

The social values and issues of a smart city are closely intertwined with the daily lives of its citizens. The use of instant messaging is increasing among the people in Seoul, and online communication in the form of social media has become an integral part of daily life. However, use of these services varies by generation; younger people frequently share their experiences through online networks, while older people still make the most of their connections offline. Furthermore, Seoulites have been found to participate in political processes through a variety of online channels, including Oasis of 10 Million Imagination, mVoting, Petition Seoul, and Democracy Seoul.

A new engagement model based on citizen participation through diverse participatory networks has emerged, which is distinct from previous engagement models. Offline participation is also increasing. From 2012 to the present, the "Seoul Policy Fair" has been organizing offline policy communication events on a regular basis. This policy fair provides opportunities for people to actualize direct democracy as they participate in developing their own agendas and vote for them.

For citizens, concerns about safety of the city, environment, transportation, industrial economic services, and increasing inequality in the future coexist with expectations of increased convenience

In a survey of Seoul citizens (including the youth who will be the future generations), we examined their views on the demand for services and urban changes in smart cities. Over half of the respondents (57.8%) reported being aware of the concept of smart cities, but there were significant discrepancies in that

awareness according to educational background, occupation, and information competency level. While respondents did not expect a transition to a smart city to resolve urban issues afflicting Seoul (industrial economy, environment, information security, regeneration, participatory communication, etc.), they did anticipate further development in the following service areas. The perceived importance of each service area was rated as follows: safety (5.86 points), environment (5.75 points), traffic (5.52 points), industrial economy (5.47 points), and welfare and health (5.33 points). The most important factors to consider when building a smart city in Seoul and implementing smart city services were: 'to establish technology and systems such as standardization' (52.8%), 'security related aspects' (43.6%), 'use of advanced technology' (38.5%), and 'participation of Seoul citizens' (37.7%).

There is a positive outlook that smart cities will help create societies that embrace diversity and ensure the happiness of their citizens. On the other hand, there is also a negative view that injustice and polarization will deepen due to technological gaps, leading to an unhappier society. Seoul citizens believe that these social gaps and injustice will continue to be prominent in Seoul as a future smart city, as they are today. They believe that the city itself will transition into a smart society via the use of advanced technology such as artificial intelligence, but that it will also become multifaceted, in which the current state of growth without employment deepens.

It is necessary to establish a system for sharing values and facilitating participatory cooperation to ensure smooth transition to existence as a smart city

The transition to becoming a smart city should be understood as a new form of urbanization that captures the value of city development. The upcoming generations are seeking ways to improve their quality of life in smart cities; at the same time, they are also concerned about issues related to inequality. Furthermore, this next generation, also referred to as the "Me" generation, expects quality of life to improve with the smart city transition, but they exhibit low levels of

participation. Further, they expect smart cities to increase technological convenience (traffic, cultural tourism, etc.). Although the next generation and the older generation display differing levels of concern regarding smart cities, the results show that overall, they share a common concern about inequality. In addition, concerns about this disparity diverge according to the degree of people's smart capability and smart city recognition.

The Seoul Metropolitan Government (SMG) must recognize the gravity of sharing with residents its vision of the type of smart city it strives to be. In other words, the SMG should actively present its vision and the values of the type of city it aims to be, which reflect the social values of its residents. Currently, a variety of smart cities have presented their visions and values, which are reflected in their names, which include the words "inclusion" and "high quality of life".

Seoul must also propose a variety of models for citizen participatory cooperation for its transition, share goal-oriented activities, and actively suggest and share various experiments (living labs, etc.) to create positive changes in the daily lives of its residents. When proposing these models, it is important that they be representative, impartial, and balanced. In addition, it is necessary to establish governance across various levels to develop a mechanism in which residents and stakeholders can participate. To increase understanding of the changes in society brought on by this transition, public debate must be encouraged.

Policy intervention is needed to resolve multidimensional inequalities in smart cities

Active policy intervention is needed to mitigate multidimensional inequalities in smart cities. A smart city in which citizen-centered information technology is applied, risks only serving those with information competency as opposed to being a 'city for all'. Smart cities need to identify new social issues that will exist in a more mature society, including the types of inequalities and gaps that differ from those that exist today. Instances of inequality are likely to occur across several dimensions, with spatial inequalities and gaps most likely, while existing

inequalities due to individual digital capabilities may deepen.

Unequal development, learning skill gaps, obstacles to job creation and destruction from new technologies are a few examples of these problems. Therefore, investigation and evaluation of inequalities in smart cities should continue. Future cities should aim to be smart cities; however, this should be a well-conceptualized process rather than a simple final goal. If this process is not well-executed, smart cities will simply become more technology-driven cities.

Encouraging the Use of Community Resources in Seoul Community Support Programs

Community service, which is unpaid work voluntarily carried out by residents for the benefit of their community, plays a pivotal role in the shaping of a vibrant community. To boost community support programs, political recognition of voluntary community service is necessary. For the purpose of promoting the use of community resources in Seoul Community Support Programs, it is essential to provide appropriate rewards for various activities. At the same time, adverse impact of situations such as the pursuit of personal interest should be minimized. **Encouraging the Use of Community Resources in Seoul Community Support Programs** reviews the current use of community resources within the program. The authors propose criteria for the recognition and support of measures, taking into consideration the opinions of parties engaging in community policy formulation and implementation.

Hyun-Chan Ahn · Yun-Jung Cho · Hye-In Chae

Community resources, including time, services, materials, and cash donated by residents, are recognized as the substantial capacity and social capital of the local community. The Seoul Community Support Program (SCSP), which has become a major policy measure for local communities, has emphasized the importance of community resources in principle, but has not appreciated them in practice. This study aims to propose assessment criteria and rewards that are appropriate for community resources for SCSP.

Based on the delphi-survey responses of 108 stakeholders, there are four categories of community resources in SCSP (volunteer time, service, material, and cash) with 14 sub-types and a monetary value assigned to each sub-type. 2,357 community resources of 44 SCSP projects from the sample survey, classified according to the categories, leads to the following outcomes: 1) the community resourcing network is based on a Long-Tail structure and mutual aid; 2) the resulting resource value is 2.1 times the initial grants, which implies that local communities in Seoul are not dependent on public support.

In conclusion, this study proposes to improve SCSP in the following ways: 1) adjust the procedures to promote assessment of community resources; 2) introduce non-financial rewards (with proven efficacy) from measuring as key outcomes to refunding partly in local vouchers.

Cultural Diversity Agenda and Policy Direction of Seoul

Korea, which at one time was an ethnically homogeneous nation, is evolving towards becoming home to a variety of ethnic groups and cultures. In May 2017, the Seoul Metropolitan Government enacted an ordinance concerning protection and promotion of cultural diversity in Seoul in an effort to accommodate this shift. But the ordinance lacks any detailed framework for cultural diversity policies. **Cultural Diversity Agenda and Policy Direction of Seoul** investigates the consistency of the existing ordinance within the context of cultural diversity. The authors present major policy direction and new projects as well as policy priorities.

Do-Sam Na · Yun-Jung Cho · Jung-Hyun Lee

The objective of this study is to suggest future directions for the Seoul Metropolitan Government's (SMG) cultural diversity policy. Cultural diversity is a basic principle of 'Cultural Democracy' and refers to the phenomenon where all class and group subcultures are reflected equally in the overall culture, as opposed to there being one dominant culture. While the notion of cultural diversity initially emerged from the process of globalization, in particular during the Uruguay Round, in reality, the term has its roots in the influx of migrants and the expression of 'gender' as well as other forms of self-identity. That is, cultural diversity helps create an environment that allows everyone to freely express their personal values and philosophies.

In an effort to embrace cultural diversity, the SMG enacted the Ordinance on the Protection and Promotion of Cultural Diversity in 2017. However, this ordinance contains elements that have the potential to harm, rather than protect, cultural diversity, such as limiting its scope to 'established social morals and customs'. Hence, through an expert survey, this study examines potential future directions of the policy as well as amendments of the ordinance on cultural diversity. We conclude that the current ordinance should be amended to ensure that cultural diversity is protected and additionally argue for the need to improve the overall system, such as forming cultural diversity commissions comprised of target groups of cultural diversity.

This study proposes the policy vision of 'Seoul - A City with Cultural Citizens,

with respect for differences and without discrimination over those differences' and suggests 'Becoming a City of Culture and Citizens where all are respected' and 'Becoming a civic culture that embraces and celebrates people's differences' as policy objectives. To implement this vision, we selected the seven target areas of disability, ethnicity/race/nation, gender/sexual orientation, age, region, religion/beliefs, and subculture, and set the main policy directions as △protecting and promoting minority cultures, △creating a civic culture of coexistence, and △establishing a foundation for cultural diversity policies.

05 Urban Administration

Fostering Active Participation by Local Governments in National Policy Affairs

The relationship between the central and local governments should be symbiotic. Nonetheless, the central government of Korea has still taken a top-down approach to governance, provoking constant conflict with local governments. A number of studies have been conducted on ways to improve this governmental relationship. However, they have been rather theoretical and their focus has been on the process of legislation. **Fostering Active Participation by Local Governments in National Policy Affairs** explores ways to increase local government participation in national affairs. The authors present policy strategies that can be implemented stage by stage.

Hee-Yun Jung · Joo Gong

In this age of local autonomy, collaborative relationships between central and local governments are emerging as an important policy agenda. However, the central government still sustains vertical relationships with local governments in practice and this leads to frequent conflicts in the process of national policy implementation. Fortunately, the current regime has adopted the concepts of local autonomy and balanced national development as key policy agenda items within the 5 key policy directions and 20 major policy strategies at the national level. The objective of this study is to suggest more collaborative policy tools and mechanisms to enhance the role of local government as the policy counterpart of the central government through active participation in the national policy making process. This research proceeds to thoroughly review related model research documents and actual case studies of conflict with central government in national policy projects to establish the status of local government involvement in national policy affairs. Projects concerning provision of free care for infants and young children, as well as offering grants for young people of the Seoul Metropolitan Government (SMG) were investigated as case studies of conflict between central and local governments in national policy affairs. Subsequently, in-depth examination of four advanced

policy tools and mechanisms for collaborative inter-governmental relations at home and abroad were conducted including: collaborative councils between central and local governments in Japan as a group consultative mechanism; horizontal administrative agreements between central and different local governments in the UK; the Unfunded Mandate Reform Act in the United States; and local autonomy impact assessment of the SMG in Korea. Additionally, e-mail surveys of experts with experience in national policy projects were conducted to establish expert perceptions and opinions of the relationships between local and central governments and the suitability of various policy tools and mechanisms currently in use.

There are two major policy implications from this study. First, despite the existence of various co-operative policy tools, some centralized authoritarian rules and practices are still in place, making local government participation in national policy affairs random and passive in reality. Second, the co-operative group consultation mechanism between the central and local governments seems to be most applicable to the Korean situation. In spite of good motives and some advantages, administrative agreements between central and individual local governments have numerous limitations and consider undeveloped policy tools for local governments in Korea with the exception of the SMG. The expert survey also confirms that the relationships between the central and local governments are perceived as vertical and sub-ordinate for a majority of experts in related fields. Emphasis is given on the importance of a solid legal basis for more collaborative inter-governmental relations and a consultative mechanism between the central and local governments. According to previous discussions, this study suggests that legislation on more solid local autonomy is required as a precondition to collaborative and horizontal inter-governmental relations. However, phased adaptive strategies are also proposed for the transition period considering the expected challenges of proper legislation in the present situation. Therefore, despite issue points based specific improvements of various current policy tools towards more cooperative inter-governmental relations are immediately suggested as a policy priority. The setting up of a collaborative council consisting of representatives

from the central government and local governments is suggested as the institutional consultative mechanism required at the national level. Similarly, for some specific public service areas, horizontal administrative agreements between the central and individual local governments need to be seriously considered as part of cooperative consultative policy tools in national policy projects. This seems useful especially for the individual local governments with sufficient administrative capacity, such as the SMG.

Evaluation of and Prospects for Local Social Economy Centers

The social economy refers to economic activities by enterprises to promote the public interest and social values, including mitigating social polarization and creating jobs. It is comprised of a variety of enterprises and organizations, such as social enterprises and co-operatives, and based on cooperation as well as social solidarity. As part of its efforts to build a social economy ecosystem, the Seoul Metropolitan Government has established Social Economy Centers in each *Gu*-district. *Gu*-district Social Economy Centers aim to increase resident access to and understanding of the social economy. **Evaluation of and Prospects for Local Social Economy Centers** in Seoul evaluates the performance of these *Gu*-district Social Economy Centers. The authors examine their current management and the Seoul Metropolitan Government's support system. Strategies to boost their performance are presented.

Yi, Joon Young · Jung Yong Lee

This study aims to evaluate the performance of and ways to improve autonomous *Gu*-district Social Economy Centers (SECs) in Seoul. *Gu*-district SECs were established by the Seoul Metropolitan Government (SMG) and are run by respective local social economy networks in each *Gu*-district. The organizational goal of these centers is to establish social economy ecosystems at the *Gu*-district level. They are funded by the SMG and *Gu*-district governments and commissioned to local social economy networks.

Additionally, this study adopts a qualitative approach, including in-depth semi-structured interviews and document analysis using a logic model in an effort to assess the performance of *Gu*-district SECs and come up with ways to improve the SMG's support system for them. Four *Gu*-district SECs were selected as research targets and three years (2015~2018) of their performance were assessed by the researchers.

The outcomes of this assessment establish that the four *Gu*-district SECs differ in terms of input, activities, output and results. They also indicate that output and results are not directly proportional to the amount of input. To put it differently, activities focused on by *Gu*-district SECs vary, which is attributed to maturity of the social economy ecosystem and differences in the related environment.

This study suggests the following ways to improve the current support system for

Gu-district SECs. First, the SMG's support system should consider size and maturity of the social economy ecosystem and the level of support from *Gu*-district governments. Second, the role of *Gu*-district governments should be expanded in their support of *Gu*-district SECs. Third, it is necessary to consider integrating several *Gu*-district SECs into larger social economy centers.

06 Economy

Diagnosis of and Policy Direction regarding Household Debt in Seoul

The Seoul Metropolitan Government has mounted an array of efforts to deal with the problem of household debt. Announcement of a comprehensive household debt management measure in 2012 is among these efforts. However, there has been significant need for new comprehensive actions for household debt since that time. **Diagnosis of and Policy Direction regarding Household Debt in Seoul** looks at the seriousness of the debt load for Seoul residents. The authors aim to define the role of the Seoul Metropolitan Government and propose support measures to curb this growing problem.

Heeseok Park · Jung Hyun-Chul

The rapid increase in household debt under increasing internal and external economic uncertainties could lead to economic crisis. Household loans in Seoul account for 74.1% of gross regional domestic product (GRDP) in 2016. This share of GRDP is larger in Seoul than in the rest of the country. There are not many systematic studies on household debt in Seoul, despite the fact that it is steadily increasing. Since most similar studies are conducted nationwide, it is difficult to diagnose the situation in Seoul using existing research. This study aims to propose the role of the Seoul Metropolitan Government (SMG) in diagnosing and reducing household debt in Seoul through various methods.

This study consists of six chapters. The introduction in chapter 1 describes the background, purpose, content, and method of this study. In chapter 2, we discuss the impact of household debt on the local economy in Seoul, and look at that debt using macroeconomic analysis. First, we use the static analysis model. Multiple regression analysis is performed with income, household debt, and loan interest rate as the three variables. Next, to overcome the limitations of static analysis, we use a structural vector autoregression (SVAR) model to perform dynamic analysis. The SVAR model consists of five variables in two channels. Two of the variables (loan interest rate, household debt) are within the financial sector channel, and three

(business cycle, real estate price, income) within the real economy sector channel. We analyze time path, change, size and effect of household debt on the change of main policy variables by impact response function. In Chapter 3, we examine the index of household debt and analyze the risk posed by that debt in Seoul. We use the composite index method to calculate a household debt index, which can be used to assess household debt levels. In Chapter 4, we survey the actual state of and prospects for household debt in Seoul. Conducted on 1,000 households, the survey examines the general status of individual households, the characteristics of assets and liabilities, the prospect for household debt, and the direction of the SMG policy in Seoul. In Chapter 5, we deal with the current state and limitations of policies related to household debt. The last chapter summarizes the implications of this study and suggests policy directions for the SMG.

Characteristics of and Strategies for the Smart Media Industry in Seoul

The Seoul Metropolitan Government has clearly demonstrated the will to develop the smart media industry as a new driver of economic growth. Having said that, the industry is still in its early stages. Accordingly, its attributes alongside the future growth path have not been clarified. **Characteristics of and Strategies for the Smart Media Industry in Seoul** discusses the current state of the smart media industry in Seoul and analyzes both domestic and foreign cases. By identifying status as well as strengths and weaknesses of the industry's ecosystem, the authors propose a role for the Seoul Metropolitan Government in further developing it.

Eunjoo Oh · Seunghoon Oh · Woosoo Jeong

Considerable attention has been paid by policy makers and academics to the smart media industry, particularly by those concerned about innovation and growth. In March 2018, the Seoul Metropolitan Government (SMG) announced massive public investment in the industry along with three other promising strategic industries. The development plan of the SMG seems to be in harmony with the plans of the central government, in the sense that the two focus on the Sangam DMC districts.

This study defines the term, "smart media industry" and identifies the technological and market changes therein. In doing so, it uses a modified value-chain framework, which we call the C-N-P-D network (Content firms - Network firms - Platform firms - Device firms). According to statistical analysis and interviews, the smart media industry in Seoul can be characterized by a higher concentration of content development firms and fewer device manufacturing firms than found in Gyeonggi-do Province. In addition, due to the smaller technological gap between prior media technology and smart media technology, which is partly attributed to technology standardization efforts by global developers such as Google, the old and new media are easily converted into smart media.

Taken together, this study proposes a customized policy for the smart media industry in Seoul, suggesting open innovation systems, procurement strategies and spatial strategies for Sangam district.

Analysis of the Characteristics of the Female Labor Market in Seoul

In 2018, the female employment rate of Seoul stood at 51.6 percent, below the male rate of 68.4 - a gap of 16.8 percentage points. This indicates that increasing the employment rate for women is a key pillar to improving the overall employment rate in Seoul. **Analysis of the Characteristics of the Female Labor Market in Seoul** gathers basic data and takes a look at the current state as well as major issues of the female labor market in Seoul. It offers data to help the Seoul Metropolitan Government formulate policies to enhance this aspect of the labor market.

Bum-Sik Kim · Yoon-Hyi Jang

The objective of this study was to analyze the status of and issues in the female labor market in Seoul and to extract policy implications based on that analysis. Key results derived from this analysis were as follows. First, the female working age population is relatively non-economically active compared to men. Second, Seoul's female employment rate is much lower than for men. Third, in 2017, there were about 351,000 women in Seoul who interrupted their careers, accounting for 20.9% of married women aged 15~54. Fourth, in 2017, the number of female NEETs in Seoul was approximately 239,000 people, exceeding the number of male NEETs (about 154,000 people). Fifth, the qualitative level of female employment is inferior to male employment in terms of wages and stability, but not for number of working hours. Sixth, female workers were concentrated in a smaller number of industries and occupations than for male workers. To improve the female employment rate in Seoul in the future, quantitative expansion and qualitative improvements are essential, as pointed out by this study. To that end, job opportunities suitable for women should be created on the demand side. On the supply side, increasing labor market participation of women is very important.

A Survey of Social Ventures in Seoul and Policy Suggestions

Social ventures, a type of social enterprise, are businesses that seek innovative solutions to address social problems. Social ventures are in the spotlight in that they support development of the social economy ecosystem. **A Survey of Social Ventures in Seoul and Policy Suggestions** takes a look at the present state of social ventures in Seoul. The authors present policy recommendations to the Seoul Metropolitan Government with an aim of furthering the social venture ecosystem.

Jaeuk Ju · Dalho Cho · Jongjin Yun

The purpose of this study is to identify the actual conditions of social ventures in Seoul and suggest policy measures for the Seoul Metropolitan Government (SMG) to develop a social venture ecosystem. The concept of social ventures, their history, the domestic as well as external background introduced in existing literature are summarized. In addition, a variety of theories explaining ecosystems surrounding them are presented in this study. We conducted surveys on major social venture activities, the growth process and perception of CEOs as social innovators. Various factors regarding social ventures in Seoul such as corporate type, social mission, location factors, corporate management and social issues were investigated through surveys.

Considering the characteristics of social ventures, the SMG needs to establish the following policy directions. First, extend the policy scope of the social economic support system in the city in consideration of the recent trends in social venture development, handled within the existing institutional framework of the social economy. Second, social ventures should evolve to promote ecosystem diversity that considers the characteristics and developmental models of cluster sites. Third, differentiated policy support infrastructures are needed for the different stages of growth beyond establishment and incubation, in the interest of sustainable development of the social venture ecosystem. Fourth, in the mid- to long-term, the SMG should concentrate on expanding social capital to expand the appearance of social ventures and the overall social economy.

Turnover and Re-employment of Youth in Seoul: Policy Implications for Youth Unemployment

Young people serve as the backbone of the economy and society, as well as playing a fundamental part in the labor market. This is why tackling youth employment challenges is at the heart of solving employment issues. The focus of existing policies, though, is on job 'creation'. There has been limited attention to job 'transitioning' among young people, as it relates to the unemployment crisis. **Turnover and Re-employment of Youth in Seoul: Policy Implications for Youth Unemployment** describes the state and features of turnover along with re-employment among youth. The authors suggest several measures that can be reflected in employment policies based on survey responses from young people regarding desirable jobs.

Jinha Kim · Min Young Hwang

The purpose of this study is to identify ways to resolve youth unemployment and contribute to supportive policy measures by examining the characteristics of job turnover and re-employment in a dynamic analysis. Toward this end, this study has analyzed youth employment policies in Seoul, and the status and empirical features of young workers therein. It also brings attention to the issue of young people increasingly and voluntarily leaving work due to being dissatisfied with the working conditions, which may be the underlying factor contributing to youth unemployment. Young workers choose to leave their jobs in search of better working conditions. Turnover improves discrepancies between pay and workability levels; however, it may represent a lost opportunity to receive welfare benefits. Repeated turnover has been shown to lower pay levels. Welfare benefits and job satisfaction have been the key determinants of job turnover. Therefore, the policy for young people should be designed to support such transitions via reasonable selection and settlement in new jobs. Specific information rather than policy measures that focus on job creation are needed to generate jobs matching the work available. It is also necessary to support small and medium-sized enterprises (SMEs) to improve working and cultural conditions towards encouraging young people to stay with their SME employers.

Industrial Clusters and Locations of Start-up Corporations in Seoul

Start-ups are a key contributor to the growth of industries in the areas in which they are located. To achieve balanced growth across all regions in Seoul, the Seoul Metropolitan Government has formed industrial clusters and built start-up support facilities in areas with fewer start-ups. When selecting locations for these support facilities, the Seoul Metropolitan Government needs to consider areas where firms in similar industry are concentrated. **Industrial Clusters and Locations of Start-up Corporations in Seoul** illustrates the geographical distribution of industrial clusters in Seoul. The authors aim to provide basic data that can be used to determine future locations of start-up infrastructure.

Dalho Cho · Jaeuk Joo · In Hye Yu

The Seoul Metropolitan Government (SMG) promotes and supports budding corporations in Seoul. In fact, corporations perform better in terms of added value and creation of employment than sole proprietorships even though there are far fewer corporations.

Corporations in specific industries tend to convene in certain areas to create synergy among them. In this study, we looked at industrial clusters of major industries in Seoul in different areas. We then studied the locations of startups to examine if the existing clusters were becoming stronger or weaker, and whether there was a need to establish new industrial clusters. We also sought to identify the determining factors in selecting a suitable location for establishing corporations.

Various clusters old and new in different locations around Seoul turned out to have different characteristics in terms of what industries they attracted and how many. Recently, the SMG has been seeking to build a few new industrial clusters in Seoul, and this study suggests a few policy implications.

Establishing a Master Plan for Developing Collaborative Governance within the Seoul Metropolitan Government

Collaborative governance refers to a process that involves multiple public and private stakeholders in decision-making. The concept has emerged as a new paradigm in public administration in that it can be used as a means for social development and sustainable political administration. **Establishing a Master Plan for Developing Collaborative Governance within the Seoul Metropolitan Government** comprehensively examines the current conditions and state of collaborative governance within the Seoul Metropolitan Government. In essence, the authors offer a basis for a "Master Plan for Developing Collaborative Governance".

Byeongsun Jeong · Sungho Lee · Sung-A Kim

As the traditional government-led public administration paradigm nears the end of its usefulness, the Seoul Metropolitan Government (SMG) has sought to set 'Collaborative Governance' as a keynote policy for the city, and now has proceeded to 'Governance Seoul 2.0'. To institutionalize this, the 'Basic Ordinance for Promoting Public-Private Collaborative Governance' was enacted in September 2016. This study serves as a precedent and basic research on setting a 'Master Plan for Developing Collaborative Governance' in accordance with Article 16 of the Ordinance.

To establish such a plan, the current conditions within the SMG related to collaborative governance were divided into three - resources, institutions, and systems - and the operational status analyzed of the leading policies for collaborative governances in the 5th and 6th presidential election period. Then, the authors derived eight issues in 'Governance Seoul 2.0':

- Remaining gap in perception between public and private actors
- Need to reorganize and innovate governance-leading administrative systems
- Need to reform the traditional administrative system so that it is more governance- friendly
- Lack of diversity and competence among private actors
- Poor conditions in communities to practice collaborative governance
- Administrative systems separately run for policy and business areas

- Structural constraints on governance-leading organizations
- Need for qualitative improvement of leading policies for collaborative governance

By diagnosing and addressing these issues, this study seeks to set a vision and policy directions for the master plan on developing collaborative governance toward 'Governance Seoul 3.0'. The vision derived through a survey and diagnosis is 'People-led sustainable collaborative governance, Making citizens happier'. To realize this vision, seven strategies and twenty-three detailed policies were developed. The seven strategies:

- Spread understanding of collaborative governance and promote friendship and cooperation
- Logically improve leading systems for collaborative governance
- Establish collaborative governance-based administrative systems
- Seoul Civil Society 2.0 - Foster and revitalize civil society
- Community-based collaborative governance 2.0 - Strengthen the basis of regional governance and the potential capacity
- Establish a decentralized and convergent governance model
- Bring innovation to 'Governance Seoul' - improve related operating systems

A Study on Policies to Revitalize Public Big Data in Seoul

Big data, a core means for forming new paradigms in the Fourth Industrial Revolution, holds unlimited potential. Public big data refers to massive data sets stored by the public sector, including the Seoul Metropolitan Government. The effective use of public big data will allow the private sector to create new values. **A Study on Policies to Revitalize Public Big Data in Seoul** examines the characteristics and role of public big data, describes policy trends and proposes policy directions.

Bong Choi · Jongjin Yun

The purpose of this study is to investigate the current state of public big data in Seoul and suggest policy directions for its revitalization. Big data is perceived as an innovation resource for the Fourth Industrial Revolution and the data economy. Public big data serves an especially significant role in terms of universal access for citizens, startups, and enterprises. The Seoul Metropolitan Government reorganized a substructure of its focus on big data and established organizations such as Big Data Campus and Urban Data Science Lab. Although the amount of public open data has increased in Seoul, not much exists with characteristics similar to big data, in terms of volume, velocity, and value. Most developers and startups suggest extending the scope of open data policy and enhancing the quality of big data. Also, cities overseas set their foundations for the use of big data by encouraging participation from residents and developing open platform systems.

Considering the results of this study, Seoul should contemplate the following policy directions. First, the open data policy paradigm should change from quantity to quality. Second, it is desirable to focus on governance for revitalization of big data. Seoul's Big Data group should be reorganized based on the rights of data, which is derived from the stages of the data life-cycle. Third, the government should concentrate on universal access through various online platforms. Fourth, technological platforms such as IoT and AI should be connected as this would encourage distribution of valuable big data towards promoting the digital industry.

Logical Improvement of the Public Commission System for Collaborative Governance in Seoul

In an attempt to harness private sector expertise, the Seoul Metropolitan Government has entrusted private entities with a variety of projects. From the perspective of collaborative governance, there are drawbacks to the civilian consignment system of the Seoul Metropolitan Government that focuses on efficiency. **Logical Improvement of the Public Commission System for Collaborative Governance in Seoul** offers recommendations on improving the existing civilian consignment system. The study seeks ways to change the system so that it runs on the mutual trust and cooperative relations between assignor and assignee.

Byeongsun Jeong · Wonsill Hwang

In the fifth and sixth presidential elections, various projects were carried out through private consultation, but the demand for improvements to the system has persisted. As cooperation and social value-oriented offices expand, the existing professionalism and performance-oriented private-entrusted systems are leading to a lot of discord in the field. Through a careful examination of the Seoul Metropolitan Government (SMG)'s civilian consignment system, this study aims to improve the system at the point of collaborative governance.

The four major system improvement tasks for improving public-private partnership were identified through surveys and meetings. First, the SMG's private-entrusted system must be prepared for a new paradigm as the administrative environment changes. Second, it is necessary to improve the relationship between trustees as well as strengthen autonomy of operations. Third, unreasonable institutional procedures and standards need to be restructured. Fourth, the SMG needs to reestablish itself as an open and democratic system of private sector-entrusted operations.

Through this study, five major actions were designed to address these challenges: introducing a cooperative "innovative private-entrusted operational model, improving the quality of the private-entrusted system, improving the review process and evaluation system of private-entrusted services, establishing democratic governance for private-entrusted operations, and establishing a trust-based integrated consignment management system.

A Preliminary Study on Modeling "Citizen Deliberative Budgeting" in Seoul

A "citizen deliberative budgeting" system, a process of democratic deliberation and decision-making that involves Seoulites and other policy stakeholders, was instituted in 2012. While operating the system, the Seoul Metropolitan Government has recognized the following institutional limits: (1) There is a limited scope to obtain the benefits of public engagement in the budgeting process; (2) There are insufficient opportunities for actual stakeholders or citizens to take part in; (3) Projects are run only on a short-term basis; and (4) There is a lack of systematic evaluation. **A Preliminary Study on Modeling "Citizen Deliberative Budgeting" in Seoul** diagnoses policy conditions in Seoul concerning adoption of the participatory budgeting process. The authors suggest measures suitable for the present policy environment.

Byeongsun Jeong

Recently, the Seoul Metropolitan Government (SMG) introduced a "citizen deliberative budgeting" system to overcome some limitations in the previous "citizen participatory budgeting" system. The new system encourages a number of citizens from various backgrounds to participate in the budgeting process through proposals and deliberations. The SMG plans to allocate KRW 200 billion for a test-run in 2019 before increasing the budget to KRW 1 trillion by 2021.

In light of this, the present study provides some insight into launching and managing the deliberative budgeting system successfully, with a particular focus on finding an adequate model for the test. Looking at various participatory budgeting examples overseas, this study concludes that, although slight differences may exist between various examples, the most common elements of successful budgeting systems are guaranteed diversity of participants, secured available resources, well-established participatory processes, and well-organized stakeholders.

Based on these findings, the following institutional suggestions were made. It is desirable to classify the programs into "citizen proposal" types and "citizen deliberation" types. The author also suggests that the latter be further divided into "city-level deliberation" types and "district-level deliberation" types. In addition, establishing an integrated process is important for a successful transition to the

deliberative budgeting system. In this regard, this study stresses the importance of separating the process into two parts: the first one focusing on developing and prioritizing agenda items, and the second one allocating funds. To make this complicated process run smoothly, an appropriate system for managing and promoting is also essential.

07 City Diplomacy

Strategies and Actions for Inter-Korean Cultural and Sports Exchange of the Seoul Metropolitan Government under UN Security Council Sanctions against North Korea

Following a series of actions taken by North Korea over the past decades, the UN Security Council has imposed far-reaching sanctions against the country. Under the circumstances, only exchanges that are specifically exempt from these sanctions can take place. Although some argue that cultural and sports exchanges can be facilitated without breaching those sanctions, the topic remains controversial. The Seoul Metropolitan Government has promoted exchanges with the North in the fields of culture and sports. There is a need for a thorough look into the Security Council resolutions in the interest of avoiding the risk of violating them. **Strategies and Actions for Inter-Korean Cultural and Sports Exchange of the Seoul Metropolitan Government under UN Security Council Sanctions against North Korea** presents strategies on such inter-Korean exchanges despite the UN sanctions in place against the North.

Min-gyu Lee

The purpose of this study is to explore measures that can be taken by the Seoul Metropolitan Government (SMG) to pursue cultural and sports exchange between South Korea and North Korea with UN Security Council sanctions still in place. Ten UN Security Council Resolutions were reviewed in depth in addition to conducting a case analysis of the PyeongChang 2018 Olympic Winter Games and the music performance in Pyongyang. To avoid conflict with the Security Council's sanctions against North Korea, the SMG may undertake the following three strategies.

The first for cultural and sports exchange between the two Koreas is to utilize positive ramifications of sports diplomacy. In order to do this, the SMG will need to come up with sound reasons to convince the UN and international community that the exchange will indeed contribute to enhancing peace and stability on the Korean peninsula and in Northeast Asia.

The second strategy is to pursue exchange, not on its own, but as a package deal

combined with other projects that could yield practical benefits. The SMG will need to identify priority projects and plans in other areas of exchange between the two Koreas.

The third strategy is to form relationships with multi-lateral forms of cooperation to drive each corresponding project. One priority is to maintain a close relationship with the central government for support when it comes to the UN Security Council sanctions and negotiations with the US government.

The following detailed actions can be undertaken in response to each of the Council's sanctions:

First, the key is to prepare a detailed list of items (including property and materials) for the projects, in response to Council sanctions against supply, sale or transfer of weapons and supplies. It is critical to classify items that can be used for both military and civilian purposes and those prohibited for exportation and importation into North Korea in the process.

Second, the option of using low-cost Korean carrier aircraft may be considered to comply with the Council resolution on inspection of cargo and sanctions as they relate to ships and airplanes.

Third, the "user pays" principle should be established to comply with the Council's financial sanctions against North Korea. Based on the principle of reciprocity, the cost of events held in Seoul would be paid by the SMG while the cost of those held in North Korea would be borne by North Korea. In addition, inter-Korean cooperation funds may be used pursuant to South Korean law and practice.

Fourth, delegations may comprise those for whom the restrictions against entry and transit do not apply, after discussing the matter with North Korea, or a request may be made to the UN Security Council Sanctions Committee on North Korea to allow for short-term exemptions.

Fifth, exceptions to the sanctions against North Korea may be utilized. The important thing to note is that these will require explicit approval from the UN Security Council Sanctions Committee.

Exploring New Possibilities for City Diplomacy by the Seoul Metropolitan Government

City diplomacy can be defined as "a range of activities and procedures performed by local governments, aimed at yielding mutual benefit". The Seoul Metropolitan Government has thus far focused on sharing its development experiences as well as best policies with other cities. However, it has been asked to take a more significant role on the international stage. **Exploring New Possibilities for City Diplomacy by the Seoul Metropolitan Government** examines the current status of city diplomacy by the Seoul Metropolitan Government and discusses its achievements and limitations. The authors identify its new possibilities through extensive research and analysis on foreign examples.

Chang Yi · Meekyong Song

The Internet revolution has granted individuals access to all kinds of information and the ability to make more informed decisions. In this process, non-state actors without physical territory have participated in economic, cultural and political globalization. These non-state actors have broken the monopoly of national government on diplomacy.

As of 2015, the global urbanization rate was 54%. More than half of the world's population now live in cities. Thus, problems that cities face are also global problems. Many studies have suggested that cities should lead the way in resolving global problems such as climate change, terrorism, security, immigration and environmental degradation as they will hurt city residents the most. Since there is only a fine line between urban and global problems, some argue that the role of cities is becoming more and more important. How global cities act is of the utmost importance. Indeed, Seoul and other global cities have significant influence on global matters.

Thus far, the Seoul Metropolitan Government (SMG) has produced positive outcomes from its activities in international city networks such as CityNet, WeGO and C40. Through these networks, the SMG has shared its innovative policies and strengthened relations. However, the SMG's city diplomacy efforts have been limited to sharing policies, staff exchanges, cultural exchanges and promoting

tourism. In other words, its city diplomacy has largely been "soft diplomacy". However, unpredictable international situations such as the US-China trade dispute, conflict over the South China Sea and Brexit do not allow the SMG to stay in the comfort zone of "easy diplomacy". The rapidly changing world demands that it take on a more substantial role. Indeed, cities in Europe and the United States often play a significant part in peace-building in cities destroyed by regional or other conflict. In other cases, cities have proposed advanced solutions to chronic global problems unresolved by the diplomatic efforts between nations.

These cases suggest that there are potential, fresh ways that city diplomacy can contribute to the world. Specifically, the following three types of city diplomacy activities have significant impact: 1) sharing policies through international city networks; 2) contributing to peace-building efforts; and 3) exporting advanced urban solutions to other cities. By reviewing numerous case studies representing these types of diplomatic activities, this study draws policy implications for the SMG. In summary, Seoul needs a city diplomacy strategy to provide understanding of the city's diplomatic assets, what the city can do with city diplomatic efforts and what direction the city should head. Through such a strategy, the SMG can play a greater role in the diplomatic arena.

Seoul Metropolitan Government Diplomacy towards the Three Northeastern Provinces of China: Strategies and Policies

The three northeastern provinces of China are Jilin, Liaoning, and Heilongjiang. From a geopolitical perspective, they are optimal areas for trilateral (South Korea, North Korea and China) and multilateral cooperation. Despite the value such cooperation can bring, there has not been significant exchanges or collaboration between the Seoul Metropolitan Government and these three provinces. **Seoul Metropolitan Government Diplomacy towards the Three Northeastern Provinces of China: Strategies and Policies** presents four diplomatic strategies towards such collaboration, based on the Seoul Metropolitan Government's City Diplomacy Plan in 2017.

Min-gyu Lee · Eun-Hyun Park

This report explores why it is important for the Seoul Metropolitan Government (SMG) to engage in exchange and cooperation with China's three northeastern provinces. Based on an analysis of the urban problems faced by these provinces and the direction of their development policy, this document proposes five agenda items for the SMG in pursuit of its diplomatic strategies in this area.

First, the SMG needs to focus on building trust with these provinces. Political diplomacy opens the doors to a diplomatic relationship and helps countries build diplomatic foundations. Specifically, the SMG could consider the following: 1) Diplomatic strategies spearheaded by the Seoul mayor towards the building of personal relations and trust with the next generation of leaders; 2) Use of Seoul's diverse systems and programs (e.g., Seoul Club, honorary citizenship) for human resources management in various fields; 3) Cooperation between Seoul's public corporations and institutions such as The Seoul Institute and major research institutions from the three Chinese provinces so as to build collaborative networks; and 4) Environment-oriented cooperation in non-traditional security issues.

Second, the SMG would do well to pursue public diplomacy in areas such as culture and human resources and also adopt foreign policies that focus on improving Seoul's image in the pertinent Chinese provinces. The following may be considered: 1) Share Seoul's outstanding policies in the six areas which comprise the major urban issues in the three northeastern provinces (transportation,

e-government, waterworks, environment, urban planning/housing, and sewage); 2) Adopt a two-track strategy to resolve historical/cultural conflicts while disseminating elements of Korean culture (Seoul); and 3) Seek assistance from the Korean-Chinese demographic and utilize them as invaluable human resources in Seoul's public diplomacy towards the three northeastern provinces, viewing them as a bridge between Seoul and the three provinces. The strategies must be designed to enable a multi-faceted approach to public diplomacy that emphasizes the reputation of Seoul as an international city that is leading the way in promoting peace and prosperity in Northeast Asia.

Third, the SMG needs to pursue economic diplomacy towards the three Chinese provinces and explore new markets for exports and investment opportunities. Currently, the SMG's economic diplomacy is characterized by two main approaches: 'Participate in the development of cities and regions around the world' and 'Create a suitable environment for investment in Seoul'. This approach may also be extended to the three Chinese provinces. In application, the following items may be considered: 1) Participate in development of Characteristic towns as well as in the national development of regions within the three northeastern provinces; 2) Win projects related to resolving urban problems; and 3) Establish an institutional framework to attract tourists from the three northeastern provinces. The entire process must be designed to achieve the ultimate goal of creating practical profit.

Fourth, the SMG needs to pursue peace diplomacy so as to build a model of multilateral economic cooperation between the cities in the two Koreas, China, and other countries. Currently, economic cooperation cannot be instantly pursued given the domestic and international variables coupled with international community sanctions. Until such a time when it becomes possible, joint studies on the framework for multilateral cooperation may be conducted to prepare for the future. A realistic approach is critical. First, pursue political and public diplomacy, then peace diplomacy, then at a later time the possibilities of aligning goals through comprehensive approaches to urban cooperation between Seoul and Pyongyang. Academic exchanges and an international forum on peace on the Korean peninsula

and Northeast Asia could also be used as major drivers of peace diplomacy. Critically, political, public, economic and peace diplomacy need to be organically connected in implementation and pursued as a whole, not as independent entities. In this way, the full potential of each area of diplomacy will be realized.

Finally, the SMG needs to build a long-term exchange platform on which the city can share agendas with the three Chinese provinces in a more stable and sustainable manner. This may be developed in two different ways: 1) by forming a sisterhood relationship with cities in the three provinces and designating them as Seoul's strategic bases for city diplomacy in China (for which purpose Changchun, Harbin, and Shenyang may be ideal as strategic target cities); and 2) by establishing a multi-layered comprehensive committee to establish a body for cooperation between northeast Asian capitals and strategic cities. Meanwhile, committees may be established for Seoul-Jilin Province, one for Seoul-Liaoning, and another for Seoul-Heilongjiang. In the mid-term, a committee could be established for cooperation between Seoul and the three Chinese provinces. In the longer term, efforts should be directed towards establishing a cooperative body of capitals and strategic cities in Northeast Asia, including a Seoul-Beijing committee.

Seoul Metropolitan Government Strategies for Inter-Korean Exchange and Cooperation: Focusing on the Role of Local Government

Since the 2018 Pyeongchang Winter Olympics, we have witnessed a dramatic turnaround on the Korean peninsula. The games seemed to have served as a political catalyst for dialogue between the two Koreas. To keep pace with this development, local governments, like the Seoul Metropolitan Government, have unveiled plans for inter-Korean cooperation. They also have bolstered multi-faceted efforts to implement such in the near future. **Seoul Metropolitan Government Strategies for Inter-Korean Exchange and Cooperation: Focusing on the Role of Local Government** examines the advantages of inter-Korean cooperation projects by local governments. Through analysis of the current situations on the Korean peninsula, the authors present ways to pursue cooperation with the North.

Min-gyu Lee

This report provides an accurate analysis of the Seoul Metropolitan Government (SMG) role as a local government in inter-Korean exchange and cooperation projects. It also suggests six directions of the Comprehensive Plans for a City-to-City Partnership between Seoul and Pyongyang through which the SMG can increase its capability to interact with North Korea.

First, the SMG ought to organize the current three areas and ten projects into priority tasks and mid- and long-term tasks to be fulfilled in phases. In the present situation where sanctions against North Korea are being enforced, the SMG needs to initiate exchange by pushing ahead with projects in the following areas: sociocultural exchange, humanitarian aid, and nonprofit public infrastructure-building projects.

Second, the SMG needs to plan and carry out projects that are in the interests and meet the needs of both South and North Korea. It is possible to continue sustainable city-to-city exchange through projects that bring tangible benefits to both sides. Such projects can be designed and implemented through cooperation in economy and city infrastructure.

Third, the SMG ought not to promote projects which can stir dispute by failing to take into account North Korea's political system. It is necessary for Seoul to ponder the formation of a joint project group and undertake tasks based on the existing

three areas and ten projects upon mutual agreement and after conducting field research.

Fourth, a legal and institutional framework where local governments can independently forge a partnership with North Korea is needed. It ought to be one of the regular tasks to lay the groundwork for Korean reunification. To that end, a new amendment is needed to the Inter-Korean Exchange and Cooperation Act to address the restrictions on the role and autonomy of local governments.

Fifth, hosting a range of social and cultural events and education programs that engage residents to build a consensus on peace and reunification needs to be a regular task. It is necessary for the SMG to examine the following four points in order to systematically develop the peace and reunification education programs it has run since 2015: To ensure consistency in education on reunification, the continuous cooperation and management of the Institute for Unification Education and the Seoul Institute is required. "Hot cognition" needs to be triggered by linking these efforts with art performances such as concerts and exhibitions. Customized education ought to be offered by collecting public opinion in real time through establishment of an online platform.

The SMG ought to hold forums on peace and reunification to ensure opportunities to interact with experts from home and abroad are presented.

Sixth, to enhance inter-Korean exchange and cooperation-related capability of the SMG, a multilateral network of cooperation ought to be created as part of the regular tasks to be done towards preparing for reunification. A cooperative relationship with the central government is critical as it is through such that the SMG will receive help and support for relevant projects. Nongovernmental organizations extending aid to North Korea are also essential partners, as they have more experience in exchange and cooperation with North Korea than local governments.

Inter-Korean exchange and cooperation-related policies need to be designed and implemented in conjunction with urban diplomacy. In this way, the SMG will be able to overcome the limitations of the local-level inter-Korean exchange and

cooperation model. Furthermore, a comprehensive multilateral partnership with cities in Northeast Asia, including North Korea, would be a good idea, through urban diplomacy. The SMG would do well to work with other local governments. There are differences in experience with exchange and cooperation-related projects between local governments. When taking this into consideration, it is vital to build a network where contacts with North Korea will be made and retained and successful cases of development and capability will be shared.

A Study on the Direction of Inter-Korean Economic Cooperation of Seoul

Inter-Korean cooperation can open up new economic opportunities for South and North Korea. The Seoul Metropolitan Government and other local governments are focusing their attention on business without accurate information about the North. **A Study on the Direction of Inter-Korean Economic Cooperation of Seoul** provides information about North Korea that is essential to developing economic partnerships. The study suggests ways for the Seoul Metropolitan Government to participate.

In-Chul Mun · Hye-In Kim

It is the view of the Moon Jae-in administration that improvement of inter-Korean relations promotes resolution of the North Korean nuclear issue. For this reason, the government proposed a 'New Economic Map' for the Korean peninsula and has actively sought to pursue inter-Korean economic cooperation since the beginning of the Moon administration. Economic cooperation will be pursued in earnest when the North Korean nuclear issue is resolved and the sanctions on the North are lifted. North-South Korean economic cooperation, when led primarily by the central government, has its limitations. The Gaeseong Industrial Complex and the Geumgangsan Tour program are cases in point.

In order for economic cooperation to be successful and maintained, it is important that local governments, relatively less sensitive politically, take on greater responsibility. Local governments tend to be more consistent in their pursuit of projects than the central government, and are more oriented toward political publicity. Furthermore, local governments are more politically flexible. Above all, economic cooperation can be a boost to sluggish local economies.

It is against this backdrop that the Seoul Metropolitan Government (SMG) and other local governments have taken a keen interest in cooperation. They are, however, more focused on identifying new projects than on finding out more about the North and what it needs or learning what we can do and if we can indeed succeed. In any project, the first and foremost job is to study the target. It is only with such information that a project can be a success.

As is the case in the South, North Korea is a state with an overarching system comprised of political, economic, societal, cultural, and other sectors. Each of these sectors is then made up of myriad sub-sectors. We, however, do not even have an accurate understanding of the North's political and social realities, which are the most fundamental information to understanding a country. Inter-Korean economic cooperation is closely related to North Korea's decision to open its doors. It is therefore undesirable to pursue cooperation without an accurate understanding of the North.

In May 2016, North Korea held its seventh Party Congress in 36 years, during which Chairman Kim Jong-un announced the Five-year Economic Development Strategy (2016~2020). The North has sought to pursue balanced growth of different sectors to boost its economy. Knowing that it cannot achieve its goals on its own, Pyongyang aims to attract foreign investment. The Five-year Plan addresses core strategic industries, which governs the international economy that is closely related to economic development zones. To date, North Korea has designated 27 economic development zones. One of the main objectives for these zones is to develop the national economy by attracting foreign investment and introducing advanced technology.

This document is a pre-study with the primary aim of examining North Korea's economic development zones and the relevant laws and systems. Inter-Korean economic cooperation should not be based on one-way assistance as it has been in the past. For the relationship to become sustainable, it should be mutually beneficial. The ultimate objective of this study is to explore the way forward for Seoul's inter-Korean economic cooperation to revitalize the sluggish local economy.

For Seoul, the way forward may be as follows: first, the SMG should align its plans with the central government's 'New Economic Map' for the Korean peninsula and its policies on North Korea; second, the SMG should work closely with the three northeastern provinces of China in its pursuit of inter-Korean economic cooperation; third, inter-city cooperation between Seoul and Pyongyang should be

aligned with inter-Korean economic cooperation; fourth, in its pursuit of cooperation, the SMG's focus should be more on the North's textile industry, as it has a relatively better production infrastructure and uses better technology than other industries; fifth, the SMG should develop tour programs that involve tours in Seoul as well as in North Korean tourist development zones; sixth, the SMG should develop the city of Seoul to be a global financial hub, developing investment funds or insurance products that utilize North Korea's economic development zones; seventh, the SMG should place priority on the construction of infrastructure (e.g., civil engineering, railways, roads) required for economic development zones; eighth, the SMG should work with affiliated public institutions in its pursuit of cooperation; lastly, the SMG should ensure that inter-Korean economic cooperation is environmentally-friendly and safe.

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