

The Transformation of the Land

Historically, the Korean Peninsula has been called Geumsugangsan, which can best be translated into this poetic phrase: nature appearing as if it were embroidered on silk. Unfortunately, years of Japanese occupation and the subsequent Korean War divided and devastated the country in many ways. The nation's infrastructure and its industrial capability were destroyed as were numerous residential areas. This devastation led to a shortage of natural resources such as minerals, lumber, oil, and gas, which then triggered a collapse of the national economy, especially in South Korea. Until the early 1960s, Korea was forced to focus on recovering from the devastation of war by utilizing international aid to restore public facilities and rebuild the national economy. For the last 60 years, there have been many changes in the Korean landscape, most of which have stemmed from government-led land development projects, urbanization, and industrialization.

The government's master plan for land development was put into action in the early 1960s. At that time, the government based its plan on the growth pole theory in order to maximize the development effect in as short a period of time as possible. Though well-intentioned, the growth pole approach only allowed for investment in the few central development areas that were most likely to succeed before development could be considered in other areas. This approach had the unfortunate result of causing both people and capital to flow to those few development centers. The resulting imbalance between those centers and all other areas in the country was later corrected with the implementation of a more balanced set of development policies.

Under the Special Area Development Project, Seoul, Incheon, and Ulsan were selected as Special Areas to be developed first on the premise that the effects

of such development would gradually enfold the surroundings areas. The Industrial Park Development Project began in Ulsan and Seoul in the early 1960s. Also, during 1960s and 1970s, the Industrial City Construction Project was launched with targeted sites near such industrial parks. This led to the emergence of major chemical industries concentrated in cities such as Ulsan-si, Yecheon-si, Pohang-si, and Gumi-si with a concordant rise in population in each of these cities.

Urban migration, the nuclearization of families, the increase in national income, and more widespread expectations for a higher quality of life all led to soaring demands for housing in the 1980s and 1990s. The housing supply rose to keep pace with the demand: In 1950, the number of housing units was 3,280,000; by 2011 it had increased five-and-a-half times to 18,130,000. The housing supply rate exceeded 100% by the year 2000. The increase in housing was also a result of many housing-related development policies, such as the Modern Housing Construction Project, the Two Million Housing Construction Project, the Rental Housing Construction Project, and the New Town Development Project. In rural areas, the Saema-eul Project and the Rural Living Environment Program were also implemented.

The transportation sector of the Korean economy rapidly developed as a result of the Export Industry Policy. This was reflected in land spatial structure and regional growth structure that centered on metropolitan areas and the Gyeongbu Axis (Seoul-Busan). Korea's entry into modern transportation actually began with railways that the Japanese built to invade Korea and seize its resources during the colonial period. In 1955, diesel engine locomotives and a subway system were introduced while double-track railway projects were also promoted. The modernization of rail traffic has been ongoing, and in 2004 the Seoul-Busan High

Speed Railway began operation. The development of highways began with the construction of the Gyeongbu Expressway in the 1970s, and since the late 1980s more and more roads have been built and improved as the number of cars has soared and the volume of road traffic has increased. Marine transportation is mainly used for overseas transportation rather than domestic purposes. Major ports of Korea are primarily located along the southeastern coast, which allows for the ready import and export of materials and products needed for chemical industrial plants located in the same region. In 2006, the Busan New Port began operation and has become the center for international marine transportation.

Air traffic development began with the construction of airfields built for military purposes during Japanese colonization. Gimpo Airport opened in 1958 and Jeju Airport began operations in 1968. Korea's air transportation has opened a new chapter with the opening of the ultra-modern Incheon International Airport on Yeongjong Island in 2001.

Other major development projects from the 1970s to the present include a number of natural resource and energy related projects such as reforestation, land reclamation, multipurpose dam construction, and nuclear power plant construction.

Urbanization has had major impacts on the country's demographics, its physical landscape, its social-behavioral institutions, as well as the economy. Symbols that represented cities on the national map kept increasing, and as the number of cities increased, the population of rural areas declined, which also led to a decrease in the percentage of the population that was engaged in agriculture and fishery activities. New cities kept appearing on the national map as larger metropolitan areas continued to expand into rural land surrounding them.

The emergence of metropolitan centers is a major feature of development in Korea and resulted primarily from the rural-to-urban migrations, especially in the capital area. After the 1960s, rapid urbanization and industrialization attracted secondary and tertiary industries to cities as well. More jobs were created prompting further mass migrations from rural to urban areas. The urbanization rate, which indicates the ratio of urban population as a percentage of the total population, increased rapidly in Korea until the 1980s, but the pace has slowed since then. Between the 1970s and 1980s urbanization occurred at a much faster rate than in many other countries. As a result, rural areas suffered from the lack of a labor force, a decrease in the coefficient of land utilization, and the rapid aging of its population; these factors ultimately contributed to the failure to meet the minimum requirements for sustaining a rural community in many instances. And at the same time urban areas were confronted with the need to mitigate the challenges of overcrowding. Additionally, the heavy concentration of industrial activity within the metropolitan areas resulted serious social and environmental issues such as housing shortages, traffic congestion, poor air quality, and overall environmental degradation.

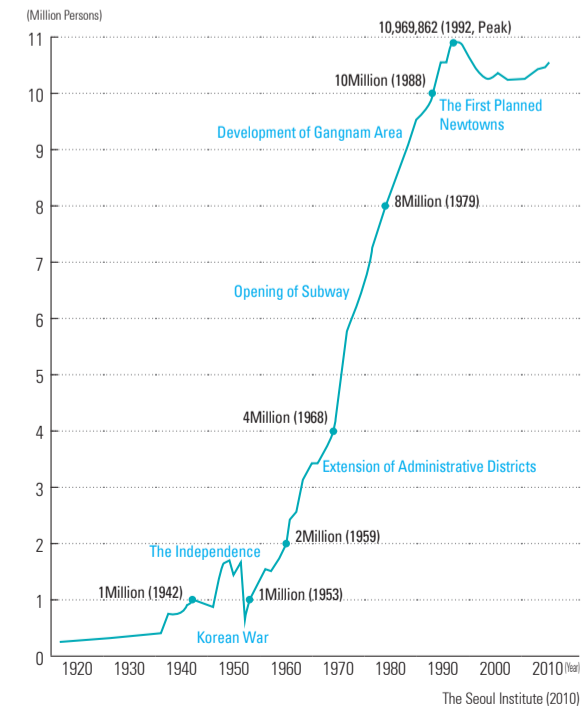
There was a clear trend toward excessive expansion in both the capital area and the port cities surrounding the Southeastern Maritime Industrial Region. The expansion between these two regions is related mainly because industrialization took place along the Gyeongbu Axis. Seoul experienced excessive increases in population, but this trend has stalled and decreased since 1990s. The population of nearby satellite cities, however, keeps growing, which results in a population concentration in the greater metropolitan area with Seoul at its center.

The Transformation of the Land Space

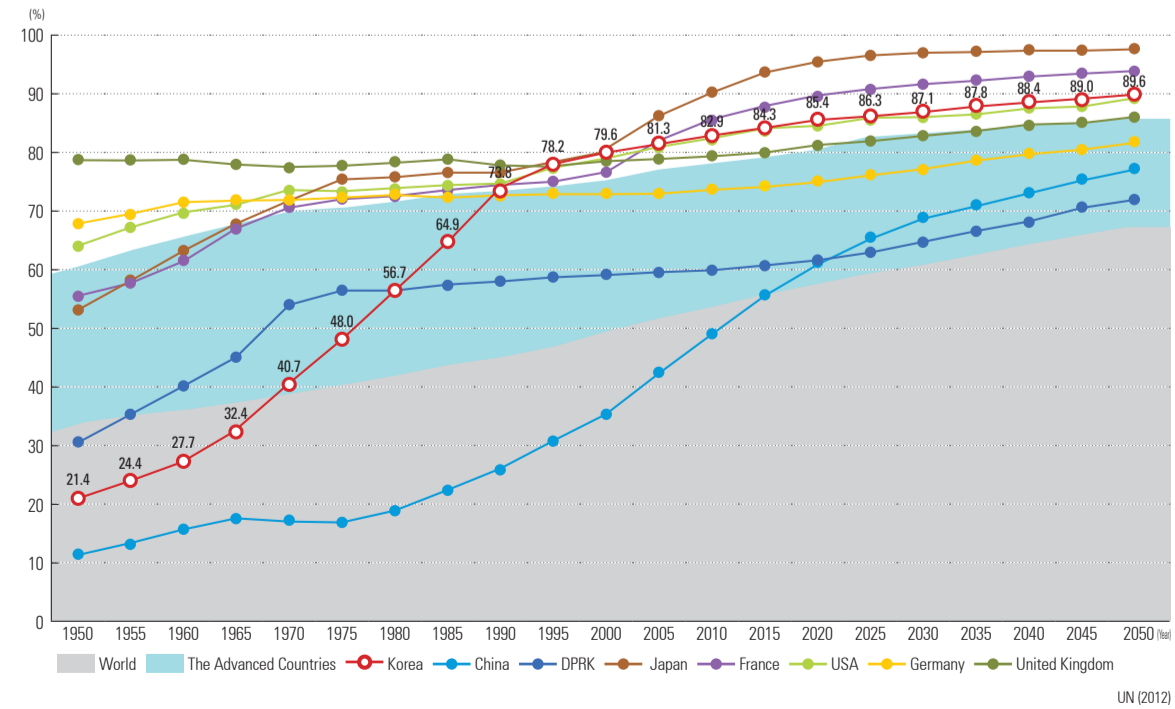
Major Land Development Projects



The Growth of Seoul



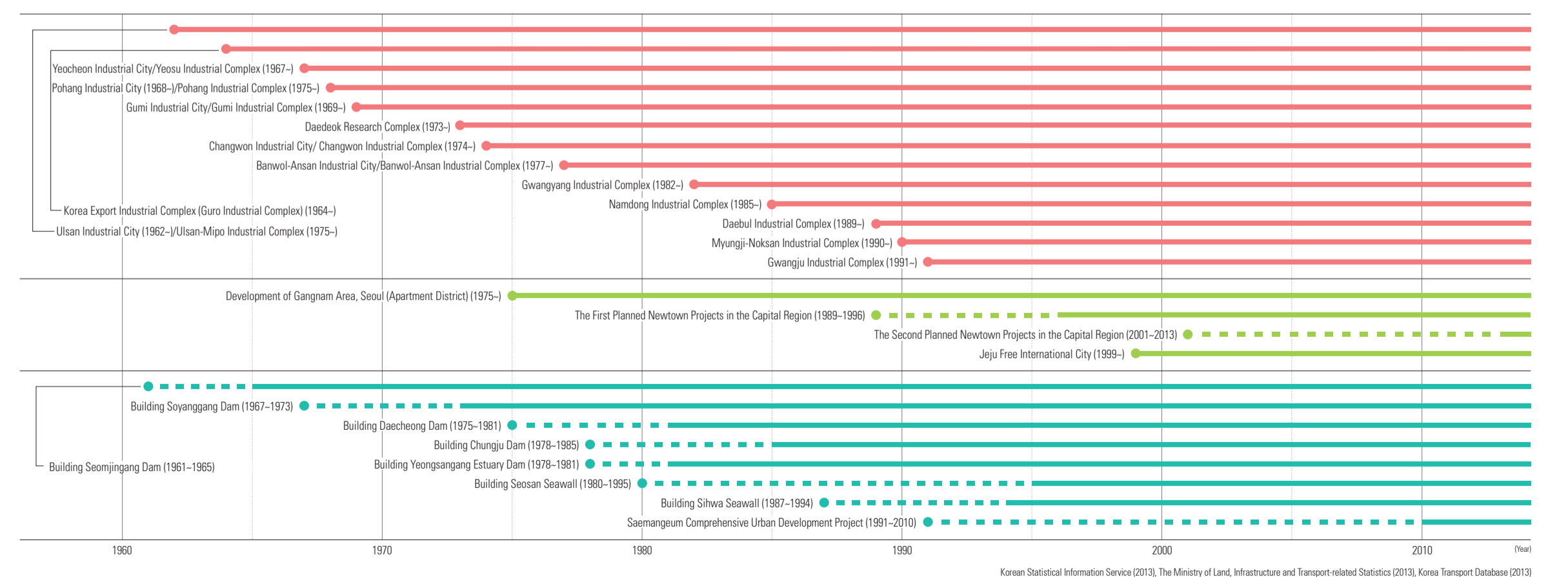
The Urbanization Rates in the World



The Development of Transportation Infrastructures



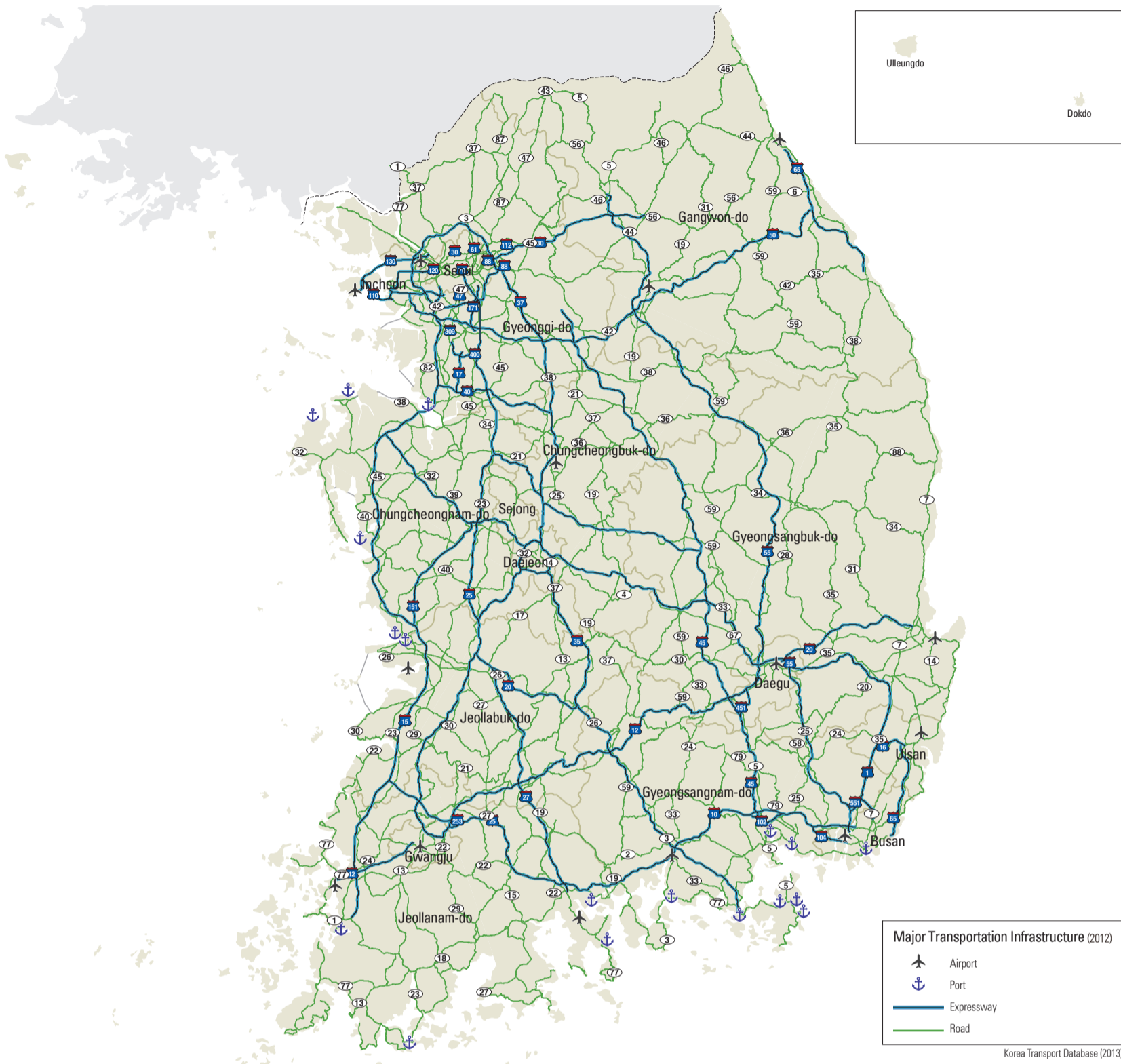
Major Land Development Projects Timetable



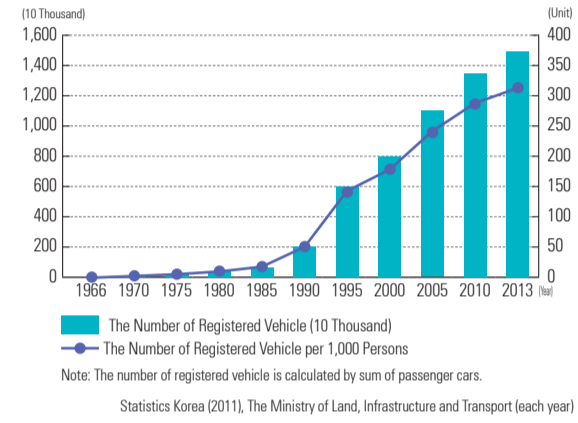
The Development of Transportation and Communication

Since the 1960s, construction of transportation infrastructure took place rapidly, and major national networks such as expressways, railways, airports, and seaports were built and served as the backbone for continued transportation expansion. Numerous important industries were developed along the Gyeongbu Axis, and in order to service those industries a main transportation network was established to connect Seoul with Busan. With the opening of Gyeongbu Expressway in 1970, the entire nation became more accessible to commuters, making it possible for travelers to move from point-to-point in the country within one day ("One-day Life Zone"). With the opening of Gyeongbu High Speed Railway in 2004, it became even more so. Literally, a "Half-day Life Zone" became available.

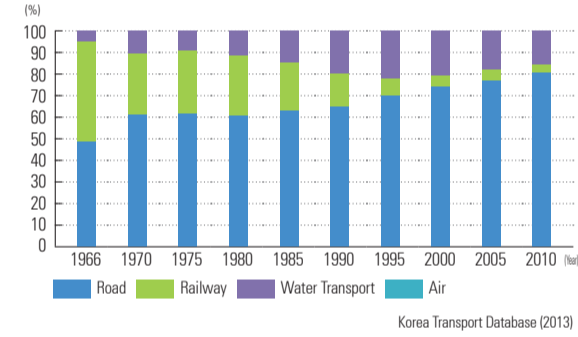
Major Transportation Infrastructure



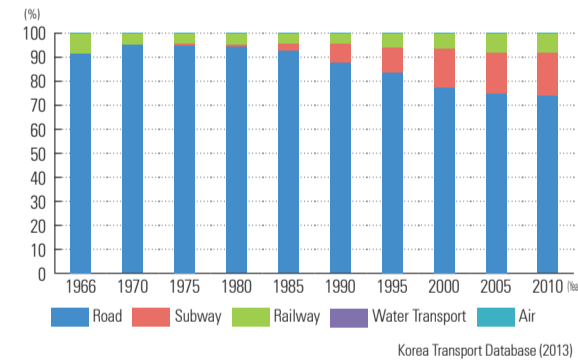
Number of Registered Vehicle per 1,000 Persons



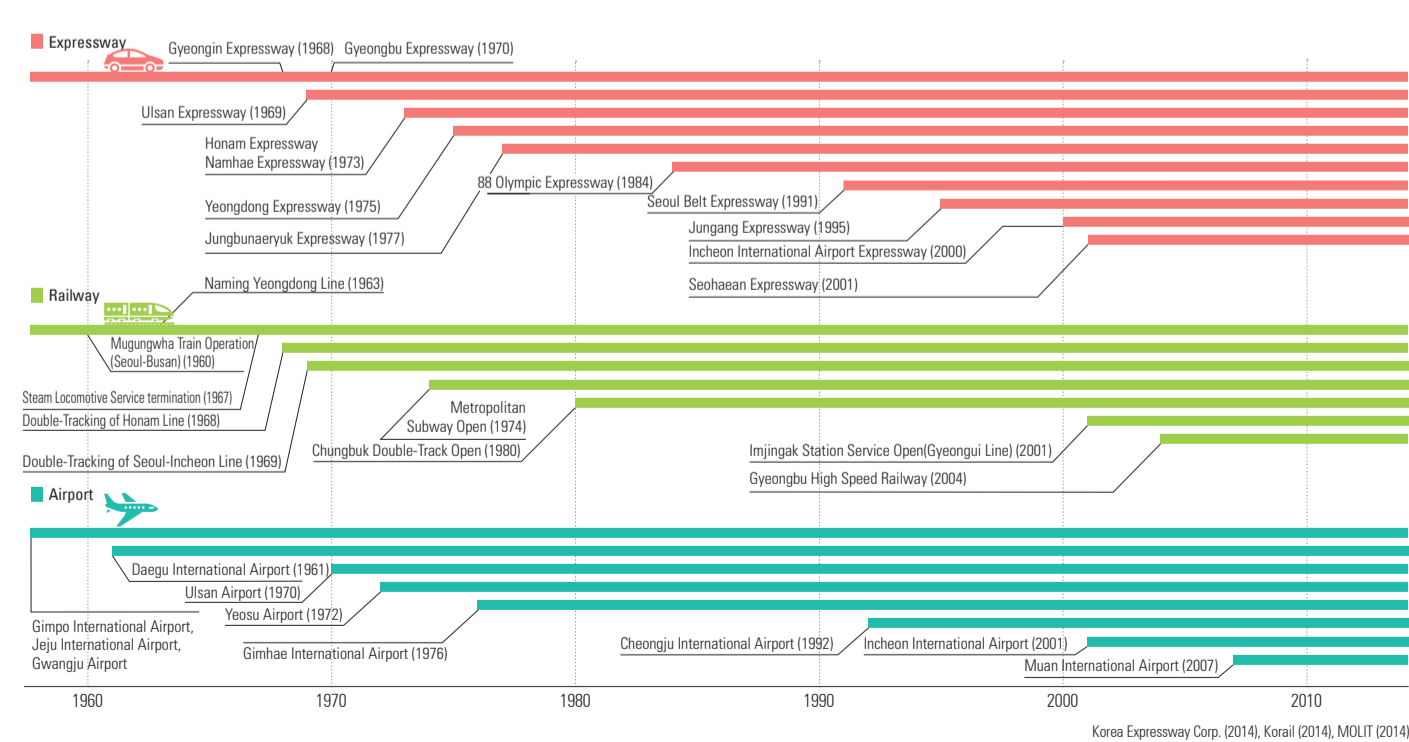
Share of Freight by Transportation System



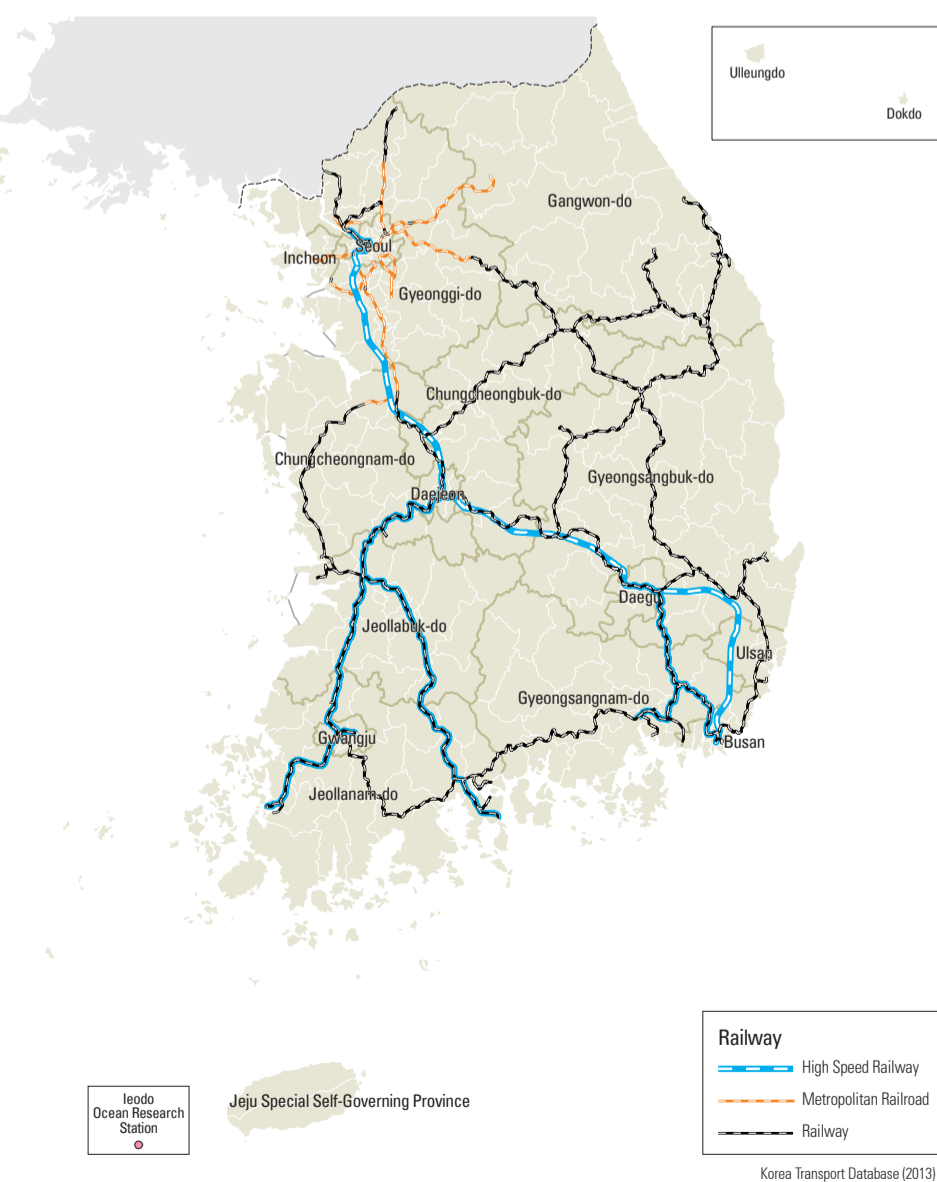
Share of Passenger by Transportation System



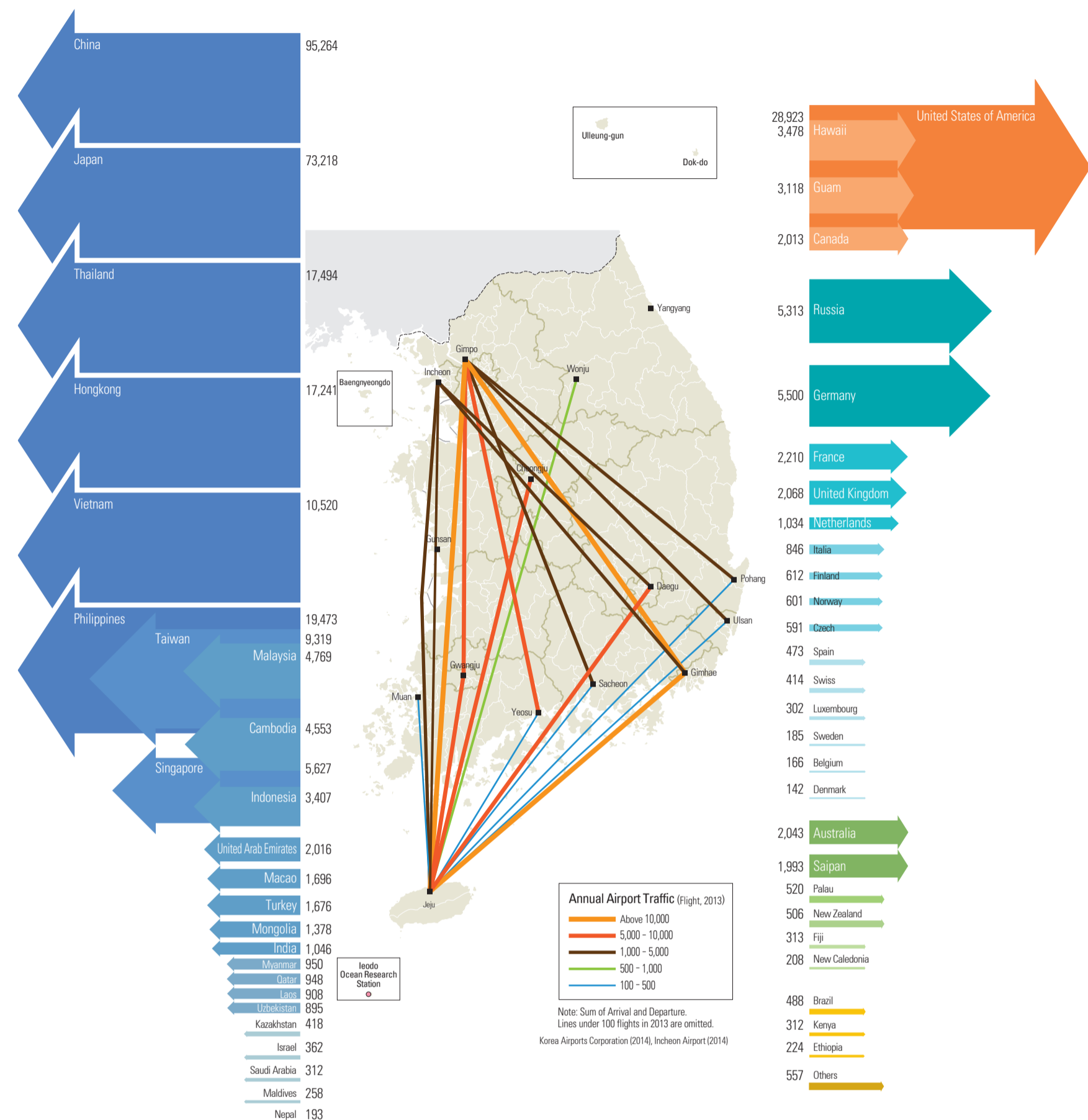
Major Transport System Development



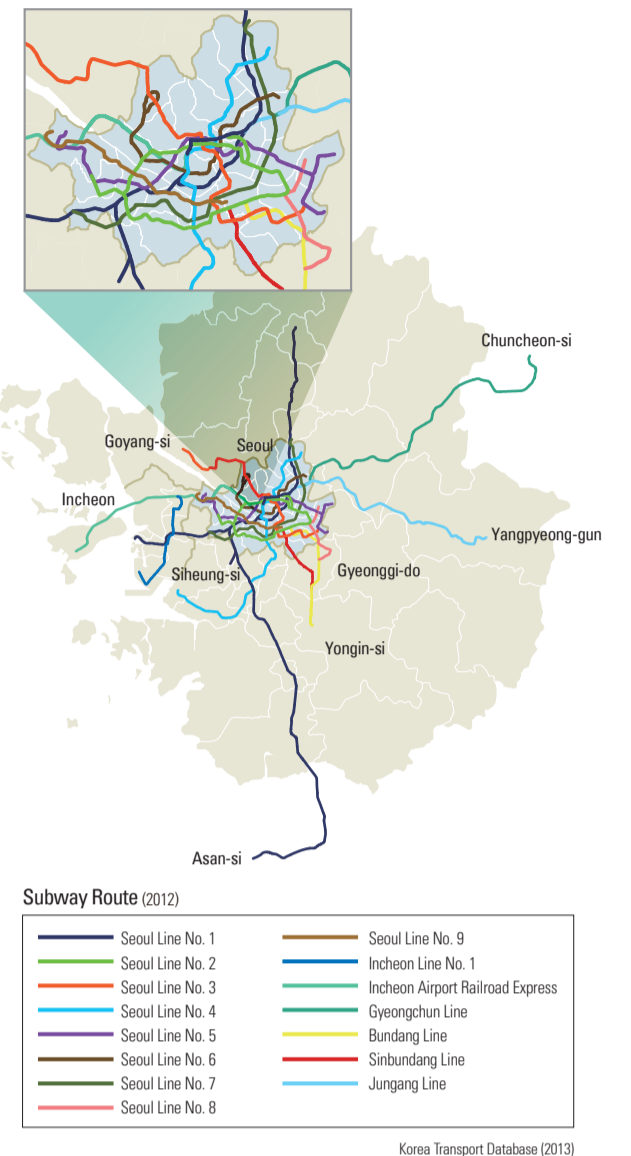
Major Railway



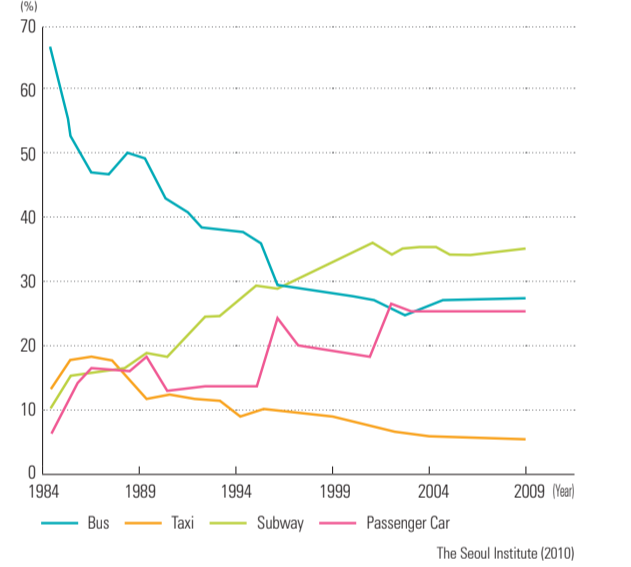
Airport Traffic



Seoul Metropolitan Railroad Map

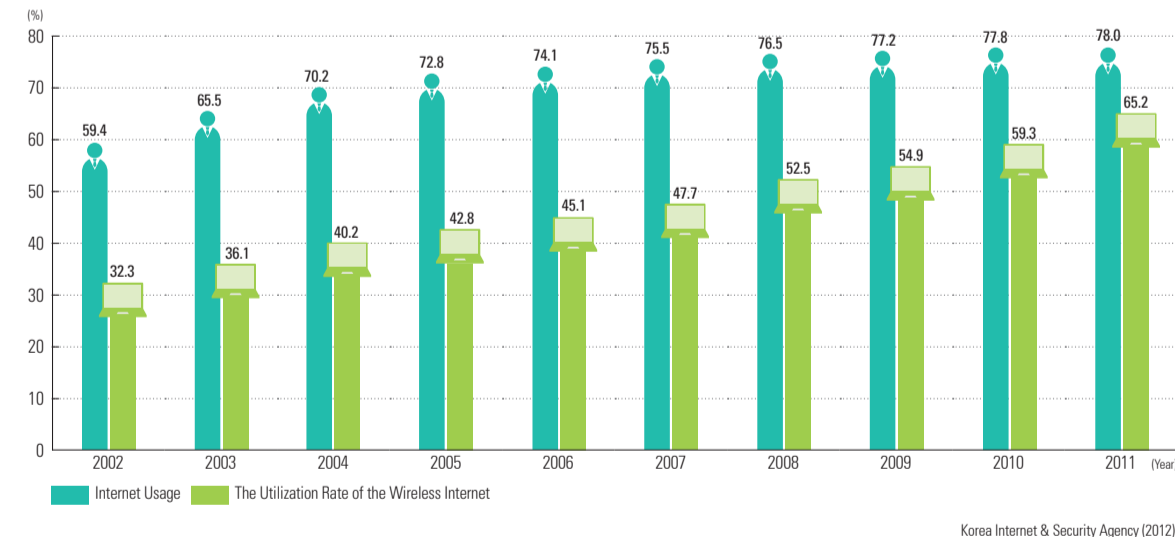


Share of Transportation by Transit System

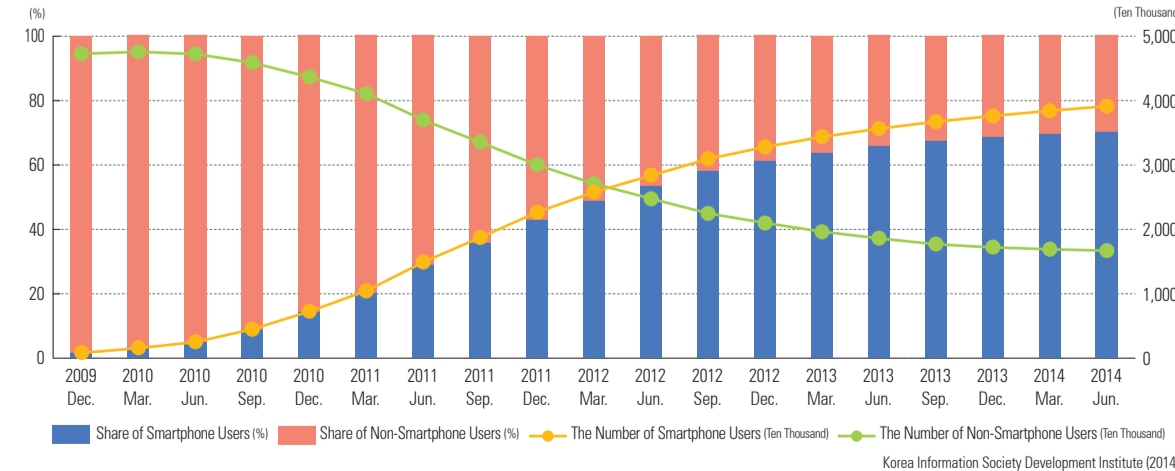


As computers are more widely used, communication through diverse digital devices has continued to grow. The development of the Internet, in particular, has made a massive amount of information accessible to people using computers, cell phones, and tablets. Unlike in the past, the bilateral exchange of information is taking place in a diverse and complex manner. The local telephone companies, which were the most important communication providers in the past, have been steadily losing subscribers dropping by 20% between 2004 and 2012. Simultaneously, the number of mobile phone subscribers has continued to increase by as much as 46% during the same time frame. Among mobile phone subscribers the use of smart phones has exceeded that of regular mobile phone users, and the customer market share of smart phone providers has exceeded 50%. As of 2011, 78% of South Korea's population has access to the Internet and 65.2% uses wireless Internet. The number of wireless Internet users has also dramatically increased due to the widening distribution of smart phones.

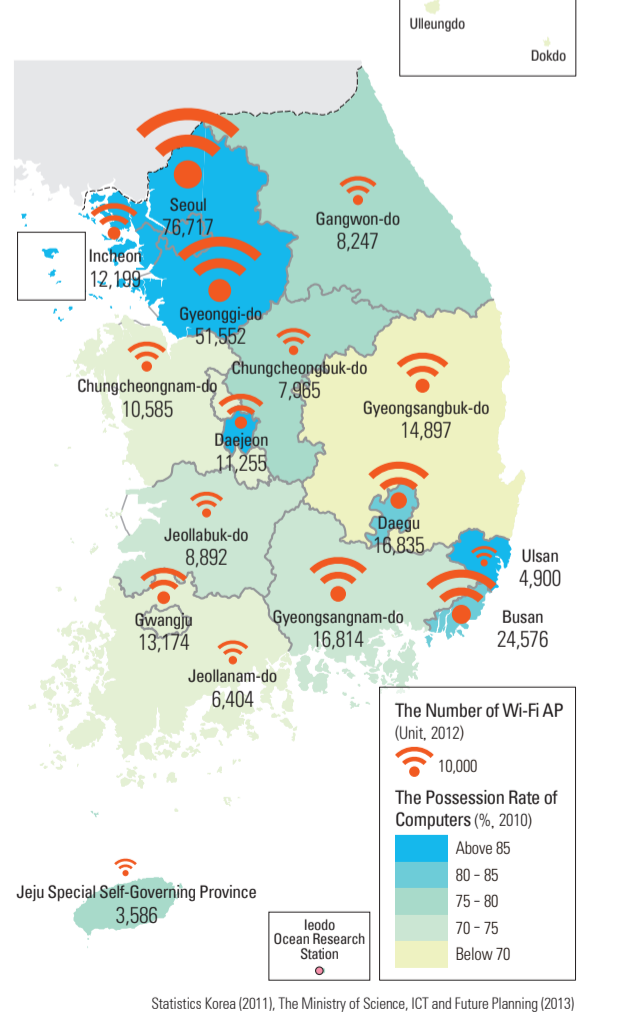
The Utilization Rate of the Internet



The Growth of Smartphone Users

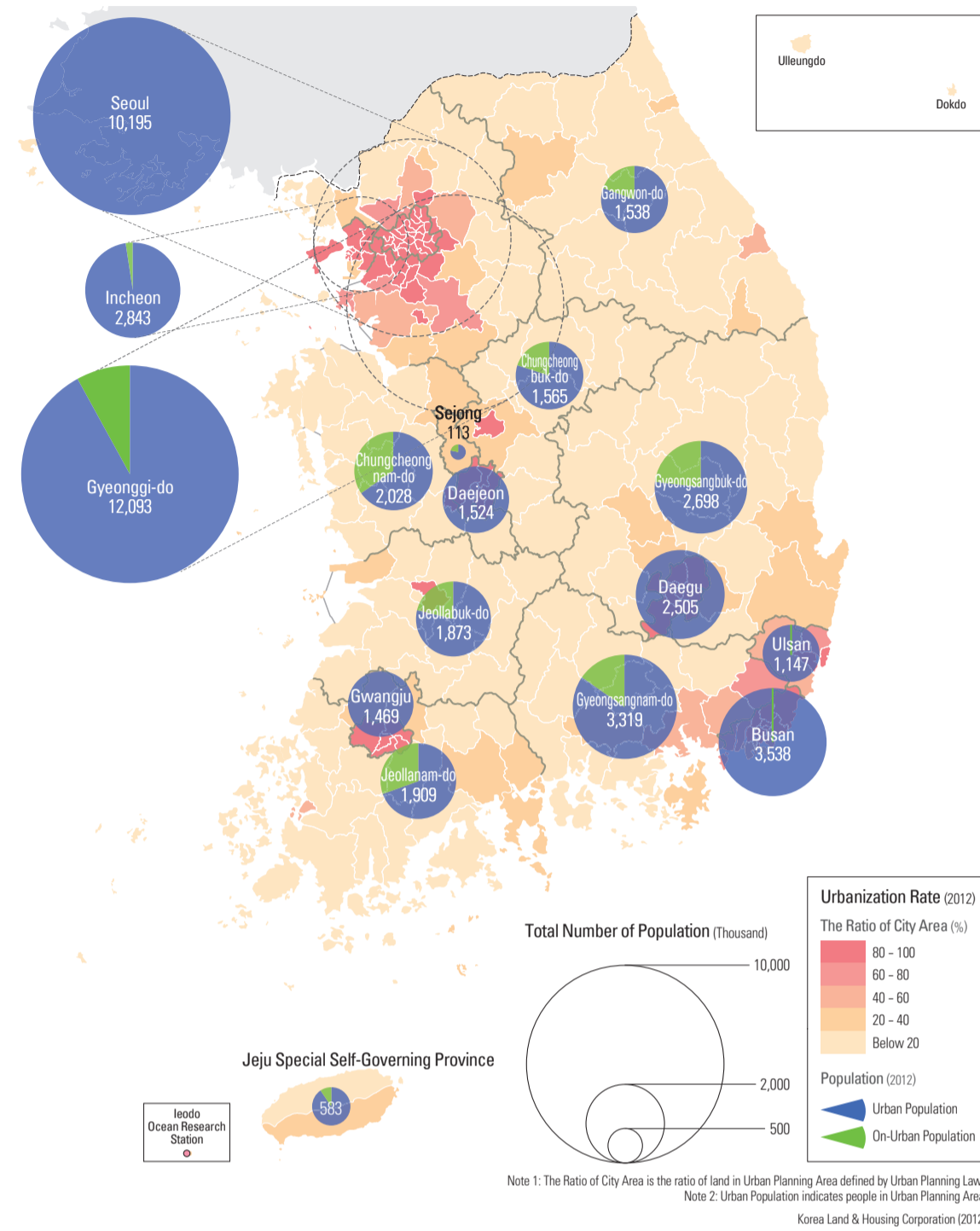


The Possession Rate of Computers and the Number of Wi-Fi AP

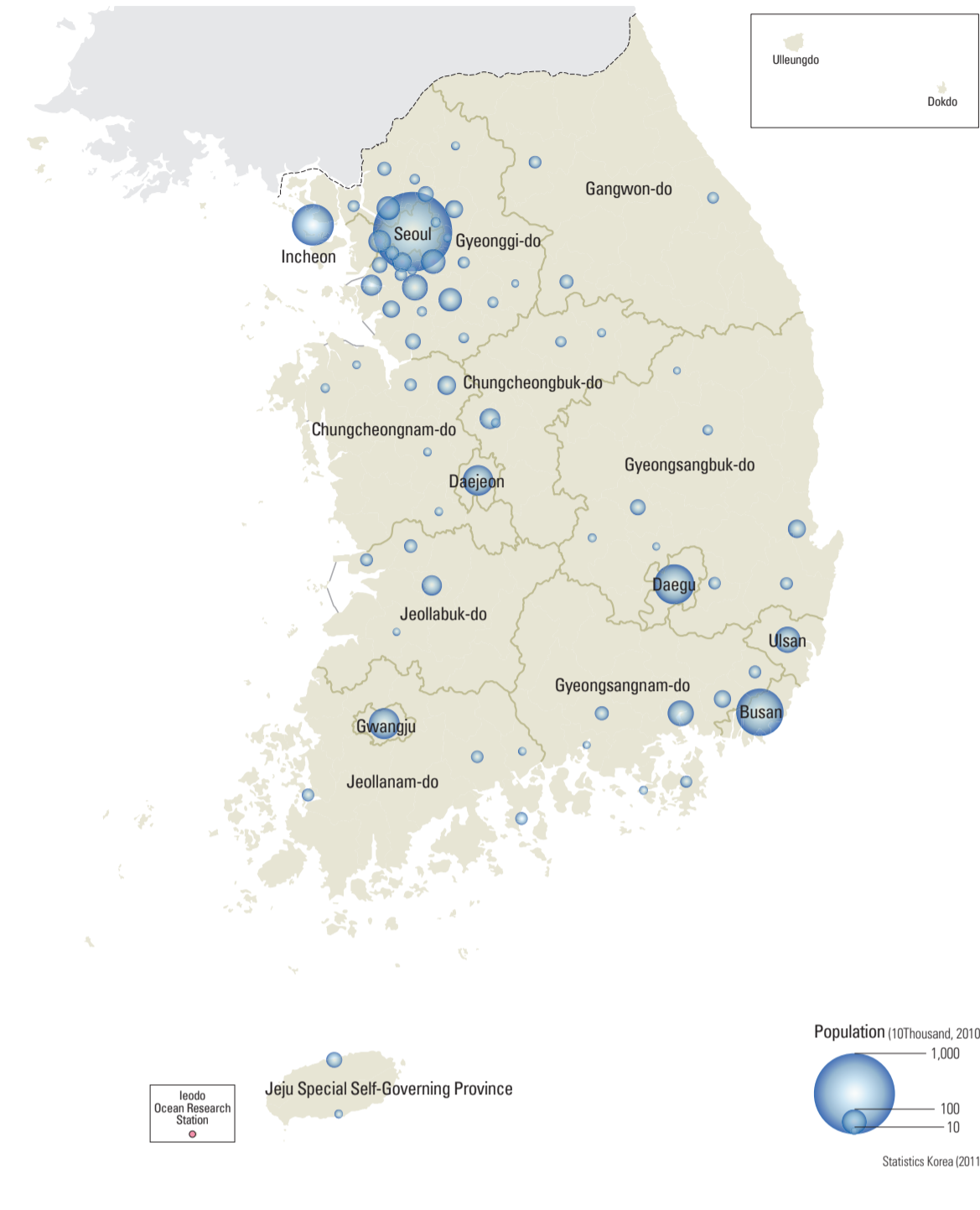


Urbanization and Living Space

Urbanization in Korea



The Spatial Pattern of Cities by Population Size



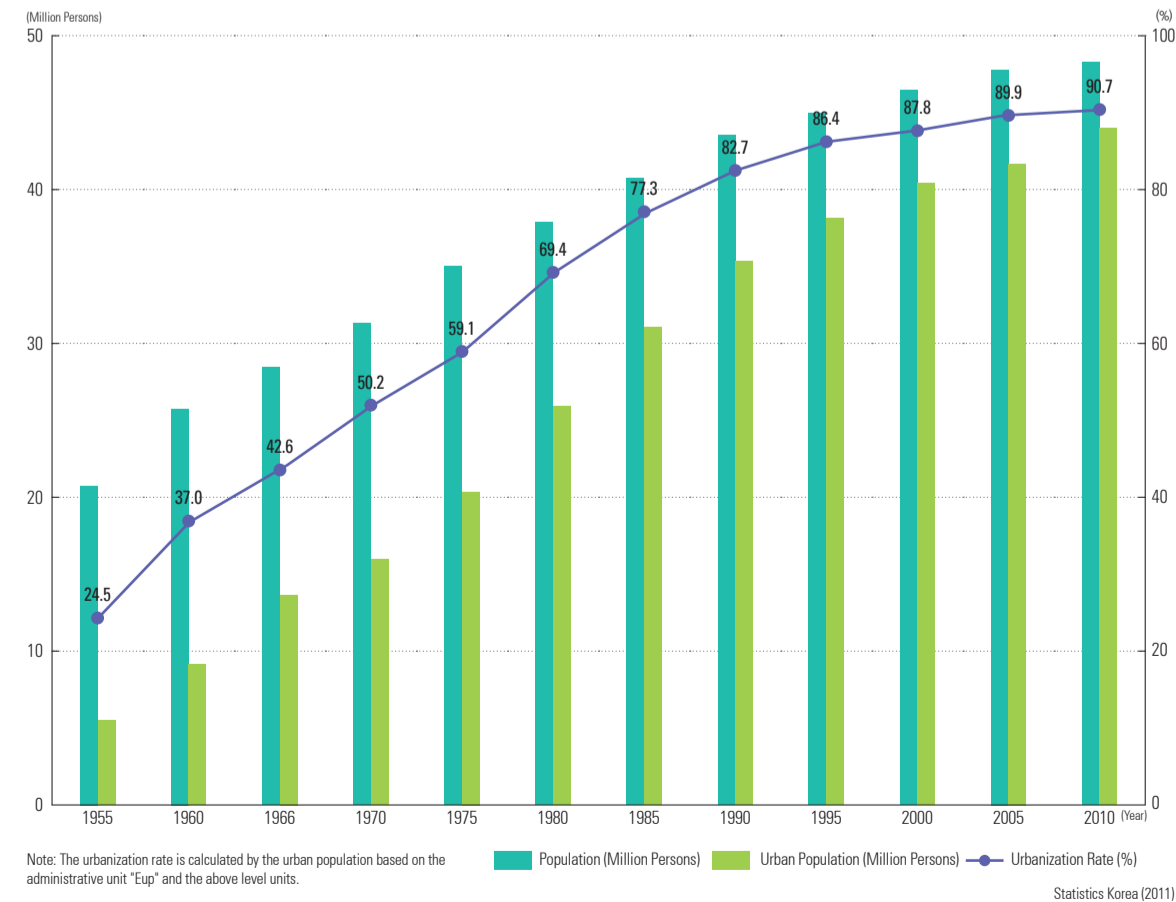
The most notable change in Korea's landscape over the past 60 years is increasing urbanization. The representative indicator of this process is the urbanization rate that shows the share of people living in urban areas out of the total national population. This statistical number can differ depending on which administrative level unit, the Dong level or the Eup level, is used to designate an area as urban or rural. According to the Eup level, Korea's urbanization rate has exceeded 90%. The

rate of increase was rapid until the 1980s, but it has since slowed down. This slowing trend indicates that Korea's urbanization has entered its final phase from the earlier acceleration phase. The capital area surrounding Seoul, Busan and its surrounding area, and other metropolitan cities all show high urbanization rates. The list indicating urban growth in Korea when each city reached 1 million residents is shown here in chronological order: Seoul (1953), Busan (1955),

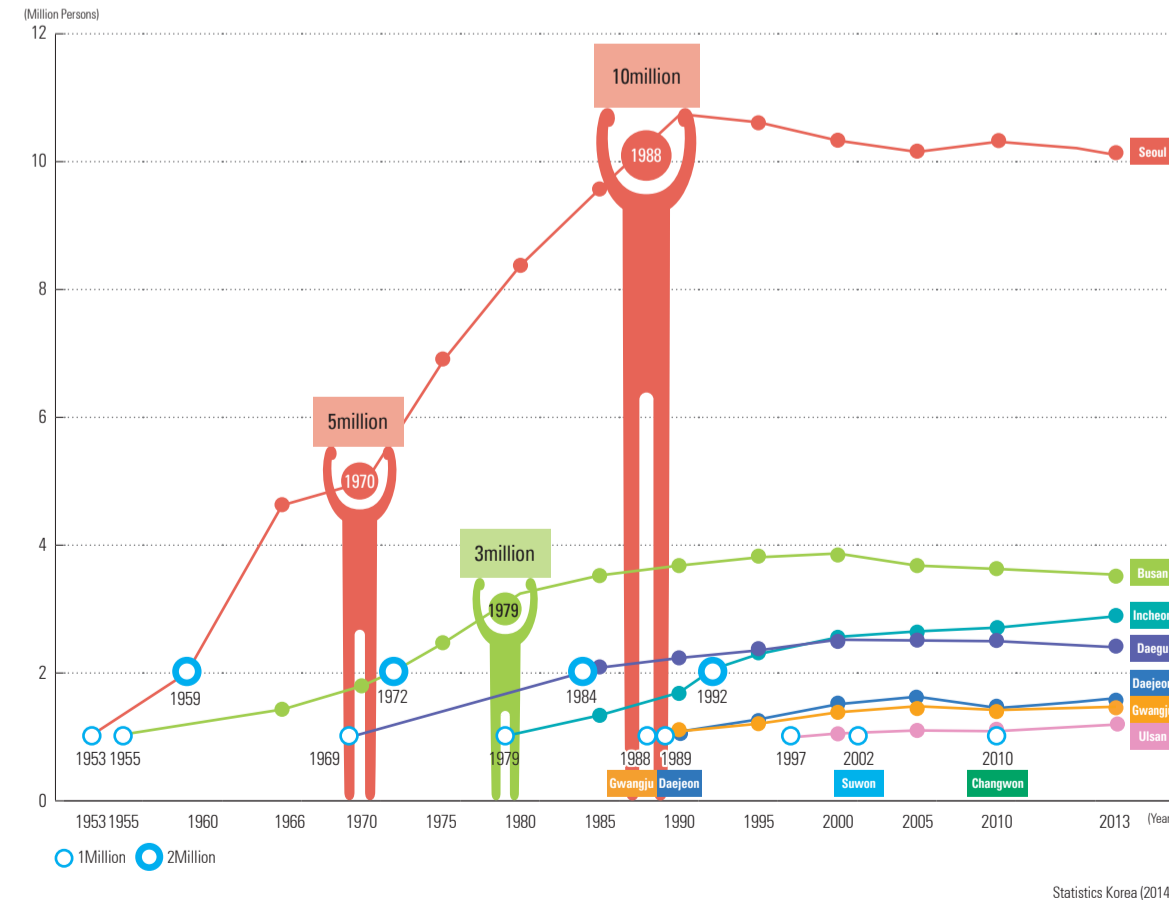
Daegu (1969), Incheon (1979), Gwangju (1988), Daejeon (1989), and Ulsan (1997). As for cities that did not meet the metropolitan definition, Suwon-si exceeded 1 million in 2002 and Changwon-si in 2010; Goyang-si and Seongnam-si are likely to follow. Seoul exceeded 10 million in 1988 and became a megacity even by international standards. Busan, the second largest city, exceeded 3 million in 1979; however, its population stagnated and has decreased recently. The distribution of cities

by population size shows a clear trend of port city development along the southeastern coastal industrial zone as well as the expansion of the greater capital area. These two urban centers in particular gave rise to the Gyeongbu Axis.

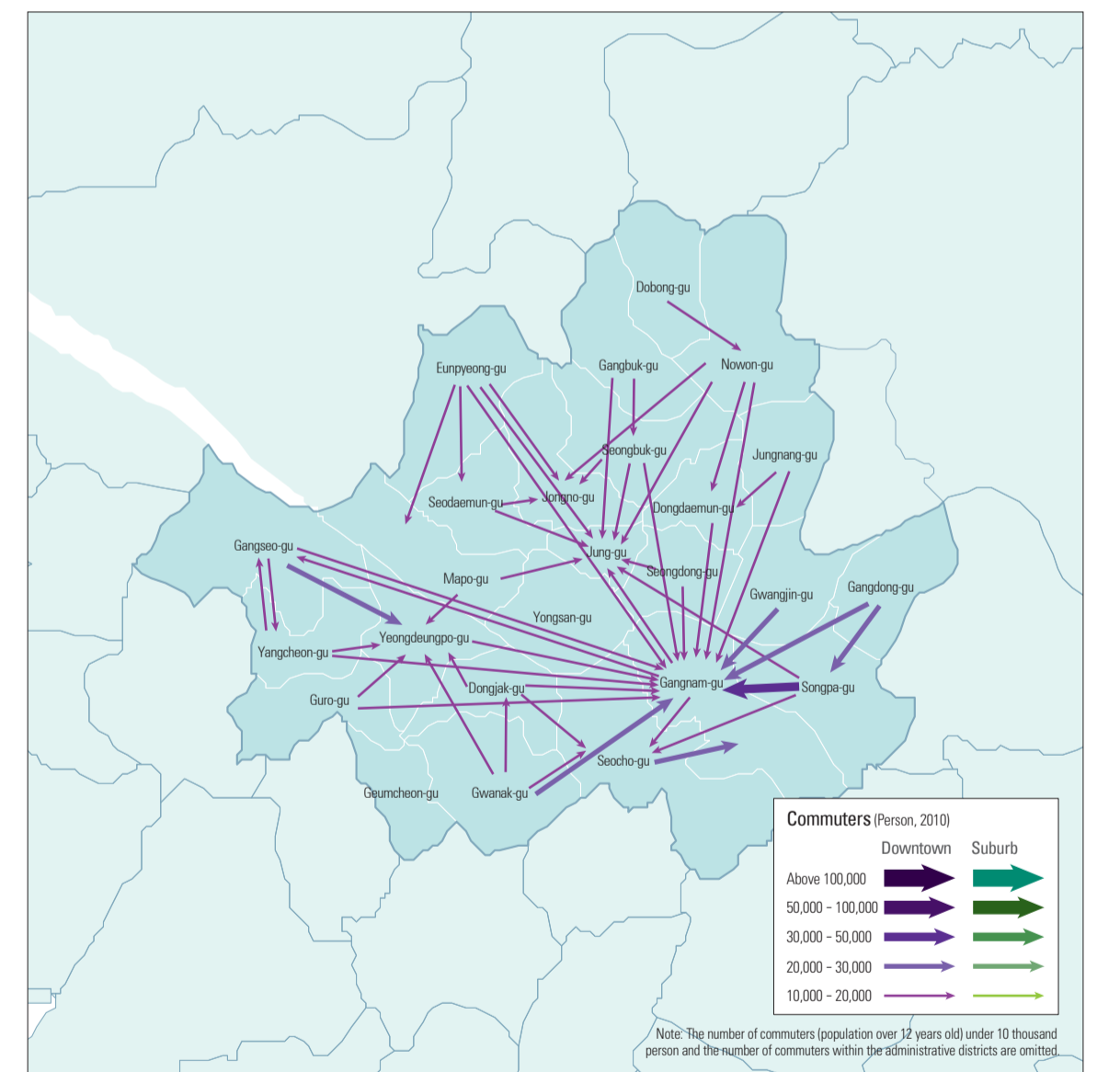
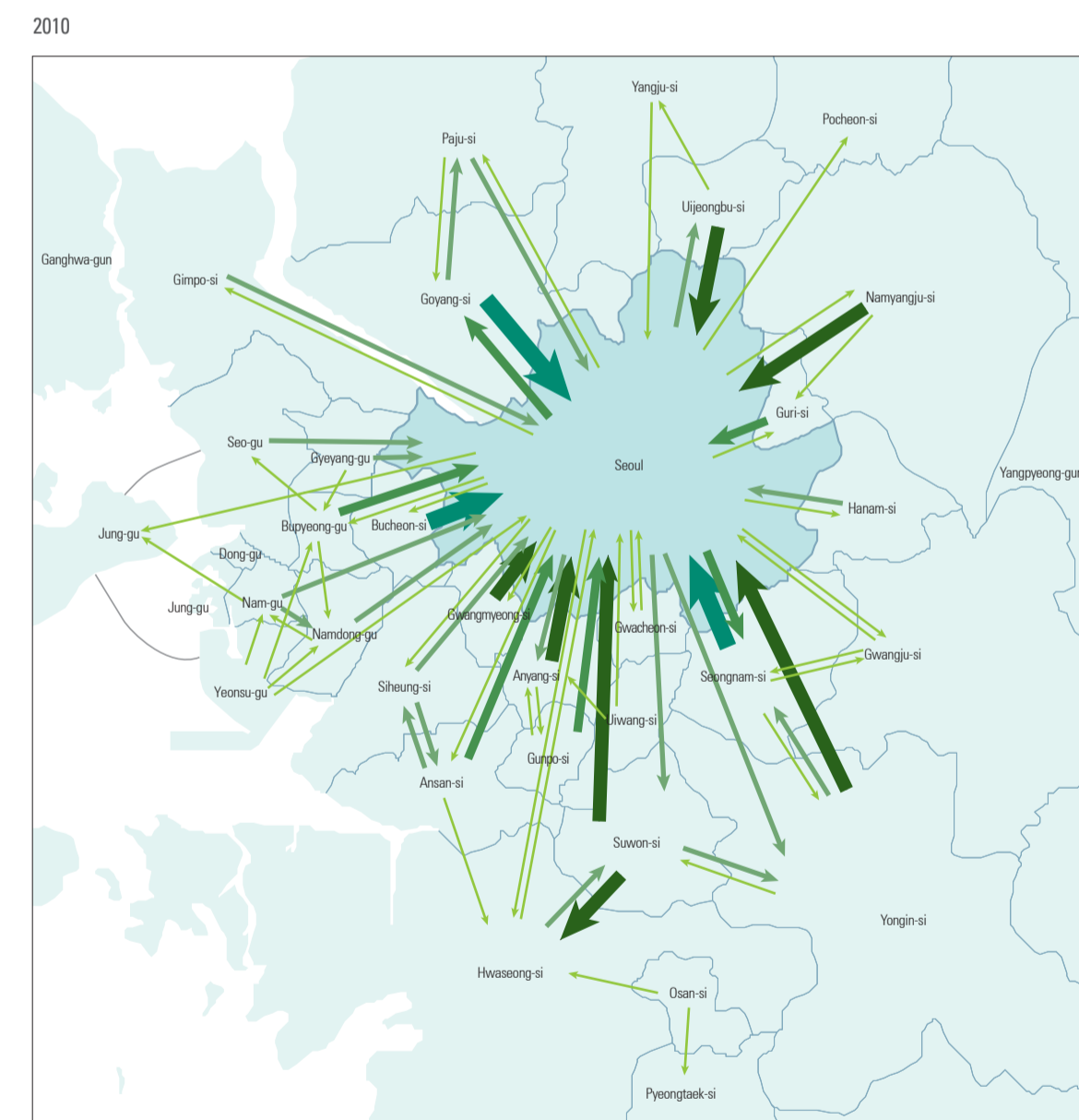
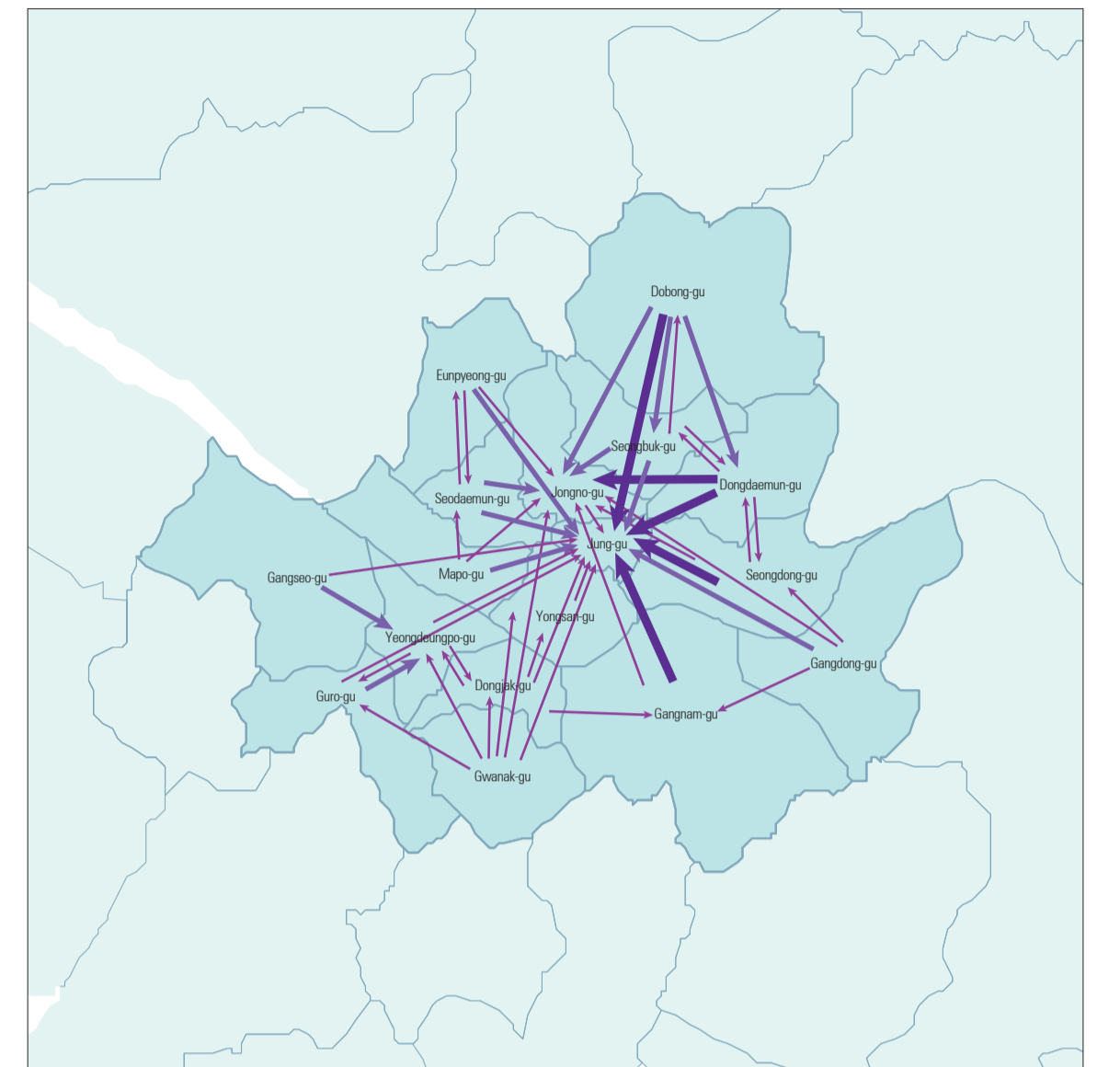
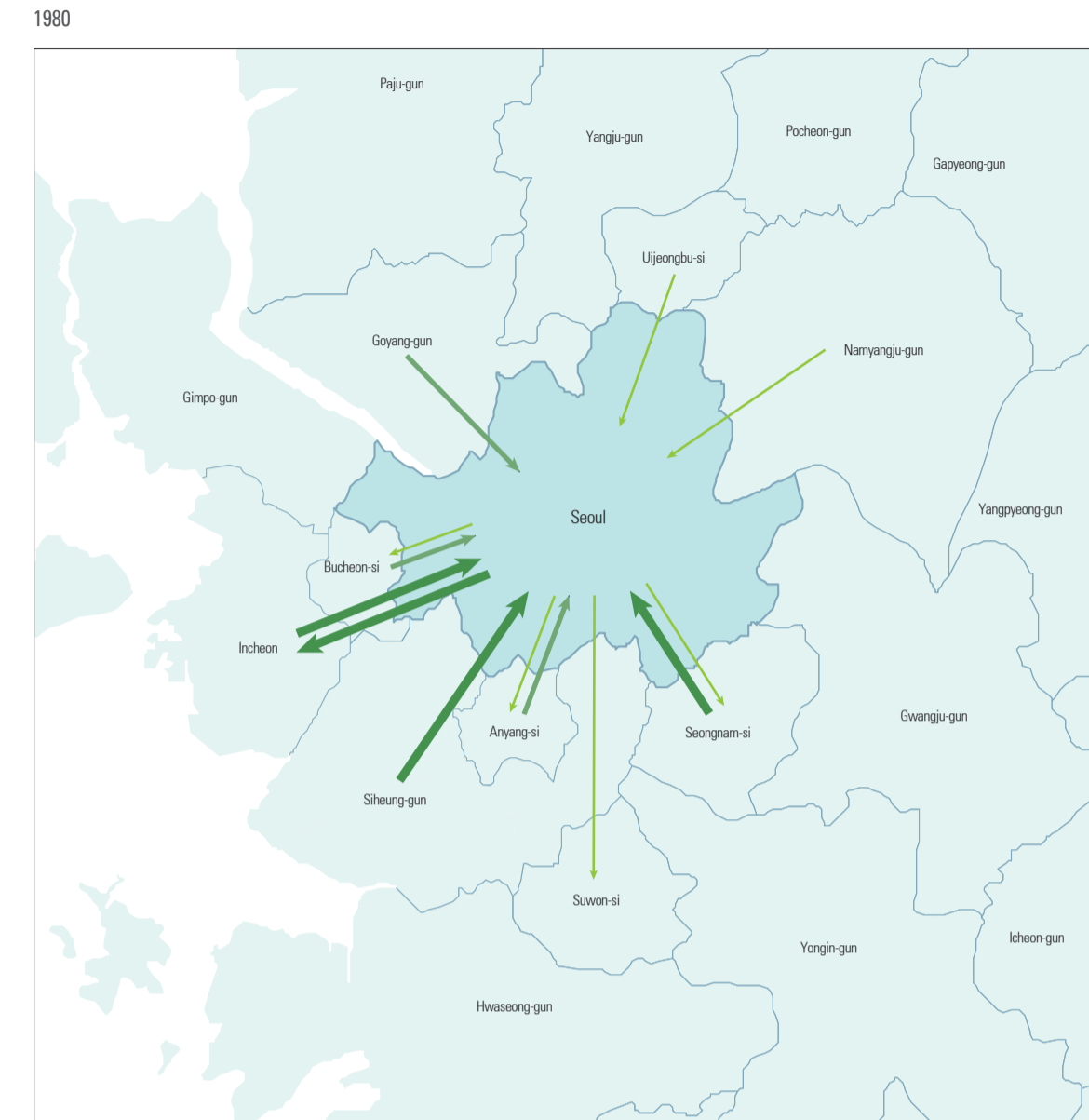
Urban Population and Urbanization Rate



Population Growth of Major Cities



The Growth of Commuters in the Capital Region



The advent of a population increase led to urbanization, both in terms of the increase in the overall number of cities as well as their expansion. In addition, as urban residents moved into the suburbs, urbanization expanded into nearby regions forming greater metropolitan areas. As cities expand, so does the demand for housing and transportation infrastructure; there is likewise a concordant increase in the number of people commuting to and from work or school in the city centers. In the case of the Seoul metropolitan

area, the number of commuters from Incheon and Gyeonggi-do to Seoul was 239,000 in 1980; this number increased to 669,000 in 1990, to 1,072,000 in 2000, and to 1,423,000 in 2010. The number of people who commute from Seoul to its suburbs has also increased from 152,000, to 336,000, to 527,000, and to 572,000 during the same period of time. The number of commuters within Seoul has increased significantly as well as that of commuters between the city and the larger province. In 1980, as many as 3,109,000

people commuted to work or school within Seoul, but that number has gradually increased from 4,680,000 in 1990 to 5,257,000 in 2010. The number of people commuting to work or school within Incheon has increased from 343,000 in 1980 to 644,000 in 1990, and again from 983,000 in 2000 to 1,237,000 in 2010. In particular, the number of people commuting to work or school within Gyeonggi-do has increased considerably from 937,000 in 1980 to 1,768,000 in 1990, and again from 3,441,000 in 2000 to 5,111,000 in 2010. City

buses provided the primary mode of transportation for almost 50% of those people commuting to work or school in 1980, but the percentage of people using the city bus system decreased to less than 20% of the total commuters in 2010 since the means for commuting has become increasingly diversified due to the construction of subway systems and increases in the use of personal transportation. In 2010, approximately 18% of commuters in Seoul relied on the subway systems for their daily travel.

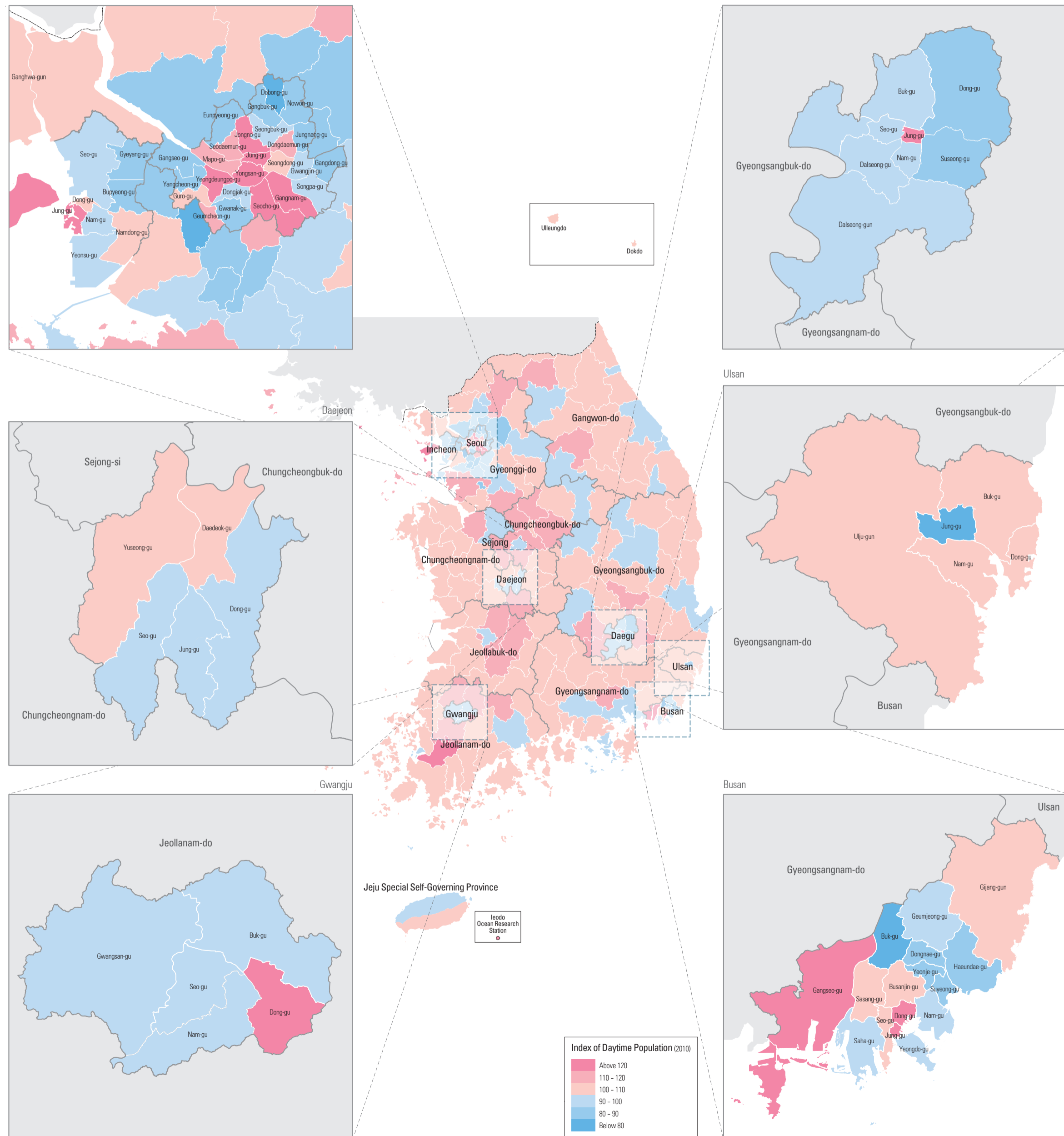
Statistically, the daytime population of a city is calculated by adding the incoming population to the resident population and by subtracting the outgoing population. The daytime population index is a ratio of daytime population as a percentage of the total resident population. The number of employees or commuters

in a certain area is included in the day population, and is calculated using the data of the commuting population. If this index is over 100, the area could be considered a commercial and business district, which means the population is concentrated there only during the daytime. If the index is lower than 100, it indicates

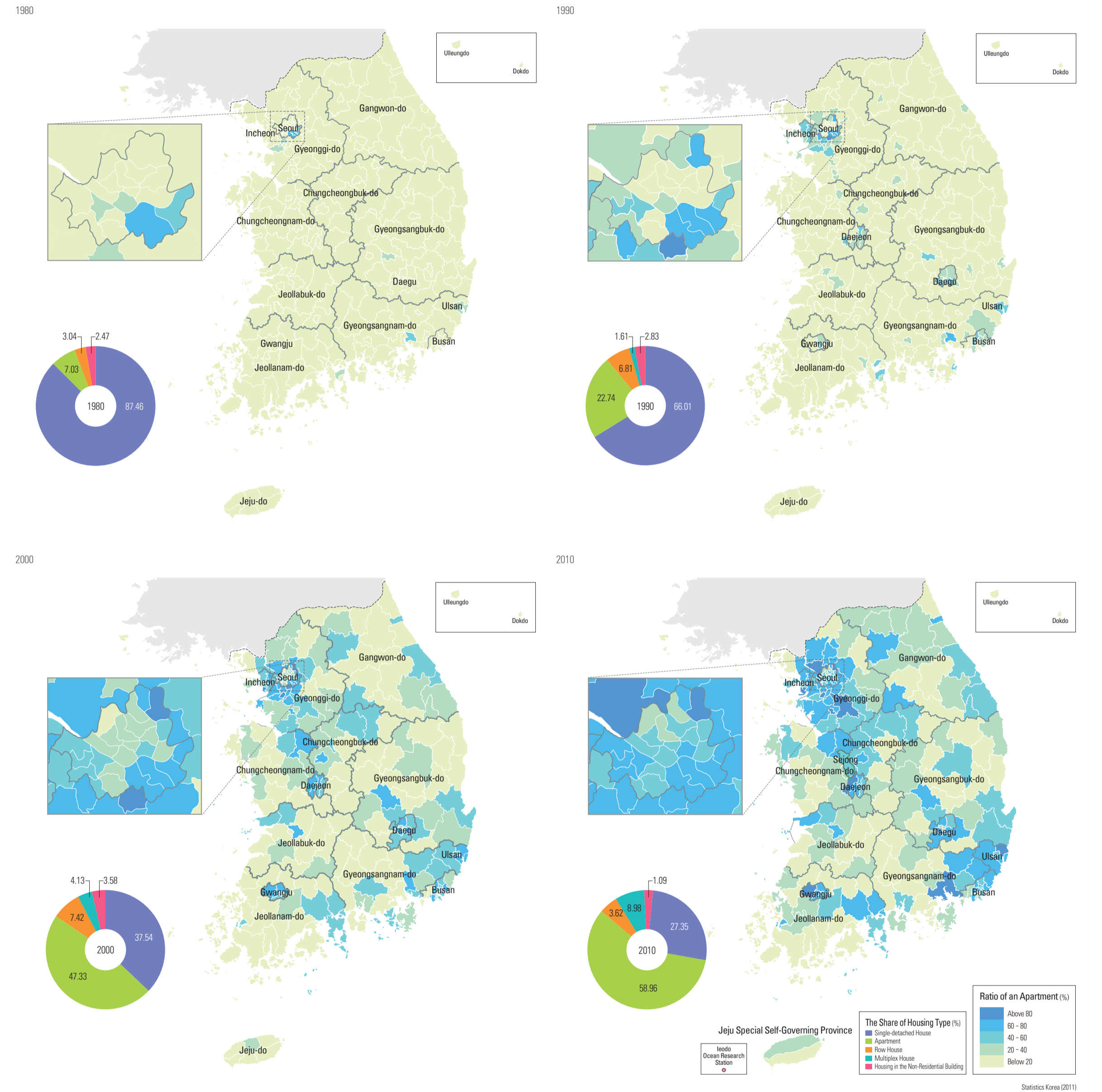
the area is residential which means the nighttime population is larger than daytime population. In the case of Seoul, two of its central business districts, Jung-gu (348.1) and Jongno-gu (238.7), each have a daytime population that is significantly higher than its resident population (as of 2010). The daytime

population index is closely linked to urban problems, and as the gap between the day population and night population becomes larger, it results in further the phenomenon of inner-city decline.

Daytime Population Index



Housing Type and The Change of Apartment Share



As Korea's population grew, the demand for and supply of housing units have both increased as well. The housing supply has soared since the 1980s, exceeding 10 million housing units by the year 2000. The housing supply rate exceeded 100% by 2008. Traditionally, the dominant housing type was single-detached dwellings; however, these have been outnumbered by apartments, thus increasing the

apartment residence rate significantly. The single-detached dwelling ratio was 87.5% in 1980, which dropped to 27.3% by 2010. During the same period, the apartment ratio has increased from 7% to 59%. The supply of apartments varies by region, and the trend shows that the supply is mainly concentrated in the capital and metropolitan areas rather than in nonmetropolitan areas.

The Development of Residential Infrastructure

