

in their careers. The Jeju Special Self-Governing Provincial Government will work with other provincial governments to build a special Jeju Haenyeo Policy Committee.

— **KANG Aeshim** The Jeju Hansupul Haenyeo School, the world's only educational institute for Haenyeo teaches its students traditional fishing methods using only flippers and goggles. Without any breathing equipment, they scour the bottom of the sea for octopus, clams, abalone and conches, among others. At a time when the number of these traditional divers is dwindling sharply (from 26,000 in the 1960s to about 4,500 now) efforts are being made nationwide to infuse pride in the culture, and spur popular endorsements for saving it. One of those endeavors was the establishment in 2007 of the Jeju Hansupul Haenyeo School. With 285 graduates so far and 78 freshmen registered this year, the school aims to train Haenyeo and preserve the culture surrounding it.

— **Joey ROSITANO** Elements of shamanism can be found everywhere in Jeju, in Buddhism and even in Confucian rites. Haenyeo women regularly perform their own rite for safety and prosperity. Shamanic funerary rites are often performed in houses even if the younger residents are not practitioners of shamanism. Shamanism and the religion's shrines on Jeju are quite different from shamanism on the mainland. In Jeju, the village shaman, called shim-bang in Jeju dialect, is the religious leader of each village. Under the pretext of building popular tourist destinations and roads, shrines and "god-trees" are destroyed and many village shamans are coerced to give up their practice as well. The Haenyeo women are deeply concerned that they are no longer able to perform rituals at shrines.

— **Brenda PAIK SUNOO** I would like to share my lessons while documenting the lives of Haenyeo between 2007 and 2009 that resulted in my book *Moon Tides: Jeju Island Grannies of the Sea*. The difference between gratitude and greed, life and death can be determined in a split second. To be a competent and surviving Haenyeo requires not only

technical skill, but humility and generosity not to take more than what you need. However, my intention in interviewing these women was only partially because of their lives in the sea. I wanted to know who these women were once they removed their wet rubber suits.

I have learned through Haenyeo and their families is that they have been able to sustain a continuous, difficult life, often well into their 90s, because they are driven by love, purpose and hope. This perseverance has been maintained in spite of their Korean Han (their pent-up sorrow, regret and suffering) before and during Japan's 35 year occupation, the Korean War and most of all, the six-year-long April 3 Incident that razed 70 percent of the villages in Jeju to the ground and claimed the lives of up to ten percent of the population. During Japan's occupation, Haenyeo led the largest women's anti-colonial demonstration in the nation and participated in subsequent struggles for fair wages and environmental protection. As a bereaved mother who has faced the loss of a child. I may not have been able to understand and replicate the Haenyeo's prowess in the sea.

I tried to find a metaphor that would capture the fluidity of their lives. It was the "tides" because the Haenyeo's diving schedules and safety are regulated by the moon. So I visualized these women's hard lives as being "lifted by the winds and tides" of economic survival, their spiritual beliefs in shamanism, survival from suffering, aging, compassion, love of family and hope for the future generation.

● ● ● Policy Implications

- The number of Haenyeo is steadily decreasing and the Jeju islanders value the unique Haenyeo's community culture more than ever and are trying to register its tangible and intangible cultural heritage with UNESCO. Enough suggestions should be made to establish Haenyeo as a sustainable professional group for the young generation, and alternative solutions like a social security system are necessary to recruit more of the younger generation into the Haenyeo profession.

The Way to Construct Jeju's Eco-Friendly Regional Transportation Infrastructure for Sustainable City



Chair	PARK Hyunchul Director General, Jeju Free International City Development Center
Keynote Speaker	PAK Jaimo Director, Jeju Free International City Development Center
Discussant	KANG Gichoon President, Jeju Research Institute YANG Keunul Vice President, Korea Railroad Research Institute MOON Youngjun Chief Director, Korea Transport Institute LEE Yongtak Director General, JIBS KIM Kyuho Professor, Gyeongju University
Rapporteur	KIM Sihwan Assistant Manager, Jeju Free International City Development Center

— **PAK Jaimo** Along with a steady increase in annual figures for the number of tourists coming to Jeju, there has also been an increase in the permanent population, making for a positive influence on tax revenues and the regional economy. However, it affects the urban infrastructure, including problems with housing, water supply and sewage, waste treatment, parking, transportation and traffic. In fact most pending issues, which stem from the increases in tourism and population have to do with basic infrastructure and are forcing us to come up with better means of tourist transport and ecofriendly regional mass transit systems for the sake of the environment. New ecofriendly means of transportation to consider, in terms of what they might symbolize for Jeju as a tourist destination and their suitability for an island region include bus rapid transit, which is a system whereby express buses run in dedicated lanes or arterial roads; monorail trains, and trams. This will also require an efficient system of connections, including multimodal transfer stations.

If we were to construct a maglev railway con-

necting Jeju International Airport to Jungmun Resort with seven trains running on a line with ten stops and a train arriving every 15 minutes, the construction would cost about 1.3 trillion won and require about 47 billion won a year to operate. This is such an important piece of infrastructure that it should be part of the national budget. Comparing the per kilometer construction cost of the Incheon International Airport maglev line, the Daegu Metro Line 3 monorail, and the Pangyo Tram (scheduled to open in the city of Seongnam in 2020), we find that the cost of the maglev came to 64.6 billion won, the monorail cost 62.3 billion won, and the tram will cost 28.8 billion won per kilometer. This makes the tram the least expensive option, and while trams are good for urban transit, their speed limitations make them less suitable for transportation over a broader region. An official recognition is not normally granted for a transport system that does not connect cities or counties, but operates within a metropolitan jurisdiction, and on an island no less, so this will make it difficult for Jeju to acquire such funding. Thus we

must generate interest in our projects at the Ministry of Transport by conducting successful demonstration projects and providing the logical basis and evidence needed to change the relevant legislation so that we will be eligible for the national governmental financial support.

— **LEE Yongtak** Since Jeju became a Special Self-Governing Province, it has focused on attracting foreign capital, but has not devoted enough attention to constructing such basic urban facilities as transportation infrastructure. In connection with this, the citizenry and the provincial government have to be in agreement, but we have been lacking in this regard as well. There are some big hurdles in the way to improve the transportation system. These included getting the citizenry and the provincial government on the same page, as already mentioned, and getting support from the national government. We also absolutely need the cooperation of related organizations. To succeed at creating a regional transportation network suited to Jeju, there are a number of tasks that have to be completed first, including raising the awareness of citizens, securing a basic traffic system that allows for 60-minute travel between any two points on the island without difficulty, diversifying the options and focus of public relations functions, and working out measures to make full use of road capacity. We also need transit centers at the entry points to the downtown area. It is important to get the local residents on board, and for this we have to hold public hearings that bring the locals into the process, even if it may delay the project. We also need a promotion strategy that makes good use of the provincial media.

— **MOON Youngjun** In Seoul and its suburbs, public transportation accounts for nearly 40 percent of all traffic, but the public transportation system is insufficiently interconnected in Jeju so that most tourists rent a car. Until last year, most of the parking space at Jeju International Airport was taken up by rental cars. I think that, if the parking lot in front of Jeju Airport had been turned into a transit center sooner, getting to Jungmun Resort, Seogwipo, and

other parts of the island would have been much more convenient and the car rental companies could have moved their bases to those other regions.

We need to consider regional transport options other than just buses, such as trams, maglev trains, or monorail systems. More than anything, it is important that we avoid building infrastructure that could be harmful to clean environment in Jeju. With that in mind, trams would be the best option to consider. The trams could run without the need for special structures such as overhead lines in the central parts of the city, but could use overhead line power outside the downtown areas. Unlike maglev trains or monorails, the trams would not spoil the natural scenery. While making the trams the main system of regional transit, we could control the rental cars coming into the city, introducing electric cars and self-driving cars. At the International Electric Vehicle Expo held in Jeju in March, there were discussions about rapidly spreading electric-vehicle and self-driving technologies and policies and about how they will enhance mobility and lead to intelligent transit systems in the cities of the future. I anticipate that Jeju could become the first model of such an intelligent transit system.

— **YANG Keunyul** The traffic problems that Jeju Island is currently experiencing stem from transportation policies that are centered on passenger cars. This is not unique to Jeju but rather is a problem faced by developed countries all over the world. This can be understood to mean that transportation policies that focus on passenger cars will not lead to a solution to serious traffic congestion. Also, transport policies are distorted by the difference in competitiveness between different means of transportation, whose fares are set without considering the indirect costs, such as the expenses incurred to pay for traffic police and electricity for streetlights, and external costs of road use. We need to make competition fair by bringing those indirect and external costs to bear on how fares are set.

Jeju Special Self-Governing Province has the highest ratio of automobile ownership per person

and per household in all of Korea. We have reached the limits of what a transport policy centered on passenger cars can do. In view of the projected permanent population and increases in tourism, we need to introduce high capacity public transit systems that would be sufficient for a city with a population of a million. Just increasing the number of electric vehicles will not solve the problem of capacity, we need to bring in ecofriendly means of transportation. Among the new transportation options being considered are maglev trains, monorails, and trams, but in my opinion, trams would be the most suitable for Jeju. Although trams are a bit slow for use over a broad region, there are tram trains that make up for this. They run like ordinary trams in central urban areas but can travel at speeds similar to railroad trains outside of urban centers. Such light rail transit systems are currently in operation in Karlsruhe, Germany, and other places. Tram trains are something we need to look into.

— **KIM Kyuho** The effects of tourism development on the environment are important because they influence the natural environment and the living space of the people residing in the areas that come under development. Areas developed as tourist attractions have the dual function of providing visitors with places to rest and amuse themselves, but also continuing to serve as places where the local people can make a living and enjoy a normal life. A development that fails to take a location's receptive capacity into account leads to problems of noise pollution, traffic congestion, waste collection, and so on. Thus, consideration of the local residents has to take precedence over the tourists. Also, we must not pursue development that is not grounded in the local culture and only seeks monetary profit. The population of our province showed an average annual increase of 2.4 percent from 2011 to 2015 while the number of tourists visiting rose by a yearly average of 11.8 percent. On the other hand, during that same period, the total length of roads on the island increased by a mere 0.0081 percent, while automobile registrations have been rising an average of 14 percent per an-

num. Any plan for introducing new forms of transportation has to be based on the results of thorough, detailed studies of potential demand, considerations of the needs of local residents versus tourists, and potential traffic problems and their costs, as well as any costs to society.

— **KANG Gichoon** We usually see Jeju's regional transportation issue as a two-fold transport system, first between Jeju and other areas and second between Jeju City and Seogwipo City. If we approach intra-provincial transportation from a somewhat broader perspective, it seems more realistic to see it in terms of the older division of the province into two cities and two counties and their respective living zones. A specific plan for building an ecofriendly transport infrastructure should look to bus rapid transit rather than going to railroads right away, and later, when the demand warrants it, we can switch to a rail system. Until such time, we should expand the role of electric buses for the sake of the environment. If we are to achieve the goal of making Jeju Island carbon-free, we need to put electric buses not only on city lines but on all regional routes. We also need to consider building roads that enable wireless charging of electric vehicles, a technology that has recently become possible.

There is a restructuring of the public transportation system scheduled to go into effect in August 2017 which will involve a variety of measures to make our buses more competitive by running express buses, introducing dedicated bus lanes, and opening new transit centers. This will provide a good basis for later creating much needed direct connections between the eastern and western ends of the island. Also, with the continuous increase in traffic around Jeju International Airport, Jeju Port, and Seongsan Port, we need to head off the problem by designating exclusive public transit lanes and establishing conditions that will make it easier to switch to rail transport in the future. How the construction of transportation infrastructure is to be carried out is of course a very important consideration, but we also need to consider the associated financial aspects.

The infrastructure could be financed by public or private funds or by some combination thereof, but we also need to examine what role local rural assets could play and how the cooperation of public institutions could be brought to bear on financing.

Keywords

construction of an ecofriendly regional transportation infrastructure, introduction of new means of transportation, transportation problems of cities that are tourist destinations, Jeju's traffic problems, self-driving electric vehicles, building infrastructure for the intelligent transport systems of the future, rail transport, maglev(magnetic levitation) trains, bus rapid transit(BRT), monorail, systems of public transportation, carbon-free island, agreement between the provincial government and the people

Policy Implications

- In view of the expectation that traffic congestion will continue to worsen with the increase in the number of both permanent residents and tourists, we have to study ways of building better, ecofriendly transportation infrastructure in order to raise capacity for receiving tourists.
- We also need to look into turning the transportation system itself into a tourist attraction by making optimum use of special characteristics of Jeju as a world class pristine tourist destination in addition to more ordinary enhancements such as introducing new means of transport and adjusting costs.
- We need to analyze the introduction and operation of light rail transit systems in Gimhae and Yongin, which have been running in the red, and in Daegu, which is a success story, and apply what we learn to our own transit systems. Building ecofriendly transportation infrastructure requires tremendous financial resources and as such, the need for an intra-regional transport system must be acknowledged and governmental policy support provided.

Direction of Creating Smart City in Jeju



Chair	BYUN Byung Seol Professor, Inha University
Keynote Speaker	HWANG Kyung Soo Professor, Jeju National University
Discussant	KIM Tae Kyung Senior Researcher, Gyeonggi Research Institute MOON Youngjun Chief Director, Korea Transport Institute SUH Kyo Professor, Seoul National University CHUNG Chae Gun President, United Nations Project Office on Governance CHOI Jeong Seok Professor, Joongbu University
Rapporteur	YUN Wonsu Research Fellow, Jeju Research Institute

— **HWANG Kyung Soo** A smart city is a futuristic high-tech city which marks the culmination of industry convergence based on Information & Communication Technology(ICT). The smart city is a new concept city, where the quality and efficiency of life can be maximized for residents through the organic connection of functions ranging from social infrastructure such as the environment, transportation, utilities and construction industries to home appliances such as electric bulbs. Jeju Special Self-Governing Province(Jeju Province) prioritizes improving the quality of life for local residents and tourists and overcoming the geographical limitations inherent to an island.

U-city is a short for ubiquitous city. The U-city represents a 21st century model for Korean cities, one which can revolutionize basic urban functions by converging urban spaces with high-tech ICT infrastructure and ubiquitous information services to make urban life more convenient, increase the quality of life, ensure safety through systematic urban management, improve the welfare of citizens

and create new industries. In contrast, leveraging ICT technologies and various convergence technologies, a smart city is networked in such a manner that enables mutual exchange of information between people-to-people, people-to-things, and city-to-city. A smart city aims to achieve sustainability, economic feasibility and a higher quality of life. The U-city and smart city are similar in that they are futuristic cities based on cutting edge ICT. However, a U-city focuses on the completeness of a city through ubiquitous technologies, whereas a smart city places a greater focus on cloud computing and big data analytics and information security. This has emerged as a key part of ICT with growing interest in sustainability through connectivity and eco-friendliness. The U.S. concentrates on the creation of smart grids and improving information accessibility to beef up smart infrastructure. In Europe, many experimental projects are underway to improve the quality of life and satisfaction with housing. Japan is building energy management systems to improve energy management technologies and supply new sources