

How Can South Korea Teach, Lead, and Help in Asia's Quest for Smart Cities?

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I. Introduction

As of 2019, Asia and the Pacific's cities were home to over two billion people. By 2050, that number is anticipated to approach 3.5 billion.¹ Meeting growing demands for improved basic services in many of these cities is already an immense public policy challenge. At the same time, many such communities must also confront several environmental and public health crises that have resulted from urbanization. This includes, for example, increasingly dire air pollution—80% of which can be attributed to urban transport in some Asian cities.²

Scaling up smart cities could support decision-makers in how they approach these challenges. For example, “smart” transit systems can use data from CCTV cameras, air sensors, and other internet-enabled devices to adjust

stoplights or bus routes, reducing traffic congestion and mitigating air pollution. Similar systems can also be deployed in power sector management or in the delivery of healthcare services. Yet the flip side of this promise is the extent to which the rapid expansion of smart cities also poses its own policy challenges and risks. This includes how to ensure that these plans are ultimately sound, sustainable, and people-oriented in their design.

This brief examines the rise of smart cities in Asia with an eye toward what role South Korea is playing (or could play) in supporting regional efforts to bring them to scale. In doing so, it seeks to detail key regional priorities and needs that South Korean stakeholders can address. This brief then notes recommendations and open questions in how to move forward.

¹ United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and United Nations Human Settlement Programme (UN-HABITAT), 2019. “The Future of Asian and Pacific Cities 2019: Transformative Pathways towards Sustainable Urban Development,”

United Nations, <https://digitallibrary.un.org/record/3850450?ln=en> (accessed 22 August 2021).

² Asian Development Bank (ADB), 2017. “Key Priorities: Urban Transport,” ADB, <https://www.adb.org/sectors/transport/key-priorities/urban-transport> (accessed 22 August 2021).

II. Overview of Smart Cities in Asia

Although there are numerous definitions for what makes a city a “smart city,” the World Bank notes that most generally convey one or both of two key ideas. The first is “a technology-intensive city,” with highly efficient public services thanks to data gathered in real time by thousands of interconnected devices. The second is more broadly “a city that cultivates a better relationship between citizens and governments—leveraged by available technology.”³

Notably, both definitions suggest a vision for urban planning where information technology plays an important role in city maintenance and control—yet also hint at the idea that different communities may vary in their views of what systems are required (or even appropriate) in their specific vision. Even so, both definitions only partially address how to think about what makes a *particular* urban center uniquely “smart”—given that, already, many communities are seeing increasingly ubiquitous use of smartphones and other digital products. On

this point, scholars at Yonsei have added that “smart” development should be understood as about not only increasing connectivity but also improving the overall usefulness and quality of locally available digital services.⁴

Understood in these terms, as of 2021, virtually every country in Asia has announced some plan for standing up smart cities, with national- and/or city-level governments launching either pilot projects or official strategies to coordinate activities and investment across different stakeholder groups. India, for example, launched a nationwide “Smart Cities Mission” in 2015 and has subsequently confirmed projects spanning 100 cities.⁵ Meanwhile, China has arguably led the region in terms of overall scale—with a review conducted by Rina Chandran of Thomson Reuters Foundation suggesting that the country is headed toward standing up roughly 500 smart cities domestically.⁶ Singapore, Indonesia, Vietnam, and the other member states of Association of Southeast Asian Nations (ASEAN) have also all individually announced pilot projects as well as collectively agreed to coordi-

³ Arturo Munte-Kunigami and Victor Mulas, 2015. “Smart Cities,” World Bank, <https://www.worldbank.org/en/topic/digitaldevelopment/brief/smart-cities> (accessed 22 August 2021).

⁴ Jung-hoon Lee, 2019. “2019 Smart Cities Index Report,” Yonsei Information Systems Intelligence Lab, <http://isi-en.yonsei.ac.kr> (accessed 22 August 2021).

⁵ Press Information Bureau, Ministry of Housing & Urban Affairs, Government of India, 2015. “Prime Minister Launches Smart Cities, AMRUT, Urban Housing Missions,” Government of India, <https://pib.gov.in/newsite/PrintRe>

<lease.aspx?reid=122788> (accessed 22 August 2021); R.K. Misa and Arun Kang Joseph. 2019. “Smart City Technologies Can Tackle India’s Urban Explosion. But Key Questions Must be Asked,” the Print, <https://the-print.in/opinion/smart-city-technologies-can-tackle-indias-urban-explosion-but-key-questions-must-be-asked/328935/> (accessed 22 August 2021).

⁶ Rina Chandran, 2020. “Tencent’s ‘Smart City’ Seen as Model for Post-Coronavirus China,” Thomson Reuters Foundation, <https://news.trust.org/item/20200624080235-95zxs> (accessed 22 August 2021).

nate planning via a recently launched sub-regional platform, the ASEAN Smart Cities Network.⁷

South Korea, too, has detailed its own roadmap for smart development. This includes designing and refining a number of national-level initiatives over the past two decades, most recently as codified in the country's *Third National Plan for Smart Cities (2019-2023)*.⁸ Though South Korea has been less ambitious than many of the efforts mentioned above in terms of the number of nationally designated pilot cities—only Busan and Sejong are currently classified as such—additional sites, such as Seoul, have already integrated smart cities goals into their urban planning. Yet arguably of greater significance (and the reason for this brief's focus on South Korea) is the way in which South Korea has been able to lead on actual development. To that end, several international indexes have ranked

Seoul as one of the world's "top" smart cities, praising the city's first-in-class digital infrastructure as well as services that support civic participation.⁹ More broadly, South Korea has also made incredible strides toward ensuring that its digital offerings are truly accessible to all. For example, a 2018 survey conducted by the Pew Research Center found that 96% of the country's adult population uses the internet or own a smartphone; the highest rate of digital adoption anywhere in the world.¹⁰

Thus, and returning to how South Korea might inform larger regional trends, President Moon Jae-in has articulated aims for not only bolstering South Korea's own smart cities, but more broadly "spearheading the era of smart cities worldwide."¹¹ This includes a goal for expanding South Korea's digital engagement with ASEAN and India under his "New Southern Policy Plus."¹² Yet in a region where many countries are already highly active on

⁷ Association of Southeast Asian Nations (ASEAN) Secretariat, 2020. "ASEAN Smart Cities Network," ASEAN Secretariat, <https://asean.org/our-communities/asean-smart-cities-network/> (accessed 22 August 2021). For a survey and independent review of various efforts within this sub-region, see also McKinsey Global Institute. 2018. "Smart Cities in Southeast Asia," McKinsey & Company, <https://www.mckinsey.com/~media/mckinsey/industries/capital%20projects%20and%20infrastructure/our%20insights/smart%20cities%20in%20south-east%20asia/mgi-smart-cities-in-southeast-asia.pdf> (accessed 22 August 2021).

⁸ Ministry of Land, Infrastructure, and Transport, Republic of Korea, 2021. "Smart Cities Portal," Ministry of Land, Infrastructure, and Transport, Republic of Korea, <https://smartcity.go.kr/en/> (accessed 22 August 2021).

⁹ See, for example, rankings by Eden Strategy Institute at <https://www.smartcitygovt.com/>.

¹⁰ Jacob Poushter, Caldwell Bishop, and Hanyu Chew, 2018. "Across 39 Countries, Three-Quarters Say They Use the Internet," Pew Research Center, <https://www.pewresearch.org/global/2018/06/19/across-39-countries-three-quarters-say-they-use-the-internet/> (accessed 8 September 2021).

¹¹ Office of the President, the Republic of Korea, 2020. "Opening Remarks by President Moon Jae-in at Presentation of Smart City Strategy Associated with Korean New Deal, Office of the President, the Republic of Korea, <https://english1.president.go.kr/briefing-speeches/speeches/896> (accessed 22 August 2021).

¹² For a detailed examination of this policy, see Moe Thuzar. 2021. "The New Southern Policy Plus: What's New and What's Next?," KIEP World Economy Brief, https://www.kiep.go.kr/gallery.es?mid=a20301000000&bid=0007&list_no=9367&act=view (accessed 22 August 2021).

smart development, what needs and roles might South Korea fill specifically? The next section explores this question in greater detail.

III. Needs

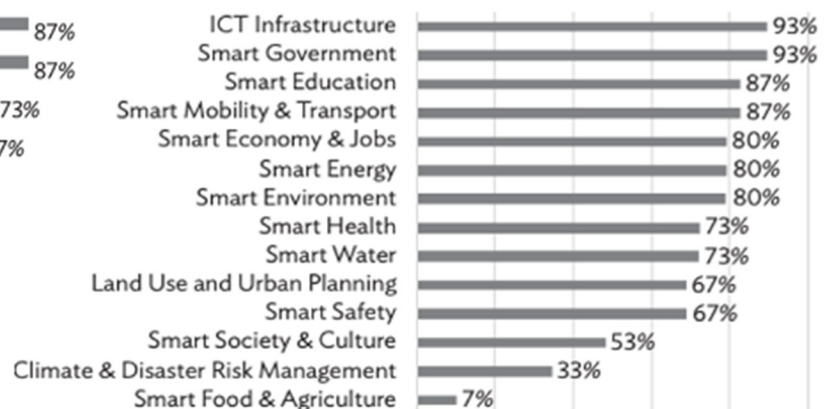
In 2020, the Asian Development Bank (ADB) reviewed fifteen templates for “smart cities” development then deployed across Asia, as a means of identifying commonalities in what different countries were hoping to achieve; findings that, in turn, could suggest potential foundations for deeper South Korea-Asia cooperation. The study found, for example, that the

two most frequently cited objectives for pursuing smart development among these models were advancing “innovation” and “sustainability” (Figure 1). In terms of how countries then looked to translate these and other high-level goals into next-steps, the study further found that virtually all of these models noted explicit aims for bolstering information and communications technology (ICT) infrastructure as well as e-governance. Many also featured notable ambitions for expanding the use of digital tools in specific functional areas, including applications linked to energy, transit, education, and the environment (Figure 2).¹³

Figure 1. Smart Cities Objectives in Asia



Figure 2. Smart Cities Action Areas in Asia



Note: As observed in 15 development templates across the region. Though the source chart for Figure 1 listed “frequency” instead of “sustainability,” this entry has been changed in line with a review of the surrounding text in the underlying study.

Source: Asian Development Bank (2020)

¹³ Seok Yong Yoon, Hong Soo Lee, Thilo Zelt, Ulf Narloch, and Elliot Aguirre, 2020. “Smart Cities Pathways for Developing Asia,” ADB,

<https://www.adb.org/sites/default/files/publication/673441/sdwp-071-smart-city-pathways-developing-asia.pdf> (accessed 22 August 2021).

At a high-level, many of these aims resonate with South Korea's own vision for smart cities. Moon, for example, has emphasized how smart projects can and should support "digital and green" growth, while plans for Sejong and Busan have prioritized acting on smart mobility, education, healthcare, and energy, among other fields.¹⁴ For thinking about appetites for collaboration generally, this suggests at least a partial alignment between South Korean and wider Asian interests and activities.

Equally notable, though, is that these shared interests also touch upon areas where South Korean government agencies, private firms, and development organizations have well-established competitive strengths. Among other fields, this includes in infrastructure, high-tech manufacturing, and advanced mobility. E-governance has also emerged as a key South Korean strength, with the country topping the Organisation for Economic Co-operation and Development (OECD)'s *Digital Government Index*.¹⁵

Indeed, South Korean stakeholders are already working with regional counterparts on

these varied fronts in numerous ways. Yet even so, at least four key opportunities for expanding South Korea-Asia cooperation on smart development stand out. These are explored in the next four sub-sections.

Scaling-up necessary infrastructure. Even with Asia's rapid digital transformation, the limited availability and reliability of basic network infrastructure remains a barrier to smart cities development in a number of countries. Meanwhile, several studies have argued that even in instances where notable digital infrastructure is already in place, some systems may nonetheless need to be updated or replaced to handle the more ambitious applications and use cases suggested above.¹⁶

Thus, and perhaps not surprisingly, a key aspect of the Moon administration's New Southern Policy has focused on strengthening mechanisms for South Korean entities to contribute to and participate in digital infrastructure projects in South and Southeast Asia.¹⁷ This includes expanding dialogues and other workstreams within well-established fora, such as

¹⁴ Office of the President, the Republic of Korea, 2020. "Opening Remarks by President Moon Jae-in at Presentation of Smart City Strategy Associated with Korean New Deal," Office of the President, the Republic of Korea, <https://english1.president.go.kr/briefing-speeches/speeches/896> (accessed 22 August 2021); Smart City Korea. 2021. "Busan Eco Delta Smart City," Ministry of Land, Infrastructure and Transport, Republic of Korea, <https://smartcity.go.kr/en/프로젝트/국가시범도시/부산-에코델타-스마트시티/> (accessed 9 September 2021); Smart City Korea. 2021. "Sejong 5-1 Living Area," Ministry of Land, Infrastructure and Transport, Republic of Korea,

<https://smartcity.go.kr/en/프로젝트/국가시범도시/세종-5-1생활권/> (accessed 9 September 2021).

¹⁵ Organisation for Economic Co-operation and Development (OECD), 2020. "Digital Government Index: 2019 Results," OECD, <https://dx.doi.org/10.1787/4de9f5bbe> (accessed 8 September 2021).

¹⁶ Centre for Liveable Cities, Singapore, and United Nations ESCAP. 2018. "The Future of Asia and Pacific Cities 2019 Report," UNESCAP, <https://www.unescap.org/sites/default/files/CLC%20UNESCAP%20Smart%20Cities%20Report.pdf>. (accessed 22 August 2021).

¹⁷ Clara Gillispie, 2021. "The Asia-Pacific's Digital

the ASEAN-Korea Centre, as well newly partnering with various regional platforms, including the aforementioned ASEAN Smart Cities Network. Other efforts have further complemented these pushes by sharing lessons learned from South Korea's experiences in rapidly scaling up its own domestic digital infrastructure, including its 5G networks and Covid-19 Smart Management System (a system that was built using the architecture of the country's smart cities digital hub).¹⁸

To take these efforts further, a key question is the extent to which Seoul might be able to better align with and build upon additional region-wide initiatives. This includes questions about the desirability of enhancing coordination between South Korea's New Southern Policy and various regional "Indo-Pacific" Strategies that have also prioritized infrastructure cooperation. Here, the United States, Australia, and Japan have already begun a trilateral partnership, where adding South Korea to this grouping might benefit multiple parties.

Bolstering data governance safeguards. As suggested earlier, policymakers and urban planners across Asia are hoping that smart technologies can help them to better manage

growing demands on a wide range of public services. Yet, if not well managed, the rapid proliferation of these technologies can also fuel new harms: increasing community exposure to serious cybersecurity threats or otherwise enabling unwanted surveillance, for example. How and to what extent communities across Asia are ultimately able to benefit from the rise of smart cities will thus also be linked to how their underlying technologies are deployed, restricted, or otherwise governed.

Here, South Korea's experiences in reforming its own data governance regimes could offer invaluable insights. For example, recent changes to both the country's Smart Cities Act and Personal Information Protection Act have explored how to better safeguard privacy rights without creating unnecessary barriers to innovation. This includes reforms that have sought to codify specific best practices—such as for anonymization—as well as reinforce how and when citizens are required to explicitly "opt-in" before their data can be used.¹⁹

Enhanced coordination between South Korea and its neighbors on smart development could thus also involve the greater sharing and debate of regional data governance best practices.

Transformation: What Role Can U.S.–South Korea Cooperation Play?," the National Bureau of Asian Research, <https://nbr.org/publication/the-asia-pacifics-digital-transformation-what-role-can-u-s-south-korea-cooperation-play/> (accessed 22 August 2021).

¹⁸ For more on this later point, see June Park. 2021. "Striking a Balance between Data Privacy and Public Health Safety: A South Korean Perspective," the National Bureau of Asian Research,

<https://www.nbr.org/publication/striking-a-balance-between-data-privacy-and-public-health-safety-a-south-korean-perspective/> (accessed 24 August 2021).

¹⁹ Clara Gillispie, 2021. "The Asia-Pacific's Digital Transformation: What Role Can U.S.–South Korea Cooperation Play?," the National Bureau of Asian Research, <https://nbr.org/publication/the-asia-pacifics-digital-transformation-what-role-can-u-s-south-korea-cooperation-play/> (accessed 22 August 2021).

India, for example, is currently in the midst of operationalizing its own new data governance regime and is grappling with a number of the issues mentioned above. This might suggest both a timely need and specific focus for expanding South Korea's regional outreach.

Yet bilateral engagement alone can also only do so much. As one example of what this means, experts have argued that fragmented development of the region's standards for data governance—such as for cybersecurity—could lead to contradictory or non-interoperable policies across Asia; ultimately “hinder[ing] data flows region-wide and increase[ing] the cost and risk of doing business online.”²⁰ Consequentially, finding opportunities to grow and strengthen bilateral and multilateral coordination should ultimately be at the heart of South Korean outreach to the wider Indo-Pacific. While both the Asia-Pacific Economic Cooperation (APEC) and Group of 20 (G20) have been important forums for these debates, the former does not cover India while the later does not include

most of ASEAN's membership. As a member of both groupings, South Korea can and does play an important role in bridging these dialogues—but to fully deliver on the vision of Moon's New Southern Policy, South Korea may also want to review the need for and benefits of a dedicated “Indo-Pacific” forum to better bring all parties together at a single table.

Encouraging a “people-oriented approach.”

Beyond privacy and surveillance risks, a growing question for smart development is how to more broadly ensure that specific systems or practices deliver on the goals that they are intended to support. For example, several studies have raised concerns that increased reliance on smart governance could amplify, rather than diminish, social inequalities; pushing critical services out of reach of certain populations if such systems are not *explicitly* designed with their concerns in mind.²¹ Others have cautioned that what government officials value in smart development does not necessarily align with the tools or services that individuals, businesses, or other local audiences actually want.²² At minimum, this suggests

²⁰ Lurong Chen, 2020. “Improving Digital Connectivity for E-commerce: A Policy Framework and Empirical Note,” in Chen, L. and F. Kimura (eds.), “E-commerce Connectivity in ASEAN,” Economic Research Institute for ASEAN and East Asia, https://www.eria.org/uploads/media/E-commerce-Connectivity-in-ASEAN/6_Chapter-2_Improving-Digital-Connectivity-for-E-commerce_A-Policy-Framework-and-Empirical-Note.pdf (accessed 22 August, 2021).

²¹ See, for example, Seok Yong Yoon, Hong Soo Lee, Thilo Zelt, Ulf Narloch, and Elliot Aguirre. 2020. “Smart Cities Pathways for Developing Asia,” ADB, <https://www.adb.org/sites/default/files/publication/673441/sdwp-071-smart-city-pathways-developing-asia.pdf> (accessed 22 August 2021).

²² See, for example, findings in KPMG China, CLP Holdings Limited, JOS, Siemens, Wilson Group, and Smart Cities Consortium. 2019. “Connected Cities: Citizen insights across Asia Pacific (2019 Survey),” KPMG, <https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2019/01/connected-cities-citizen-insights-across-asia-pacific.pdf> (accessed 9 September 2021). For more on this issue in the context of past South Korean smart city efforts, see also Clara Gillispie. 2020. “https://www.nbr.org/wp-content/uploads/pdfs/publications/sr84_networked_benefits_may2020.pdf,” the National Bureau of Asian Research, https://www.nbr.org/wp-content/uploads/pdfs/publications/sr84_networked_benefits_may2020.pdf (accessed 9 September 2021).

that overly “top-down” development strategies may result in missed opportunities—including for catalyzing greater overall levels of innovation.

At least part of the above has a remedy that is relatively straightforward: including more diverse perspectives in decision-making. To this point, Jung-hoon Lee, an expert on smart cities who advises the city of Seoul, has argued that one of the most significant reforms that South Korea has undertaken in revitalizing its own approach to smart development during the past decade has been crafting new mechanisms for integrating community feedback (e.g. standing committees that are formally tasked with bringing together a range of stakeholders both inside and outside of government).²³ National policies that encourage “open by design” digital development (e.g. committing to open-source infrastructure; making datasets publicly accessible) can also help to support how private developers and the public can independently shape the future of smart cities; supporting how they might create their own tools as well as audit and refine those of others. Though South Korea admittedly has more to do on advancing its own work here, its efforts to date have nonetheless been laudable—and are a key part of the reason for its top ranking in the OECD’s *Digital Government Index*.²⁴

As South Korea considers how to expand its

collaboration with other countries in Asia, sharing these kinds of lessons learned and specific practices could help to better ensure that the region’s “smart” development is genuinely deserving of that name. Yet if such region-wide dialogues are to truly reflect a “people-oriented” approach, they cannot be solely between government officials. Here, it is worth noting that a range of South Korean stakeholders—including civic tech activists, business leaders, and other non-governmental representatives—are already active in such regional engagement, including via relevant platforms such as WeGO, GoSMART, and GOV. Growing these and other similar initiatives should thus be considered a key pillar, rather than an ancillary track, in how South Korea can deepen its regional outreach.

Expanding funding mechanisms. All of the above require resources. To date, the South Korean government has been active in providing development financing to countries across Asia, including via the Korean International Cooperation Agency (KOICA) and the more recently established Korea Overseas Infrastructure & Urban Development Corporation (KIND). South Korea also serves as a vital sponsor and partner nation of the World Bank and Asian Development Bank, two organizations that play a critical role in providing grants and loans for “smart and sustainable” urban planning in emerging Asia.

²³ Author’s conversation with Jung-hoon Lee, Seoul, October 2019.

²⁴ OECD, 2020. “Digital Government Index: 2019 Results,” OECD, <https://dx.doi.org/10.1787/4de9f5bb-en> (accessed 8 September 2021).

Yet more than just the direct provision of capital is the question of how to improve the general bankability of the region's increasingly numerous smart city projects, so that they are better able to attract funding from a diverse range of sources (including the private sector). As aptly framed by ADB's Lara Arjan, smart cities proposals can often face challenges in attracting investment due to a number of reasons, including their "uncertain return on investment," "complexities due to the involvement of stakeholders from multiple sectors," "long timelines" for development, and difficult to quantify benefits ("especially the social benefits").²⁵

While KIND and KOICA already play a role in helping projects to address these concerns via various capacity building efforts, there remains significant need for such efforts to be expanded (as well as for more innovative financing models more broadly). Here, once again, the impact of South Korean efforts might be best amplified not by "going it alone," but by finding ways to combine forces with like-minded partners. As this essay has repeatedly sought to highlight, this includes the potential for deepening coordination and cooperation with the United States.

IV. Scenarios for the Future

As aptly put by the OECD, "[w]hile smart cities have the potential to change cities for the better, they also come with potential hidden costs."²⁶ For Asia, this includes potential trade-offs in the pursuit of certain tools or systems, as well as ever-present risks that if not well aligned with local needs, time- and money-intensive projects may ultimately become stranded assets.

These issues are complex, and the technical, philosophical, and structural considerations that impact them are ever evolving. Even countries with decades of experience in smart development may ultimately struggle to find "good" and lasting answers on their own. This caveat applies to South Korea as well. For the Asia-Pacific to be able to fully realize the benefits of a "smart" development in the years ahead, there is thus an immediate and longer-term need for decision-makers to address the deficiencies in existing mechanisms for regional collaboration mentioned above. Equally critical is expanding *who* is at the table, where bolstering engagement across professional and personal backgrounds remains an unfinished yet urgently needed task.

²⁵ Centre for Liveable Cities, Singapore, and UNESCAP, 2018. "The Future of Asia and Pacific Cities 2019 Report," UNESCAP, <https://www.unescap.org/sites/default/files/CLC%20UNESCAP%20Smart%20Cities%20Report.pdf>. (accessed 22 August 2021).

²⁶ Organisation for Economic Co-operation and Development (OECD), 2020. "Smart Cities and Inclusive Growth," OECD, https://www.oecd.org/cfe/cities/OECD_Policy_Paper_Smart_Cities_and_Inclusive_Growth.pdf (accessed 22 August 2021).

While many such efforts are underway, their success is by no means guaranteed. And with the Covid-19 pandemic increasing strains on many local- and national-level budgets across the region, there is a risk that some may retreat in their ambitions: prioritizing quick, cheap, and easy, over inclusive, sustainable, and complex. In sum, “smart” development may offer the promise of spurring on innovation and economic advancement – but what it requires is more than just technology.

V. Conclusion

Countries across Asia are betting big on smart cities and have outlined ambitious national plans for their development. As this brief has explored, South Korea could play a positive role in how other countries across the region might be able to realize these ambitions through

several means. Such means include not only providing direct financial, technical, and developmental support, but also sharing its own lessons learned and best practices in cultivating sustainable, secure, and inclusive smart cities.

Even so, this brief has also argued that additional attention should be given to deepening and expanding South Korea’s regional engagements, if the country is to realize the Moon administration’s vision of “leading” a new era of smart development. To that end, enhanced coordination might be conducted via several existing forums, including ASEAN, APEC, and the G20, as well as through establishing new joint initiatives. Through helping to foster new and more robust mechanisms for multilateral cooperation, South Korean could not only play a positive role in supporting the rise of smart cities in Asia but also contribute to securing its own “smart” future. **KIEP**