



The Future of Asia and Pacific Cities 2019 Report

Thematic consultation on Smart Cities in Asia and the Pacific

10 July 2018, Singapore
Meeting Report

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Thematic consultation on Smart Cities in Asia and the Pacific

15:00-18:00, 10 July 2018

Room 4812, Level 4, Simpor Junior Ballroom,
Marina Bay Sands Expo & Convention Centre, Singapore

Meeting Report

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Background

The speed and scope of urbanisation in Asia and the Pacific is unprecedented. Between 1980 and 2010, the region's cities grew by around one billion people, and by 2014, 55 per cent of the worldwide population was living in Asia and the Pacific.¹ This growth will continue – United Nations projections show the region's cities will add another one billion by 2040.² This rapid urbanisation has contributed to a number of development challenges; it is estimated up to 65 per cent of the Sustainable Development Goal targets will need to be met in or by cities.³ The region's development prospects will increasingly depend on how its cities are managed, and the future success of sustainability in Asia-Pacific cities will to a great extent determine the future state of the planet and the sustainability of the global population's shared prosperity. As a result, the Asia-Pacific region is primed to serve as a 'possibility space' for re-imagining the built and natural environments that can emerge or be strengthened in cities.

The concept of smart cities is one way to re-imagine the region's cities and may provide a pathway towards equitable and sustainable cities. Though there is no universal definition of a smart city, it generally refers to a city in which traditional infrastructure is integrated and coordinated with ICT and other new digital technologies.⁴ Smart cities promise both the automation of routine functions that serve individual people, buildings, and traffic systems, but also the capabilities and capacities to be able to monitor, understand, analyse, and plan a city to improve the efficiency, equity, and quality of life for its citizens in real time, whilst reducing the city's environmental impacts and emissions.⁵ Therefore, smart city strategies support or encompass some or all of the following: buildings, transportation, energy, water, waste management, public safety, disaster warning and response, education, and governance and administration. The concept is rapidly gaining traction in the Asia-Pacific region. It is estimated that investments in the technologies that enable smart city initiatives will reach \$28.3 billion in 2018 in the Asia-Pacific region (excluding Japan), and that this spending will accelerate, reaching \$45.3 billion in 2021.⁶

However, there are potential challenges and limitations of developing Asia-Pacific's cities using a smart cities approach. For example, top-down or technocratic approaches to smart cities risk not being participatory and not capturing or responding to the needs of citizens. Smart cities in developing countries also need to overcome the digital divide, which falls along social, economic, generational, and gender lines.⁷ For example, though the proportion is increasing rapidly, only 43

¹ UN-Habitat and ESCAP, *The State of Asian and Pacific Cities 2015* (UN-Habitat and ESCAP, 2015).

² Ibid.

³ Philipp Misselwitz and Jesús Salcedo Villanueva, "The Urban Dimension of the SDGs: Implications for the New Urban Agenda", in *Sustainable Development Goals and Habitat III: Opportunities for a successful New Urban Agenda* (Brussels, Cities Alliance, 2015). (<http://www.citiesalliance.org/sites/citiesalliance.org/files/Opportunities%20for%20the%20New%20Urban%20Agenda.pdf>).

⁴ M. Batty and others, "Smart cities of the future", *The European Physical Journal Special Topics*, 214(1), pp.481-518 (<https://link.springer.com/content/pdf/10.1140%2Fepjst%2Fe2012-01703-3.pdf>).

⁵ Ibid.

⁶ IDC, *First-ever IDC Smart Cities Spending Guide Expects Technologies Enabling Smart Cities Initiatives to Reach \$28.3 Billion in 2018* (IDC, 22 March 2018) (<https://www.idc.com/getdoc.jsp?containerId=prAP43679518>).

⁷ Ayona Datta, *Three big challenges for smart cities and how to solve them*, (The Conversation US, 9 June 2016) (<https://theconversation.com/three-big-challenges-for-smart-cities-and-how-to-solve-them-59191>).

per cent of people in Asia-Pacific were internet users in 2016.⁸ Data for smart cities is also an issue, both in the quality availability, ownership, transparency and accountability, security, and whether citizens' rights to privacy and political activity are respected.⁹

There are a variety of examples of smart city initiatives in the Asia-Pacific region. The ASEAN Smart Cities Network, supported by the Government of Singapore through its ASEAN Chairmanship, aims to facilitate cooperation on smart cities development. The initiative will work with 26 pilot cities to catalyse bankable projects with the private sector, and secure funding and support from ASEAN's external partners, whilst recognising the need to focus on local priorities and cultural contexts.¹⁰ In India, the Smart Cities Mission, administered by the Ministry of Housing and Urban Affairs, seeks to retrofit and redevelop existing areas, including slums, into better planned ones, and develop new greenfield areas around cities in order to accommodate expanding urban populations.¹¹ Countries such as Singapore and the Republic of Korea are also investing in smart cities, with an emphasis on technology, connectivity, efficiency, urban density, and environmental sustainability.¹² These examples represent different approaches in the region, driven by different stakeholders (national government versus city-driven, with different roles for private national and multinational corporations). They also reflect the various understandings and conceptualisations of the term smart cities, and the multifaceted and disruptive potential of the concept to contribute to sustainable and equitable cities in the region.

⁸ ESCAP Online Statistical Database based on data from the ITU, 20 February 2018 (Available from http://data.unescap.org/escap_stat/ (accessed 10 May 2018)).

⁹ Archit Grover and Neelu Walia, Big Data in Smart Cities (Carleton University, 2015) (https://www.researchgate.net/publication/313074360_Big_Data_in_Smart_Cities?enrichId=rgreq-c058b08f04ccd01ff1ff60fe07b338d0-XXX&enrichSource=Y292ZXJQYWdlOzMzMzA3NDM2MDtBUzo0NTYyOTE4ODI2NzlxMjhAMTQ4NTc5OTg3MTAwMg%3D%3D&I=1_x_2&esc=publicationCoverPdf).

¹⁰ ASEAN, ASEAN Smart Cities Network Concept Note (ASEAN, 2018) (<http://asean.org/storage/2018/04/Concept-Note-of-the-ASEAN-Smart-Cities-Network.pdf>).

¹¹ Ministry of Housing and Urban Affairs, the Government of India, What is Smart City (2017) (<http://smartcities.gov.in/upload/uploadfiles/files/What%20is%20Smart%20City.pdf>).

¹² Celine Delacharlerie, Asia-Pacific is paving the way for Smart Cities (Innovation Is Everywhere, April 2017) (<https://www.innovationiseverywhere.com/smart-cities-asia/>).

The Future of Asia and Pacific Cities 2019 Report

The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) in partnership with the Asian Development Bank, UN-Habitat, the Rockefeller Foundation, Singapore's Centre for Liveable Cities and UNDP are producing a major Report on cities in the Asia-Pacific region, titled the Future of Asia and Pacific Cities 2019 Report. It will be a policy advocacy Report, and its purpose will be to support inclusive and sustainable long-term thinking and decision-making by national and local governments by providing a conceptual framework for solutions to the problem of localising the global agendas in Asia-Pacific cities. To these ends the Report will critically assess and provide knowledge and best practices of the means of implementation on a range of urban sustainability areas, including the future of urban finance, governance and capacity development, smart urban data and technologies, and urban/territorial planning.



The Report is envisaged as more than a publication, but also seeks to strengthen partnerships formed while creating knowledge for the Report through a diverse array of countries and urban stakeholders. This process has engaged partners to co-produce the Report's thematic areas, and to co-convene and co-host a series of consultative meetings throughout the Asia-Pacific region to discuss and provide inputs into various chapters. Through such a process, the Report will be produced both for and by countries in the Asia-Pacific region, and it is expected that consultations will build champions, with the participants developing ownership over the Report and taking forth knowledge and recommendations. Participants will be contributing to a major policy advocacy Report on cities in the region, and this Report and the process of producing it will inform the thematic areas and structure of the 7th Asia-Pacific Urban Forum, where the Report will be launched in the second half of 2019.

To these ends, ESCAP and Singapore's Centre for Liveable Cities (CLC) are partnering to develop the Report's chapter on the Future of Smart Urban Data and Technologies, which will focus on how cities in the region can create sustainable communities and contribute to achieving the SDGs through the application of data innovations and smart city development, and will highlight issues around the governance of smart cities, the digital divide, the gaps in technical capacities and skills to implement and run smart systems, data limitations, and privacy concerns.

As part of this process, ESCAP, in partnership with CLC, hosted a thematic consultation on smart cities in Asia and the Pacific. The purpose of this consultation was to provide stakeholder inputs for the overall Future of Asia and Pacific Cities 2019 Report on the key thematic area of smart cities. It focused on a review of challenges and future opportunities related to smart cities in Asia and the Pacific. The consultation took place during the afternoon of 10 July 2018 at Marina Bay Sands, Singapore, during the World Cities Summit.

Objectives

The overall objective of the thematic consultation on smart cities in Asia and the Pacific was to generate valuable inputs into the Future of Asia and Pacific Cities 2019 Report by engaging stakeholders, senior policymakers, experts, and smart cities specialists to:

1. Review the overall issues and assess the sustainability of smart cities in Asia and the Pacific, and develop recommendations for public, private and civil society organisations for future urban data and smart cities initiatives.
2. Broaden the knowledge base regarding smart cities through the elaboration of international good practices and knowledge partnerships.
3. Build ownership for the Report and encourage participants to become champions, to take its knowledge and recommendations forward, and to disseminate, and raise awareness within their networks.

Expected Outcomes

The expected outcomes of the thematic consultation on smart cities in Asia and the Pacific were threefold:

1. Validation of the overall narrative and structure of the Report's focus on smart cities, data and technology.
2. A more granular and regionally-specific understanding of the challenges and future opportunities of smart cities in Asia and the Pacific, to generate examples of best practices and case studies that can feed into the Report, including empirical evidence on what smart city strategies have and have not worked.
3. Confirmation of timeline and thematic working group for the Report on smart cities, technologies and data.

Presentations

Smart Cities Agenda for ASEAN: Challenges, Opportunities, and Strategies

Yimin Zhou, Senior Assistant Director, Research cluster lead (Smart Cities and Complexity)



The ASEAN Smart Cities Network (ASCN) is a collaborative platform for cities to work with one another to improve citizens' lives, using technology as an enabler. ASCN seeks to complement existing national plans and help cities focus on specific areas through securing support from ASEAN external partners and catalysing bankable projects with the private sector. ASCN was launched in April, and the inaugural meeting was held at the side-lines of the World Cities Summit. Thus far, 26 cities in the ASEAN region are participating in the ASCN. ASCN is thus a valuable platform for cities to draw upon to learn and grow from each other.

This presentation introduced the challenges, opportunities, and strategies facing ASEAN cities as they move towards building smart cities. Southeast Asia is experiencing greater pressure from its rapid urbanisation in areas such as housing and waste management. However, the following building blocks of smart city development will allow cities in the ASEAN region to leverage solutions for smart cities: the generally younger population, the penetration of digital technology, greater city autonomy, and increasing investments in housing. These factors provide reasons for ASEAN cities to be optimistic of their future.

There are three smart city archetypes: the agile seedbeds, emerging champions, and prime movers, and the key characteristics of each are described below:

SMART CITY ARCHETYPES ACROSS ASEAN

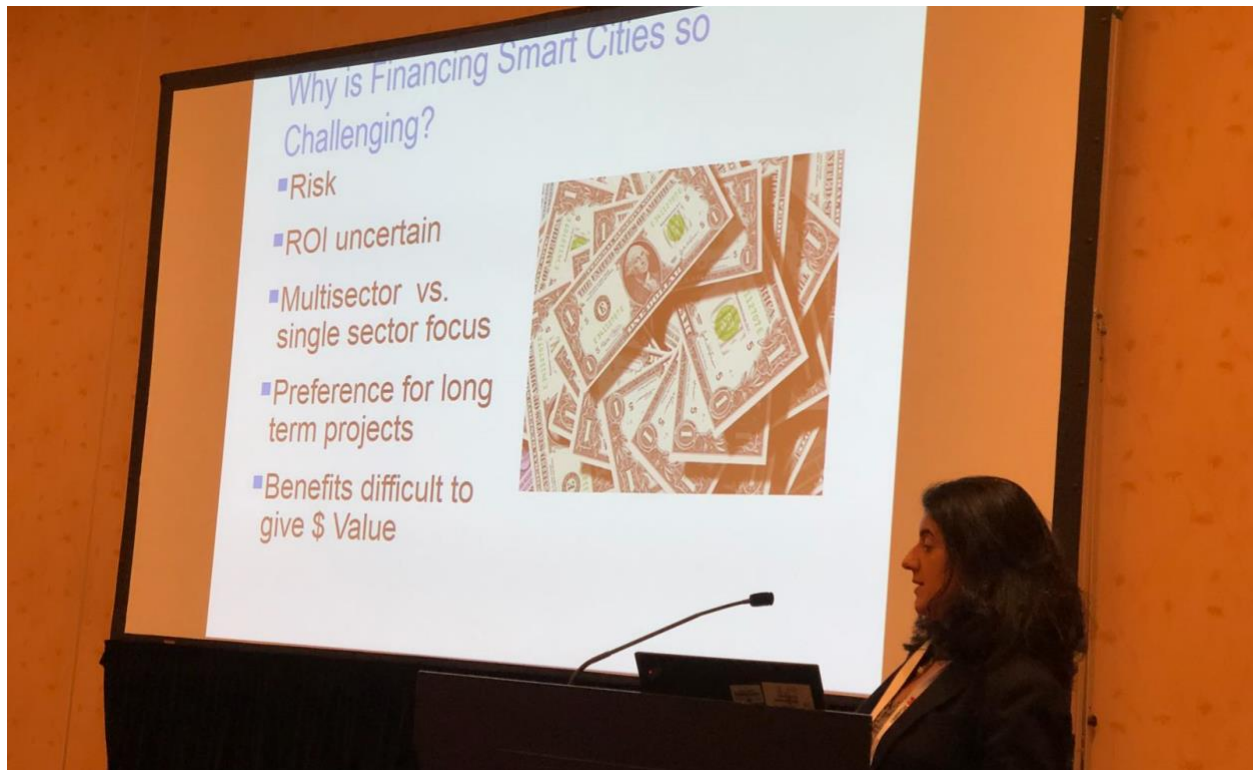
AGILE SEEDBEDS	EMERGING CHAMPIONS	PRIME MOVERS
<ul style="list-style-type: none"> • Smaller population • Basic ICT infrastructure • Lack of comprehensive plans, but more greenfield opportunities • Nimble in piloting and scaling up 	<ul style="list-style-type: none"> • Mid-sized cities • Systems need integration • Wider use of technological solutions for urban development & management • Need larger-scale investment 	<ul style="list-style-type: none"> • Large cities • Major hardware and software are in place • Clear smart city development plans & strategies • Need optimise systems to serve more people
		

Cities can take immediate action to advance their smart city development by pairing smart technologies with complementary policies through integrated planning and adopting a more data-driven approach that measures progress against a clear set of goals, thereby achieving greater synergies amongst stakeholders through the provision of common infrastructure. This could be as simple as creating digital platforms or open source applications for various stakeholders to contribute and collaborate together. Most importantly, cities must develop partnerships between government, people, and the private sector. By collaborating more and promoting greater understanding amongst stakeholders, ASCN effectively anchors more of the project's offerings and the value proposition to the real needs of the region's residents.

Smart City Applications and Financing in Asia-Pacific

Lara Arjan, Urban Development Specialist, Asian Development Bank

Smart city applications connect a city's infrastructure, people, businesses, and government in order to maximise the use of resources. However, there are challenges in obtaining finance from risk-averse banks for smart city initiatives and applications as there are often risks and uncertainties involved, including: uncertain Return on Investment (ROI); complexities due to the involvement of stakeholders from multiple sectors; long timelines for some smart city projects can make assessments more difficult; and the benefits (especially the social benefits) generated by smart cities applications are difficult to quantify.



To make a valid case for investors and banks, revenue models should be established for the financial sustainability of a smart city application. In projects with longer timelines, new revenue streams need to be identified. Digital strategies and technology that helps parking management and traffic ticketing is popular and well-supported by many government administrators, as it helps the city to generate revenue. GIS and data analysis can improve the efficiency of energy harvesting by 65 to 70 per cent by identifying specific areas in which to install solar panels. Another popular application would be to improve bus services in order to deliver a better commuting experience in the city.

Developers could explore alternatives by requesting funding from multilateral banks. However, it could be difficult to utilise this form of funding if the country's economy is crumbling. Scalable projects and proof-of-concepts will help developers convince local governments to implement their proposals. Partners from the private sector are usually willing to get involved because they understand that collaboration keeps the project sustainable in the long run. On the other hand, the public sector should take opportunities for cities to pilot projects that improve the city. Within ADB's operations, financing decisions depend on the level of preparation and the quality of the project design that enables cities to access downstream funding; for instance, with the India Smart Cities Mission.

Knowledge partners are key stakeholders who provide expertise and efficiency to deliver smart city projects. ADB partners with the Future Cities Laboratory in Bandung, Indonesia in building

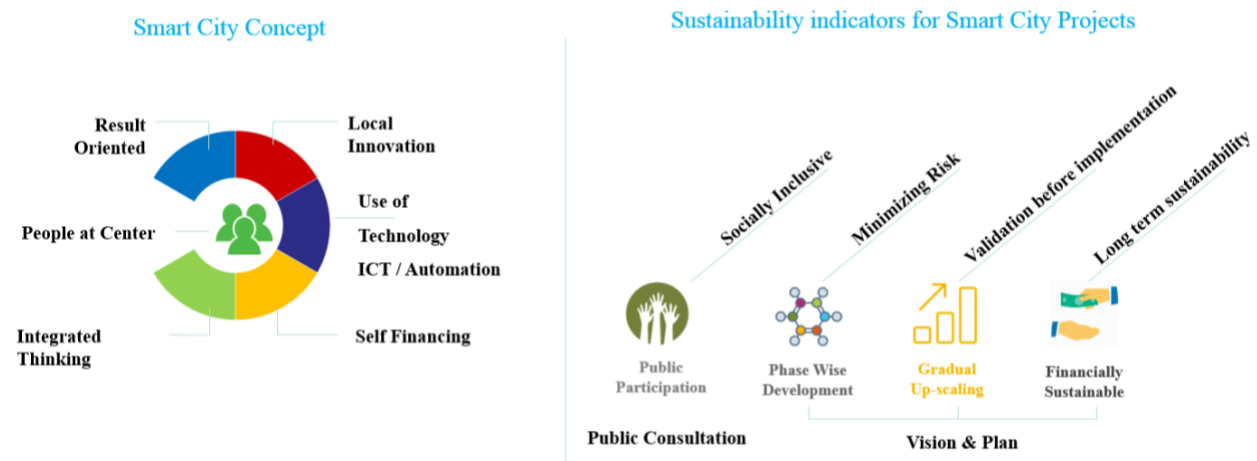
the city's information database that collates personal inputs from residents. The project allows rural communities (Kampungs) to contribute through smartphones and paper submissions as well.

One of the successful projects in Fiji is a digital solution which transformed the real estate industry. Approximately 90 per cent of the land in Fiji belongs to private landowners. The Land Price Index was created to help landowners be more adaptive. The Index captures how climate risks and price appreciation change the value of land, which makes land leasing more efficient compared to paper records. The system also acts as a pilot project to set up a blockchain platform. Suva, Fiji is testing the shared digital platform and, once it is set up, provinces will be able to share knowledge and information with each other as well.

Smart Cities Challenges in India

Emani Kumar, ICLEI South Asia

110 of India's cities have prepared a Smart City challenge proposal for India's Smart City Mission, 99 of which were selected under the program. India has invested \$31 billion into the projects, which have benefitted 99.5 million people. The program is focused on two strategic components: area-based development (pilot projects), and pan-city initiatives in which one smart ICT solution is applied across a city. The Smart City Concept in India and its key performance indicators are described below:



The projects are evaluated mainly on citizen participation, with 16 per cent weighted towards citizen engagement. Most projects are devoted to ICT solutions in urban transport, area development, economic development, and energy. 44 per cent of these projects are funded by the government.

However, there are various challenges in implementing the projects. Many times, the solutions end up becoming problems, or governments do not want to share power or resources. Moreover, governance issues may arise when departments cannot work together efficiently to arrange

clearances, share assets, and set regulations. Statutory bodies are also needed to provide quick approvals.

To engage citizens, cities should create awareness about the Smart City Challenge, consult citizens to get feedback, and then ensure this feedback is prioritised and informs the Smart City strategies. Questions cities can ask citizens could include what benefits they want from a smart city, and what areas they are interested in.

One major challenge India is facing is governance. Each municipality is asked to have a special purpose vehicle (SPV) made up of people various departments. However, often the local municipality does not wish to share power and resources with SPVs, and so the SPVs are forced to rely on government schemes. Instead, the local municipality will only be willing to share resources when the CEO of the SPV is part of their government structure. Split between 17 government agencies with different focus areas, the government is disjointed and unable to collaborate on working towards becoming a smart city.

Beyond the issue of governance, India also faces technical challenges. Cities lack the proper infrastructure to support the booming population and smart city technologies. Most infrastructure needs to be retrofitted but cities have limited capacities to do so. Furthermore, most of the smart city projects still depend on grants and central government funds.



Panel and Plenary Discussions

Participants asked how cities are implementing open data and whether that has become a prerequisite of building smart cities. Open data was seen to help cities to more accurately estimate and quantify their needs, citing the examples of energy and water. India lacks data on the number street lights, and this knowledge gap means cities do not know how much energy could be saved from the implementation of better streetlight technology. Similarly, water leakage reportedly accounts for 50 per cent of the annual water usage in India, but the actual number is estimated to be higher (up to 70 per cent) according to water suppliers. The Government of India is not being transparent about the non-revenue water and energy and therefore it is not possible to estimate the potential energy and water savings that could be achieved with technological innovations. Furthermore, there are cities and countries that struggle to gather the census data necessary for urban planning, and cities which cannot provide the basic resources and infrastructure to informal settlements do not allocate budgetary resources for data collection.

Participants also stressed the importance of data collection, interpretation, and of establishing a channel for open data. They noted four main themes to investigate further: water, resilience, identifying the perspectives that need to be brought into the discussion, and thoughts on how this issue should be identified across the themes. In response, private technology firms were now the main drivers in this industry and should be involved. Speakers shared experiences in setting up an Open311 platform project for a village in Canada for citizens to inform the Government – the conclusion being government administration is often outdated and needs to be digitalised. Rather than using primitive population projection methods to try to predict and plan a city, urban planning should evolve with technology.

The question of whether automation could drive people out of employment and subsequently out of the city was raised, as was the question of how pricing will affect decisions (such as by shifting budgets from water to education). It was also noted that cities should not create silos in reporting their states and progress because of the interlinkages between resilience, smart technologies, liveability, and other factors. Cities can focus on too much on data and technology, but a smart city is not only based on the rapid dissemination of information, but also on other factors like ICT and resilience, and smart cities need to be designed to be able to adapt to and accommodate the disruption of services.

The issue of urban nutrition was raised as particularly important in discussions around health and sustainability. The smart city platform could be an opportunity to bring the data and food sectors together.

It was noted that the success of a smart city lies in smart governance and collaboration. Moving forward the question is about how to scale good practice within the region. Currently, there is lots of duplication and little collaboration.



Group Discussions

How will smart applications of technologies and data in the region change the built form, environment, and socio-economic fabric of cities in the future?

This group explored how data and technologies would shape cities in the future. The discussants agreed that smart applications will result in decentralisation. For example, a decentralised water system could help reduce the investments needed in additional infrastructure.

Technologies could help to eliminate the geological distance and accumulate social venture capital by harvesting the power of the people. It is also the government's task to create an enabling environment where technology assists to reach the smaller and rural regions.

What are current good practices and emerging examples of smart cities in the region which address sustainability, taking into consideration compatibility with current systems, greater flexibility and openness, the capacity of stakeholders (such as municipal workers and the public), and the technology's appropriateness to the city?

The discussants found that most of the current smart city solutions are not being scaled up and are not driving decisions for urban development. A lot of small and simple applications are

emerging in the market but few address sustainability issues in cities. The city's technological capacity usually determines the compatibility of the solution to the city's current system, which means the solution provider needs to understand how the city's system works, and the public administrators need to be trained to understand the impact from the application of the technology.

Several discussants highlighted that quality should come before quantity when urban data is collected. Data sheets without proper standards and metadata would be useless and result in misleading analysis which would not help with decision making. The discussants also noted that some developing countries prioritise the construction of physical infrastructure over building digital or smart city capabilities. Therefore, comprehensive strategies are needed for the long-term development of cities.

The group agreed that commercial solutions could be patchy as they aim for revenues and profits instead of social benefits. Therefore, the public sector should come in with policy level solutions when complicated urban issues are being tackled.

Voices from participants:

- *“Kaohsiung, Taiwan, is making efforts in reducing motorised transport by analysing the transport data.”*
- *“In Bandung, a command centre is set up to release congestion off the road.”*
- *“Seoul takes information such as busy taxi routes at night into consideration to design the best night bus routes.”*
- *“In Kenya an application was originally created to report violence and crime, but it was subsequently used to collect and collate other information.”*
- *“Jakarta is trying a lot in urban data and information collection with crowdsourcing. There's an app for reporting flood levels. The UN's Pulse Lab is contributing to the project as well.”*
- *“In India, small scale urban farming and waste management are in action.”*
- *“Grab (a car share application in South East Asia) data could be used to find traffic congestion spots.”*
- *“Some cities acquire data to monitor air pollution for asthma sufferers.”*

How can smart city strategies and initiatives be localised through participatory and multi stakeholder processes? What policies and technologies can provide robust ICT infrastructure to help overcome the digital divide and ensure that no one is left behind in making cities smarter?

One of the most challenging issues for some cities is the supply of electricity. Compared to major cities, some rural cities are unable to access power. However, this is not merely an issue of resources but rather of management. Before developing smart city solutions, cities should balance the power supply between urban and rural area, and cities should prioritise the provision of basic infrastructure, such as electricity. Innovative solutions could help cities overcome

constraints, and the group advocated for better management that could make use of these technologies and address the barriers cities face, both now and in the future.

The group also recognised how access to the internet and infrastructure for connectivity are critical for smart city developments, yet 45 per cent of the global population are not online. They proposed that countries could develop national broadband and digital hubs to support smart city solutions. After analysing the context of the country, the central government should then set goals and priorities based on the country's specific needs.

The group agreed that start-ups could be supported and capitalised in order to bring social benefits to the city by creating employment opportunities, helping to bridge social differences. It was also mentioned in the group that the current legislative system can often be too onerous and unsupportive of start-ups, with firms required to overcome many hurdles before being capitalised. Start-ups need opportunities to grow, a conducive environment, flexibility in the system, and the leverage and support to help them join the market and compete against large firms who already hold economic and political influence.

Voices from participants:

- *"Many street food vendors in Thailand are from Myanmar. A lot of people from Myanmar travel to Thailand to work because technology has enabled them to have a comparative advantage in the English Language."*
- *"The internet should be a public good. It is evident that the internet has contributed to the cities' growth."*
- *"The youth are more receptive to changes brought about by technology."*

How can smart solutions be scaled up – recognising different challenges within cities, across countries and subregions?

The group agreed there should be a main enabler, either government or private enterprise, to deliver an integrated solution. For example, in transport and mobility, the government could develop policies to roll out sensors and collect data securely. On the other hand, the private sector could influence behaviour and consumption patterns through the market. In the case of Kuala Lumpur, the local authority collects all CCTV data from the traffic cameras. The integration of strategy and policy is needed within the government structure and between the federal and local governments as sometimes the problem originates from the delegation of authority powers.

The challenges for scaling up smart solutions that were identified by the group included: issues of security and privacy regarding the collection of personal data, the accessibility and transfer of knowledge in order to close the learning loop, and the construction of appropriate structures to support the implementation of more widespread smart solutions. Cities need to go beyond forming policies and making top-down commitments as a receptive and engaging environment is needed to empower smart solutions.

Who are the “smart city champions” that can support an enabling environment and promote implementation at the city level?

Smart city champions could be leaders, project owners (with the responsibility to implement the projects), beneficiaries, solution providers, or stakeholders (for example, business associations, planning agencies, or local NGOs). The group posed the questions of whether smart city providers take on the role of champion in the process of implementing smart city initiatives, and whether they can create their own demand. Currently, providers often struggle because they do not see enough proposals originating from their cities. This raises the question of how cities can integrate and scale up solution providers, and the group suggested cities should place greater emphasis on these “champions” to facilitate the process of implementing and scaling up smart city projects. As well-placed champions in each stakeholder group can drive change, cities should strategically utilise all actors to enable and promote smart city projects. In addition, smart city champions can be other cities as well, who can teach and share best practices with other cities.



Summary and Next Steps

There was consensus amongst the participants over the thematic areas identified for the Future of Asia and Pacific Cities 2019 Report's chapters, and of its forward-looking narrative based around the means of implementation for localizing the global agendas, and that it would be useful to apply smart frameworks to the urban Asia-Pacific context through leveraging local knowledge and case studies which the group would contribute to the Report's partners. A contemporary synthesis of new and emerging issues and solutions related to systems of smart cities in Asia-Pacific is required to be captured in the Report, presenting an approach where 'smart' provides the means to realising the end goal of an equitable and sustainable city.

Key takeaways included:

- *Underlying the development of any smart urban system is the need for robust ICT infrastructure.* Without robust broadband and wireless infrastructure, any discussion of smart urban systems is moot. While internet penetration is expanding throughout Asia-Pacific and the world, particularly amongst young people, there is still a significant digital divide. There is specific and strong policy support in the Asia-Pacific region for smart cities, although it is still more extensive in high or middle-income countries such as China, India, Indonesia, Republic of Korea, and Singapore. The technologies adopted in some of the larger markets such as China and India will become influential for the region.
- *Private sector and national level policies driving smart city initiatives.* These could include initiatives that are: driven by national government policy and financial support with some engagement of multinational corporations as service providers but that also have a strong interest in providing platforms for local private/business sector development along with service provision (Singapore); driven by national government policy along with co-financing with municipalities and the private sector (including a discussion on PPPs) with strong engagement of multinational corporations for service provision (India); city-driven, engaged with national and international corporations for service provision, with some national level policy coordination and financing (Seoul, Songdo, Singapore, Surabaya, Jayapura).

Challenges to and emerging good practices in smart city implementation:

- *The implementation of smart cities.* Smart city initiatives are ultimately a new kind of tool for addressing perennial problems and therefore are subject to the same requirements for good governance and strong institutions as any other urban infrastructure system. There are a few aspects of smart systems that are relatively unique, such as the rapid evolution of technology and the scale of privacy issues, but most of the challenges (and solutions) to the effective use of smart systems have parallels in any approach to making cities more livable and sustainable.

- *Technical capacity and skills gaps to implement and run smart systems.* Municipalities frequently lack skilled personnel to make informed decisions about the adoption and management of smart technologies which can result in the outsourcing of smart systems planning, implementation, and management to private sector entities who may not have a deep understanding of or be aligned with the needs or priorities of the city.
- *Financing mechanisms.* Financing smart initiatives can often involve both government and private sector entities. Strategic investment with good business / revenue models are required as is ensuring that the priorities of city residents are accurately reflected in investment decisions.
- *Data limitations and smart opportunities.* The primary assumption of the value of smart city initiatives is that the data gathered through sensors or through social media and communication applications can help cities formulate and implement better policies and improve management of urban systems. Underlying this is the assumption that the data is high quality and comprehensive and that the analytic models used to turn the data into actionable information are objective and give an accurate and complete picture of the issues being analysed.

The key next step and outcome from the consultative meeting will be the incorporation of these inputs into the final Future of Asia and Pacific Cities 2019 Report and supplementary communications and outputs, which will take up these solutions for means of implementation and will highlight case studies and share knowledge of best practices. Participants are invited to further share their experiences and contribute to the development of case studies for the Report.

This Meeting Report and additional resources will be shared with all participants, who are encouraged to stay connected to the process of crafting the Report and to take its knowledge and recommendations forward and disseminate and raise awareness of it within their networks. The Report will also inform the thematic areas and structure of the 7th Asia-Pacific Urban Forum in 2019. Participants are invited to participate in these and other upcoming peer learning events.

Further resources and presentations made at the meeting can be found online at:
<https://www.unescap.org/events/future-asia-and-pacific-cities-2019-report-thematic-consultation-smart-cities-asia-and>

For any questions or to share information and case studies, upcoming events, and experience with the Future of Asia and Pacific Cities 2019 Report team, please kindly contact:
omar.siddique@un.org.

Appendices

Participant Evaluation from Summary and Analysis

At the end of the thematic consultation, an evaluation form was distributed to participants to collect inputs for next steps, to take the knowledge generated forward as inputs into the Future of Asia and Pacific Cities 2019 Report, and to assess the relevance and effectiveness of the meeting. Evaluation forms provided participants with an additional opportunity to share qualitative feedback for consideration by the organisers. The following provides an overview of comments and inputs shared.

What follow up to this consultation would you recommend ESCAP undertakes?

Synthesis of common responses:

- Include the private sector, city leaders and representatives from local government, civil society organizations, and community-level actors in ESCAP's smart cities work and in producing the Report.
- Conduct further research on the questions and issues raised during the consultation as part of the Report making process, particularly on small city examples and best practices.
- Continue to include the participants and stakeholders in the process of producing the Report and share a draft of the Report for discussions and final inputs prior to finalization.
- Have further consultations by sector to explore opportunities for smart solutions in, for example, water, energy, or governance.

What aspect(s) of the consultation did you like most?

Synthesis of common responses:

- The inclusion of inputs from the private sector.
- The solution-oriented presentations and discussions.
- The sharing of knowledge, ideas, experiences, stories, case studies, and practical examples of what others are doing during the focused and well-facilitated group discussions.
- The multi-stakeholder discussions with insights from experts, including on the issue of financing for smart cities.

Which critical area(s) of sustainable urban development in Asia and the Pacific do you find under researched, analysed, or covered by existing reports?

Voices from participants:

- "Infrastructure financing."
- "Food, nutrition, and health beyond hospitals or pollution."
- "Governance, community engagement, and water management."
- "Urban poverty – stories about people in cities driving change at scale."

Participant responses on the effectiveness of the event

The consultation has increased my understanding of the solutions for means of implementation of smart cities in the Asia-Pacific region.



The overall quality of the discussions and presentations was good.



The content of the consultation was relevant to my work.



Disagree Neither agree nor disagree Agree moderately Agree strongly

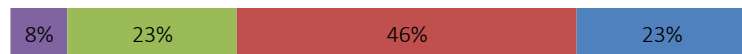
Based upon the feedback received, 85 per cent of the participants who completed evaluation forms agreed strongly or moderately that the consultation had increased their understanding of the solutions for means of implementation of smart cities in the Asia-Pacific region, 92 per cent remarked that the overall quality of the discussions and presentations was good, and 100 per cent reported that the content was relevant to their work.

Participant responses on the impact of the event

I am able to share and spread the information and knowledge I have received.



My personal capacity to address the sustainability challenges of smart cities in Asia-Pacific was strengthened in terms of analysis of the issues and information provided.



The consultation was useful; I will be able to apply the knowledge in my work.



Disagree Neither agree nor disagree Agree moderately Agree strongly

Regarding the impact of the of the consultative meeting, 92 per cent of participants who completed the evaluation reported that they were able to and would share the information and knowledge they received, 69 per cent reported that their personal capacity to address the sustainability challenges of smart cities in the Asia-Pacific region was strengthened through the knowledge provided and generated, and 92 per cent of respondents remarked that the consultation was strongly or moderately useful and they will be able to apply the knowledge in their work.

Programme

15:00-15:05	Registration at the door
15:05-15:25	Opening and Introduction <ul style="list-style-type: none"> Opening statements Dr. Stefanos Fotiou, Director, Environment and Development Division, ESCAP Mr. Teng Leng Lim, Deputy Director, Centre for Liveable Cities, Ministry of National Development, Singapore Introduction to the Future of Asia and Pacific Cities 2019 Report Mr. Curt Garrigan, Chief, Sustainable Urban Development Section, ESCAP
15:25-16:45	Impact presentations on Smart Cities in Asia-Pacific <ul style="list-style-type: none"> Smart Cities Agenda for ASEAN: Challenges, Opportunities, and Strategies Mr. Yimin Zhou, Senior Assistant Director, Research cluster lead (Smart Cities and Complexity) Smart City Applications and Financing in Asia-Pacific Ms. Lara Arjan, Urban Development Specialist, Asian Development Bank Smart Cities Challenges in India Mr. Emani Kumar, ICLEI South Asia Plenary discussion
16:45-17:15	Coffee break
17:15-17:50	Breakout group discussions on five key questions around smart cities in Asia and the Pacific Plenary discussion to share recommendations by each group
17:50-18:00	Next steps and closing remarks from ESCAP and CLC

Participant List

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Sensitive Cities

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Singapore Centre for Liveable Cities

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Singapore Centre for Liveable Cities

Fotiou, Stefanos
UNESCAP

Garrigan, Curt
UNESCAP

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Austrade

Jaffee, Steven
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Living

Ritter, Waltraut
Knowledge Dialogues

Roño, Chee Anne
Asian Development Bank

Siddique, Omar
UNESCAP

Sorkin, Lauren
100 Resilient Cities

Steine, Matthew
City of Townsville

Suzuki, Toru
A.T. Kearney

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Singapore Centre for Liveable Cities

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