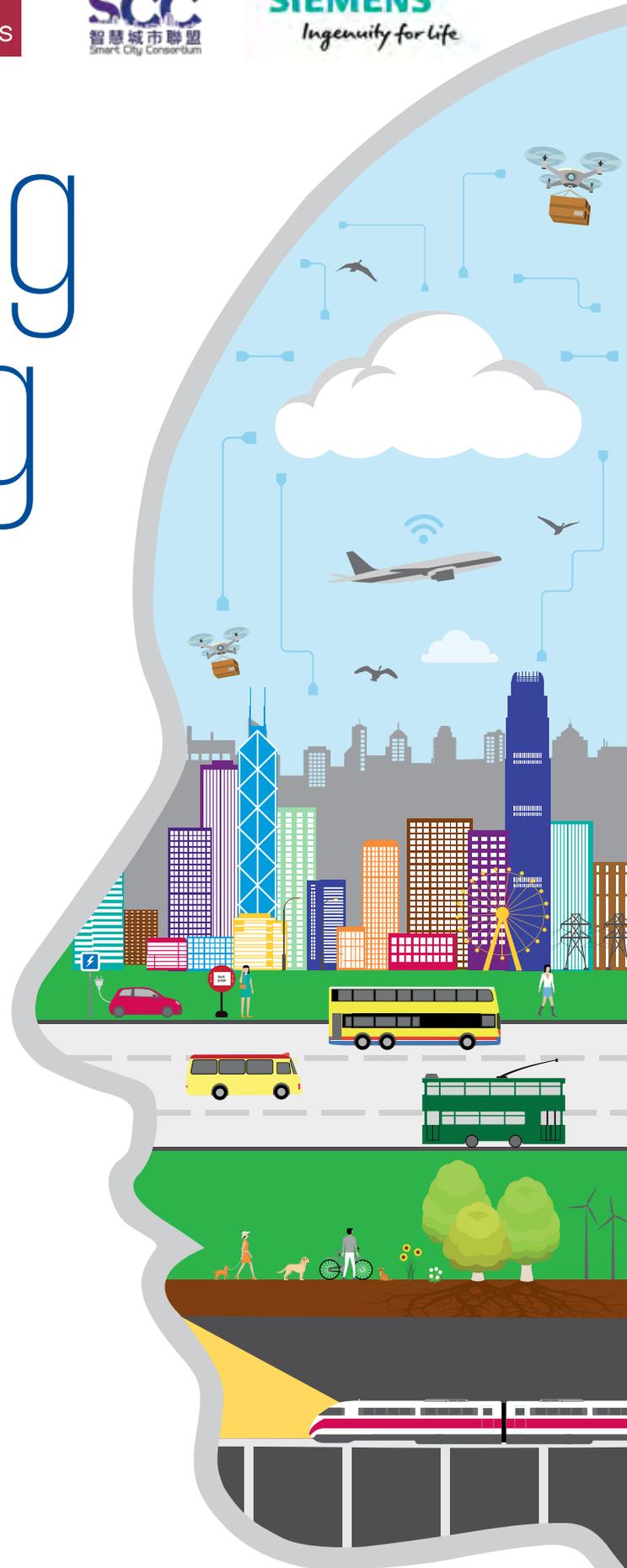




# Connecting Hong Kong

*Perspectives on our future  
as a smart city*



Survey conducted by



[kpmg.com/cn](http://kpmg.com/cn)

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# About this Survey

For this report, KPMG commissioned YouGov to conduct an online survey of Hong Kong residents aged 18 or over, and business executives working for companies in Hong Kong.

The survey explored two areas. First, it asked the respondents about their overall perceptions of Hong Kong's smart city strengths and weaknesses. Then it looked in more detail at six key sectors for Hong Kong's smart city development: transportation and mobility, finance, education, environment, healthcare, and energy and resources.

The survey was conducted between October and December 2017, receiving responses from 1,022 residents and 536 business executives.



# Foreword

Around the world, cities are moving to a new stage of smart city thinking. Initially, excited by the new wave of digital tools made possible by linking the internet to sensors via broadband and mobile communications, the main focus has been on deploying technology that could make a city smart.

Now, this is switching to an emphasis on how that technology can be harnessed to realise greater goals – that of a sustainable city, with enduring economic advantages, and above all an enhanced quality of life for all its citizens.

This new approach comes at a time when the rate of urbanisation around the world is accelerating – in China, the share of its population living in cities is targeted to increase from its current level of 58 percent to around two-thirds – or more than 900 million people – by 2030.<sup>1</sup>

Hong Kong, one of China's most developed cities, can both benefit from and contribute to this phenomenal project. But first, it must figure out its own ways to harness the opportunities to reshape city living created by the rise of smart technology.

This paper, jointly published by KPMG China, CLP Holdings, JOS, Siemens and the Smart City Consortium, aims at understanding how Hong Kong is rising to this challenge. At its core is a survey, conducted by KPMG in association with YouGov, of more than 500 business executives and 1,000 citizens in Hong Kong. The survey explored two areas. First it asked the respondents about their overall perceptions of Hong Kong's smart city strengths and weaknesses. Then it looked in more detail at six key sectors for Hong Kong's smart city development: transportation and mobility, finance, education, environment, healthcare, and energy and resources.

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<sup>1</sup> Source: World Bank/State Council Development Research Center, China 2030, page 277; available at [www.worldbank.org/content/dam/Worldbank/document/China-2030-complete.pdf](http://www.worldbank.org/content/dam/Worldbank/document/China-2030-complete.pdf) (accessed 17 January 2018).

# Executive summary

A smart city is a connected city – one where its transportation system provides seamless mobility, its technology channels information and links businesses with customers, and where the government, businesses and citizens communicate and collaborate with each other to drive economic growth and improve the overall quality of life for its people.

Cross-border connectivity is also an important attribute of a smart city. For Hong Kong, its links to mainland China and Southeast Asia are highlighted as key strengths. There is strong support from the business community and our citizens more broadly for Hong Kong to focus on supporting the Greater Bay Area and the Belt and Road initiatives, as well as connectivity with the ASEAN region, to capitalise on emerging business opportunities and drive Hong Kong's economic prosperity (see page 52).

Hong Kong is viewed as performing well against other developed cities in a number of key areas, including the standard of its transport network, its healthcare system and its role as an international financial services centre.

However, it has work to do in others, with the city's technology and innovation culture the most pressing area for further development. For both citizens and business executives, 'digitalised, well-connected public services' and 'advanced technology' are among the top three key qualities of a smart city. Notably, nearly two-thirds of executives view the former as a key feature, indicating a business link to creating a liveable, well-connected city that can attract – and retain – talent to ultimately drive economic growth (see page 10). There is a need to continue to nurture a culture that encourages entrepreneurship and a new way of thinking, and to create the conditions where government, established companies and startups are willing to take sensible risks with new ideas.

Achieving this requires a greater focus on Hong Kong's education system to cultivate the mindset and harness the talent needed to thrive in the fast-evolving market environment. Getting education right will be crucial for Hong Kong's long-term development, especially in equipping future generations with the creative thinking and technical skills needed to foster a culture of innovation.

To address these issues, smart cities around the world have a government that sets out a clear vision, and plays a driving role in realising its ambitions. As regulator, the largest owner of resources and the key provider of services to the community, it is important that governments adopt a more proactive role as the engine that harnesses their resources and the strengths and talents of their citizens to drive growth, improve the quality of life for their citizens, and enhance long-term sustainability.

Consistent with this requirement, Hong Kong's Smart City Blueprint, released in December 2017, lays out a number of projects and strategic initiatives to drive Hong Kong's smart city development – many of which are in line with the views and expectations put forward by the surveyed business executives and citizens in this report.

There is also a strong desire from business executives and the broader community for the private sector to become more involved in Hong Kong's smart city development. This is an important step in achieving Hong Kong's smart city ambitions, and presents an important opportunity for the public and private sectors to increasingly collaborate in areas such as healthcare, finance, education, and energy and resources.

In order to realise its smart city ambitions, Hong Kong – its government, business and citizens – should strive to be viewed as a leader across all aspects of world-class smart city performance to achieve the ambition set out in the Smart City Blueprint to build Hong Kong into a world-class smart city.

The respondents to our survey also highlighted important, and in many ways, interrelated themes in the areas of education, energy and the environment, and healthcare, as follows:

**Education:** Business executives view 'technology and innovation culture', 'education' and 'talent' as the top three most important areas for Hong Kong's continued success, indicating a need for a future population equipped with the right skills and innovative drive to meet the needs of an increasingly complex, fast-changing environment. This calls for a greater focus on Hong Kong's education system to encourage creativity and continuous learning, with an emphasis on science, technology, engineering and mathematics (see page 34).

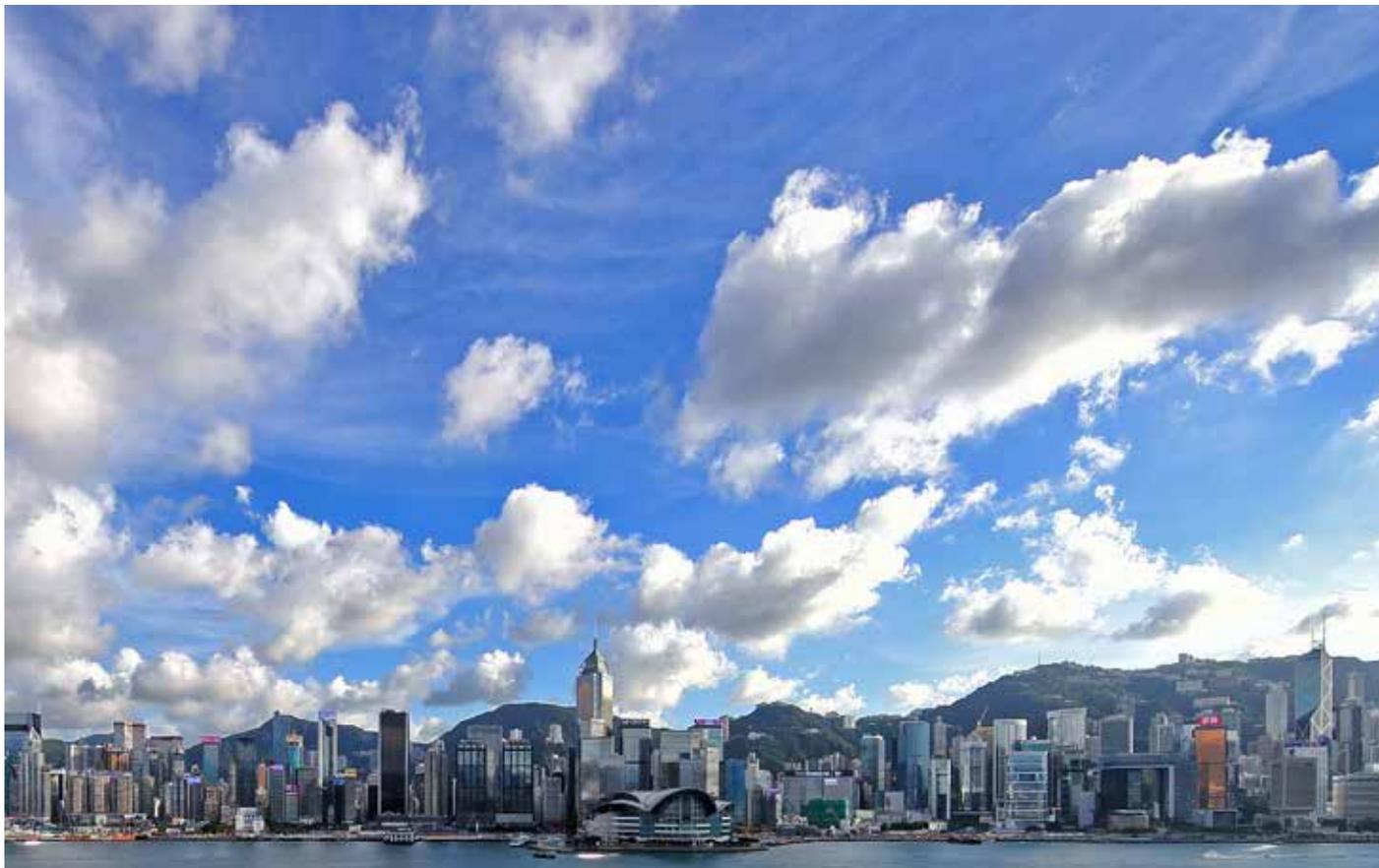
**Energy and the Environment:** Citizens and business executives overwhelmingly view 'waste treatment', 'use of renewable energy' and 'energy efficiency' as key development areas for Hong Kong. The need to invest in energy-efficient technology and encourage energy-saving practices are of particular importance, as a growing population and the proliferation of technology place increasing demands on Hong Kong's energy system. With these trends increasing exponentially, it will be important to take a holistic view of the increased connectivity between energy, technology and transportation, and adopt an approach that efficiently meets the city's energy and environmental sustainability needs (see pages 38 and 46).

**Healthcare:** There is a strong need to bring together a greater use of technology and more private sector participation and expertise to support and further develop Hong Kong's healthcare system for its citizens, particularly the elderly (see page 42).

With a smart city being one that is connected, it is important to maintain clear channels of communication between the government, its business community and its citizens, in order to ensure that views and opinions flow in both directions, and encourage open dialogue.

This report, through its survey of both parts of the community – citizens and business – and its interviews with companies and other stakeholders, aims at contributing to that dialogue.

# The liveable city



Today, just over half of the world's population live in urban areas. This is expected to grow to two-thirds by 2050, according to the UN – this translates to the total number of people living in cities rising from around 3.5 billion to 6.7 billion.<sup>2</sup> These cities will become increasingly hyperconnected, especially with citizens, businesses and governments using tens of billions of devices every day. This will require significant investment in infrastructure, especially on the digital front. According to IDC Research, global spending on smart city and Internet of Things (IoT) technologies will reach US\$1.7 trillion by 2020.<sup>3</sup>

But what will qualify these cities as smart is not entirely based on this hardware and software, or the companies, government agencies and other organisations that manage their use, but the outcomes: whether the cities that emerge are better places to live and work, and are environmentally sustainable.

For a city to be smart, its government will have to be acutely conscious of the needs and wishes of its population, the economic interconnectedness of its businesses with surrounding regions, and the potential impact – both positive and negative – of technological developments.

In short, technology alone will not make a city smart, says Julian Vella, Asia Pacific Regional Head for KPMG's Global Infrastructure Advisory Practice.

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<sup>2</sup> United Nations, <http://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html>, accessed 17 January 2018

<sup>3</sup> IDC, <https://www.idc.com/getdoc.jsp?containerId=prUS42209117>, accessed 17 January 2018

Cities will have to display leadership and vision in five areas:



Across all these issues, government will need to play the driving role. As regulator, the biggest holder of resources and the repository of the community's general interest, it is the only institution able to generate the overall vision for smart city development, and encourage and empower organisations and the population to act in ways that will realise that vision.

Importantly, the only way a government can articulate a vision that captures the needs and wishes of both its citizens and its business community is by having clear channels of communication along which views and opinions can flow in both directions, as well as a willingness to engage in dialogue.

“

*Strengthening Hong Kong's connectivity, both locally and regionally, is key to its smart city development. China's Belt and Road initiative and the emerging Greater Bay Area provide significant cross-border investment and financing opportunities for Hong Kong, and highlight the city's prominent role as a 'super-connector' to Southern China and the fast growing ASEAN economies. In addition, Hong Kong's stock connect with Shenzhen is creating new high tech opportunities for businesses and investors, and is promoting cross-border capital flows between Southern China and Hong Kong.*

**Andrew Weir**

*Senior Partner, Hong Kong, KPMG China,  
and Global Chairman of Real Estate and Construction*

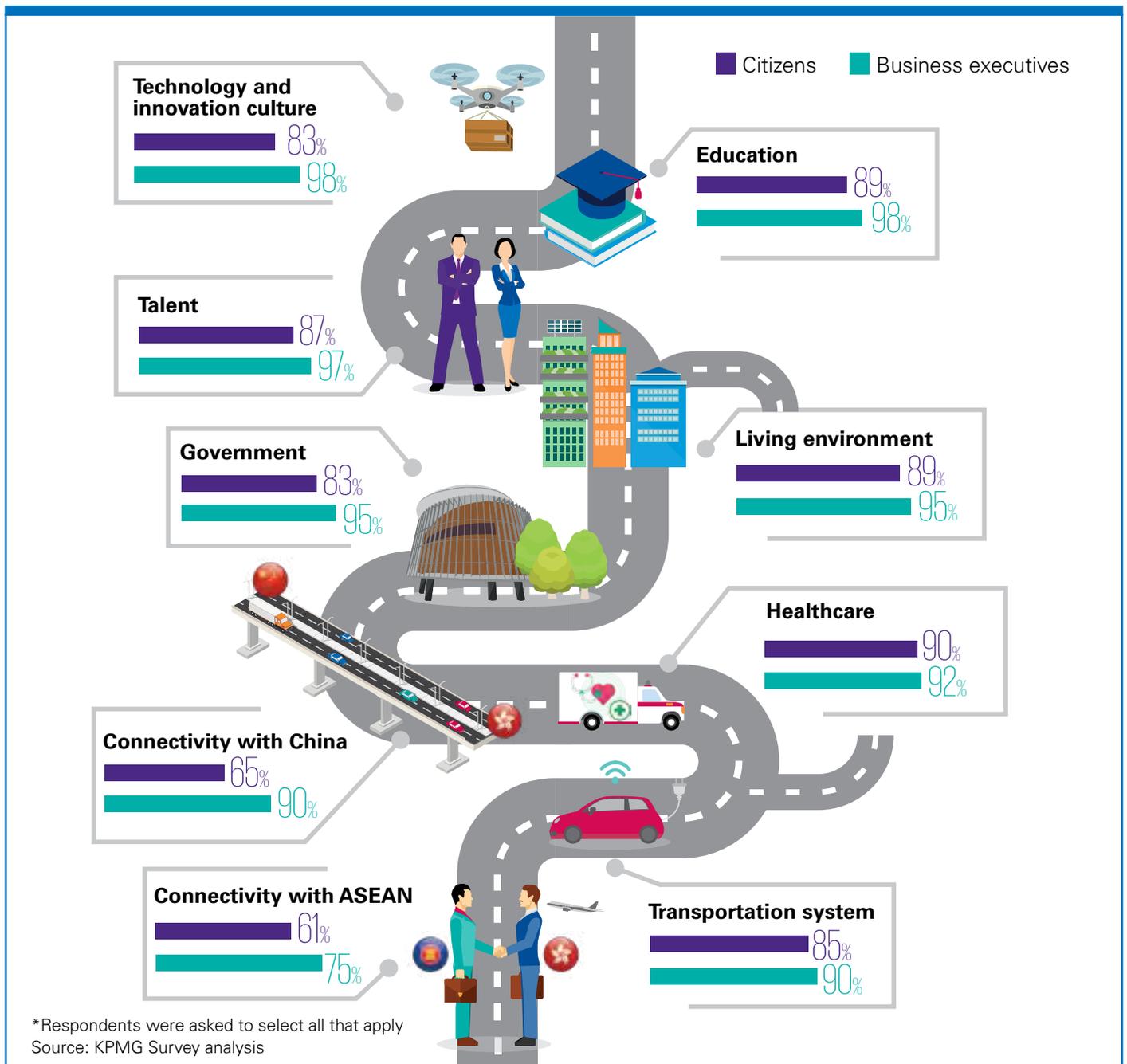
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# What Hong Kong wants

The survey respondents consider a number of areas as important for Hong Kong’s continued success (see Figure 1.1). Within this, the top three factors for business executives are a ‘technology and innovation culture’, ‘education’ and ‘talent’, indicating a need for a future population equipped with the right skills and innovative drive to meet the needs of an increasingly complex, fast-changing environment.

In contrast, the surveyed citizens rank ‘healthcare’, ‘education’ and the ‘living environment’ as their top three keys to success. This points to a preference for quality of life issues, and emphasises that while a smart city should bring economic benefits, its ultimate goal has to be to improve liveability for its people.

**Figure 1.1: Percentage of respondents that view the following areas as important for Hong Kong's continued success in the next 10 years\***



# Viewpoint

## Key ingredients for an innovative environment

What makes for an innovative environment? Mike Zamora, managing director of Asia Real Estate Advisors, identifies four key factors – in order of importance:

### Culture

- An environment where lateral thinking is possible
- Where the desire to innovate and make new things dominates
- Where failure is allowed

### Ecosystem

- Sources for replenishing ideas exist, such as universities
- Established veterans are around to help
- Business support system
- Vibrant after-hours environment

### Finance

- A permanent funding culture – money is always available for the right ideas
- Reasonable tax rate that allows long-term capital gains
- Access to exits for IPOs

### Infrastructure

- Everything that is needed for growth from startup to large corporation – usually a nearby major city

Source: Asia Real Estate Advisors, Copyright Michael Zamora 2017



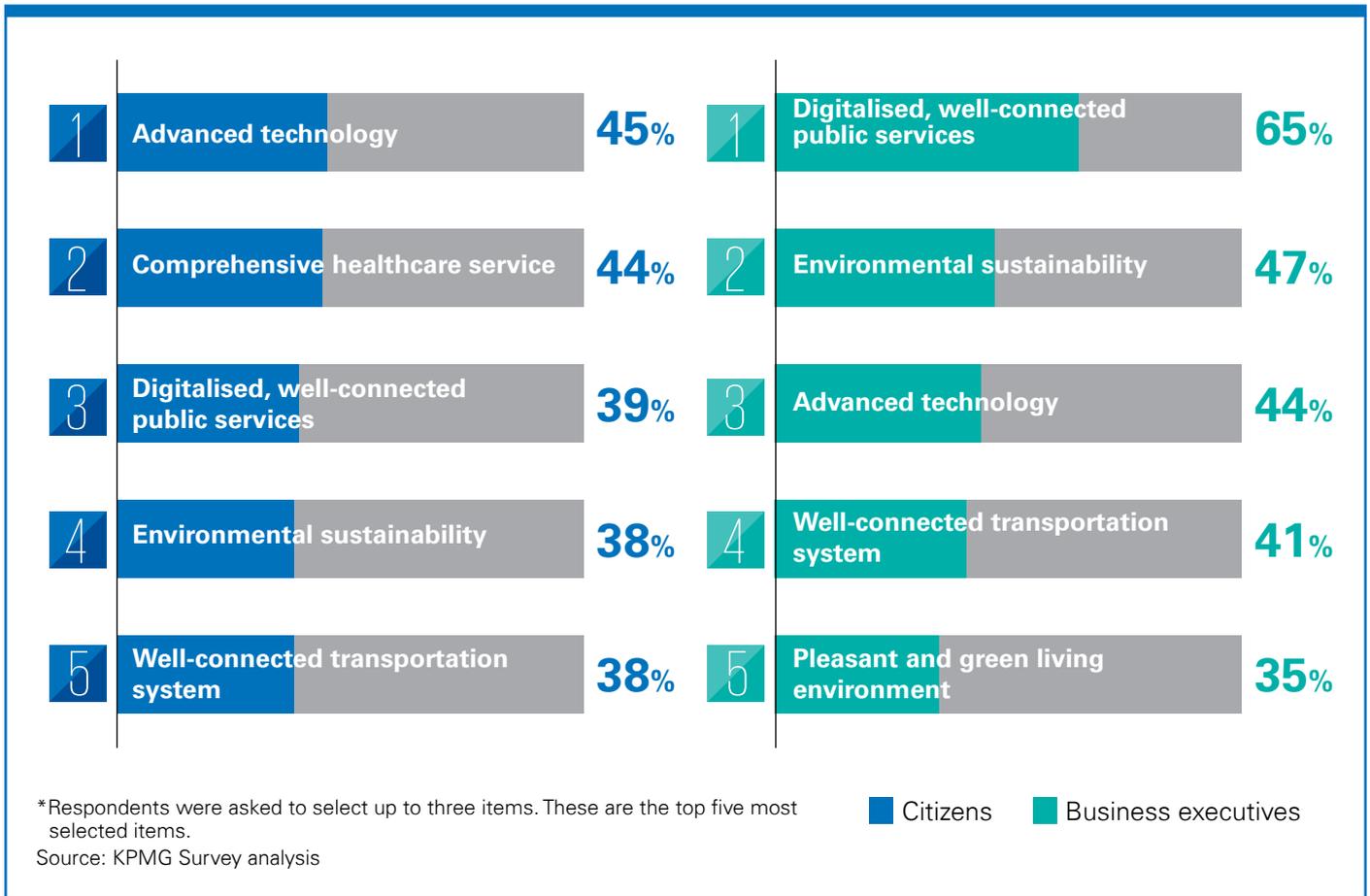
“  
*If we want to make our city smarter, big service providers have to embrace open data. Only then can we develop more and better apps.*

**Eric Yeung**  
 President,  
 Smart City Consortium

## Smart qualities

The desire to improve Hong Kong’s technology and innovation culture and its overall liveability are aligned with the survey respondents’ views on the key qualities of a smart city. For both citizens and business executives, ‘digitalised, well-connected public services’ and ‘advanced technology’ are viewed as among the top three attributes of a smart city. Notably, nearly two-thirds of executives chose the former as a key feature (see Figure 1.2), indicating a business link to creating a liveable, well-connected city that can attract – and retain – talent to ultimately drive economic growth. Many businesses are already investing in advanced technologies and exploring innovative approaches to drive Hong Kong’s smart city development (see Page 11).

**Figure 1.2: What do you expect to exist in a smart city?\***





# Developing a Smart City Hub – Hong Kong

## Eric Chong

President & CEO  
Siemens

Siemens is gearing up to become a major player in Hong Kong's smart city development, and helping to make the city the hub of an innovative technology ecosystem at the heart of the Greater Bay Area in Southern China.

In December 2017, Siemens launched a Smart City Digital Hub – its first city-focussed research centre – in the Hong Kong Science Park. It will work in collaboration with the Hong Kong Science and Technology Parks Corporation's Data Studio to accelerate the development of smart city applications and solutions specifically for Hong Kong.

"The plan is to have more than 30 scientists, with more than half of them data analytics scientists, working in the hub within the next few months," says Eric Chong, President & CEO of Siemens Hong Kong.

Designed as an open lab, the hub will offer start-ups and infrastructure providers a platform to nurture their digital portfolios and develop "Made in Hong Kong" smart city solutions across six areas: data analytics, IoT, connectivity, smart buildings, smart energy and smart mobility.

The hub is aimed at identifying and accelerating innovations that can help tackle city challenges such as traffic congestion, public safety, energy saving and city planning. Underpinning the hub's work is Siemens's MindSphere, an open cloud-based IoT operating system with built-in data analytics and connectivity capabilities.

Stressing the role that businesses should play in driving Hong Kong's smart city development, Eric says that Hong Kong's success has come from letting free enterprise drive the economy, and officials need to set up a regulatory framework and then let companies take over.

"We also need to think about how we develop smart city clusters," says Eric. "You need anchors or certain big players, and you need diversity in the ecosystem. In recent months, we have been talking to a number of different parties – it's about bringing people together."

This points to Hong Kong's key role in driving smart city development across the entire Greater Bay Area – comprising nine cities in Southern China, including Hong Kong and Macau – and beyond that in the evolution of China's Belt and Road Initiative.

"We are closely linked in with our colleagues in the Pearl River Delta area, and the more than 300 scientists already working for Siemens across mainland China," says Eric.

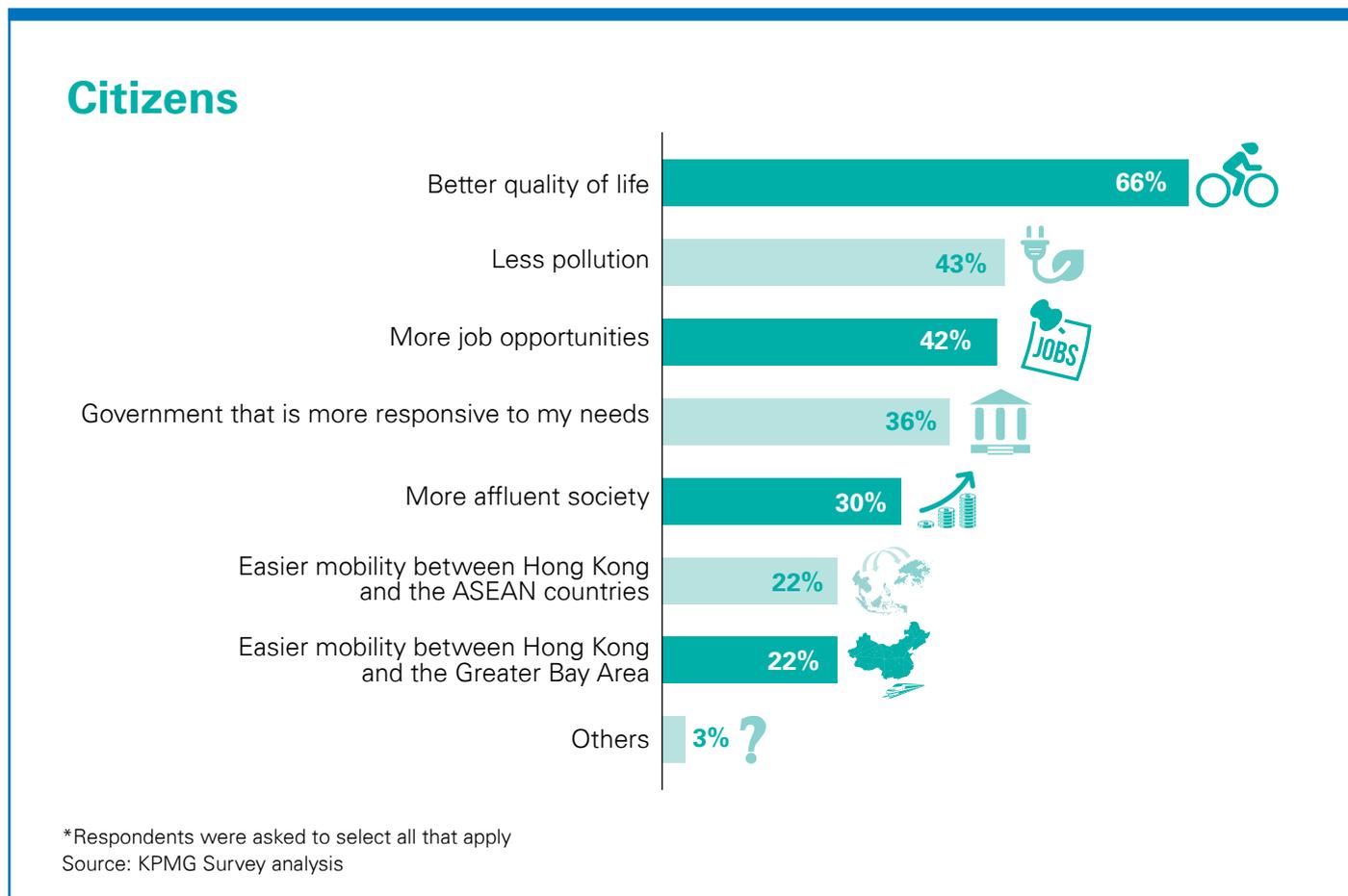
"Hong Kong has a track record in making things work. What we need to do now is break down the silos – develop startup clusters and put companies together."

*“We also need to think about how we develop smart city clusters. You need anchors or certain big players, and you need diversity in the ecosystem.”*

# Smart city vision

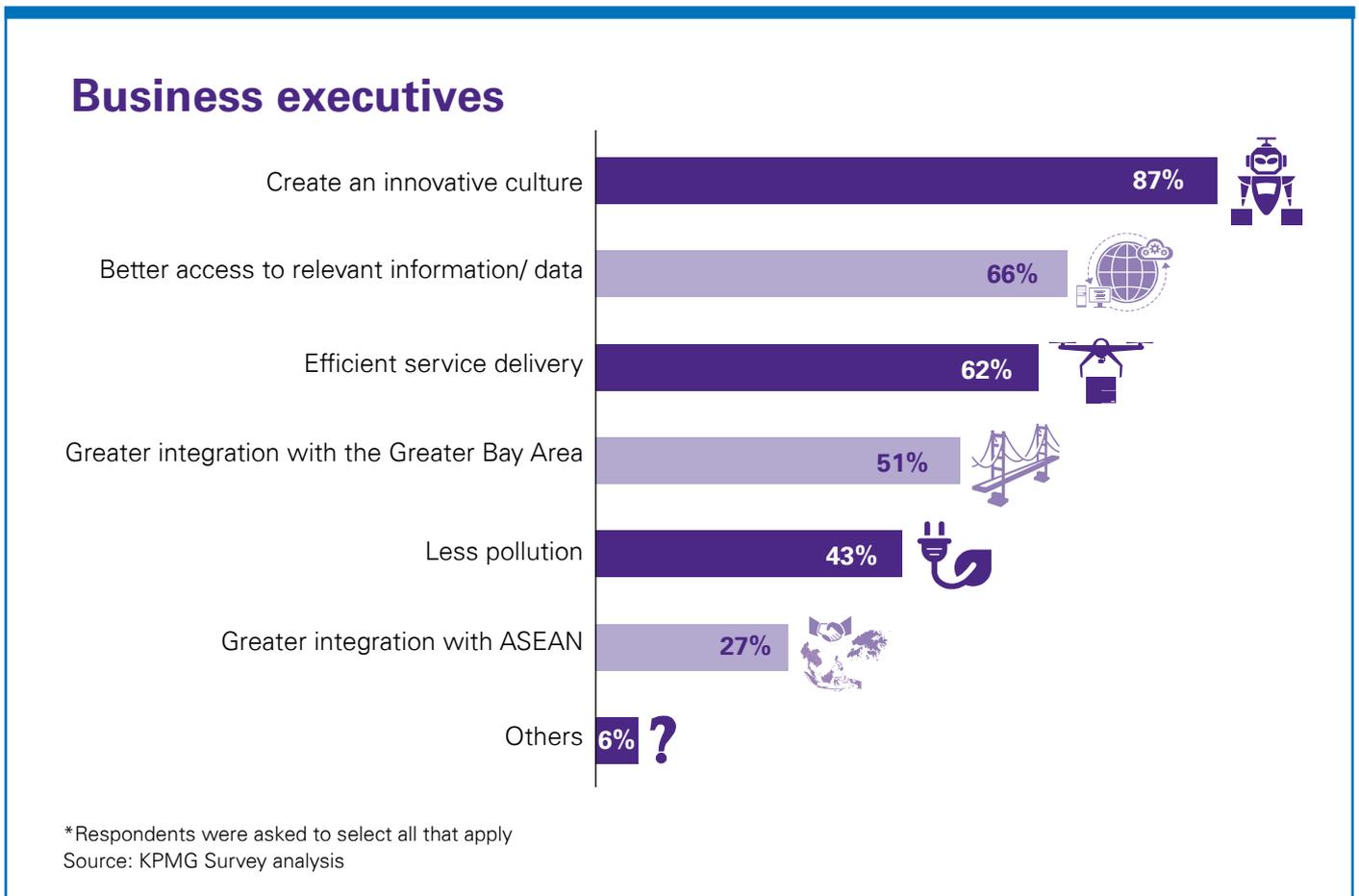
The major expected benefit of Hong Kong becoming a smarter city, according to two-thirds of the surveyed citizens, is ultimately a better quality of life. This encompasses a cleaner environment, more job opportunities and a government that is more responsive to their needs, all of which are also seen as expected benefits of Hong Kong’s smart city development (see Figure 1.3).

**Figure 1.3: What are the expected benefits of Hong Kong's vision to become a smarter city?\***



An overwhelming majority of the surveyed executives (87 percent) view the creation of an innovative culture as having the biggest impact on Hong Kong's smart city development (see Figure 1.4). 'Better access to relevant information/data' (66 percent) and 'efficient service delivery' (62 percent) are also key factors for business executives. In many ways, fostering innovation, enhancing services and promoting information accessibility are key to creating a better living and working environment for citizens, who ultimately want an improved quality of life.

**Figure 1.4: Which of the following will have an impact on Hong Kong's progress towards being a smarter city?\***





# Connectivity is key

## Eric Yeung

President

Smart City Consortium

Hong Kong's Smart City Consortium (SCC) supports and advises the government on how to make Hong Kong one of the world's leading smart cities. "Our role is to be a bridge between the government and the industry in this respect," says its president, Eric Yeung.

Founded in March 2016, much of SCC's work centres on offering policy opinions and proposals to the government on how information and communications technologies can be used to foster a knowledge-based economy, develop effective resource management strategies and enhance the quality of life.

"Hong Kong is very good at infrastructure," says Yeung. "But we are lagging behind on the policy side in areas such as electronic payments and open data." The SCC sees itself as able to play a role here, providing views and information from its approximately 100 members, among them both technology providers and technology users – some of them Hong Kong's biggest companies, but also a number of SMEs.

But the focus is not entirely on the government. Also important, says Yeung, is persuading companies that they can contribute too. "We find that many companies aren't willing to share their data. Yet if we want to make the city smarter, then service providers and other business have to be persuaded to embrace open data in order for more and better apps to be developed."

Additionally, says Yeung, Hong Kong companies need to increase their research spending. "R&D investment in Hong Kong is low. The government has just introduced some new incentives. Now it is up to local companies to invest more."

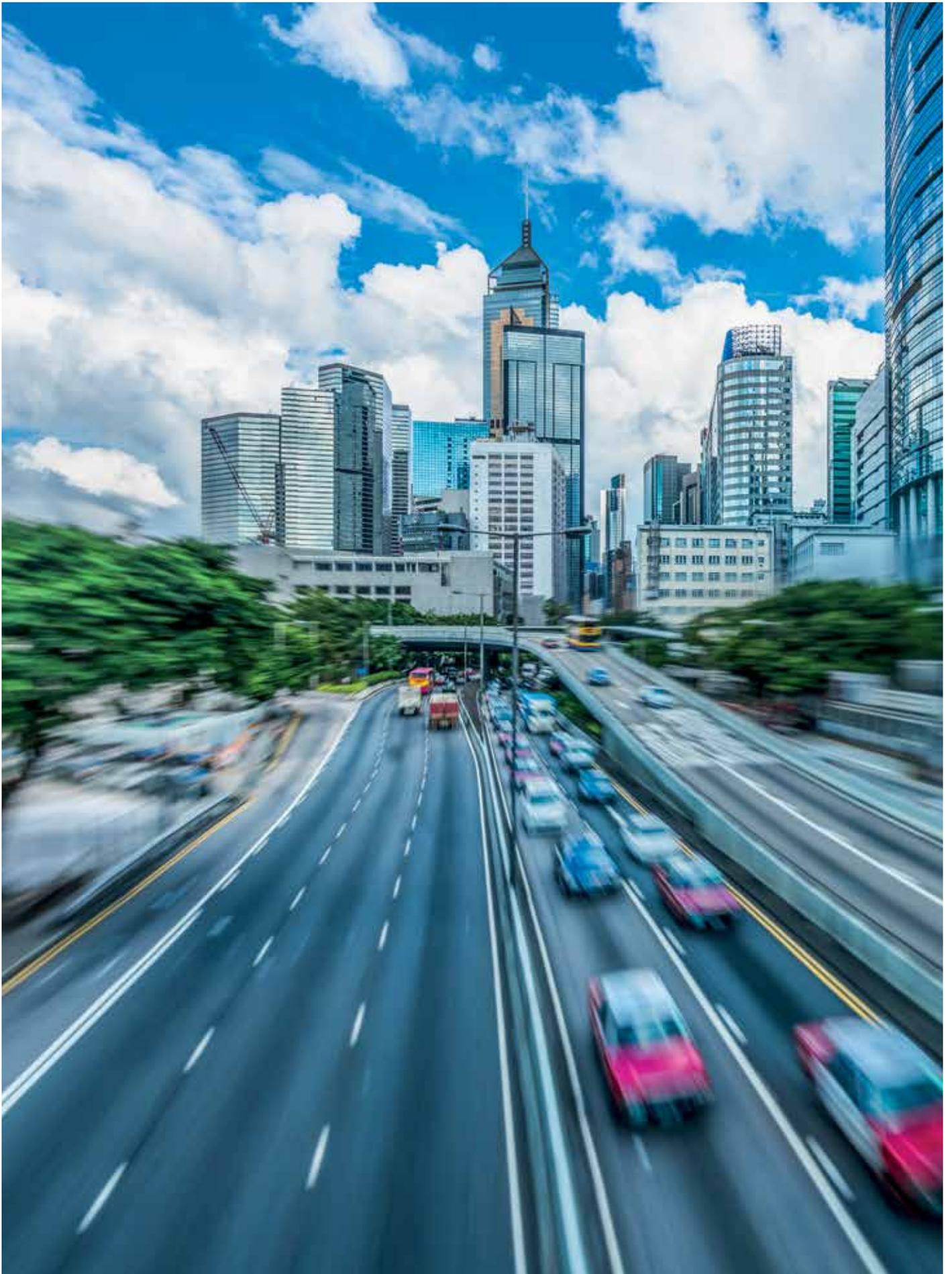
Worldwide collaboration is also key to creating an ecosystem capable of fostering innovation and sustainable economic growth. "The key to being a smart city is connectivity – not just locally, but globally, so we can bring ideas from outside to Hong Kong and share those from Hong Kong with others," says Yeung. To date, the organisation has signed memoranda of understanding with 22 different organisations from 15 countries.

"One of the key things we are working on is promoting standards," says Yeung. "The SCC stands between government and industry. We can help both sides come together to set standards for Internet of Things devices, security and open data."

With the appropriate standards in place, Hong Kong would then be in a strong position to reinvent itself once again as a trading intermediary, but this time transferring information rather than goods.

"We are talking with the mainland Chinese government about a policy arrangement that would allow Hong Kong to become an export centre for data," says Yeung. "Maybe in the next 10 years, Hong Kong could become a data hub between China and the world."

“The key to being a smart city is connectivity – not just locally, but globally, so we can bring ideas from outside to Hong Kong and share those from Hong Kong with others.”



# Hong Kong's smart city aspirations



Around the world, smart city thinking is evolving fast. Until recently, the focus of smart city planning used to be predominantly on technology – using information and communications technology to gather and analyse data from city-wide sensors and other sources in order to manage assets and resources efficiently.

This is giving way to a broader, more holistic view – of smart cities as places that harness their resources to improve the quality of life for their citizens, strengthen their economies and enhance long-term sustainability.

“  
 A key learning for smart cities is that today’s citizens are more empowered – they have more information, and they want more say. Prototyping urban solutions at the neighbourhood and district level, for example in waste management or public space design, can have great impact and change the way we use resources every day in our immediate surrounding.

**Waltraut Ritter**  
 Principal  
 Knowledge Dialogues”

The tools may be the same – the data gathered from a city’s streets, power networks, flows of people and vehicles – but the outcomes will have to be different. In this phase, cities must switch their focus to consider the competitive advantage they can gain by combining connected-city technologies with their economic strengths and the connectivity opportunities offered by their neighbours. They can then identify ways in which they can invest wisely and create a more liveable community for their citizens and businesses.

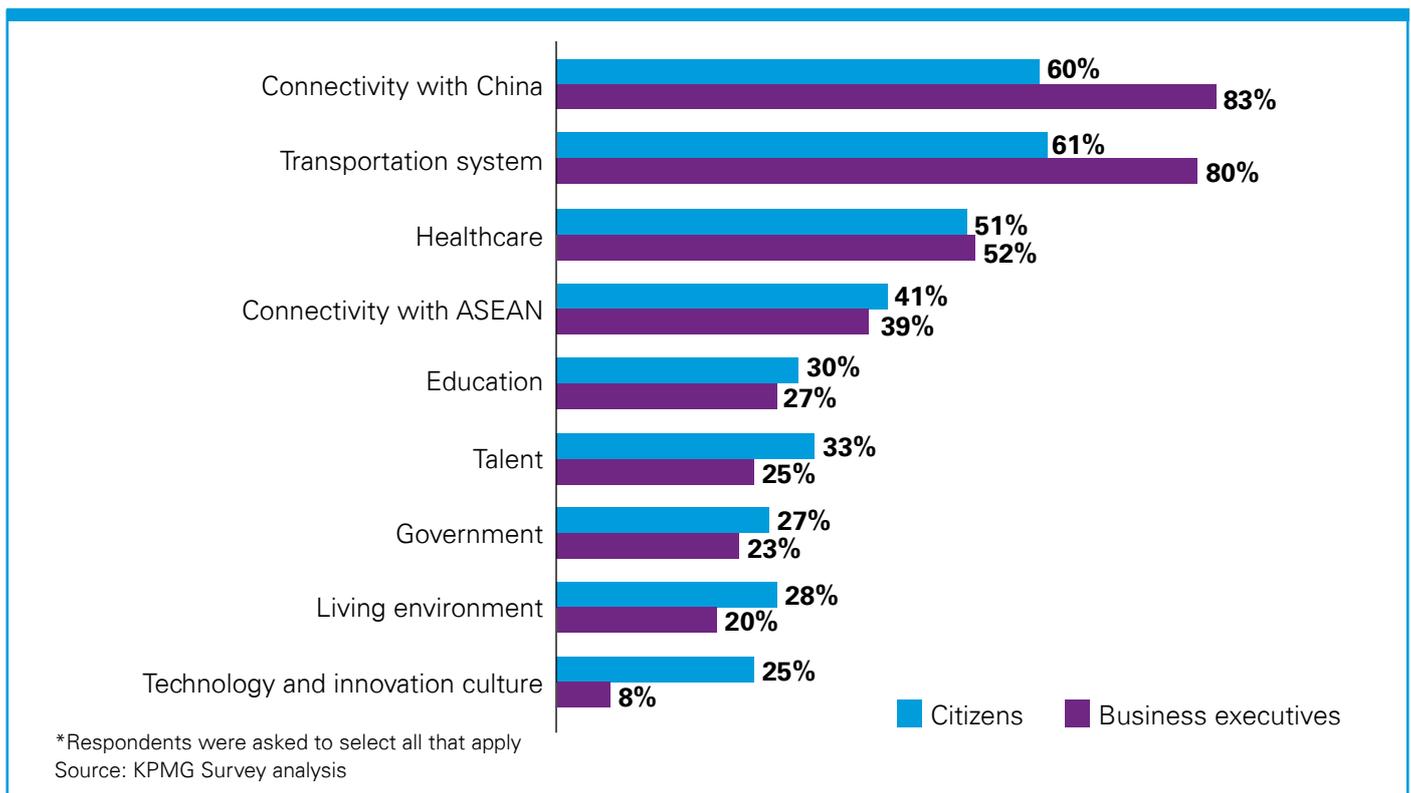
To find out what issues Hong Kong needs to address to realise its smart city ambitions, the KPMG/YouGov survey asked citizens and executives what they see as the city’s strengths and disadvantages, and how it performs against other developed cities.

## Hong Kong’s pros and cons

Regarding Hong Kong’s strengths, more than four-in-five surveyed executives identify the city’s connectivity with China and its transportation system as outperforming other developed cities. Citizens also agree that both these features are Hong Kong’s two most important strengths, though to a lesser extent than the surveyed executives (see Figure 2.1). More than half of the respondents also believe that Hong Kong’s healthcare system outperforms other developed cities.

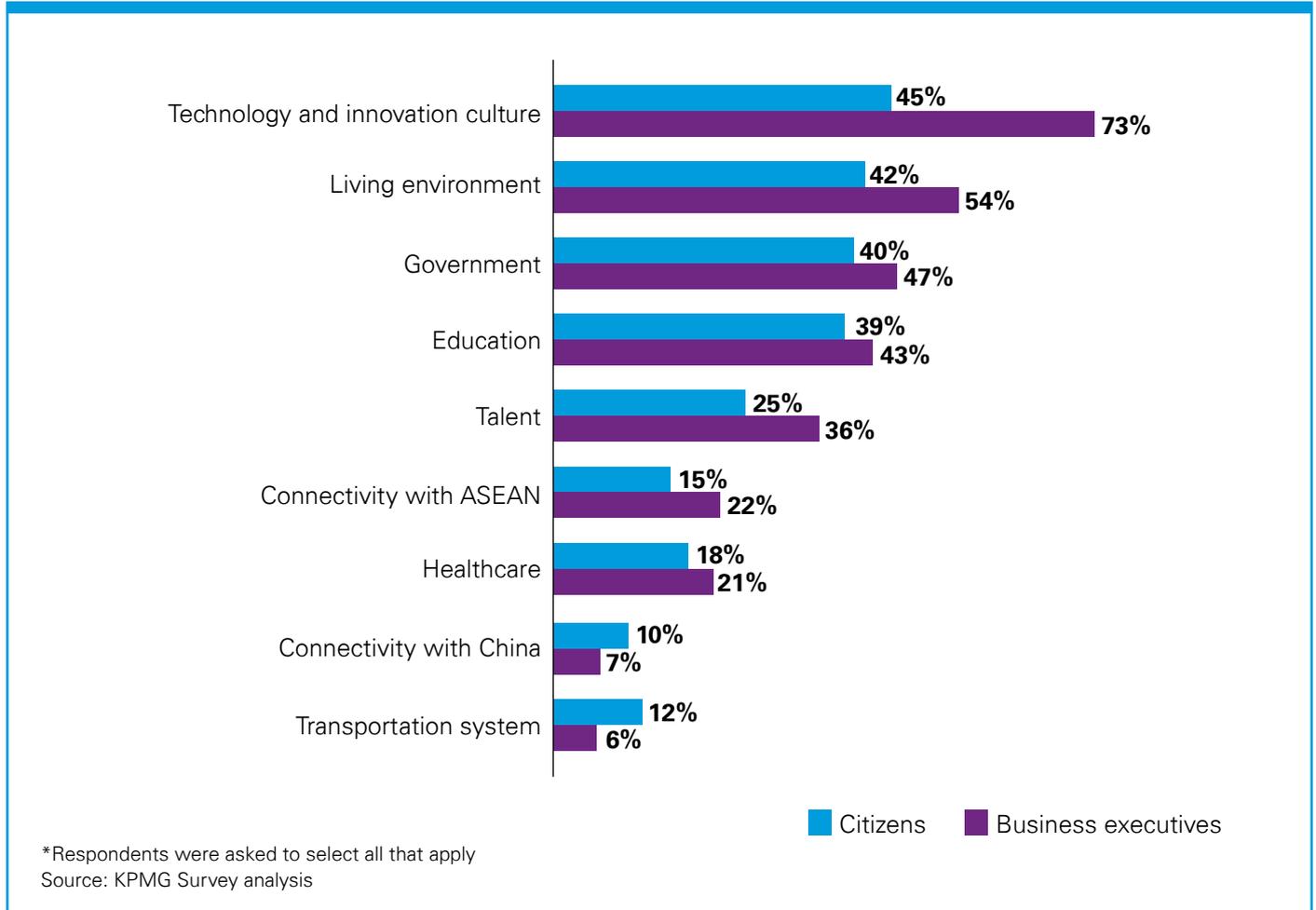
At the other end of the scale, while a quarter of citizens see Hong Kong’s technology and innovation culture as better than those of other developed cities, just 8 percent of executives share the same sentiment. This finding is in line with executives’ view of technology and innovation culture as the most important area for Hong Kong’s growth and success (see Figure 1.1 on page 8). The city’s education, talent, government and living environment all received lukewarm backing, seen as better than those of other comparable cities by between just one-fifth and one-third of both citizens and executives.

**Figure 2.1: Areas where Hong Kong performs better than other developed cities\***



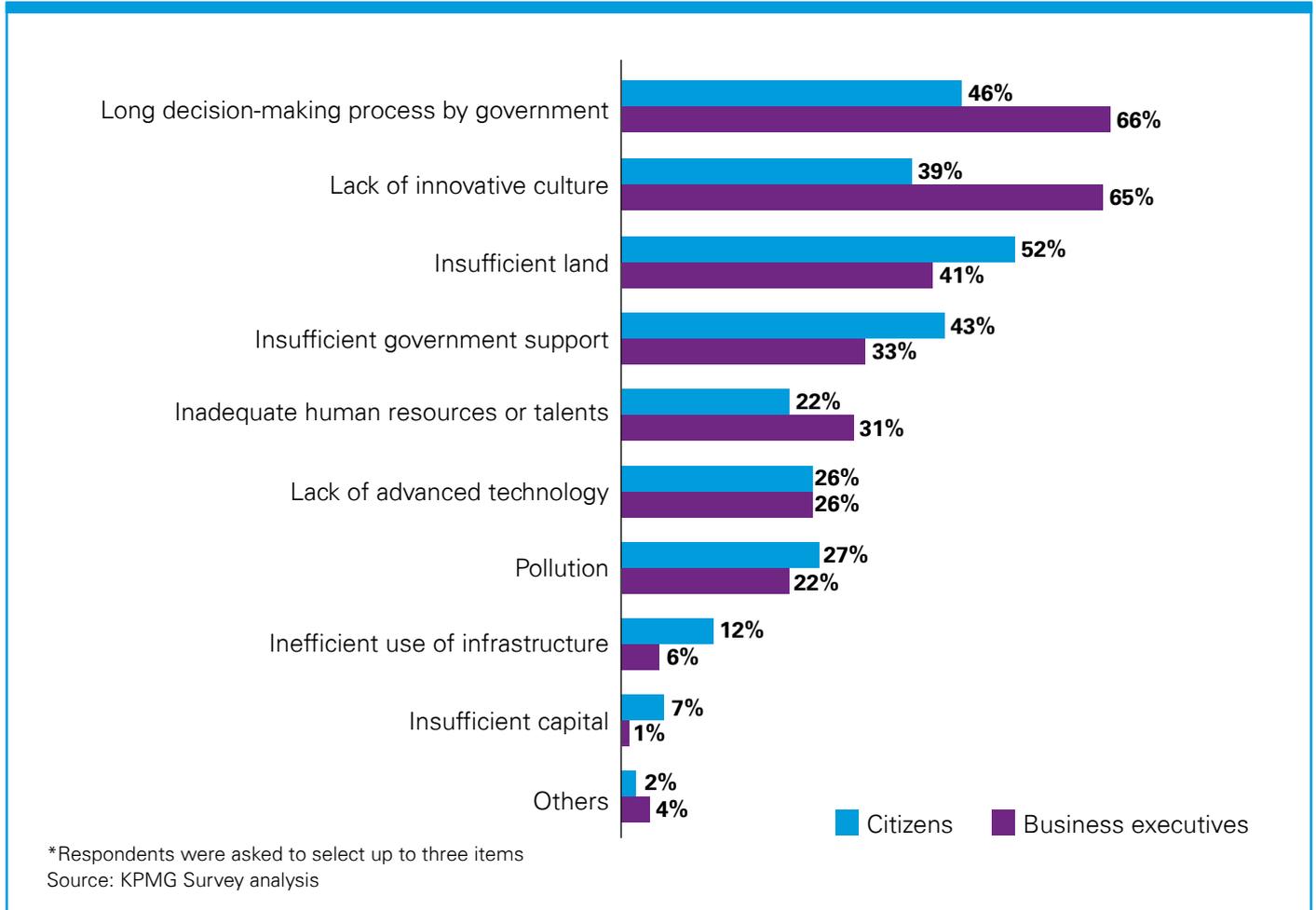
Asked to identify Hong Kong’s weaknesses, executives were more emphatic in their views than citizens. Although both groups see ‘technology and innovation culture’ as where Hong Kong performs worst against its peers, this area is singled out by nearly three-quarters of executives, compared to less than half of the surveyed citizens. Next in the rankings are ‘living environment’, ‘government’ and ‘education’ – again, all seen as more of an issue by executives than by citizens.

**Figure 2.2: Areas where Hong Kong performs worse than other developed cities\***



Meanwhile, a significantly larger proportion of executives than citizens single out the government’s long decision-making process and the lack of an innovative culture as holding Hong Kong’s development back. For citizens, the biggest issue is the city’s difficulties finding enough land for housing, followed by insufficient government support and the government’s long-decision-making process (see Figure 2.3).

**Figure 2.3: Which of the following areas are disadvantages for Hong Kong?\***



## Official thinking

Since 2015, when then chief executive Leung Chun-ying launched the Energising East Kowloon Project, the government has stepped up its smart city initiatives (see page 21).

Currently, it is establishing a dedicated Smart City Office to coordinate smart city projects across different government departments and agencies in the public and private sector, and monitor project progress and effectiveness. The office will be set up under the Innovation and Technology Bureau, with the Office of the Government Chief Information Officer assisting with providing technical support to other government bureaux and departments.

In her first policy address, Chief Executive Carrie Lam said that the office will build on the various measures aimed at boosting innovation, and is aiming for the city to double its expenditure on research and development (R&D) to 1.5 percent of GDP within five years. While this is both a significant and welcome development for Hong Kong, even further increases in expenditure will be required in the future to match that of other developed jurisdictions (see Chart below).

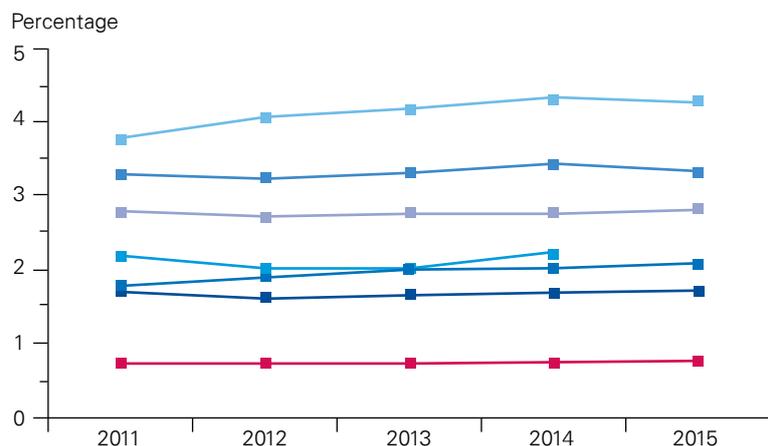
Lam said that companies would be given a 300 percent tax deduction for the first HK\$2 million they spend on R&D, and 200 percent for any amount above that (at present, the deduction stands at 100 percent for R&D spending).

She also announced an overhaul of higher education’s research support and funding allocation mechanisms, and that the government would grant more than HK\$10 billion to fund research at the local public universities, and HK\$3 billion to the city’s research endowment fund to pay for studentships.

To help startups, some 60,000 square feet will be made available to young entrepreneurs in revitalised industrial and commercial buildings at no more than one-third the market rate. Lam will also launch and head a high-level steering committee to look at ways of removing outdated rules and unnecessary bureaucracy.

A host of further smart city initiatives were unveiled in the government’s Smart City Blueprint, released in December 2017. Announcing the goal of making Hong Kong a world-class smart city in the next five years, the report listed a series of short-, medium- and long-term recommendations across six areas – Smart Mobility, Smart Living, Smart Environment, Smart People, Smart Government and Smart Economy.

Spending on R&D as percentage of GDP



Source: World Bank data

# Energising East Kowloon

A key smart-city test-bed project for Hong Kong is Energising East Kowloon – the transformation of a swathe of east Kowloon into a new central business district. Covering 488 hectares across Kai Tak – the site of Hong Kong’s old airport – Kwun Tong and Kowloon Bay, the area brings together business districts already home to 30,000 firms and more than 270,000 jobs.

Guiding the project is the Energising Kowloon East Office, a government one-stop shop for land and building development projects set up in 2012. In 2016, the office developed a smart city feasibility study for the district. The study includes devising an overall framework, an implementation strategy and a business model that can later be expanded to cover all of Hong Kong.

The office is also looking at developing a centralised digital infrastructure with cybersecurity capable of supporting Internet of Things and big data applications, including plans for proof-of-concept trials and implementation strategies.

## Smart city timeline



Then chief executive Leung Chun-ying identifies Kowloon East as Hong Kong’s primary smart city catalyst project. “We intend to use Kowloon East as a pilot area to explore the feasibility of developing a Smart City,” he announced.

**January  
2015**



The Central Policy Unit releases its Smart City Research Report, in which it calls for Hong Kong to “adopt a visionary and international perspective to embrace this latest development opportunity”.

**September  
2015**



The government announces a HK\$2 billion information and communications technology (ICT) development fund, a HK\$200 million Cyberport fund for ICT start-up investments, and a HK\$500 million Fund for Better Living to finance innovative projects aimed at improving life quality.

**January  
2016**



The Office of the Government Chief Information Officer commissions a HK\$5 million Smart City Development Blueprint to cover policy objectives and strategy, development plans, governance arrangements, digital infrastructure, open data sharing and public-private collaboration models.

**December  
2017**



The government releases its Smart City Blueprint, with the goal of making Hong Kong a world-class smart city in the next five years.



## Cyberport: supporting Hong Kong's digital tech industry

"We're very bullish on the next few years," says Herman Lam, CEO of Hong Kong's biggest digital hub, Cyberport. "The government's focus on technology will help a lot, putting Cyberport in a very good position to support the digital tech industry and Hong Kong's smart city development."

An innovative digital community with 1,000 digital tech companies, Cyberport is managed by Hong Kong Cyberport Management Company Limited, which is wholly owned by the Hong Kong SAR Government. Cyberport actively seeks to nurture youth, start-ups and entrepreneurs to grow in the digital industry by connecting them to strategic partners and investors, driving collaboration with local and international business partners, and accelerating digital adoption among corporates and SMEs. "It took time to set up the ecosystem, but now things are maturing," says Lam. "We are receiving more applications to come here – 1,700 last year – and the quality is better than ever."

Its incubation programmes offer startups up to HK\$330,000 in funding, while a HK\$200 million macro fund launched in 2016 helps companies bridge the funding gap as they advance from the seed stage.

Situated in Pokfulam on the west side of Hong Kong island, its attractions include boot camps, incubation and acceleration programmes, and affordable office and co-working space. It also houses Hong Kong's largest fintech co-work space, covering 35,000 square feet, and includes an information lab and training rooms.

With some recent initiatives focusing on bringing talent to Hong Kong, Lam notes that attitudes to careers are also changing. "For a long time, people wanted to become a doctor, a lawyer or a banker. It took a lot of effort for people to see the potential of tech. But now, more and more people want to explore the new economy."

Perhaps that is because the new economy is also starting to breed successes. Among the companies to have graduated from Cyberport's incubation programme is online logistics firm GoGo Van. The recipient of HK\$100,000 seed funding from the Cyberport Creative Micro Fund in 2013, Gogo Van became Hong Kong's first start-up to reach "unicorn" status – a US\$1 billion valuation – in September 2017 after merging with Chinese freight business 58 Suyun.

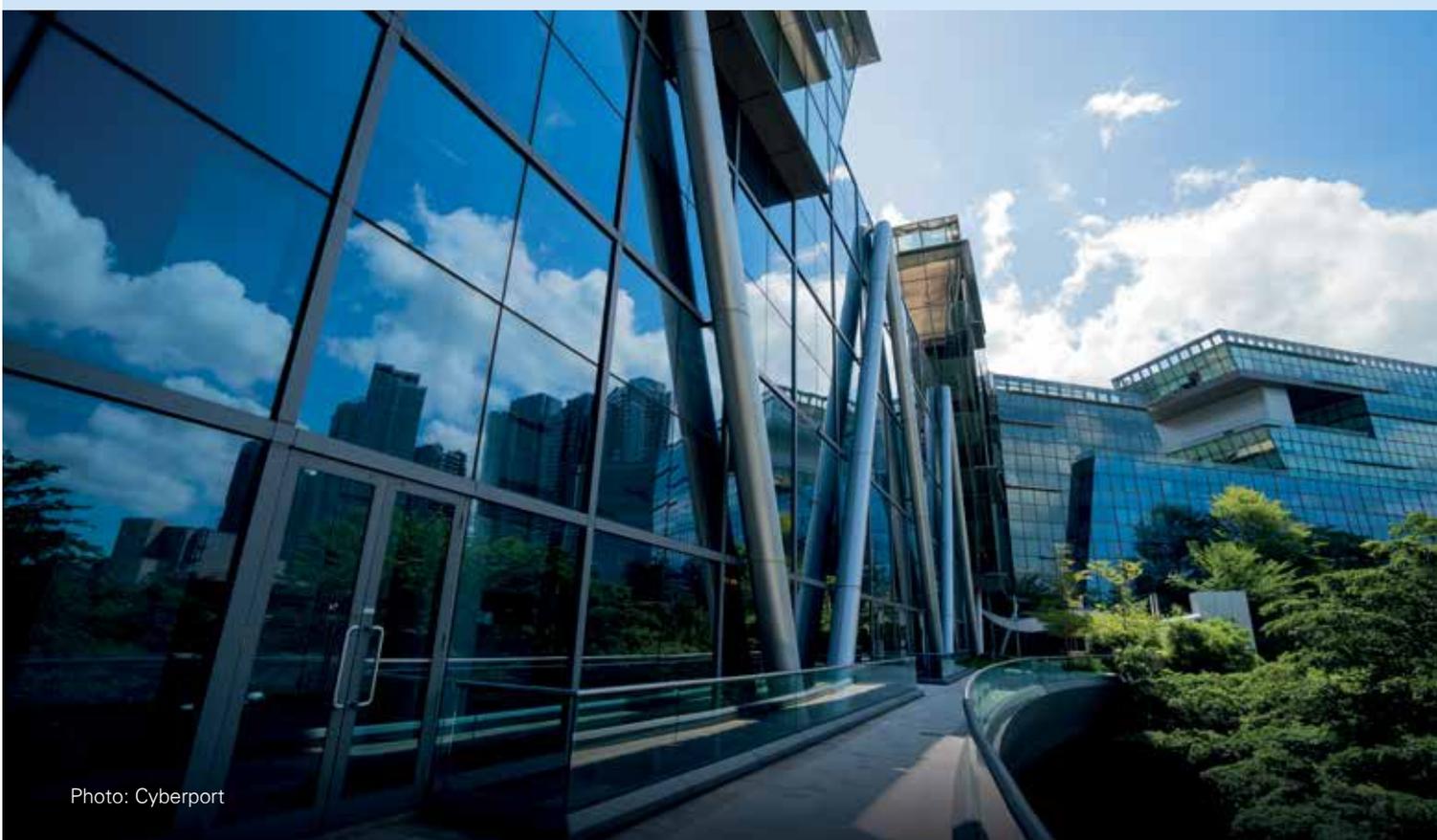


Photo: Cyberport



Photo: Science Park

## Science Park's boldest new venture

Hong Kong Science Park, home to 650 technology companies and nearly 13,000 innovators, entrepreneurs and other staff, stands as a major test-bed for new ideas. In early 2017, it was given the responsibility for managing the development of the Lok Ma Chau Loop into an innovation and technology park.

Under an agreement reached between Hong Kong and Shenzhen, the project – officially known as the Hong Kong/Shenzhen Innovation and Technology Park – is set to become one of Hong Kong's boldest efforts at boosting its high-tech ambitions.

Due to become home to academic and research facilities as well as new technology businesses, the project has enormous potential to boost cross-border collaboration in the high-tech sector, says Albert Wong, CEO of the Hong Kong Science and Technology Parks Corporation. "Having an ecosystem working closely with Shenzhen in the Lok Ma Chau Loop can help strengthen Hong Kong's role as a hub for data, funds, talent and goods," he says.

In addition, the longer-term goal is to pair Hong Kong's strengths in finance, the predictability offered by its rule of law and first-class links to the rest of the world, with Shenzhen's high-tech manufacturing and product innovation strengths, to produce a rival to California's Silicon Valley-San Francisco pairing.

## Viewpoint

“Smart cities put their citizens first,” says Julian Vella, Asia Pacific Regional Leader, KPMG Global Infrastructure Practice. In smart cities, he explains, the government, business and citizens communicate, engage and collaborate with each other, and interact to drive economic growth, improve living standards, create amenities and ensure long-term environmental sustainability.

This means a smart city has to have multiple connections, including technology that enables the flow of data and information, and communication that allows voices from the entire community to be heard.

**Julian Vella**

*ASPAC Regional Head -  
Global Infrastructure Advisory  
KPMG China*



## Viewpoint

Prioritising Hong Kong's smart city ambitions is essential for the city to drive its next stage of development, says Gregg Li, president of Invotech, a non-profit "do-tank" that focuses on innovation and technology changes and adaptation in Hong Kong.

Reinventing the city as a digital hub could help achieve this – transforming it into a place that is faster, more aware of itself, and with a higher quality of life and more opportunities for its citizens. "Hong Kong needs to be like a multi-plug adaptor – the place that can link anything with anything. In particular, to take advantage of China's One Belt One Road initiative, Hong Kong can be a digital trader."

This will call for contributions from all key industry players. "Hong Kong needs a multidisciplinary strategy to come together," says Li. The government can invest some of its nearly HK\$2 trillion fiscal reserves in digital infrastructure, and put in place digital mechanisms such as cybersecurity and cryptocurrency standards so that people can trust their data with the city, suggests Li. "Setting new standards to link China and the world should be the next step."

"Educators also need to play a role, particularly in fostering creativity. Governments around the world have been prioritising STEM learning – science, technology, engineering and mathematics. We should emphasise STEAM – adding 'art' to the other four, as creativity is something that cannot be taken away by artificial intelligence," says Li.

Universities also need to move at the same pace as technological change – offering shorter, faster courses that are more responsive to the market, says Li. "These days, it can take a few years to introduce a new programme into the university curriculum. With the rise of China, digitalisation and disruption, we are seeing exponential change."

To cope, Hong Kong needs a new mindset of awareness. "A smart city is one that is conscious – that knows where it stands, and where it is going," says Li. "Hong Kong has pretty much everything it needs for this. Now we need to be bold and learn to be more mindful of ourselves, our surroundings (like what is happening in Shenzhen), and of each other."

**Dr. Gregg Li**

President  
Invotech

## Smart Hangzhou: A centralised 'city brain'



Hangzhou, the capital of Zhejiang province, and home to 9 million people, has what is probably China's most advanced smart city project.

Known as the City Brain, it tracks the movements, social media activity, shopping and other activity across every one of the city's population, collecting data from people's computers and mobile phones, from sensors and from roadside cameras, then transferring it to the City Brain's database.

There, the information is processed by Apsara, a cloud-based artificial intelligence application developed by Alibaba, that can deliver real-time analytics about what is happening across the city, twenty-four hours a day, seven days a week.

The City Brain can monitor where traffic accidents take place or road congestion is building up, allowing for the better management of the city's electronic traffic signs. In parts of the city, this had led to a more than 10 percent increase in average traffic speeds.

Announced in 2016, the scheme also makes it easier for drivers to find parking spaces and – thanks to its ability to track stolen vehicles – has led to a fall in crime rates.

# Hong Kong's smart city development

## Transportation and mobility



Daily passenger trips  
on public transport in  
Hong Kong:

**12.6** million

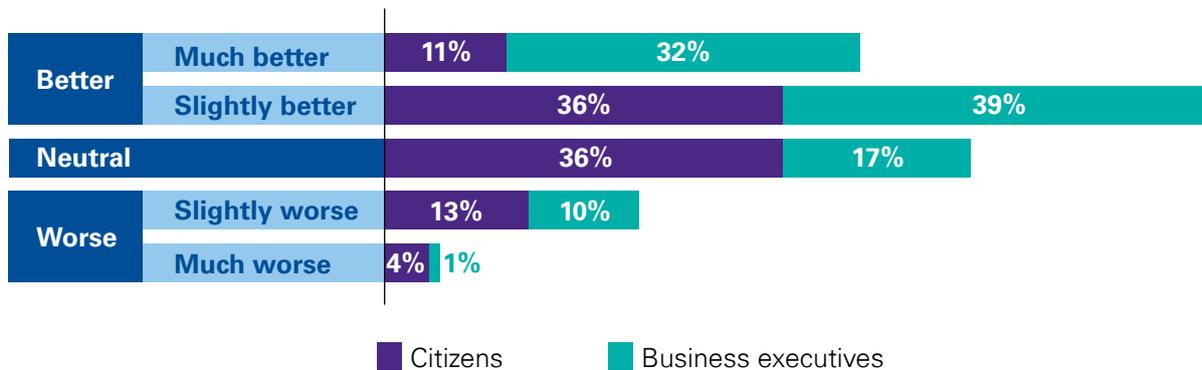
Source: Hong Kong Smart City Blueprint

Hong Kong undoubtedly has one of the world's best-developed public transport systems. Daily, more than 12 million trips are taken by public transport – about 90 percent of all passenger trips in the city. Rail dominates this mix – with its share set to keep rising as new projects are brought into service through and beyond the end of the decade.

However, with private vehicle numbers continuing to rise, and roadside pollution emissions still a major concern, improving the efficiency of Hong Kong's traffic system remains a priority. For the government, this calls for developing more environmentally friendly modes of transport, making journeys more efficient with real-time traffic information and having better traffic planning and management through the enhanced use of data analytics – all of which are addressed in its Smart City Blueprint.



**Figure 3.1: How does Hong Kong’s transportation and mobility compare with other developed cities?**



Source: KPMG Survey analysis

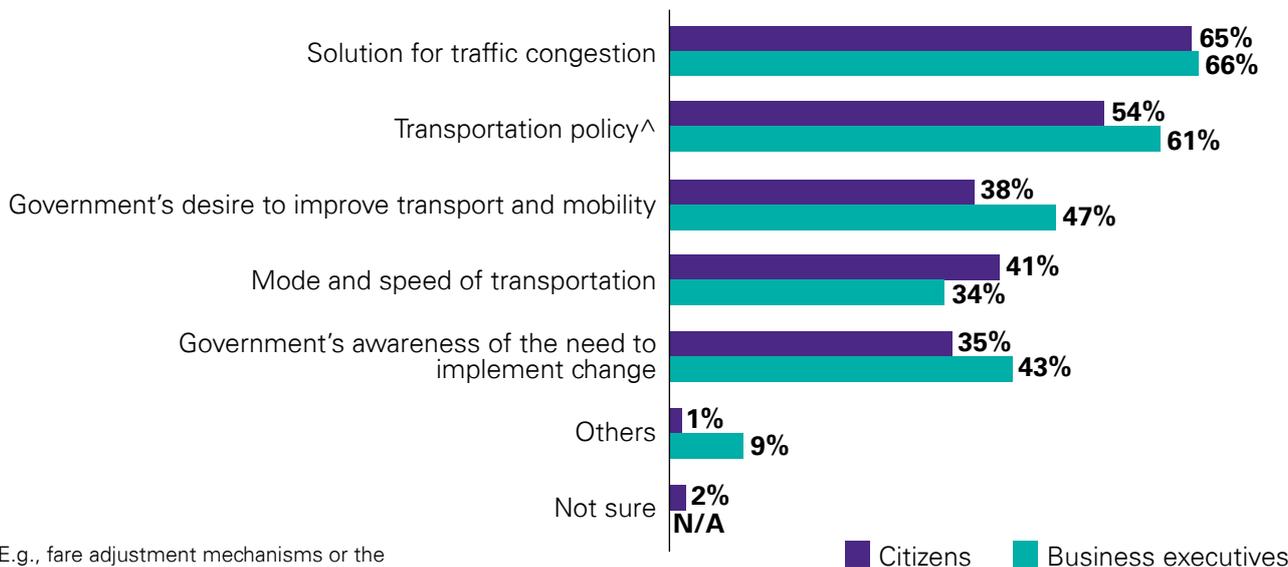
That the performance of Hong Kong’s transportation system was strong but could improve is one of the key survey findings, especially for citizens. While 71 percent of business executives see Hong Kong as performing better than other developed cities in terms of transportation and mobility, that approval rating drops to 47 percent for citizens.

For both groups, ‘solutions for traffic congestion’ is a high priority for transportation mobility to improve in the next 10 years (citizens 65 percent; executives 66 percent), as is ‘transportation policy’ in general (citizens 54 percent; executives 61 percent).

Where the two differ is in their support for improving the ‘mode and speed of transportation’ (citizens 41 percent versus executives 34 percent), while substantially more business executives mention ‘government’s desire to improve’, ‘government’s awareness of the need to implement change’ and ‘transportation policy’ as areas of focus.



**Figure 3.2: What needs to be changed to better develop transportation and mobility in Hong Kong in the next 10 years?\***



<sup>^</sup>E.g., fare adjustment mechanisms or the construction of new railways and/or highways

\*Respondents were asked to select all that apply

Source: KPMG Survey analysis

To accelerate the development of Hong Kong’s transportation and mobility over the coming decade, both citizens and executives note the government needs to show a desire to address transportation problems as their top priority (citizens 57 percent; executives 64 percent – see Figure 3.3).

Furthermore, while citizens rate ‘constructing more rail and underground transportation’ as the next most important priority, executives want Hong Kong to build the infrastructure needed for electric vehicles. Their preference for better integration with the rest of the Greater Bay Area is also higher than that of the surveyed citizens (41 percent versus 23 percent).

Promoting driverless transportation is rated low by both citizens (21 percent) and executives (30 percent).

## Smart Airport



With cargo throughput reaching 4.94 million tonnes in 2017, Hong Kong International Airport remains the world’s busiest air freight hub. It is exploring a host of ways in which technology can improve the efficiency of its operations, from using robots for cargo and baggage handling to sharing weather and flight data with external companies.

In 2016, the Airport Authority and the Hong Kong Applied Science and Technology Research Institute (ASTRI) jointly set up the ASTRI-HKIA Joint Research and Development Centre for Smart Airport, to look at new technologies that can help transform the airport into a smart airport.

Trial projects underway include a partnership with the Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies for a barcode and radio-frequency identification scanner that allows passengers to print luggage tags at home and then check in luggage by themselves. A driverless tractor trial is also currently underway, as well as a project for a Digital Twin for the Airport.

The airport is also looking at ways of expanding mobile check-in and baggage pickup services to off-airport locations such as theme parks, hotels, convention centres and cruise terminals. Together with the government, the airport is also exploring how facial biometrics technology can be used at check-in, boarding pass checkpoints and when boarding aircraft.



**World’s busiest cargo airports, 2016 Freight throughput (million tonnes)**

Hong Kong International Airport	<b>4.5</b>
Incheon International Airport	<b>2.6</b>
Dubai International Airport	<b>2.6</b>
Shanghai Pudong International Airport	<b>2.5</b>
Tokyo Narita International Airport	<b>2.1</b>

Source: Airports Council International; Hong Kong government



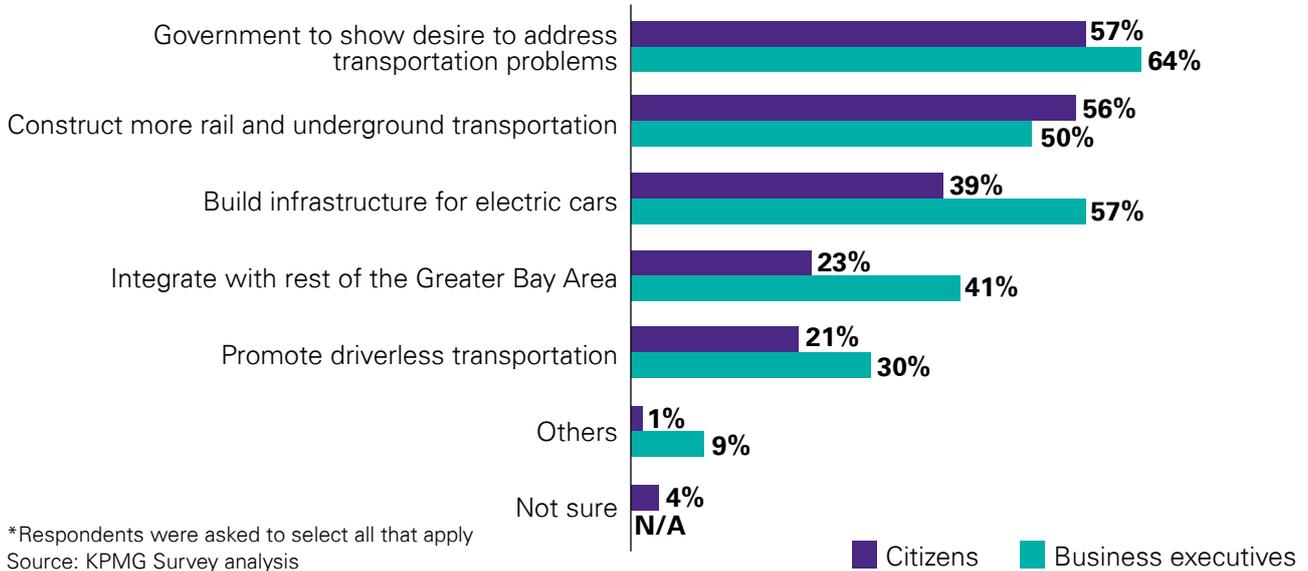
**World’s busiest airports, 2016 Total passenger traffic (million)**

Hartsfield-Jackson Atlanta International Airport	<b>104.2</b>
Beijing Capital International Airport	<b>94.4</b>
Dubai International Airport	<b>83.7</b>
Los Angeles International Airport	<b>80.9</b>
Tokyo International (Haneda) Airport	<b>79.7</b>
O’Hare International Airport	<b>78</b>
Heathrow Airport	<b>75.7</b>
Hong Kong International Airport	<b>70.3</b>
Shanghai Pudong International Airport	<b>66</b>
Paris Charles de Gaulle Airport	<b>65.9</b>

Source: Airports Council International



**Figure 3.3: What actions are important to accelerate the development of transportation and mobility in Hong Kong in the next 10 years?\***



For both environmental and economic reasons, railways form the backbone of Hong Kong’s passenger transport system. Hong Kong’s MTR continues to support the government in building a smarter city through the development of its future railway network under “Railway Development Strategy 2014” and the “Hong Kong 2030+” plan.

Currently under construction are the MTR line Sha Tin to Central Link and the cross-boundary high-speed rail link connecting Hong Kong with mainland China’s national high-speed rail network. Combined with the three MTR lines that came into operation in 2015 and 2016 – the West Island Line, the Kwun Tong Line Extension and the South Island Line – Hong Kong’s rail network will span more than 270 kilometres and cover areas inhabited by more than 70 percent of the population.

Through its RailGen2.0 programme, MTR is not just building new railways and upgrading its assets, but it is also focusing on enhancing customer experience. One example is the use of its digital platform to provide commuters with more real-time and personalised information during their MTR journey.

MTR is also supporting the government’s Smart City Blueprint on Smart People by establishing the MTR Academy, which aims to nurture more railway and related talent and expertise, both inside and outside of Hong Kong.

# Hong Kong's smart city development

## Finance



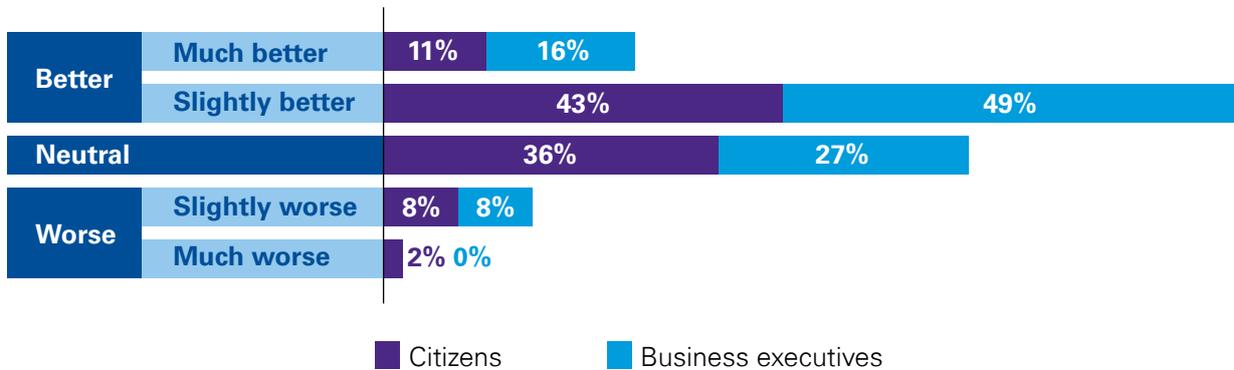
As one of the world's leading financial centres, it is no surprise that more than nine out of ten surveyed business executives and almost as many citizens see Hong Kong's financial development as the same or better than other comparable cities around the world (see Figure 3.4).

However, the surveyed executives have far stronger views than those of citizens around the finance sector-related changes that would benefit Hong Kong's future development. Sixty-three percent of executives single out greater government support for the setting up of financial-related technology (compared to 43 percent of citizens), while 60 percent call for better awareness and education (44 percent of citizens), and 56 percent want faster/nimbler regulation (46 percent of citizens – see Figure 3.5).

The only area where citizens hold a stronger view is over increasing the opportunities for money to stay in Hong Kong (favoured by 37 percent of citizens compared to 27 percent of executives).



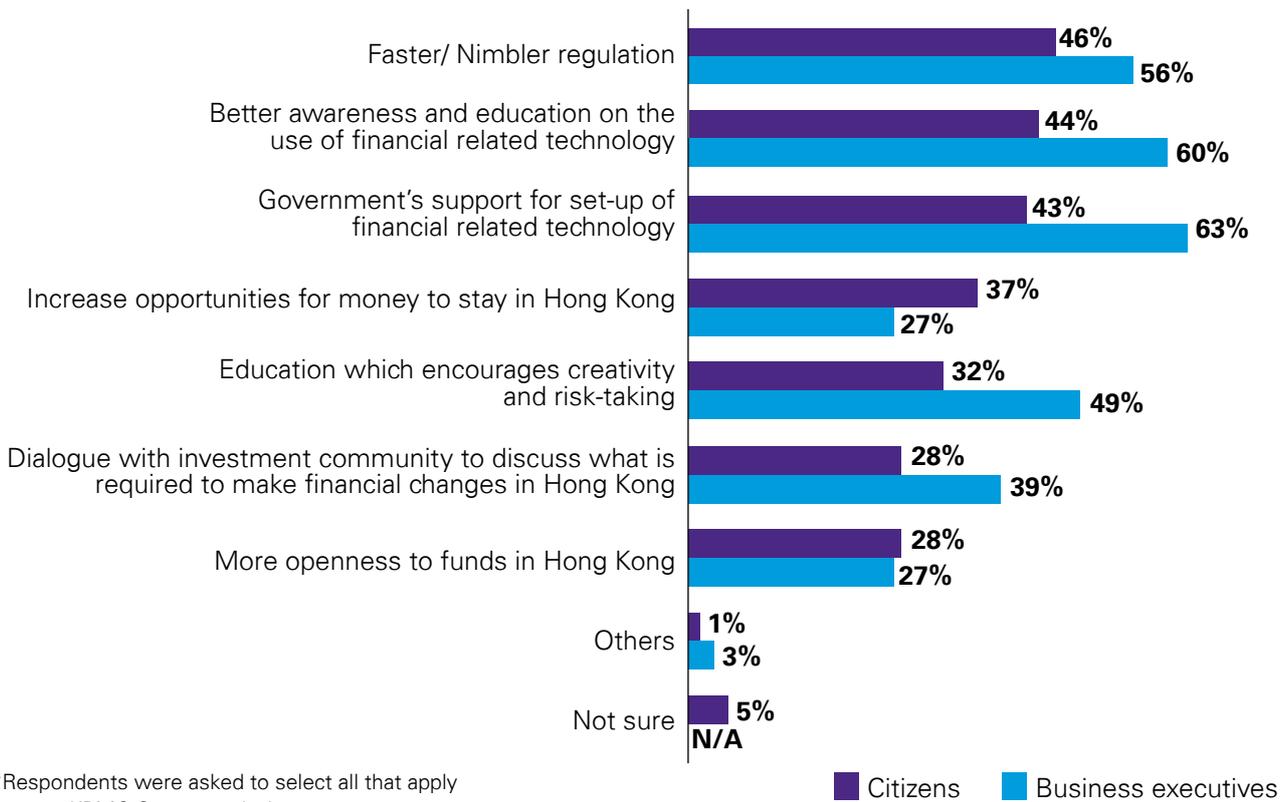
**Figure 3.4: How does Hong Kong’s financial development compare with other developed cities?**



Source: KPMG Survey analysis



**Figure 3.5: What needs to be changed to better develop finance in Hong Kong in the next 10 years?\***



\* Respondents were asked to select all that apply  
Source: KPMG Survey analysis

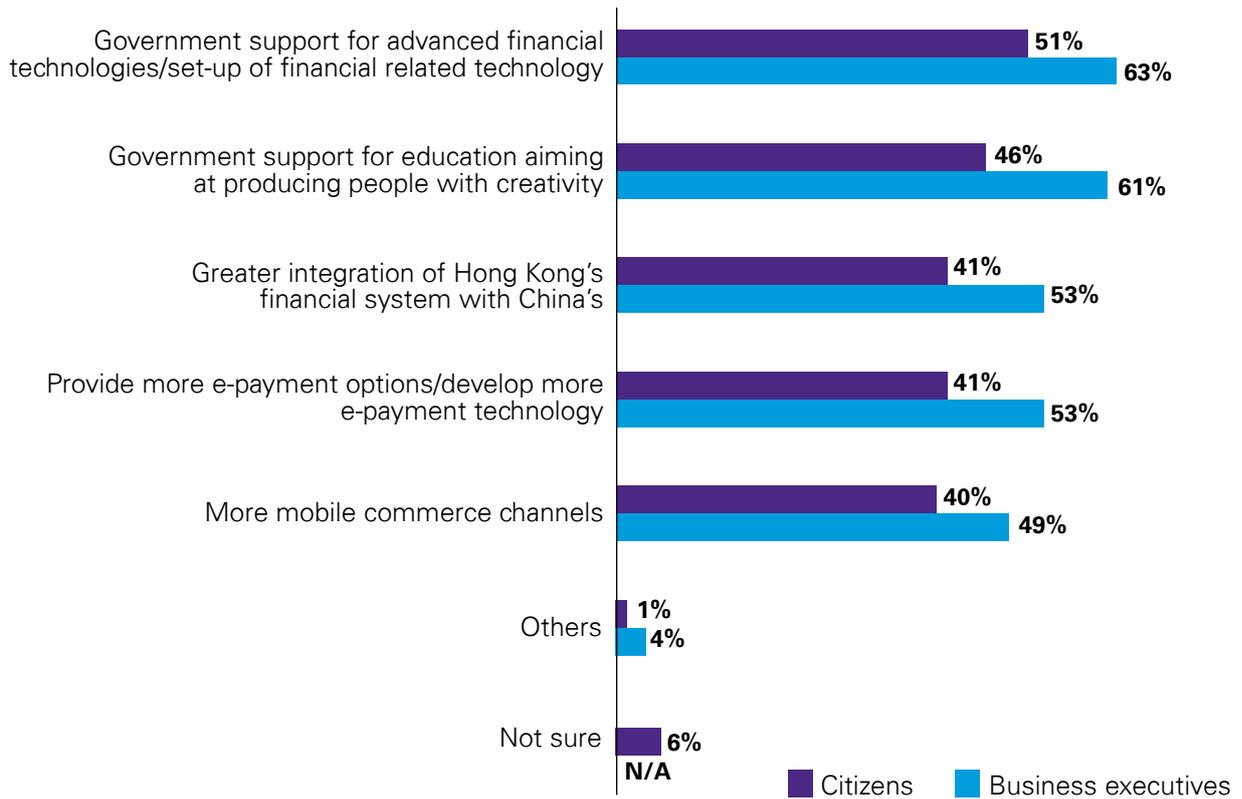
To accelerate Hong Kong’s development in the next 10 years, both citizens (51 percent) and business executives (63 percent) believe that government support should be given to help advanced and other financial technologies set up in Hong Kong.

Education aimed at stimulating creativity is also ranked highly by executives. To this end, some companies are calling for greater entrepreneurship and creative thinking to develop a more innovative culture in Hong Kong (see page 33).

The greater integration of Hong Kong’s financial system with China’s, the development of e-payment options and technology, and more mobile commerce channels are also important areas for both executives and citizens.



**Figure 3.6: What actions are important to accelerate the development of finance in Hong Kong in the next 10 years?\***



\*Respondents were asked to select all that apply  
Source: KPMG Survey analysis

# Encouraging entrepreneurship



**Michael Kwok**

Chairman, East Asia  
Arup



**Wilfred Lau**

Director  
Arup

UK-headquartered Arup provides engineering, design, planning, project management and consulting services for all aspects of the built environment. Responsible for the engineering behind Hong Kong landmarks – including Central’s HSBC headquarters building and the International Financial in Central, and Stonecutters Bridge across Rambler Channel – it is now contributing to Hong Kong’s smart city development as lead consultant for the city’s first smart district in East Kowloon.

“The big question for Hong Kong is how to create a more innovative culture,” says Wilfred Lau, the head of Arup’s consulting activities across East Asia. “Hong Kong people are smart, they are not afraid of creativity and innovation, but perhaps we have been in a comfort zone for a little too long.”

Part of the answer, he says, is looking afresh at Hong Kong’s education system and examining the ways to encourage greater freedom of thought and discussion. But perhaps more important is looking for ways of injecting a greater sense of urgency into the city. “We are seeing places like Singapore and Shenzhen surging ahead. We are seeing lots of new ideas in China. But we aren’t reacting – we are getting left behind,” says Lau. “Hong Kong has become a little too risk averse. We need to possess a real sense of urgency. We need to ask ourselves if there should be some changes.”

Take banking and taxi services as examples, says Lau: “We need to think about how far competition should be allowed, and about what the best ways are to change regulation to allow new forms of competition.”

Lau’s thoughts are echoed by Michael Kwok, Arup’s Chairman, East Asia. “Young people are wondering about their future, and we should be trying to grow the innovative environment here to give them more opportunities.”

Also important, say both Lau and Kwok, is looking at what companies should be doing, both individually and together, to encourage entrepreneurship. “Companies like ours should work with others to create a smart city ecosystem that enables entrepreneurship,” says Lau. “There is frustration in Hong Kong, especially among the young, so it is important that we in business change where Hong Kong is going – creating more business opportunities for others, and using our capabilities to promote entrepreneurship.”

Going forward, Kwok and Lau suggest that companies should take advantage of the opportunities emerging from the sharing economy and open data, and look to offer new services around this. “We can be the test-bed for more of these services,” says Kwok. “We can use Hong Kong’s smart city evolution to create an ‘equal’ smart city ecosystem – one that creates opportunities for everyone, and focuses on delivering quality of life improvements for all of its population.”

“Young people are wondering about their future, and we should be trying to grow the innovative environment here to give them more opportunities.”

# Hong Kong's smart city development

## Education



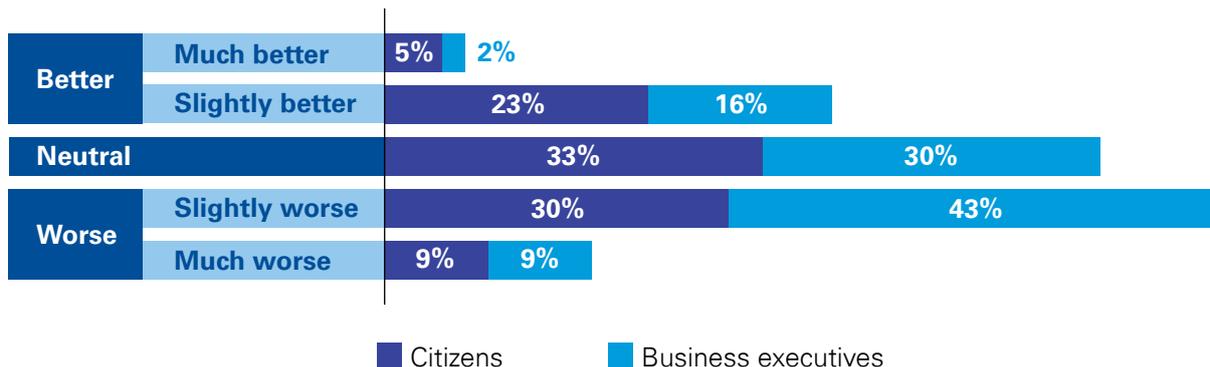
Getting education right will be crucial for Hong Kong's development, especially in nurturing future generations with the creative thinking and technical skills needed to achieve the city's aspirations to further develop a culture of innovation and drive economic growth.

Both citizens and business executives believe there is significant room for development regarding Hong Kong's current state of learning.

More than half of the business executives polled view Hong Kong’s education and research system as worse than that of other developed cities; only 18 percent see it as better. Citizens are slightly less critical: 39 percent see the system as worse, while 28 percent view it as either much better (5 percent) or slightly better (23 percent – see Figure 3.7).



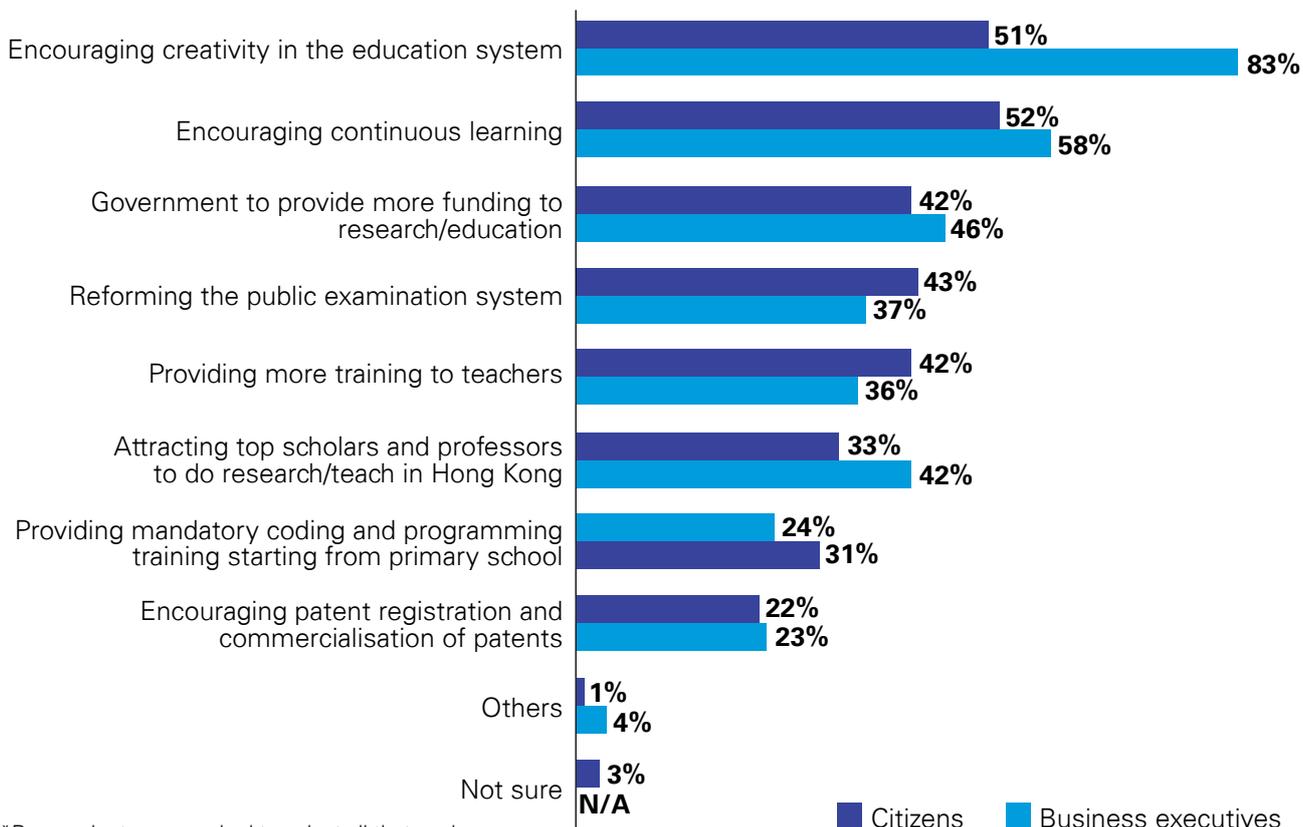
**Figure 3.7: How does Hong Kong’s research/education compare with other developed cities?**



Source: KPMG Survey analysis



**Figure 3.8: What actions are important to accelerate the development of research/education in Hong Kong in the next 10 years?\***



\* Respondents were asked to select all that apply

Source: KPMG Survey analysis

Asked which education-related actions they consider most important for Hong Kong’s development, an overwhelming share of business executives – 83 percent – identify ‘encouraging creativity in the education system’ (see Figure 3.8). ‘Encouraging continuous learning’ is also an important factor for business executives (58 percent).

Citizens likewise rank the encouragement of creativity and continuous learning as the top two priorities (selected by 51 percent and 52 percent of respondents, respectively). Additionally, they also identify three other key issues to address: reform of the public examination system, providing more training to teachers and providing more funding to the education system as a whole.

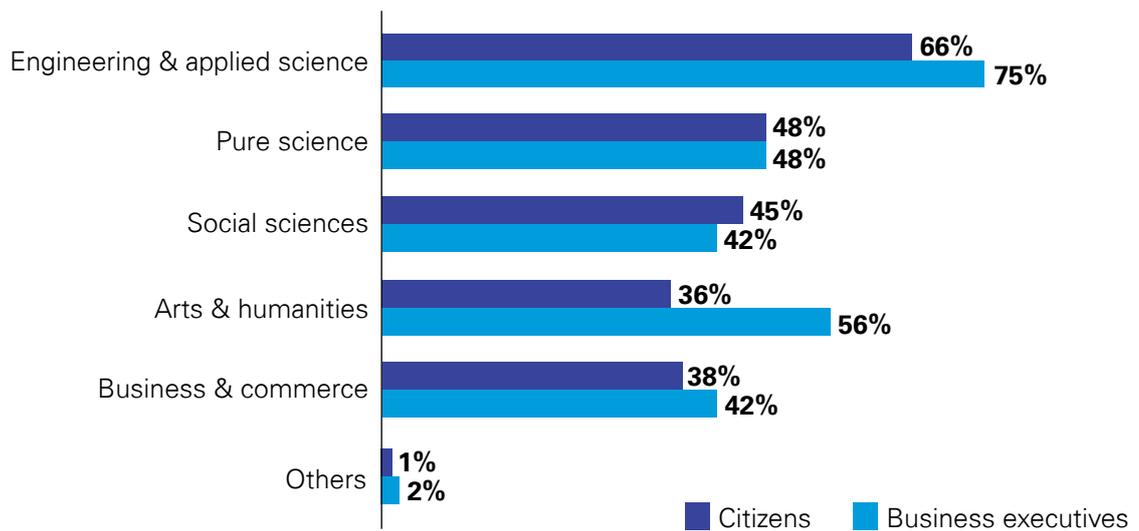
Asked which disciplines would be most important for Hong Kong’s development in the next 10 years, both citizens and executives chose engineering and applied science (citizens 66 percent; executives 75 percent).

The findings indicate a strong need for Hong Kong’s education system to be improved to encourage creativity and continuous learning, with a focus on science, technology, engineering and mathematics (STEM).

For its part, the government in its Smart City Blueprint has laid out initiatives to encourage more students to pursue STEM programmes and more companies to hire STEM graduates, among other plans aimed at harnessing talent and developing an innovation and entrepreneurial culture. It is also important that competitive remuneration is offered for jobs related to these fields.



**Figure 3.9: Which of the following disciplines will be most important for the development of Hong Kong’s next generation in the next 10 years?\***



\* Respondents were asked to select up to three items  
 Source: KPMG Survey analysis

## Viewpoint

A commitment to nurturing talent is key to economic and environmental sustainability, according to Vince Chan, Co-founder of TGN Creta Ventures, a venture investment platform that drives cross-border innovation in education and learning. "In the digital age, human capital is mobile. We are entering an era in which we can acquire, transform, assess and even monetise skills and knowledge, anytime and anywhere," says Chan.

"With technology constantly evolving the way we do business, what we have to develop in Hong Kong is a 'growth mindset' – that means we must all have the ability to keep unlearning and relearning," she adds.

To this end, Chan makes a distinction between education and learning: "Education is about putting people into boxes that are related to the current economic system. However, learning is limitless and future-driven – about opening minds," she says.

She also believes that, ultimately, people have to take responsibility for their own learning. Governments and companies, however, do have to play roles

in putting the right learning tools and practices in place, in addition to being learning institutions themselves. "Having a growth mindset and the ability to unlearn and relearn applies to the personal, corporate and government level – allowing corporate transformation, personal career development and even smart city development," she says.

Looking ahead, in order to become a truly smart city, Chan says that Hong Kong needs to ensure that it creates, empowers and sustains talent mobility, knowledge transfer and skills transformation in a continuous, agile and scalable manner.

In this regard, Chan notes that TGN Creta Ventures is harnessing technology and capital to help realise this vision. "We consider ourselves ecosystem-driven venture capitalists. In this ecosystem, we have students and their parents, schools, enterprises and the government – a lot of silos that do not talk much to each other. We have started looking for ways to break down these silos and link these stakeholders, both within countries and across borders."

**Vince Chan**

*Co-founder  
TGN Creta Ventures*

## Smart Helsinki: A free-form approach to learning



For a different take on the education needed to make a city smart, Helsinki combines a high level of digital tools with an increasingly free-form approach to learning.

At the very start of their school days, children often learn to write using keyboards, make up stories using video and play with LEGO robots.

As they grow older, instead of learning everything subject by subject, they embark on projects that call for them to use skills and knowledge from multiple disciplines – known as phenomenon-based learning. Rather than studying maths in abstract for example, children will learn how to calculate as part of a project about energy – which will also incorporate history – explaining how the power industry has changed over time – and geography – by showing them where global energy sources come from.

All secondary students have their own e-portfolios – places where they can store information they collect, manage ongoing projects and keep a record of all the projects they have completed.

The digitalisation of Helsinki's schools is leading to a host of new experiments, among them the elimination of textbooks and their replacement with electronic media, school rooms with no desks, and a move away from a timetable of lessons to having learning take place at workshops, in out of school locations, and even in workplaces.

# Hong Kong's smart city development

## Environment



Hong Kong's combination of a densely built environment and service-centred economy means that buildings account for 90 percent of the city's electricity usage. And with power generation accounting for nearly 70 percent of Hong Kong's carbon emissions, this means that buildings are also the city's biggest source of greenhouse gas emissions.

A key part of making Hong Kong a more sustainable city, therefore, centres on improving the environmental performance of its buildings – either by constructing more environmentally friendly new buildings or encouraging the retrofitting of existing ones.

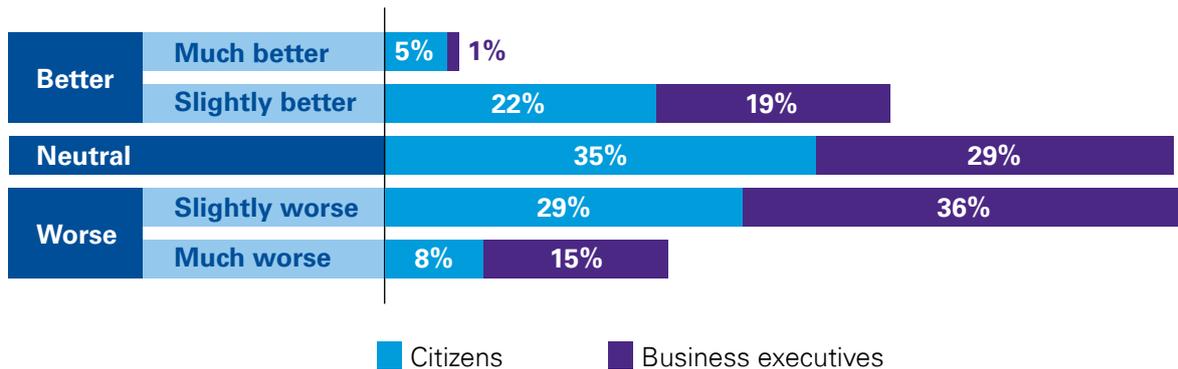
The challenges this presents are reflected in the survey findings. Overall, while nearly two-thirds of citizens see Hong Kong as performing the same or better than other developed cities in environment/urban planning, 51 percent of business executives note that the city performs worse than its global peers (see Figure 3.10).

Asked to identify areas of the environment and urban planning that need change for Hong Kong to further develop, business executives and citizens are largely in accord (see Figure 3.11). Both single out waste handling as the top priority (citizens 58 percent; executives 75 percent), followed by the housing system, handling of ageing buildings and the regulation of pollution.

Other important areas for both groups are the availability of green space/country parks, transport/mobility, planning for land reclamation and reduction of carbon intensity.



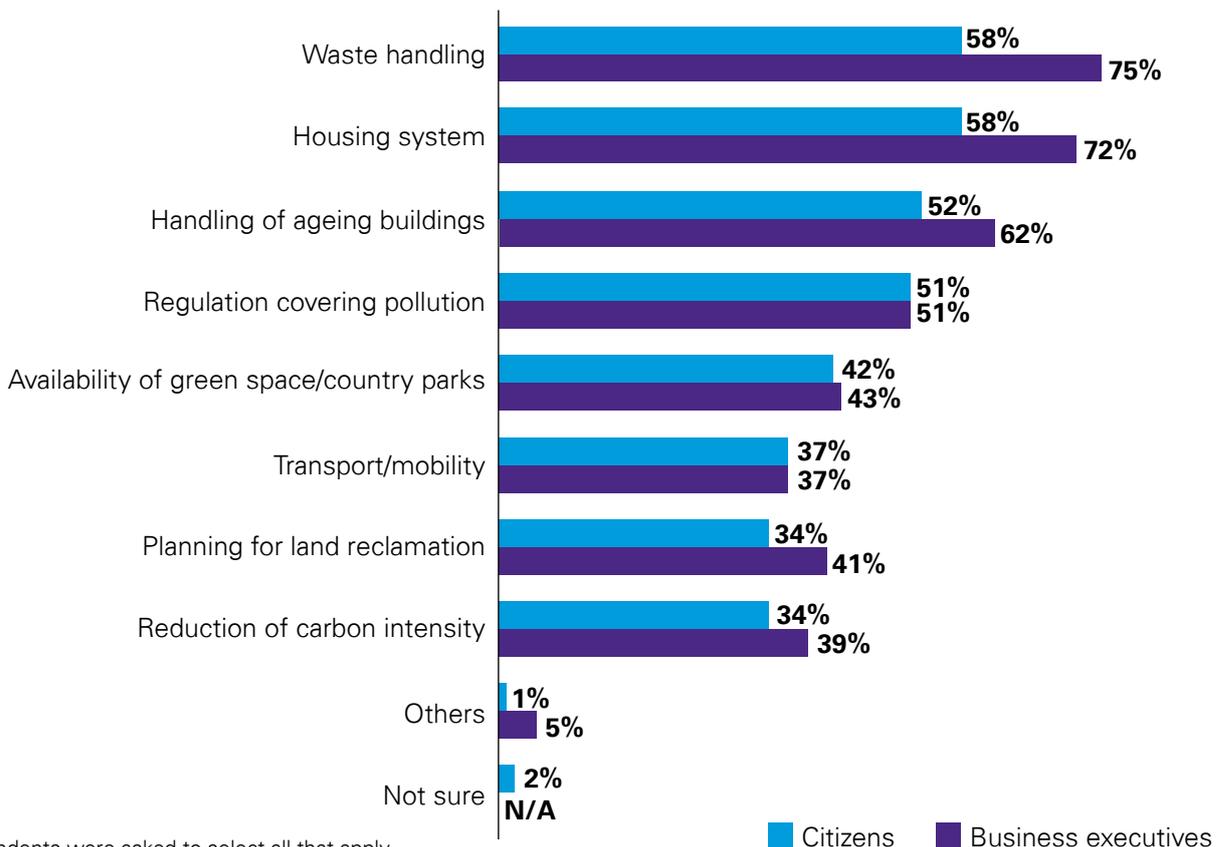
**Figure 3.10: How does Hong Kong’s environment/urban planning compare with other developed cities?**



Source: KPMG Survey analysis



**Figure 3.11: What needs to be changed to better develop Hong Kong's environment/urban planning in the next 10 years?\***



\* Respondents were asked to select all that apply  
Source: KPMG Survey analysis

“  
 To understand how we will want to live in the future, we must ask the people, for what is the city but the people?”

**Anne Kerr**  
 Global Head Cities  
 Mott MacDonald

To accelerate Hong Kong’s development, both citizens and business executives view ‘converting waste materials into energy’ (citizens 59 percent; executives 63 percent) and ‘encouraging more recycling of materials’ (citizens 50 percent; executives 63 percent) as the top priorities (see Figure 3.12).

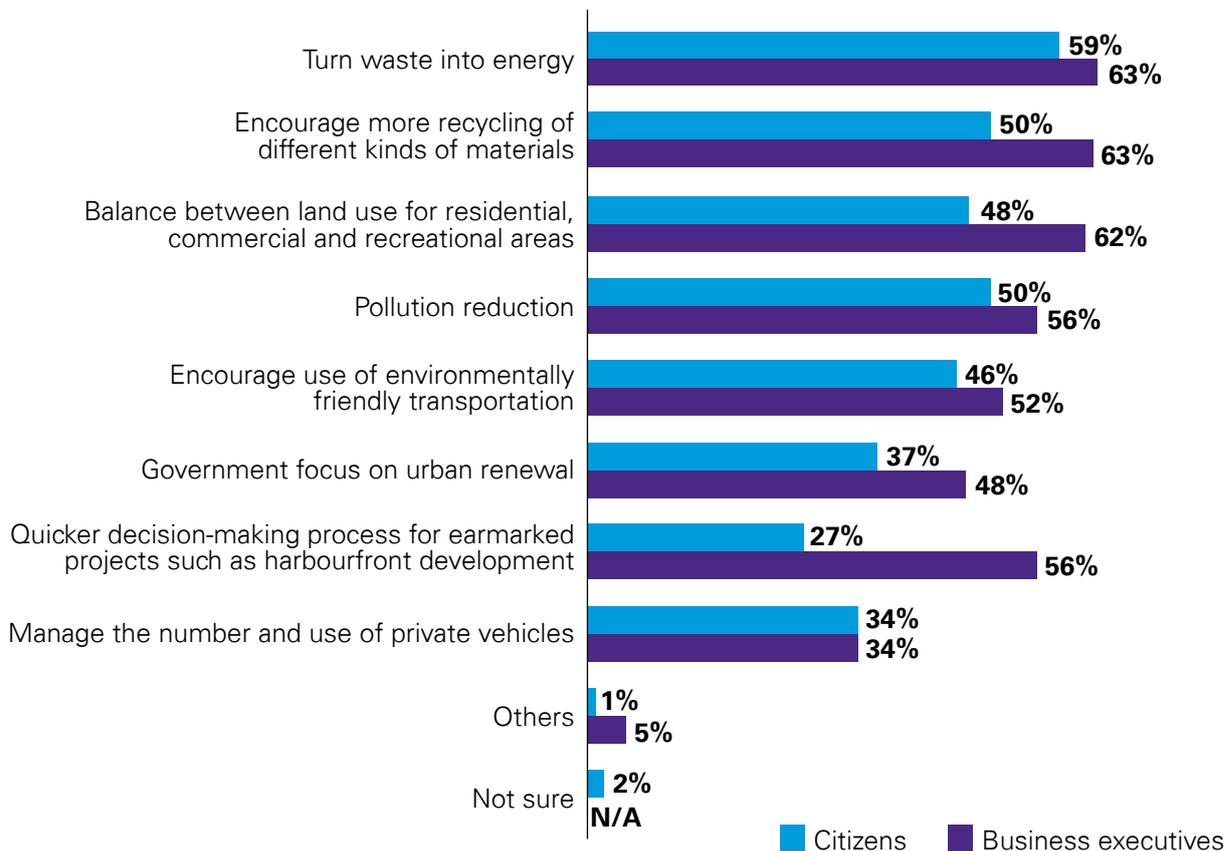
Executives rate ‘maintaining a balance between land use for residential, commercial and recreational areas’ considerably higher than citizens (62 percent versus 48 percent), while both groups also view ‘pollution reduction’ and ‘encouraging the use of environmentally friendly transportation’ as important focus areas. Interestingly, executives are more emphatic than the surveyed citizens across the board in their views on accelerating Hong Kong’s environmental development.

The results suggest a need for Hong Kong to focus on energy-efficient practices and environmental sustainability to further develop as a smart city. Achieving this would go a long way in improving the quality of life of its citizens, highlighted as their key expectation of what a smart city should deliver.

As was found in other areas of the survey, executives also single out what they see as the government’s slow decision-making processes as an issue. Despite the concerns over roadside emissions and worries about congestion being issues for transportation in Hong Kong, just over a third of both citizens and executives see ‘managing the number and use of private vehicles’ as important for the city’s development.



**Figure 3.12: What actions are important to accelerate the development of the environment/urban planning in Hong Kong in the next 10 years?\***



\*Respondents were asked to select all that apply  
 Source: KPMG Survey analysis



## Smart Vienna: A zero-emissions city

Vienna has long ranked among the world's smartest cities – perhaps because it started early, launching its Smart City Wien Initiative in 2011. The programme laid out an ambitious vision of changes to be realised across energy, mobility and other liveability issues through to 2050.

Among its targets for the mid-century is slashing its per capita greenhouse gas emissions to 20 percent of their 1990 levels, with an interim 65 percent reduction target for 2030 – and the ultimate goal of being a zero-emissions city.

Its action plan spans five key areas: citizen participation, urban modernisation, the promotion of renewable energy sources, making energy planning a fundamental part of spatial planning, and new mobility concepts.

Rather than starting from scratch, Smart City Wien began by involving a large number of already existing programmes and institutions, to which it then added groups from business, academia, the city's administration and – most importantly – its citizens.



# Hong Kong's smart city development

## Healthcare



### Hong Kong health expenditure

Annual expenditure  
on health:  
**HKD 123.8 billion**

As a percentage of GDP:  
**5.7**

Per capita expenditure  
on health:  
**HKD 17,228**

Source: Hong Kong Department of Health

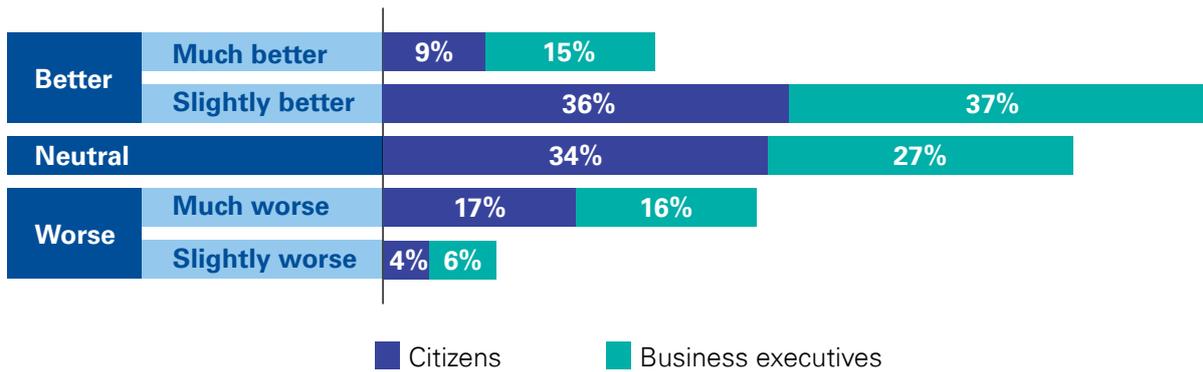
While Hong Kong has one of the world's highest life expectancies for both men and women, the survey results show that only about half of the respondents view Hong Kong's healthcare performance as better than that of other developed cities (see Figure 3.13).

With the city's population set to age rapidly in the coming decades, healthcare provision will become a growing issue for the city. While just over half the citizens single out the 'provision of elderly-care services' as the key development area for Hong Kong's healthcare system, nearly three-quarters of the surveyed executives view this as the most important factor (see Figure 3.14).

Citizens are also keen to see the issue of ‘healthcare subsidies provided by the government’ addressed (selected by 53 percent of respondents, versus 43 percent of executives). Meanwhile, more than two-thirds of executives view collaboration between the private and public sector as a key development area, compared to just less than half of the surveyed citizens.



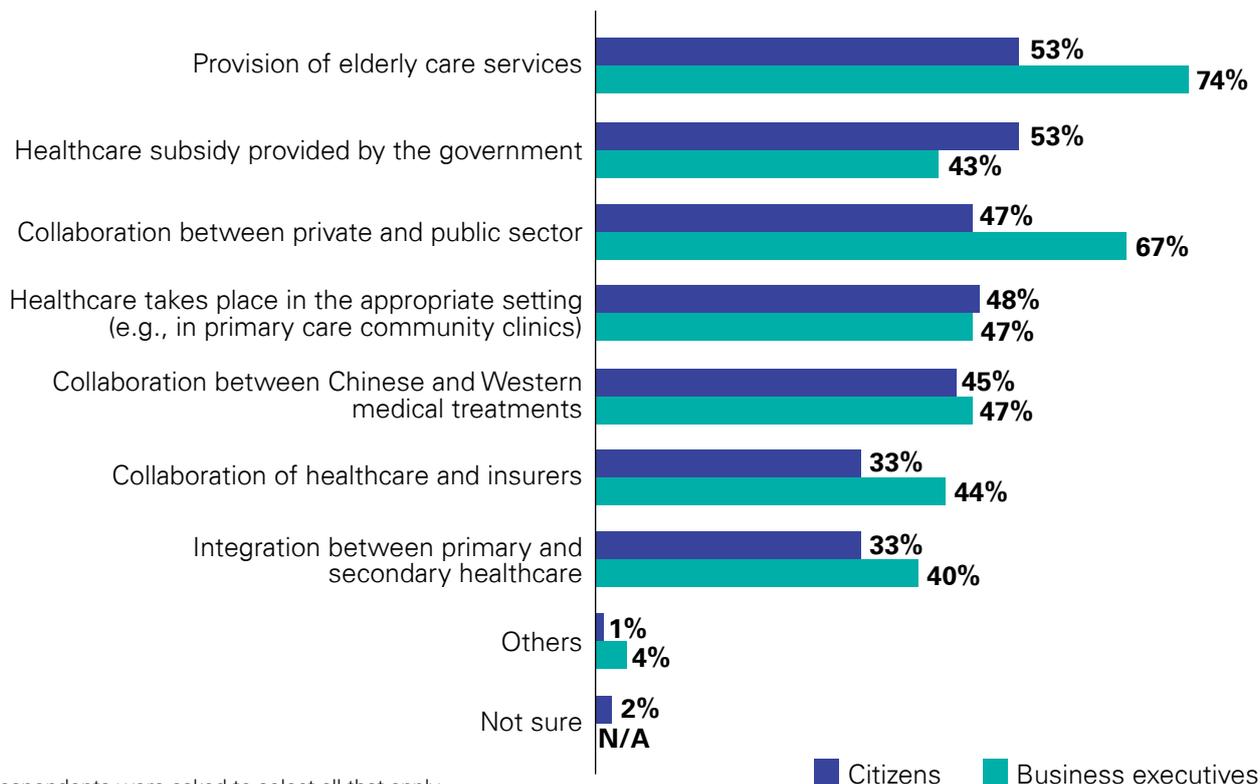
**Figure 3.13: How does Hong Kong’s healthcare system compare with other developed cities?**



Source: KPMG Survey analysis



**Figure 3.14: What needs to be changed to better develop Hong Kong's healthcare system in the next 10 years?\***



\* Respondents were asked to select all that apply  
Source: KPMG Survey analysis

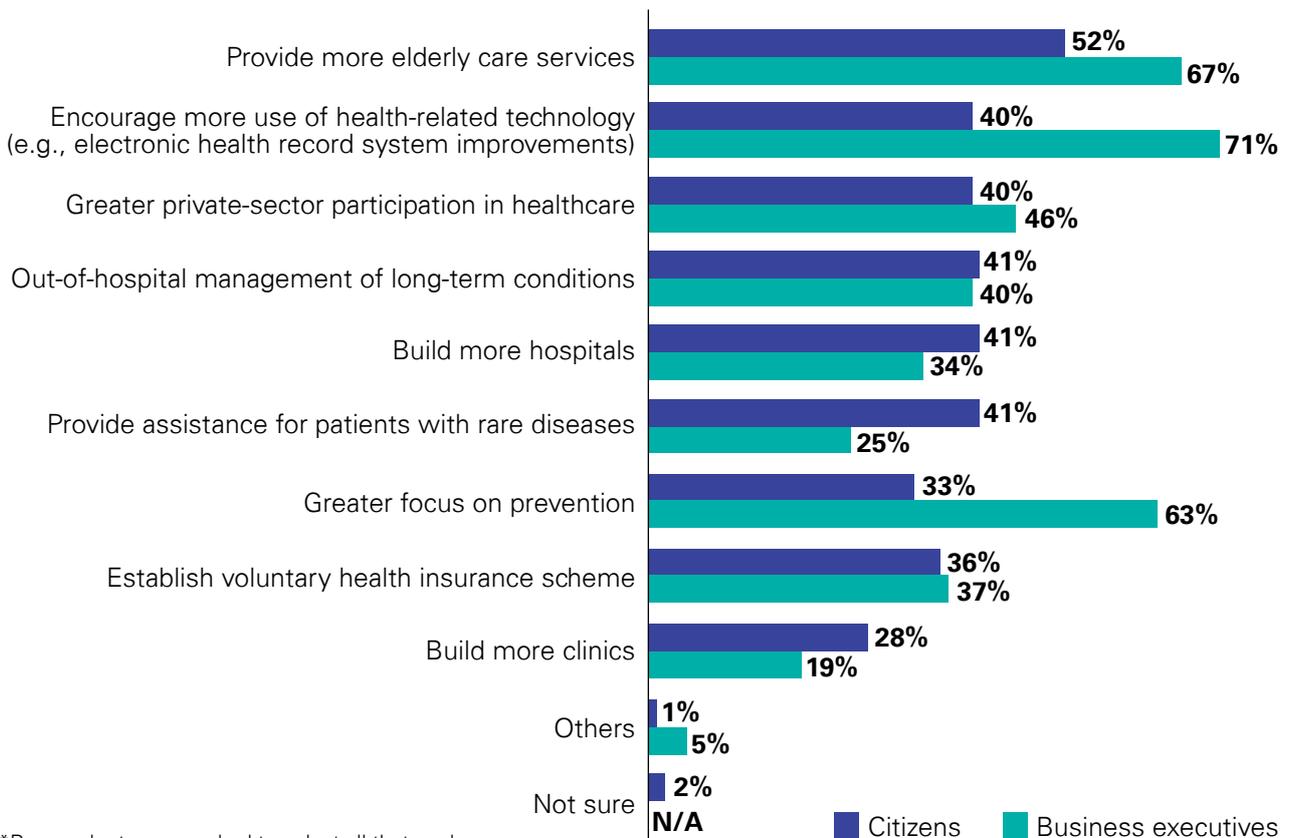
A significantly larger percentage of executives than citizens view ‘more use of health-related technology’ and the ‘provision of more elderly-care services’ as the key priorities needed to accelerate Hong Kong’s healthcare development (see Figure 3.15). On the other hand, citizens have a more diverse range of needs. While the provision of more elderly care services is the most important area of need for citizens, a significant number also selected ‘out-of-hospital management of long-term conditions’, ‘provision of assistance for patients with rare diseases’ and ‘building more hospitals’ as key areas for Hong Kong’s development.

The findings suggest a need to bring together a greater use of technology and more private sector participation and expertise to support and further develop Hong Kong’s healthcare system for its citizens, particularly the elderly.

For its part, in its Smart City Blueprint, the government has laid out a clear strategy and initiatives to improve its healthcare services – including for the elderly and persons with disabilities – and promote healthy living (see page 45).



**Figure 3.15: What actions are important to accelerate the development of the healthcare system in Hong Kong in the next 10 years?\***



\*Respondents were asked to select all that apply  
Source: KPMG Survey analysis

## Health support



The government's Hong Kong Smart City Blueprint identifies three areas where digital initiatives can contribute to improving the performance of the city's healthcare system:

- Facilitating healthcare-related research through a "Big Data Analytics Platform" due to be set up for the Hospital Authority in 2019.
- The adoption of a "smart hospital" programme that from 2020 will pilot a range of projects, including an automated system interface that allows devices to track vital signs and navigation apps that can help people find their way around hospitals.
- The phasing in between now and 2022 of the second stage of Hong Kong's electronic health record sharing system. This will allow a broader range of data sharing, including possibly giving patients access to information that will allow them a greater say in the management of their health.

Source: Hong Kong Smart City Blueprint



# Hong Kong's smart city development

## Energy and resources



### Hong Kong's per capita carbon emissions, tonnes



Source: Hong Kong Environment Bureau

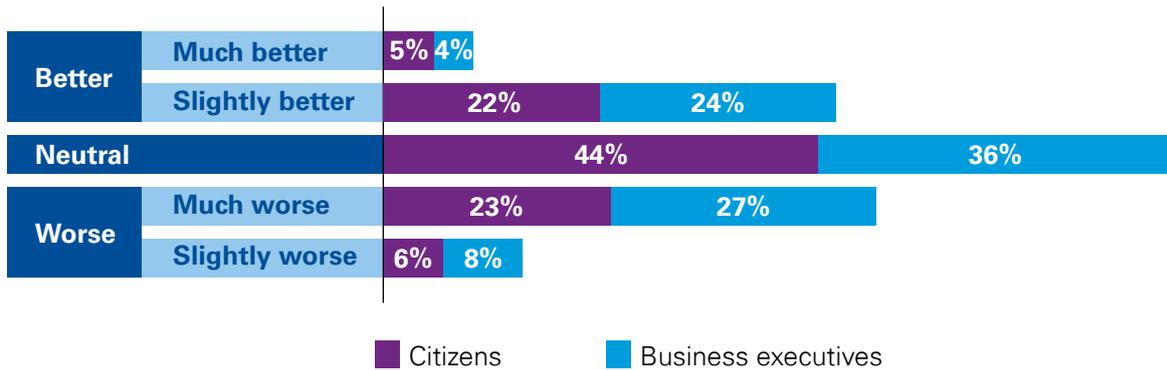
Hong Kong spelled out its long-term energy and resource ambitions in January 2017 with the release of the government's Climate Action Plan 2030+, which calls for the city to reduce its carbon intensity by 65 to 70 percent of its 2005 level by 2030. To meet its sustainability targets, goals including inducing systemic and cultural changes in thinking, as well as changing the ways in which energy, waste management and pollution reductions are realised through the use of smart technology in the electricity grid, increased recycling and a greater use of remote sensor technology.

When it comes to perceptions of Hong Kong's energy and resources performance, just over a quarter of surveyed citizens and business executives think Hong Kong performs better than other developed cities – slightly fewer than the 29 percent of citizens and 35 percent of executives who see it as worse (see Figure 3.16).

Citizens and business executives overwhelmingly view the interrelated aspects of 'waste treatment', 'use of renewable energy' and 'energy efficiency' as the key development areas for Hong Kong (see Figure 3.17). Water saving, a lower carbon fuel mix and control of greenhouse emissions are also seen as other development areas by some of the surveyed citizens and executives.



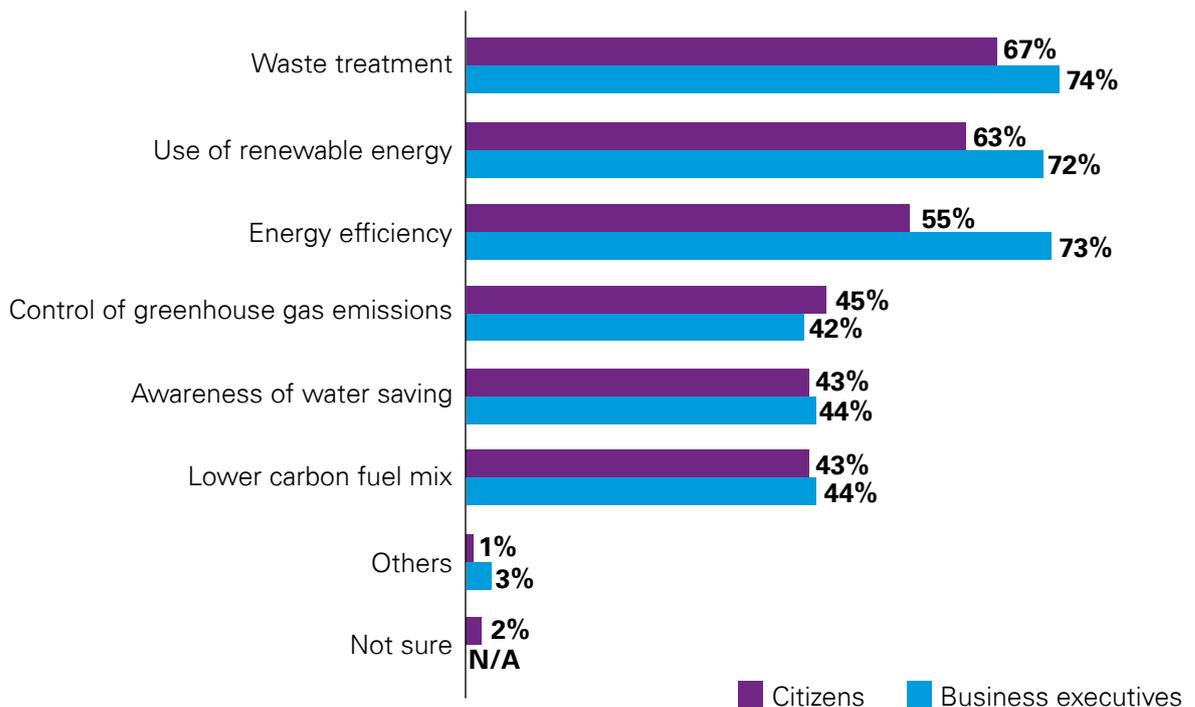
**Figure 3.16: How does Hong Kong's energy and resources industry compare with other developed cities?**



Source: KPMG Survey analysis



**Figure 3.17: What needs to be changed to better develop Hong Kong's energy and resources in the next 10 years?\***



\* Respondents were asked to select all that apply  
Source: KPMG Survey analysis

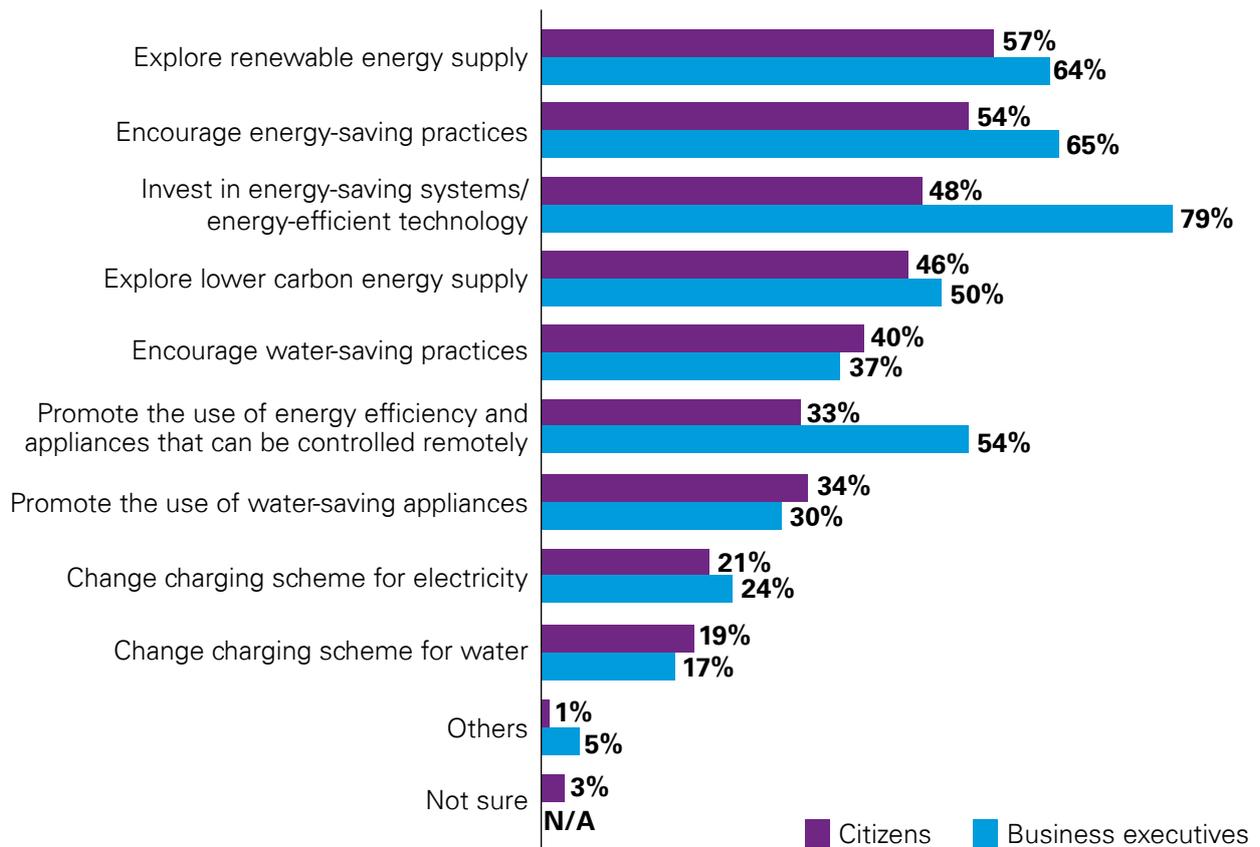
To accelerate Hong Kong’s energy and resources development, a significant majority of executives believe the top priority should be to ‘invest in energy-saving systems and energy-efficient technology’ (see Figure 3.18). Furthermore, nearly two-thirds of the surveyed executives view the ‘encouragement of energy-saving practices’ and ‘exploring the use of renewable energy supplies’ as key factors.

From the citizens’ perspective, the focus should principally be on exploring the use of renewable energy supplies (57 percent) and encouraging energy-saving practices (54 percent).

The need to invest in energy-efficient technology and encourage energy-saving practices are of particular importance, as a growing population and the proliferation of technology place increasing demands on Hong Kong’s energy system. With these trends showing no signs of abating, it will be important to take a holistic view of the increased connectivity between energy, technology and transportation, and adopt an approach that efficiently meets the city’s energy needs.



**Figure 3.18: What actions are important to accelerate the development of the energy and resources industry in Hong Kong in the next 10 years?\***



\* Respondents were asked to select all that apply  
 Source: KPMG Survey analysis



# Energising Hong Kong

## Austin Bryan

Senior Director – Innovation  
CLP Holdings Limited

Standing at the heart of Hong Kong's aspirations to become a smart, sustainable city is CLP, the city's biggest electricity generator. "For us, a smart, connected city is about solving problems for citizens," says Austin Bryan, CLP Holdings' Senior Director – Innovation. "This is an exciting world where we are witnessing the digital transformation of our sector – but also the new volatility of energy in a digital, connected society."

CLP sees itself as engaged in two facets of the 21st century economy. First is a change in the world of energy, where power no longer moves in just one direction – from generation through transmission, distribution and retail – but instead can flow both into and from the grid. Second is a digitalisation of the industry, as the technologies that have transformed other parts of the economy move into the energy sector.

"We can expect electricity to become a much more volatile, but also a more valuable commodity," says Bryan. "The exciting aspect about this is that we can think about connecting assets with ecosystems and services, as well as the proliferation of those services. The challenge is to fully understand the value of the data involved, not just the value of electrons."

The launch in mid-2017 of its Smart Energy Programme – a one-year pilot scheme involving 26,000 homes installed with smart meters – underlines CLP's efforts to provide a critical element of infrastructure to facilitate the development of a smart grid and encourage smart living.

This was followed by CLP signing a memorandum of understanding with Siemens in November 2017 to collaborate on investigating and developing next generation smart city energy initiatives. The two companies will work together on the design, testing and implementation of technologies and services that can meet Hong Kong's future energy needs.

The collaboration will focus on four key areas: digitalised power generation, smart city solutions, smart grid applications and cybersecurity – taking full advantage of the data analytics services and connectivity capabilities Siemens is putting in place at its Hong Kong Science Park-based Smart City Digital Hub.

CLP's aim is to leverage innovation and technology to improve operational performance, enhance customer engagement and introduce new products and services that improve quality of life for citizens. "Over time, Hong Kong will become a smart, sustainable city," says Bryan. "This exciting new work is going to help cities transform themselves into becoming much more liveable, less congested and easier to navigate with increased mobility."

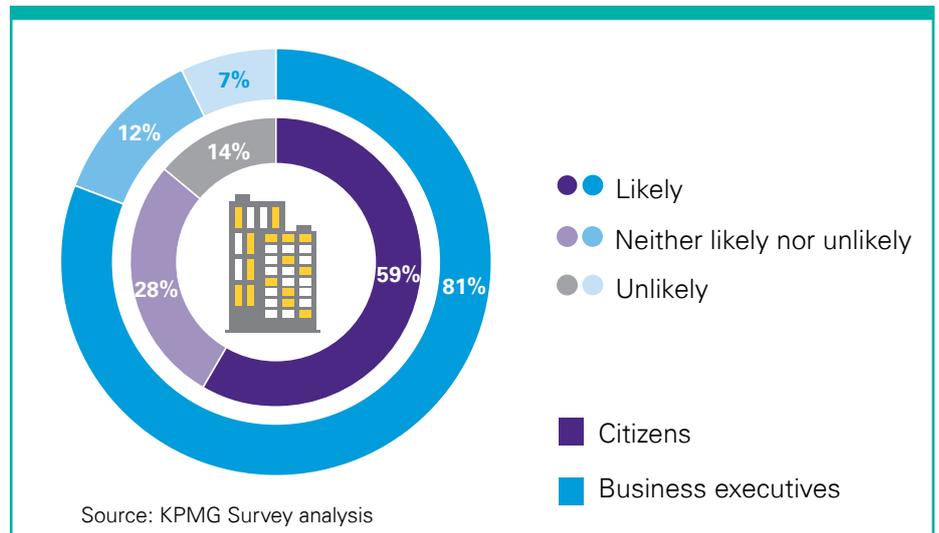
*“ This is an exciting world where we are witnessing the digital transformation of our sector – but also the new volatility of energy in a digital, connected society. ”*

# Smart Economics



While the government has been taking the lead in promoting Hong Kong's smart city development, the private sector has a strong desire to become more involved. Companies are bullish about supporting Hong Kong's smart city development, with more than four out of five of the surveyed executives saying that it is likely that their company will contribute. Citizens too share the same sentiment, with a majority expecting private companies to contribute to the city's development (see Figure 4.1).

**Figure 4.1: How likely do you expect private companies to contribute to smart city development in Hong Kong?**





*Hong Kong needs to consider what the landscape might look like in five or 10 years, and the opportunities that might emerge. Looking at the Greater Bay Area for example, Hong Kong could leverage its unique qualities as an intermediary to become the region's data hub – a trusted partner offering safe and secure transmission and storage.*

**Sabine Reppert**

Founder and Director  
Intent-X



Where citizens focused more on internal issues such as a higher quality with their expected benefits of Hong Kong being a smarter city, companies, unsurprisingly, looked more outward, ranking connectivity to other regions far higher than citizens did.

## Government initiatives

The Hong Kong government sees smart city initiatives as having the potential both to strengthen the economy's current pillar industries and to allow for the growth of other sectors.

It has already committed to supporting a range of fintech initiatives, such as the Hong Kong Monetary Authority's fintech sandbox launched in September 2016 to allow companies to try out finance-related technologies. And it hopes that its collaboration with Shenzhen through the establishment of an innovation and technology park at the Lok Ma Chau Loop on Hong Kong's northern border, to bring together technology companies, universities and research institutions from both Hong Kong and mainland China, can help boost both R&D and the re-industrialisation of Hong Kong.

Other measures aimed at promoting R&D include enhanced tax deductions for R&D expenditure, adding innovation and technology and design thinking components to official tender requirements, and plans to set up a series of collaborative technology platforms that can attract internationally renowned universities, research institutes and technology companies to establish a presence in Hong Kong.

As part of a re-industrialisation policy, it plans to set up a data technology hub by 2020 and an advanced manufacturing centre by 2022, both in Tseung Kwan O in western Hong Kong.

## Viewpoint

"Collaboration is the key for Hong Kong to realise its smart city potential," says Joanna Cheung, managing director and co-founder of TusPark Hong Kong, an offshoot of China's biggest science park developer.

What the city should do, she suggests, is focus on a handful of key areas. "For example, Hong Kong can play a significant role as a smart fintech hub for the Greater Bay Area region," says Cheung.

Given its strength in communications, the city should also look for ways to facilitate connectivity across the Greater Bay Area. "You can't have smart cars without smart traffic," she says, suggesting that integrating mobility across the area's cluster of eleven cities should be another priority.

Hong Kong should also be building on its strengths as an education hub. The city is already a gateway to mainland China, enabling the two-way flow of

knowhow and technology. However, it needs to find better ways of persuading would-be entrepreneurs from the mainland who study at its universities to stay in the city.

"Currently, Hong Kong has a low retention rate for talent. People come here to do PhDs, but then go back to the mainland to start businesses," says Cheung. "We need to make Hong Kong a platform for both attracting and retaining mainland Chinese talent."

For Cheung, greater cross-border integration is crucial. "Hong Kong can't treat itself as a silo. Its future, like its past, has to centre on being an intermediary between China and the world.

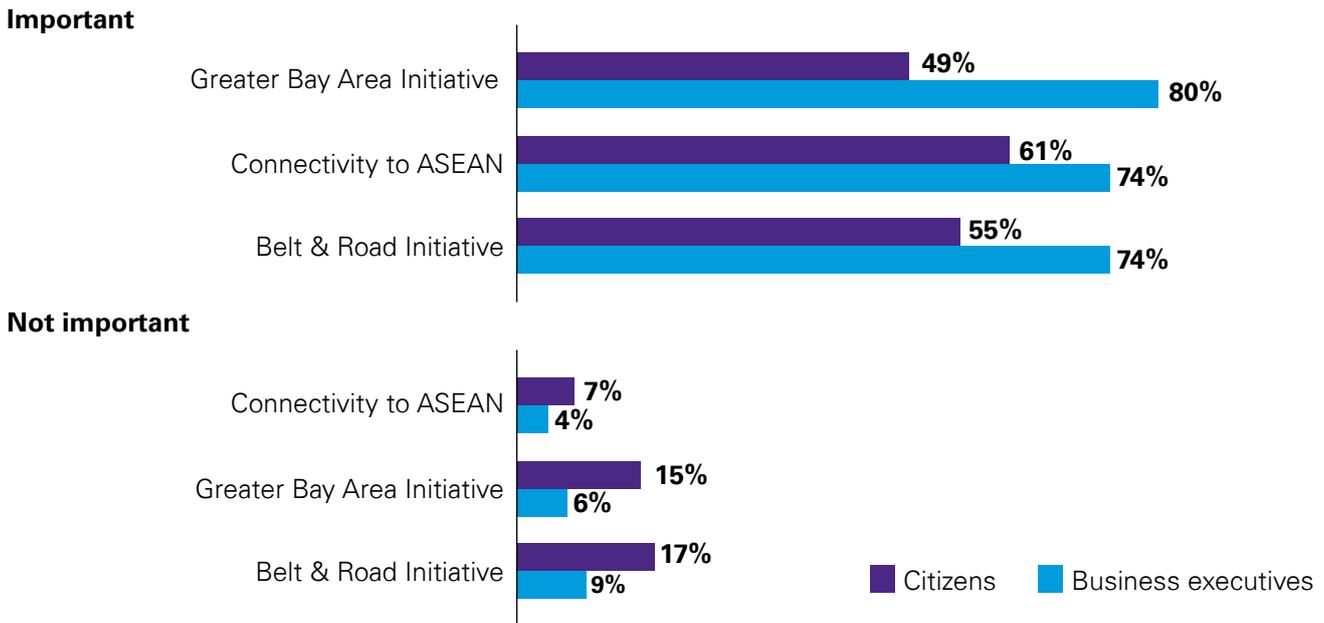
**Joanna Cheung**

Managing Director  
TusPark Hong Kong

# Cross-border connectivity

Cross-border connectivity is a priority area for business – far more so than for citizens. Four out of five surveyed executives rate the Greater Bay Area as important for Hong Kong’s future prosperity, and nearly three-quarters feel the same about the ASEAN region and China’s Belt and Road Initiative. Citizens in contrast see ties with ASEAN as most important (selected by 61 percent), followed by the Belt and Road Initiative (55 percent), and just under half for the Greater Bay Area.

**Figure 4.2: How important are the following areas to the future prosperity of Hong Kong?**



Source: KPMG Survey analysis

## China’s top 10 cities for smart city governance

In September 2017, China’s National Development and Reform Commission and the China Center for Urban Development released a report evaluating 293 provincial and prefectural level cities across the country according to a range of smart city indicators, among them their provision of smart services, the extent of smart management systems and the local population’s understanding of smart technology.

Of the top ten cities, four – Guangzhou, Shenzhen, Zhuhai and Foshan – fall within the Greater Bay Area.

- 1 Qingdao, Shandong province
- 2 Hangzhou, Zhejiang province
- 3 Xiamen, Fujian province
- 4 **Guangzhou, Guangdong province**
- 5 **Shenzhen, Guangdong province**
- 6 **Zhuhai, Guangdong province**
- 7 Ningbo, Zhejiang province
- 8 **Foshan, Guangdong province**
- 9 Chengdu, Sichuan province
- 10 Wuxi, Jiangsu province

Source: National Development and Reform Commission; China Center for Urban Development



# Unlocking the power of technology

## Mark Lunt

Group Managing Director  
JOS

Now is the time for Hong Kong to embrace smart city technologies, believes Mark Lunt, Group Managing Director of JOS (Jardine OneSolution), one of Asia's leading technology consultancy and system integration providers.

"Hong Kong has many issues to consider around liveability, productivity, and its place in the world vis-à-vis China, and as a competitor with cities such as Singapore and Tokyo," says Lunt. "But the smart city debate is gathering momentum, and it is clear the government wants to articulate a clear vision and support that vision."

Technology already plays a vital role in Hong Kong's two biggest industries – finance and trade and logistics – though there remains a need for the city to keep abreast of new technologies. "Hong Kong needs to retain its advantages as a financial centre, which means there should be more investment in our understanding of issues like blockchain and cryptocurrencies."

Elsewhere, in industries such as retail, property and construction, the opportunities are greater. The strong performance of these sectors in recent years has allowed companies to thrive without having to change their ways. However, a tighter business environment – especially for retailers – and challenges finding solutions to the city's most pressing liveability issues, means that both companies and the government are now paying more attention to how technology can be leveraged efficiently to increase profits and keep citizens happy.

"As a result of underinvestment in technology over the last five to ten years, Hong Kong has huge opportunities for productivity gains," says Lunt. With the city focussing on developing talent in many areas, introducing new technologies opens the way to upskilling the workforce. "This is not robots taking over," says Lunt. "It is going to involve increasing

productivity through investment in training and education and technology platforms to enable us to get more out of finite resources."

The government can help by developing a clear vision of the city's direction, shaping education policy in ways that will enhance productivity, and ensuring Hong Kong has clear privacy and cybersecurity rules.

With Hong Kong's government spending more on research and development than the private sector, companies also need to step up, especially when it comes to investment.

"There is a need for a greater awareness of technology – to see it not as a cost, but as a source of competitive advantage," says Lunt. Companies are becoming increasingly aware of this. "There have been a couple of instances where our proposals have been more expensive than those of other companies, but the customer saw the solution we were offering as more sophisticated and powerful – more expensive now, but with greater long-term benefits."

As a company, JOS feels optimistic about Hong Kong's future as a smart city, says Lunt. "I've been in the tech sector for a long time, but I've never seen a better time than now in terms of opportunity and impact."

*“There is a need for a greater awareness of technology – to see it not as a cost, but as a source of competitive advantage.”*

# Thoughts on the next steps



**Julian Vella**  
 ASPAC Regional Head -  
 Global Infrastructure Advisory  
 KPMG China

Julian Vella, Asia Pacific Regional Head of KPMG's Global Infrastructure Advisory Practice, which advises governments around the world on smart city development, notes that it is important for well-functioning governments to have the following five attributes:

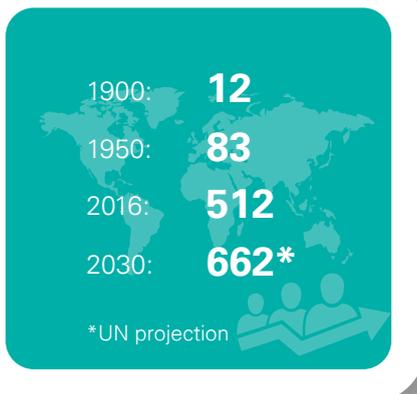
- Strong leadership with a clear vision of where it is heading and what is needed to translate that vision into actionable plans that benefit citizens.
- Effective ways for the government and communities to engage and communicate with each other.
- Being early adopters, not followers, of new technologies – an especially critical attribute in today's world where technology is transforming, and often disrupting, almost every aspect of life.
- Effective cross-ministerial and departmental cooperation and sharing of information.
- Frameworks that encourage a culture of appropriate risk-taking.

For Hong Kong to develop its smart city aspirations, it needs to look at each of these five attributes and devise ways of applying them to its economic, geographical, political and social context.

As this report has explored, the city faces challenges around liveability. Many of its younger people express frustration at the lack of opportunities. Furthermore, many of its neighbours – both in mainland China and elsewhere across Asia – are moving ahead rapidly, and increasing the competitive landscape in the region.



### Worldwide number of cities with a population of 1 million or more



Source: United Nations

“  
While infrastructure is very important to Hong Kong’s smart city development, it is also essential to leverage technology and equip people with the right skills in order to fully harness all of these exciting new innovative technologies.

#### Anson Bailey

Head of Technology,  
Hong Kong;  
Head of Consumer & Retail,  
ASPAC  
KPMG China

This indicates a need to apply a more concerted effort to drive Hong Kong’s smart city development by:

- Developing a clearer vision of its smart city future, including the benefits this would bring to its people. An audacious vision could serve as both a goal and a rallying call, marking Hong Kong out as a smart city leader and an inspiration to other cities.
- Fostering greater citizen involvement. Hong Kong already has many smart city projects underway. It is important to gather the views of citizens and – more importantly – convert these into actions that will significantly improve the city’s liveability.
- Nurturing a culture that encourages new thinking and ideas. Standing out as Hong Kong’s top priority is fostering a technology and innovation culture. This is partly about education, but also about creating the conditions where both established companies and startups are willing to take sensible risks with new ideas.
- Providing a better living environment in order to attract and retain talent. Making the city more attractive to talent – and better at retaining the talent that comes – will require a long hard look at quality of life issues, especially housing.
- Strengthening Hong Kong’s connectivity. Hong Kong’s links to China and Southeast Asia are one of its core strengths – but this can be further strengthened. The Greater Bay Area initiative in particular offers Hong Kong the opportunity to become further integrated into south China’s emerging Pearl River Delta megalopolis.
- Joining up official thinking. There is a need for a holistic view that leads to the building of links across government bureaux and departments, that in turn can establish system-wide planning.

Importantly, for Hong Kong to move forward, the city needs to embrace a move towards appropriate risk-taking, be that through loosening regulations to allow for an expansion of the sharing economy, lessening its emphasis on rote-learning and memorisation at its schools, or opening up some of the more protected sectors of its economy. Success in this respect could pave the way for Hong Kong to move on to the next stage of development its government, businesses and citizens clearly both want and need.

# About KPMG



KPMG China operates in 16 cities across China, with around 12,000 partners and staff in Beijing, Beijing Zhongguancun, Chengdu, Chongqing, Foshan, Fuzhou, Guangzhou, Hangzhou, Nanjing, Qingdao, Shanghai, Shenyang, Shenzhen, Tianjin, Xiamen, Hong Kong SAR and Macau SAR. With a single management structure across all these offices, KPMG China can deploy experienced professionals efficiently, wherever our client is located.

KPMG is a global network of professional services firms providing Audit, Tax and Advisory services. We operate in 154 countries and territories and have 200,000 people working in member firms around the world. The independent member firms of the KPMG network are affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity. Each KPMG firm is a legally distinct and separate entity and describes itself as such.

In 1992, KPMG became the first international accounting network to be granted a joint venture licence in mainland China. KPMG China was also the first among the Big Four in mainland China to convert from a joint venture to a special general partnership, as of 1 August 2012. Additionally, the Hong Kong office can trace its origins to 1945. This early commitment to the China market, together with an unwavering focus on quality, has been the foundation for accumulated industry experience, and is reflected in the Chinese member firm's appointment by some of China's most prestigious companies.

# About CLP Holdings Limited



CLP Holdings Limited, a company listed on the Stock Exchange of Hong Kong, is the holding company for the CLP Group, one of the largest investor-owned power businesses in Asia Pacific. Through CLP Power Hong Kong Limited, it operates a vertically-integrated electricity supply business providing a highly-reliable supply of electricity to 80% of Hong Kong's population.

Outside Hong Kong, CLP holds investment in the energy sector in Mainland China, India, Southeast Asia, Taiwan and Australia. Its diversified portfolio of generating assets uses a wide range of fuels including coal, gas, nuclear and renewable sources. CLP is one of the largest external investors in the Mainland's renewable energy sector. In India, it is one of the biggest renewable energy producers and among the largest foreign investors in the electricity sector. In Australia, its wholly-owned subsidiary EnergyAustralia is one of the largest integrated energy companies, providing gas and electricity to over 2.6 million households and businesses.

CLP is listed on the Global Dow – a 150-stock index of the world's leading blue-chips, the Dow Jones Sustainability Asia Pacific Index (DJSI Asia Pacific), the Dow Jones Sustainability Asia Pacific 40 Index (DJSI Asia Pacific 40), Hang Seng Corporate Sustainability Index Series and MSCI Global Sustainability Index Series.

# About JOS



With over 60 years' experience in Asia, JOS is a systems integrator, solutions provider and technology consultancy with deep local and industry knowledge and an exceptional ability to execute. With 2,200 IT professionals working from nine offices across Asia's major business hubs in China, Hong Kong, Macau, Malaysia and Singapore, JOS aims to improve the performance of business and governments across the region by applying the best technology to address their challenges. JOS has extensive experience across a range of industries, more than 10,000 private and public sector customers in Asia, and core capabilities in artificial intelligence, cloud computing, big data, enterprise security, enterprise applications, mobility, next generation infrastructure and internet of things. JOS is a division of JTH Group, a member of the Fortune Global 500-listed Jardine Matheson Group. For more information, visit [JOS.com](http://JOS.com). Follow us: Facebook (JOS it solutions), LinkedIn (JOS) and WeChat (jos-china).

# About Siemens



Siemens is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for 170 years, focusing on the areas of electrification, automation and digitalization. As one of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of gas and steam turbines for power generation, a major provider of power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. As of September 30, 2016, Siemens had around 351,000 employees in more than 200 countries. In fiscal 2016, they generated orders of €86.5 billion and revenues of €79.6 billion.

In 1911, Siemens opened its first sales office in Hong Kong. Since then, the company has committed to be a trusted technology partner and providing innovative solutions in Hong Kong and Macao. Siemens has provided integrated solutions for infrastructure development projects, including gas turbine at Black Point Power Station and power substations for CLP Power in Hong Kong and CEM in Macao; signaling, main control and fixed communication systems for Shatin Central Link; traffic control and surveillance system for Liantang / Heung Yuen Wai Boundary Control Point and total building solutions for City of Dreams in Macao. Siemens' innovative technologies help creating a valuable future and Siemens takes responsibility in the communities. Since 2003, the company has been awarded the Caring Company Logo by the Hong Kong Council of Social Services.

# About Smart City Consortium (SCC)



Smart City Consortium (SCC) is formed by a group of professionals from different corporations and organizations to provide opinions and suggestions to the Government for formulating related policies and standards in the development of Hong Kong as a world-class smart city. We encourage worldwide collaboration with different stakeholders to create the right ecosystem which fosters innovation and sustainable economic growth for Hong Kong.

Our vision is to build Hong Kong as the world's leading Smart City to foster knowledge-based economy, enhance the quality of life and to create a vibrant ecosystem leveraging relevant Information and Communication Technologies and adopting effective resources management. We provide related opinions and suggestions based on our members' professional knowledge for the development of Smart City in Hong Kong. We are the vanguard in creating smart living culture and collaborate with the Government in developing Smart City strategic plans.

In the past year, with the continuous support of our members, SCC has successfully organized and supported over 80 local and international events and over 10,000 people joined us there. To facilitate the international exchange of experience and to accelerate business opportunities, we have signed 23 memorandums of understanding with worldwide Smart City organizations, with many professional views and ideas exchanged with the overseas experts during our visits. As we know that Hong Kong has all the elements to be the global and regional fintech hub, it is one of the international financial centers, the freest economy, rule of law, large talent pool, a strong legacy of trade and work ethic etc, Hong Kong is looking to capitalize on financial technology to keep its leading position as one of the world's top financial hubs in the world. We believe that with the Alliance, we can play a more proactive role in this aspect.

At the same time, with the joint effort of SCC and the Smart City Development Alliance (SCDA) in mainland China, I would like to introduce you our international business matching platform under the theme of Smart City, called LinkedSmart. Along with the Alliance, it can provide more supports to the start-ups when they are ready to go for market or looking for investors. This platform aims at accelerating collaborations among strategic partnerships, startups and investors with the strong network of SCC so as to co-create a unique ecosystem for those innovative entrepreneurs in Hong Kong and around the world.

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