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ACCELERATING URBAN INTELLIGENCE

People, business and
the cities of tomorrow

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About the research

Accelerating urban intelligence: People, business and the cities of tomorrow is an Economist Intelligence Unit report, sponsored by Nutanix. It explores expectations of citizens and businesses for smart-city development in some of the world's major urban centres. The analysis is based on two parallel surveys conducted in 19 cities: one of 6,746 residents and another of 969 business executives. The cities included are Amsterdam, Copenhagen, Dubai, Frankfurt, Hong Kong, Johannesburg, London, Los Angeles, Mumbai, New York, Paris, Riyadh, San Francisco, São Paulo, Singapore, Stockholm, Sydney, Tokyo and Zurich.

Respondents to the citizen survey were evenly balanced by age (roughly one-third in each of the 18-38, 39-54 and 55 years and older age groups) and gender. A majority (56%) had household incomes above the median level in their city, with 44% below it. Respondents to the business survey were mainly senior executives (65% at C-suite or director level) working in a range of different functions. They work in large, midsize and small firms in over a dozen industries. See the report appendix for full survey results and demographics.

Additional insights were obtained from in-depth interviews with city officials, smart-city experts at NGOs and other institutions, and business executives. We would like to thank the following individuals for their time and insights.

- Pascual Berrone, academic co-director, Cities in Motion, and professor, strategic management, IESE Business School (Barcelona)
- Lawrence Boya, director, Smart City Programme, city of Johannesburg
- Amanda Daflos, chief innovation officer, city of Los Angeles
- Linda Gerull, chief information officer, city of San Francisco
- Praveen Pardeshi, municipal commissioner, Brihanmumbai Municipal Corporation (Mumbai)
- Brian Roberts, policy analyst, city of San Francisco
- Sameer Sharma, global general manager, Internet of Things (IoT), Intel
- Marius Sylvestersen, programme director, Copenhagen Solutions Lab
- Tan Kok Yam, deputy secretary of the Smart Nation and Digital Government, Prime Minister's Office, Singapore

The report was written by Denis McCauley and edited by Michael Gold.

Executive summary

Visions of smart cities often paint a striking picture: driverless buses, flying taxis, buildings blanketed by solar panels, intelligent rubbish bins, police with augmented reality displays and many other elements of technology nirvana. City officials, and some citizens, may be spellbound, but such visions often fail to show the bigger picture—the incremental improvements in urban living that the use of advanced technologies provide.

Smart-city programmes managed by municipal authorities often solicit feedback from residents and businesses to gauge the efficacy of the initiatives or services they develop. Rarely, however, do officials have a clear idea of the improvements constituents actually want smart-city initiatives to deliver. That is the purpose of this study, which is based on two surveys involving over 7,700 residents and business executives in 19 large cities around the world.

Responses differ from city to city, but overall the study finds that citizens want smart-city initiatives to make public services more affordable while businesses want them to be more efficient and reliable. Nearly as important for both groups, however, is that smart initiatives produce greener, cleaner environments in which to live and work. Many individual demands of respondents—such as more renewable energy options, cleaner air and water, more efficient waste recovery and smarter energy tariffing—all contribute to more liveable environments for citizens and workers alike.

The key findings of the study are:

- **Priorities differ between developed and emerging-world cities.** Developing smart-city solutions to ease the blights of unemployment, crime, poor sanitation and rubbish accumulation are especially high priorities in Johannesburg, Mumbai and São Paulo. Respondents from developed-world cities place stronger emphasis on improving transport efficiency, reducing road congestion and making services more affordable.
- **Big dreams for big tech.** Wariness of large technology firms may be on the rise due to negative media coverage about privacy scandals, disruptions to jobs and other factors, but most respondents want their cities to be involved in smart-city initiatives. Citizens expect they will create job opportunities, and executives hope they will spur innovation and create new market opportunities.
- **Inevitable trade-offs to urban intelligence—particularly involving data—should not deter its development.** Over two-thirds (70%) of business respondents say the ability to access open-government data is vital to their business. Nearly as many executives (69%) say they are willing to share more data to secure the benefits of smart cities. Most citizens, too, are ready to share data with their governments if it means smarter public services. Some seem ready to compromise on privacy as well: two-thirds (66%) believe facial recognition technology will do more good than harm when used to fight crime.
- **Some smart-city expectations will be tough to meet.** Citizens' hopes for job creation and those of executives for new business opportunities will be difficult for smart-city programmes to fulfil, according to experts interviewed for the study. Transport and other services may be more efficient and cleaner, but not always cheaper. City officials must try to manage expectations for what smart initiatives can deliver.

Introduction: Great expectations

There are few large cities in the world that do not have an office, programme or set of initiatives focused on delivering smart-city solutions. Today, mayors and other public officials base their appeal to voters partly on their ability to deliver technology-enabled services which will improve the quality of urban life. City offices, technology companies, research institutes and other organisations generate considerable media content—articles, videos, press releases, reports—extolling the benefits of smart technologies. Perhaps as a result, urban residents have a positive view of what smart cities can deliver: 71% of citizens and 81% of business executives believe that their smart city will be an appealing place to live.

But do city officials, technology companies and others understand what residents really want from these initiatives? Are people's expectations realistic? Too much focus on new technologies often clouds what the actual benefits are and can inflate expectations, says Sameer Sharma of chip giant Intel. "Audiences

get excited hearing about flying taxis and other futuristic technologies," he says, "but the real impact of smart initiatives is that people's everyday lives will become smoother. Cities need to set the right expectations".

This lesson is not lost on Linda Gerull, San Francisco's chief information officer. "We realise that we need to avoid telling citizens about cool technologies such as IoT. Instead we talk about things like automated trash collection, smart traffic signals and prevention of saltwater intrusion."



Audiences get excited hearing about flying taxis and other futuristic technologies, but the real impact of smart initiatives is that people's everyday lives will become smoother.

Sameer Sharma, Intel

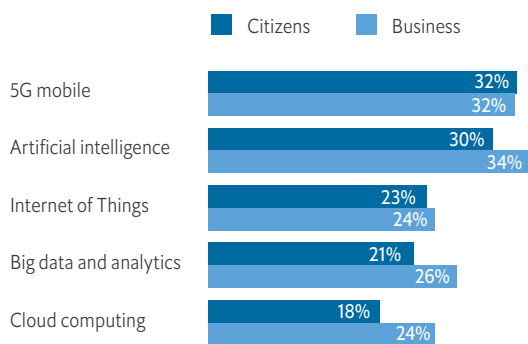


“Our job is not to deliver state-of-the-art technology,” says Tan Kok Yam, deputy secretary of Smart Nation and Digital Government in the Singapore Prime Minister’s Office. “It is to find ways of using digital technology to deliver public services better; for example, ensuring public buses run on time, improving the cleanliness and facilities management of public housing, and improving education in public schools.”

While the technologies that underpin many existing or planned urban projects are hardly exotic territory for most people, they need to address the fundamental problems of everyday urban life. When asked to choose from a menu of technologies most integral to their town’s smart-city initiatives, the vast majority select 5G mobile, artificial intelligence (AI) and IoT. The same is true of business respondents, many of whom also point to data analytics and cloud computing. Governments must first understand the problems these technologies should address before designing whizzy solutions, says Pascual Berrone of Spain’s IESE Business School. “The technology used to address a problem may be low-tech—as in bicycle sharing—but the solution itself will usually be very smart,” he says.

Our survey responses provide a strong clue about the underlying problems that need to be addressed. Some refer to affordability of transport, utilities or housing. Others involve cleaner air and water and safer streets. Some of the expectations will be extraordinarily difficult for smart-city programmes to meet, as in the case of creating employment and reducing certain types of costs. But from this city authorities can learn what expectations are and how to manage them.

Figure 1: Tech-tastic cities
Emerging technologies considered most integral to the success of smart-city initiatives
 (top responses, average across 19 cities)



Source: The Economist Intelligence Unit



Getting smarter: Room for improvement in urban intelligence

Urban residents and business leaders are rarely shy about telling the authorities how they need to up their game, and they are predictably vocal when it comes to smart-city development. Taken as a global sample, citizens stress above all the need to be kept better informed about such initiatives, while business executives say authorities must improve their long-term planning. But the key areas identified for improvement differ widely between the cities.

Residents of Los Angeles, San Francisco, Dubai and Zurich, for example, emphasise keeping smart-city initiatives within budget. Better long-term planning is the most oft-cited plea of London, Riyadh, Stockholm and Sydney residents. In the less-developed cities of Johannesburg and Mumbai, people want initiatives to create more business opportunities for small firms. Doing better at ensuring equitable access to smart services is the most sought-after improvement in São Paulo and Singapore, while Hongkongers appeal above all for stronger data protection.

Figure 2: Big-city life

Top ways cities can improve their development of smart initiatives (citizens)

Country	Keeping citizens informed	Keeping costs within/close to budget	Ensuring equitable access for all	Planning for the long-term	Strengthening protection of personal data	Creating business opportunities for local firms	Incorporating the most advanced technologies
Amsterdam	x						
Copenhagen	x						
Dubai		x					
Frankfurt							x
Hong Kong					x		
Johannesburg						x	
London				x			
Los Angeles		x					
Mumbai						x	
New York	x						
Paris	x						
Riyadh				x			
San Francisco		x					
São Paulo			x				
Singapore		x					
Stockholm				x			
Sydney				x			
Tokyo	x						
Zurich		x					

Source: The Economist Intelligence Unit

Business leaders typically strive for predictability and cost-efficiency, goals reflected in the list of improvements they want from smart-city initiatives. Executives in six of the surveyed cities put better long-term planning at the top of their list, and

those in another three stress keeping the cost of initiatives within budget. Like the residents, executives in Johannesburg and Mumbai want smart-city initiatives to create more business opportunities for local firms.

Figure 3: Working round-the-clock

Top ways cities can improve their development of smart initiatives (businesses)

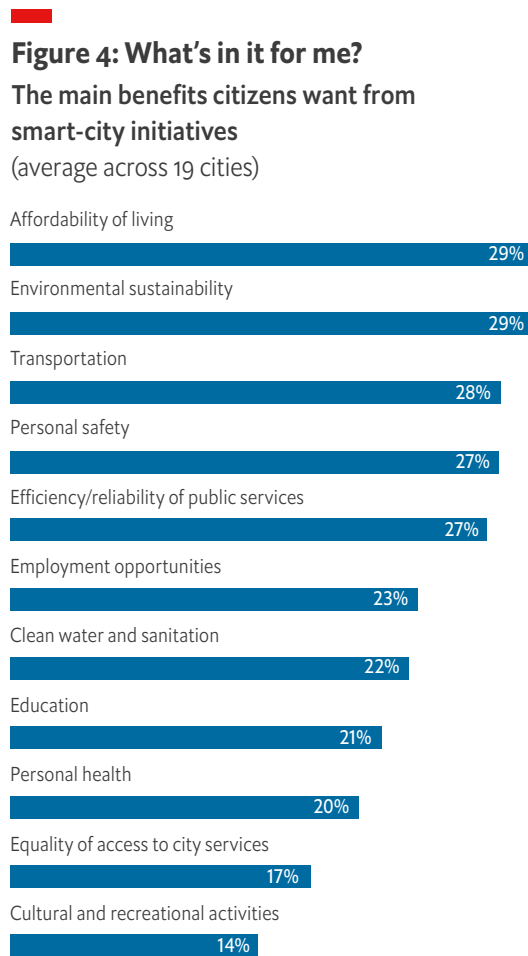
Country	Planning for the long-term	Ensuring new services are easy to use	Keeping costs within/close to budget	Creating business opportunities for local firms	Keeping citizens and businesses informed	Incorporating the most advanced technologies	Increasing overall investment	Paying sufficient attention to data-privacy concerns	Soliciting advice from businesses
Amsterdam						x			
Copenhagen									x
Dubai (tie)	x	x							
Frankfurt						x			
Hong Kong	x								
Johannesburg				x					
London	x								
Los Angeles			x					x	
Mumbai				x					
New York	x								
Paris					x				
Riyadh	x								
San Francisco			x						
São Paulo							x		
Singapore	x		x						
Stockholm	x								
Sydney	x								
Tokyo								x	
Zurich						x			

Source: The Economist Intelligence Unit

Chapter 1: Heading the citizen call

Among the different facets of life where citizens want smart-city development to make an impact, affordability is top of the list for seven of the 19 cities and is the highest ranked category overall. A look at recent cost of living indices helps to explain this. Four of the 19 cities in the survey—Singapore, Hong Kong, Paris and Zurich—are currently the most expensive in the world according to our 2019 cost of living index, which covers 133 cities. Three others—New York, Copenhagen and Los Angeles—rank among the ten most expensive, while Tokyo and Sydney fall in the top 20.¹

Almost as many respondents say that solutions which deliver greener, cleaner cities are equally important. Transportation, personal safety, public-service efficiency and employment are other areas where citizens want smart-city initiatives to generate benefits.



Source: The Economist Intelligence Unit

¹ [“The world's most expensive cities”](#), *The Economist*, March 19th 2019.

Affordable expectations?

Low-cost transport is the area where the largest share of citizens expect smart-city initiatives to enhance affordability, especially in Frankfurt, Zurich and Stockholm. In other places, notably Johannesburg and Singapore, citizens want smarter tariffing schemes to rein in or reduce energy and water costs. Parisians, meanwhile, prioritise greater energy efficiency in their buildings.



Figure 5: Making ends meet
 How citizens expect smart-city programmes to improve affordability
 (top response in each city)

Country	Encouraging the growth of low-cost transport options	Improving the ability of energy and water utilities to vary pricing according to usage	Improving the energy efficiency of buildings	Expanding the availability of free internet access in public spaces
Amsterdam	x			
Copenhagen	x			
Dubai		x		
Frankfurt	x			
Hong Kong		x		
Johannesburg		x		
London	x			
Los Angeles		x		
Mumbai		x		
New York	x			
Paris			x	
Riyadh				x
San Francisco	x			
São Paulo	x			
Singapore		x		
Stockholm	x			
Sydney		x		
Tokyo	x			
Zurich	x			

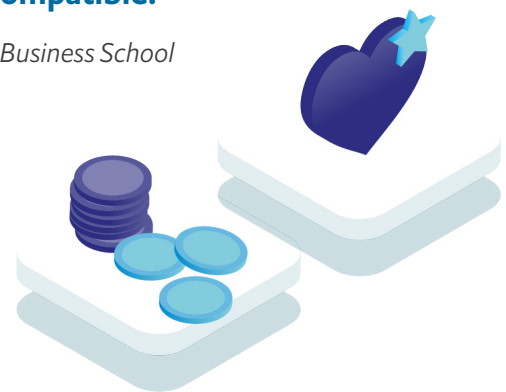
Source: The Economist Intelligence Unit

Low-cost smart-transport solutions are already a reality in many cities, a good example being bicycle-sharing schemes.² Far from all are inexpensive, however, underscoring the fact that more efficient or cleaner transport may not be cheaper. Mr Berrone, for one, has found that smart grids and smart water-management systems sometimes generate savings for public utilities but seldom translate into lower rates for consumers. In the short term, he says, cost reduction is unlikely as cities must pay for the technologies and systems they deploy. It is another case, he believes, of cities needing to manage their citizens' expectations. "City managers need to decide the main objective of each proposed solution. Is it to save money, or to improve citizens' quality of life? The two may not be compatible, at least in the short term."



City managers need to decide the main objective...is it to save money, or to improve citizens' quality of life? The two may not be compatible.

Pascual Berrone, IESE Business School



² Patrick Collinson, "[On your bike: the best and the worst of city cycle schemes](#)", *The Guardian*, February 25th 2017.

The green imperative

One of the UN’s Sustainable Development Goals (SDGs) calls for all people to have “access to affordable, reliable, sustainable and modern energy”,³ an aspiration also shared by survey respondents (see box). This need is felt especially keenly in emerging-world cities such as Johannesburg, Dubai and São Paulo. Many residents of these metropolises, as well as Mumbai, also demand that smart solutions improve waste recovery.

Praveen Pardeshi, municipal commissioner of Mumbai’s regional government, says that much

is being done in his city to meet demands for smart waste recovery and water management, but that the results are not readily visible to citizens. He cites the example of Mumbai’s automated water distribution system, which manages the flow of clean water into and within the city. A solution that is more visible to the public is a camera-activated flood monitoring system designed to minimise damage to people and property during seasonal monsoons. Early flood warnings sent to residents via SMS enable families to evacuate their homes quickly, Mr Pardeshi explains.

Figure 6: It’s easy being green

How citizens expect smart-city programmes to enhance environmental sustainability

(top response in each city)

Country	Expanding the availability of renewable energy sources (eg wind and solar power)	Improving the efficiency of public transport (eg buses, trains)	Improving the efficiency of waste recovery (eg recycling)	Reducing road congestion through more efficient traffic management
Amsterdam			x	
Copenhagen		x		
Dubai	x			
Frankfurt		x		
Hong Kong	x			
Johannesburg	x			
London	x			
Los Angeles				x
Mumbai			x	
New York		x		
Paris			x	
Riyadh	x			
San Francisco				x
São Paulo		x		
Singapore			x	
Stockholm		x		
Sydney			x	
Tokyo		x		
Zurich	x			

Source: The Economist Intelligence Unit

³ The SDGs are a set of 17 global aims for the betterment of humanity, codified in 2015. [Sustainable Development Goals Knowledge Platform](https://www.un.org/sustainabledevelopment/), United Nations website.

While exploring how digital technology can be used to enhance sustainability, city authorities must also work to minimise the adverse effects it can generate. For example, Mr Tan points to the emissions produced by data centres. “We need to figure out how we can make our data centres green as well as efficient.”

Safety, health and jobs

Improving the crime-fighting capabilities of police ranks highest on respondents’ list of personal health and safety priorities for smart-city development (and is the most frequently-cited priority in Stockholm, Johannesburg and São Paulo by a wide margin). Better air and water quality are a close second concern. Some crime-fighting

technologies, such as facial recognition, pose a dilemma for citizens and authorities given how difficult it can be to gain individuals’ consent to use the data they generate.

Many citizens also expect smart-city initiatives to create employment opportunities. Technology training in city schools and universities helps to expand the talent pools that large and small businesses alike need to support their digital projects and operations. But citizens lay their primary hopes for job creation on the big technology firms they anticipate attracting given their city’s increasingly ambitious digital projects. These residents may be surprised to learn that business executives in their cities hope for the same, albeit for different reasons.

What smart cities mean for the world’s sustainable development

The UN likes to think big. Its 17 Sustainable Development Goals (SDGs), adopted by member states in 2015, aim to provide “a shared blueprint for peace and prosperity for people and the planet, now and into the future”.⁴ Urban challenges figure in several of the SDGs, most prominently in goal 11: “Sustainable Cities and Communities”. The words “smart” and “technology” are mentioned only in passing in the SDG description, but the UN makes the link it sees between intelligence and sustainability in urban development clear, not least in the United Smart Cities initiative organised by the UN Economic Commission for Europe.⁵

The connection is also apparent to city officials and heads of smart-city programmes. According to Marius Sylvestersen, programme director of a body that oversees the Danish capital’s smart-city efforts, Copenhagen Solutions Labs, “the SDGs provide a reference point for the work that we and our counterparts elsewhere in the world are doing. We also link some of our efforts to specific SDGs, which also helps us get public buy-in.”

Lawrence Boya, director of Johannesburg’s Smart City Programme, confirms the SDGs are relevant to his team’s efforts, too. They helped guide the drafting of the city’s medium- and long-term development plans, he says. When it comes to smart-city development, “the SDGs provide the critical framework for our thinking”.

⁴ Ibid.

⁵ [United Smart Cities website](#)

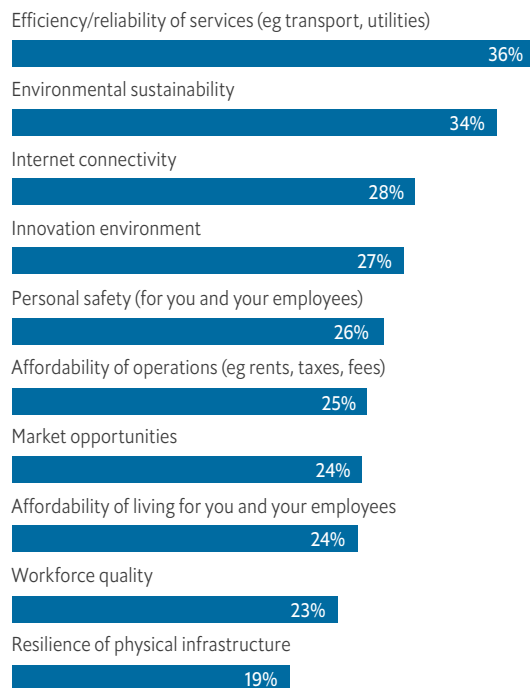
Chapter 2: Cities of business opportunity

All businesses that operate in a city—not just technology firms—have much to gain from the success of smart-city initiatives. The projects that city governments launch or sponsor often help stimulate collaborative innovation and generate data that businesses can tap for their own benefit. The need to support smart services and projects with bandwidth and computing power leads to efforts to expand and improve internet connectivity, two of the chief benefits of smart-city development that executives seek to exploit.

At the top of the business wish list, however, are two other items. The first is more efficient and reliable public services. Companies need an assured and stable power supply, for example, and means of transport that convey employees to work on time each day. They also want smart cities to deliver a more sustainable natural environment. This priority ranks a close second to efficiency among our business respondents.

According to Mr Sharma, sustainability is part of a higher-level interest that businesses have in smart-city development: creation of an environment that enables their employees to reach their full potential. “That potential may be in producing software, pharmaceuticals, entertainment content or some other product. Realising that potential requires a clean, liveable environment and communities where people want to raise their kids.”

Figure 7: Beyond the bottom line
 The main benefits businesses want from smart-city initiatives
 (average across 19 cities)



Source: The Economist Intelligence Unit



Smarter together

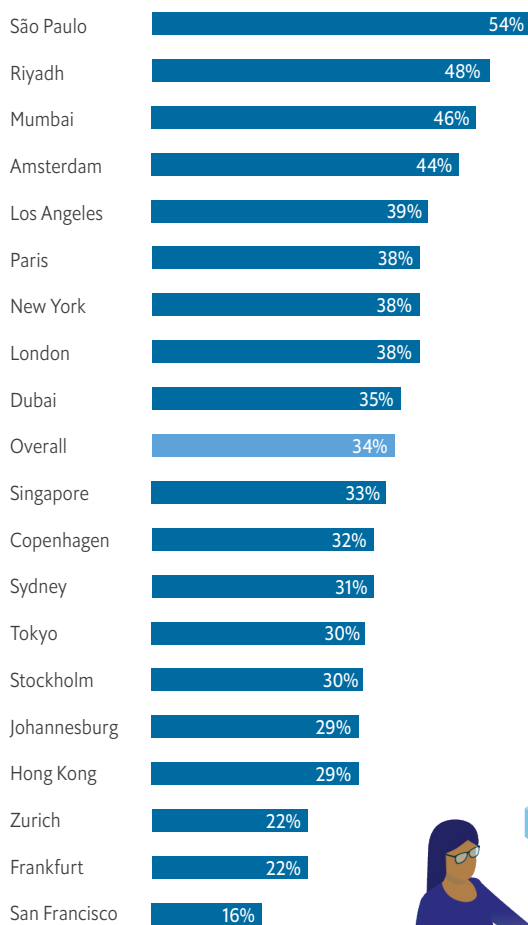
Smart-city programmes can enrich local innovation environments in many ways. Amsterdam Smart City, a public-private partnership established in 2009, does more than issue tenders for projects. It organises hackathons and other forums for brainstorming technology solutions to city challenges and supports an open-data platform that firms tap into to help develop their own products and services. Start-ups, large firms and universities are all beneficiaries of the programmes.⁶

Copenhagen offers another example of this. Mr Sylvestersen says the city does not seek to develop solutions on its own but rather does so through public-private partnerships. “Our preferred way of working is to get companies and research organisations to address urban problems for which there are no solutions.” He cites the example of measuring air quality: to do so, the city has convinced Google to let its Street View car moonlight as an air-quality meter.

Akin to citizens, executives in our survey place high hopes on the involvement of big technology companies in smart-city projects, both as a means of improving the innovation environment and for creating business opportunities for their own firms.⁷ According to Mr Berrone, innovation, opportunities and new jobs are more likely to arise from large firms’ involvement in projects compared to smaller ones. “When it comes to selecting partners, city managers often fear that small companies’ solutions will become obsolete or that the companies themselves will disappear. When such fears kick in, officials tend to favour big companies with established platforms and staying power.”

Figure 8: The bigger the better?

Share of business executives choosing “attracting large tech companies” as the main way smart-city initiatives can improve the innovation environment (average across 19 cities)



Source: The Economist Intelligence Unit



⁶ See, for example, Lauren Macpherson, “8 Years On, Amsterdam is Still Leading the Way as a Smart City”, *Medium*, September 7th 2017; and the [Amsterdam Smart City website](#)

⁷ A notable exception is San Francisco, where there is considerable criticism of big tech firms’ role in the city.

The unrealised promise of data

The sharing of government data (on, for example, traffic patterns, building permits, streetlights, park usage, and taxi and bus fleets) via open-data platforms is a common feature of smart-city programmes, as in the previous example of Amsterdam. Many executives see the ability to use such data as a key market opportunity. Nearly half of business respondents in Singapore (49%) and Sydney (45%) place high priority on using open data to develop new marketing strategies. In the survey overall, 70% of respondents say the ability to access open-government data is vital to their business.

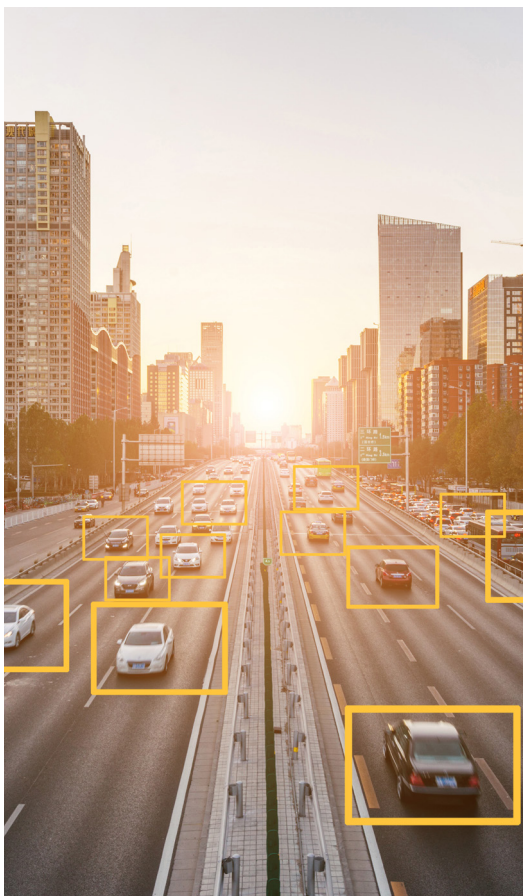
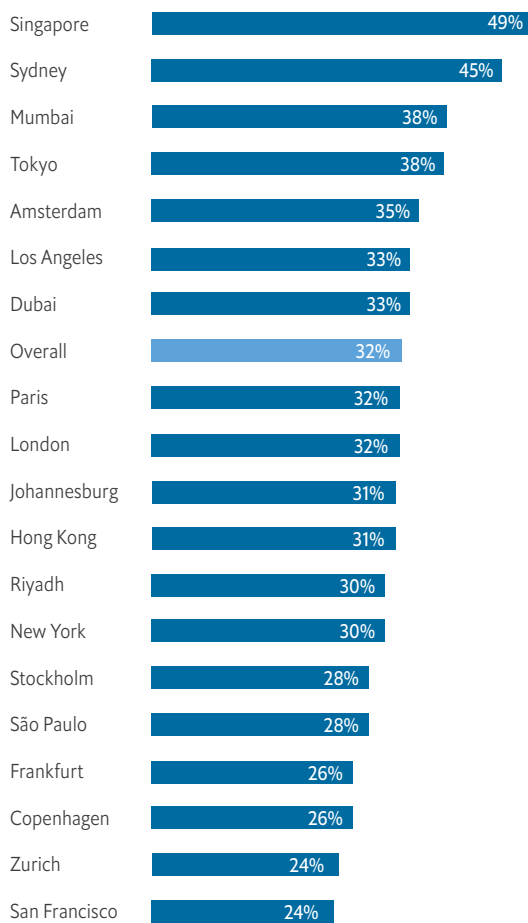


Figure 9: Open sesame

Share of business executives choosing “developing new marketing strategies through the use of open-government data” as the main way smart-city initiatives can create market opportunities (average across 19 cities)



Source: The Economist Intelligence Unit



In Copenhagen, Mr Sylvestersen is disappointed by the contribution of open-government data towards the creation of new products and services by businesses, and exhorts cities to do more to make their data useful to businesses. "Governments can't just make data available and hope that businesses will build new solutions on top of it," he says. "We have to work with businesses in a more focused way."

Mr Sharma believes businesses and governments have yet to crack the data

challenge. He cites three barriers that are holding progress back: the difficulty of taming the huge masses of data being generated; an ongoing shortage of qualified data scientists and AI specialists who know how to generate insights from data; and the relative immaturity of existing data analysis tools. He believes, however, that as skill sets start matching up to the available technology and cities experience the benefits of AI and data analytics, the stage is set for a change to everyday lives.

Governments can't just make data available and hope that businesses will build new solutions on top of it.

*Marius Sylvestersen,
 Copenhagen
 Solutions Lab*

Worlds of smart-city diversity

It is risky to generalise about citizen and business views in a study encompassing 19 cities in different regions of the world and with different levels of income, crime, social inequality and other features of urban life. In several areas variations are particularly noticeable between emerging-world cities (Dubai, Johannesburg, Mumbai, Riyadh and São Paulo) and those in the developed world, including:

Affordability and employment

When probed on the most-desired benefits from smart-city initiatives, residents of higher-income but also higher-cost cities such as Singapore, San Francisco and Los Angeles emphasise gains in affordability of living. The top response of those in Johannesburg and Dubai, by contrast, is the creation of employment opportunities.

Green priorities

Improving the efficiency of public transport and reducing road congestion are high priorities for enhancing environmental sustainability in the likes of Frankfurt, Stockholm, New York and San Francisco. Residents of Johannesburg, São Paulo, Dubai and Riyadh, meanwhile, view benefits from

expanding the availability of renewable energy sources and from improved waste recovery as especially important.

Fighting crime

Asked how smart-city initiatives should create a healthier and safer environment, Johannesburg and São Paulo residents say that improving the crime-fighting capabilities of police is priority number one. Those in most developed-world cities, by contrast, emphasise initiatives to improve air and water quality. (Stockholm is an exception, emphasising better crime-fighting.) Residents of Mumbai, São Paulo and Dubai are also more accepting of facial recognition technology as a means of fighting crime than those in, say, San Francisco, Los Angeles or Copenhagen.

Attitudes towards big tech

Whether it's smart-city projects that create employment opportunities, improve the innovation environment or create business opportunities for local firms, citizens and business executives in São Paulo, Mumbai, Riyadh, Johannesburg and Dubai are more likely than those in more developed cities (especially San Francisco) to view the involvement of large technology companies as a high priority.

Chapter 3: Trade-offs to urban intelligence

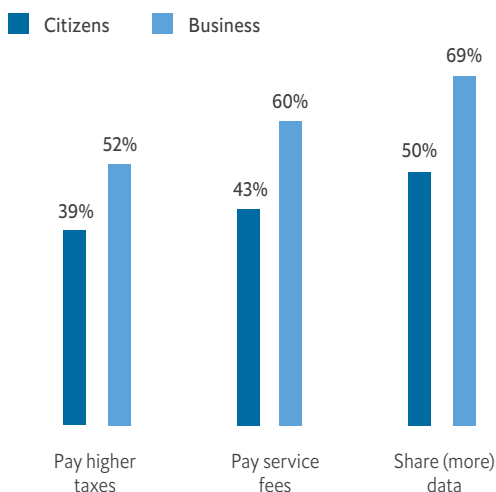
How much are residents and businesses willing to contribute—or sacrifice—to turn their smart-city hopes into reality? Although a minority, many residents (39%) across 19 cities are willing to pay more taxes to help fund smart-city upgrades. Even more (43%) are willing to pay higher fees for services such as transport and utilities. Both figures rise considerably (to 52% and 60% respectively) among the executive cohort.

There is also a broad willingness to share data in order to improve services, although far from all citizens and businesses (notably in Zurich and Stockholm) are comfortable with it.

Another type of trade-off that many citizens fear is deeper social inequality that could result from smart-city initiatives. Availing oneself of smart services, after all, requires ownership of an internet-enabled device and a familiarity with how the online world works—attributes that are not a given in all layers of society. Over half of citizens in the survey (52%, and as many as 84% in Mumbai and 66% in Riyadh) believe that the growth of smart technologies will exacerbate existing social inequalities in their city.

Figure 10: Pay to play?

Willingness of citizens and businesses to do the following in exchange for smart-city benefits (average across 19 cities)



Source: The Economist Intelligence Unit

Over half of citizens in the survey believe that the growth of smart technologies will exacerbate existing social inequalities in their city.

Lawrence Boya of Johannesburg’s Smart City Programme thinks they are right to be concerned. “Public fears about smart technology’s potential for deepening social inequalities are justified,” he says. “Most citizens have mobile devices today, but we must expand internet access and reduce users’ costs of accessing data.”

How can cities avoid deepening inequality via their smart-city programmes? According to Ms Gerull, this requires the city to systematically evaluate the equity dimension of every technology solution it agrees to support and every technology partnership it forges. For Mr Sylvestersen, ensuring equality of access to smart services must be in the very DNA of city planning.



Robust public education campaigns must be conducted every time we offer new services to our citizens, because everyone should have equal access to the resources available to them and know how to use them.

Amanda Daflos, City of Los Angeles

Figure 11: Facing up to trade-offs

Share of citizens agreeing with the following statements

(average across 19 cities)

■ Strongly agree ■ Somewhat agree

The use of facial recognition technology in urban crime prevention will do more good than harm



The potential benefits from the growth of smart-city technologies outweigh any potential loss of personal privacy



The growth of smart technologies will exacerbate existing social inequalities in my city



Source: The Economist Intelligence Unit

Mumbai's low-tech smart solution for transport

Transport is a social inequality flashpoint in Mumbai, according to its municipal commissioner Praveen Pardeshi. Unlike many large cities, Mumbai does not have a mass transit underground railway. Private cars often cause congestion and chronically late buses, forcing commuters to hail taxis, which is a considerably more expensive proposition.

Mumbai's poor may not own cars but most have a mobile phone, so local telecommunications and software companies have created an app allowing commuters to locate their bus and estimate its arrival time, allowing for more efficient scheduling of journeys.

Commuters can also use the app to pay the bus fare in advance.

The app is based on the iconic M-Pesa money transfer service, first launched in 2007 by the Kenyan subsidiary of Vodafone, a mobile operator, and now used by many millions of mobile phone owners across Africa, Asia and parts of Eastern Europe. (The app was designed for people without access to bank accounts.) Its use has helped Mumbai's transport agency boost daily bus ridership more than tenfold since 2016, to over 3m people, according to Mr Pardeshi. "It has also," he says, "increased commuters' likelihood of reaching their destination on time and at little cost."

Conclusion: Realism and hype in the smart urban future

Urban citizens and businesses demand a lot from the smart-city efforts their municipal authorities are pursuing. Whatever the technologies used to deliver new services—IoT, AI or more prosaic ones such as mobile phones or bicycles—residents expect the outcomes to be greater efficiency and reliability of services. Hopes are especially high for improved public transport; a greener and more sustainable physical environment; cleaner air and water; safer streets; more jobs; vibrant innovation; and a plethora of new business opportunities for local firms. Last but not least, people believe smart cities should be affordable, with transport, housing and utilities accessible to all segments of the population.

This seems a tall order for city officials and those leading their smart-city efforts. Tellingly, more than one of the experts interviewed for this report expressed doubt that smart-city initiatives will generate more jobs or can do much to affect the cost of housing—areas of deep concern to residents and businesses alike.

In other ways, however, smart initiatives are starting to deliver in many cities. Smart traffic management is helping to reduce road congestion; shared mobility schemes are making it easier for people to leave their cars at home; intelligent street lighting is helping to make city streets and parks safer; sensors in rubbish bins are helping to make waste removal more efficient. These are only a few of the myriad examples currently in practice around the world.

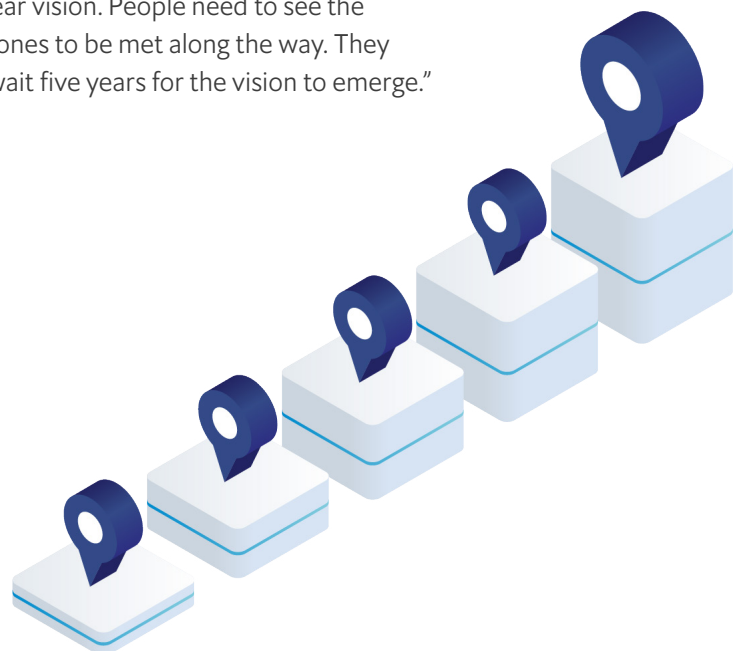
For city officials, this suggests that the way to meet the public's smart-city expectations is to manage them and to communicate progress effectively. Mayors and other public officials are often good at communicating a vision. But without an implementation plan and milestones, vision is not enough.

“City officials need to create a smart-city roadmap of where they're trying to get to,” says Mr Sharma. “But don't just project a five-year vision. People need to see the milestones to be met along the way. They can't wait five years for the vision to emerge.”



City officials need to create a smart-city roadmap of where they're trying to get to. But don't just project a five-year vision. People need to see the milestones to be met along the way.

Sameer Sharma, Intel

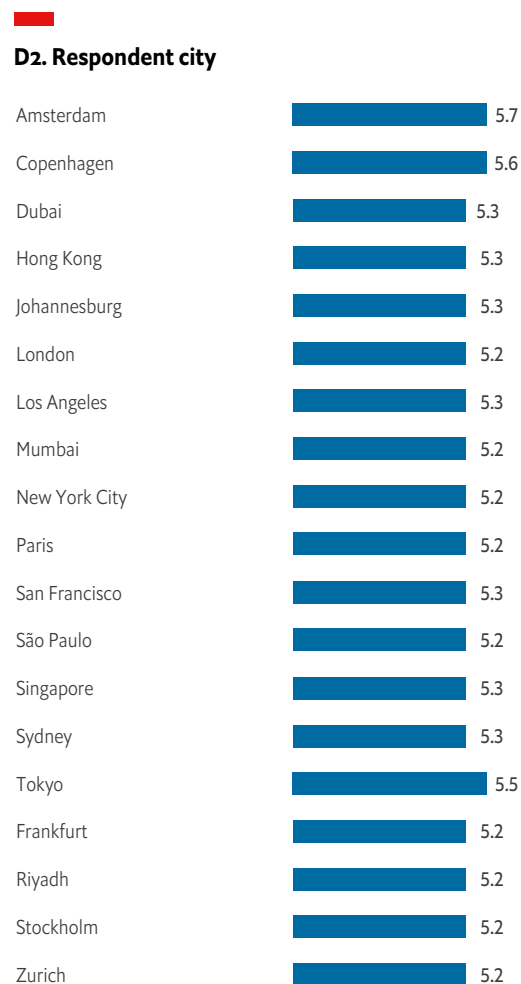
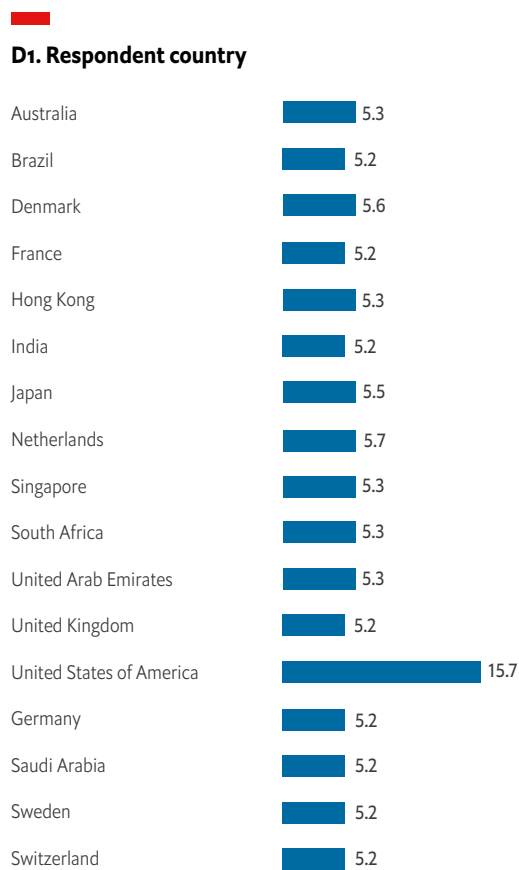


Appendix: Survey results

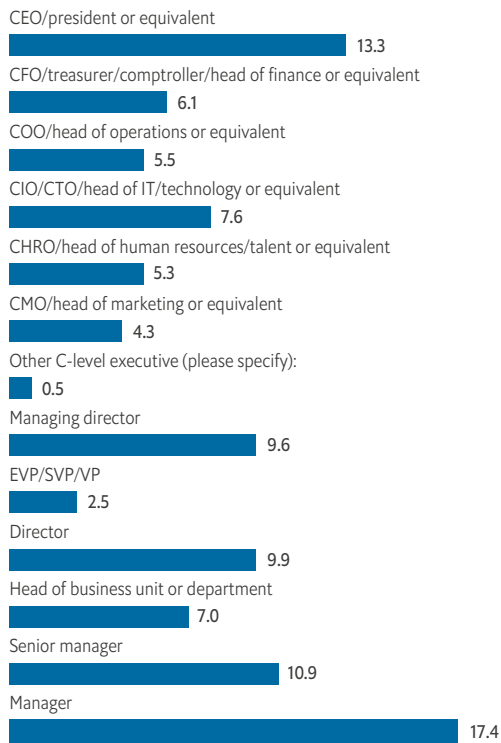
All figures represent % of respondents

Businesses

Demographic questions



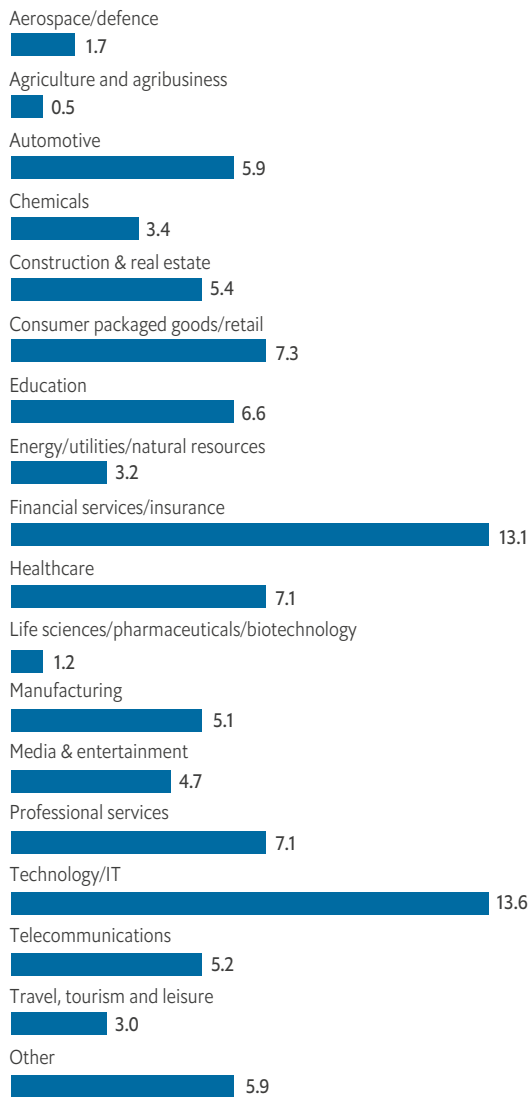
D3. Job title



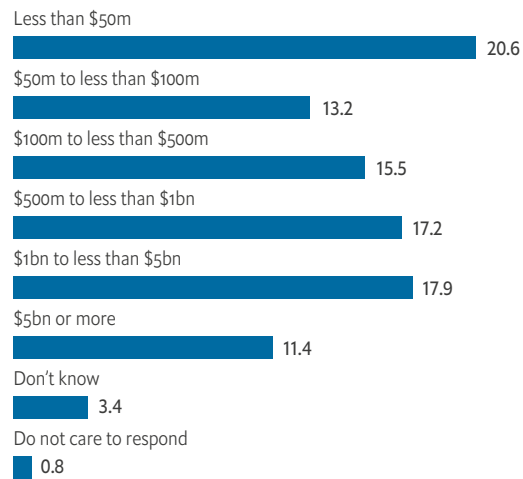
D4. Functional role



D5. Respondent industry

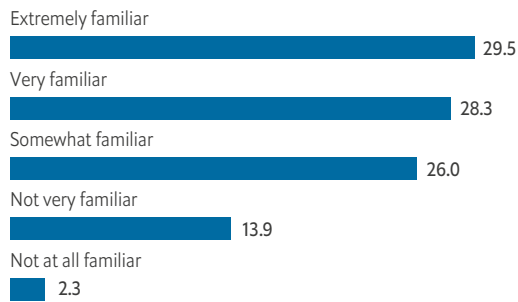


D6. Annual global revenue of respondent organisation

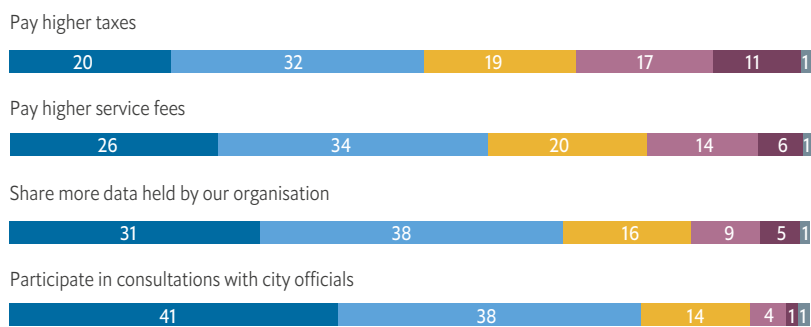
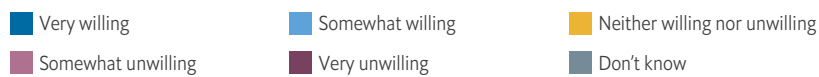


Content questions

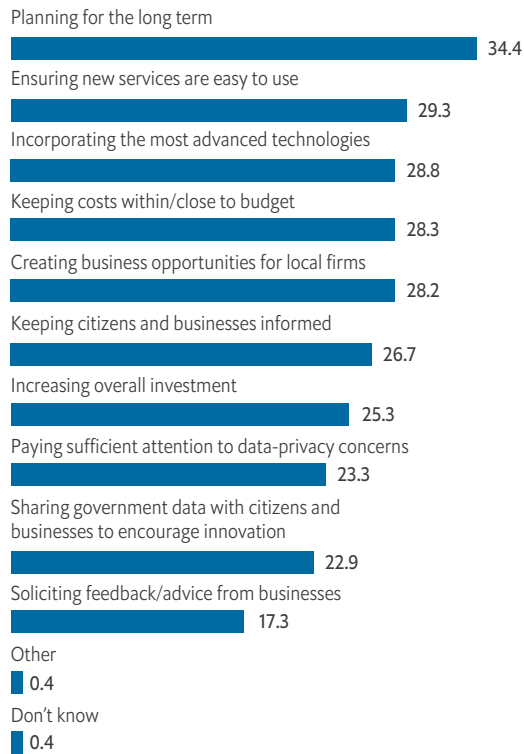
Q1. How familiar are you with your city's smart-city initiatives?



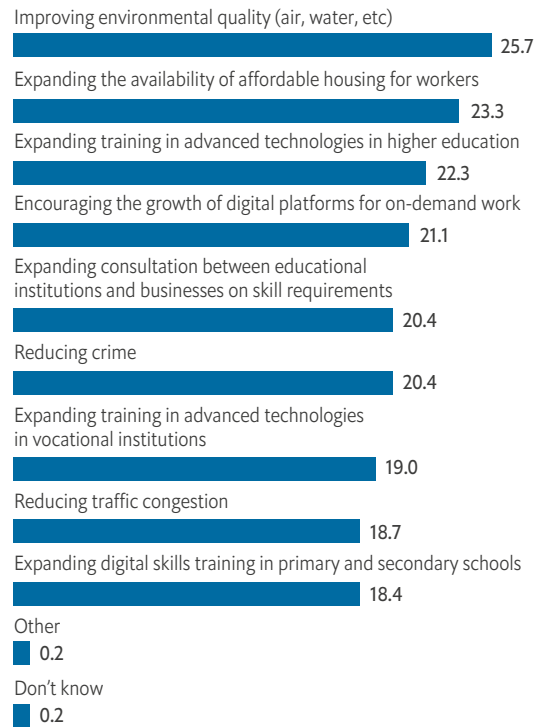
Q2. In exchange for the benefits resulting from smart-city initiatives, to what extent would your organisation be willing to do the following?



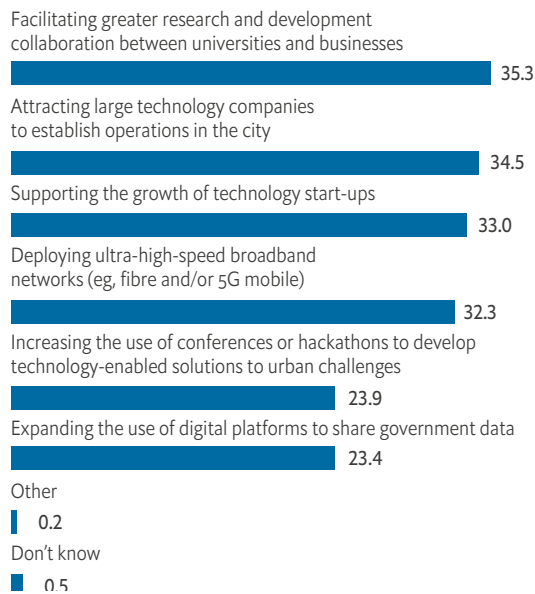
Q3. When it comes to developing smart-city initiatives, in which of the following area(s) does your city government need to improve the most?



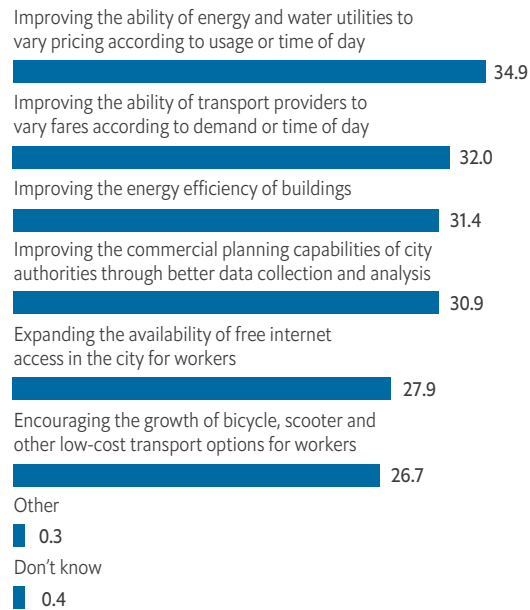
Q4. When it comes to the availability of talent for your organisation, which of the following do you believe should be the main priorities of smart-city development?



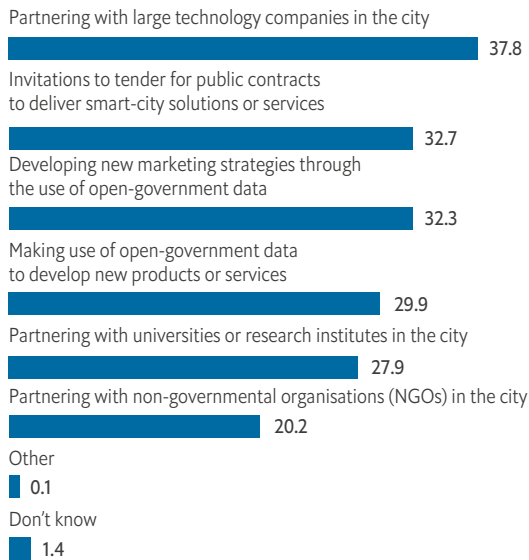
Q5. When it comes to the innovation environment in your city, which of the following do you believe should be the main priorities of smart-city development?



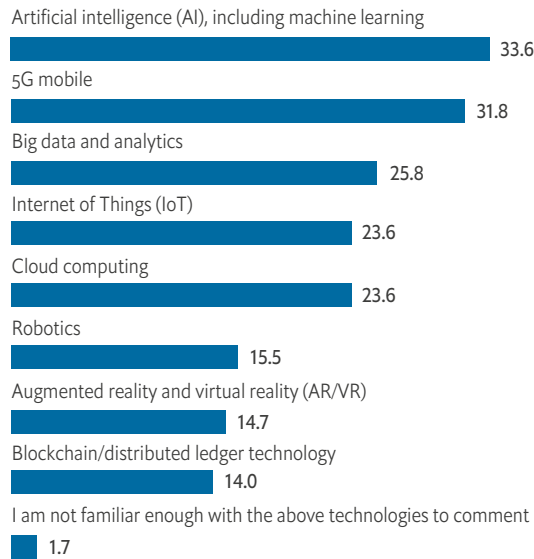
Q6. When it comes to your city's affordability, which of the following do you believe should be the main priorities of smart-city development?



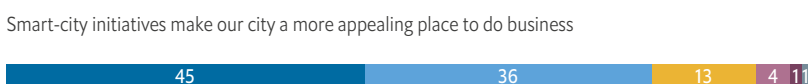
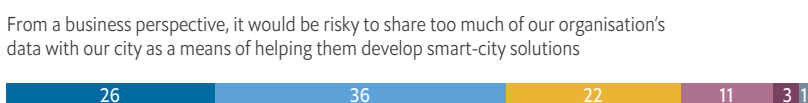
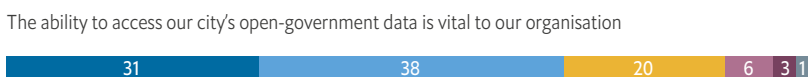
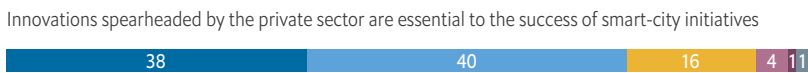
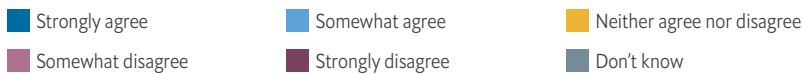
Q7. What are the main types of market opportunities for your organisation that you hope will result from your city's smart-city initiatives?



Q8. Which of the following emerging technologies, when utilised as part of smart-city initiatives, do you believe will be most integral to the success of your city's business ecosystem?

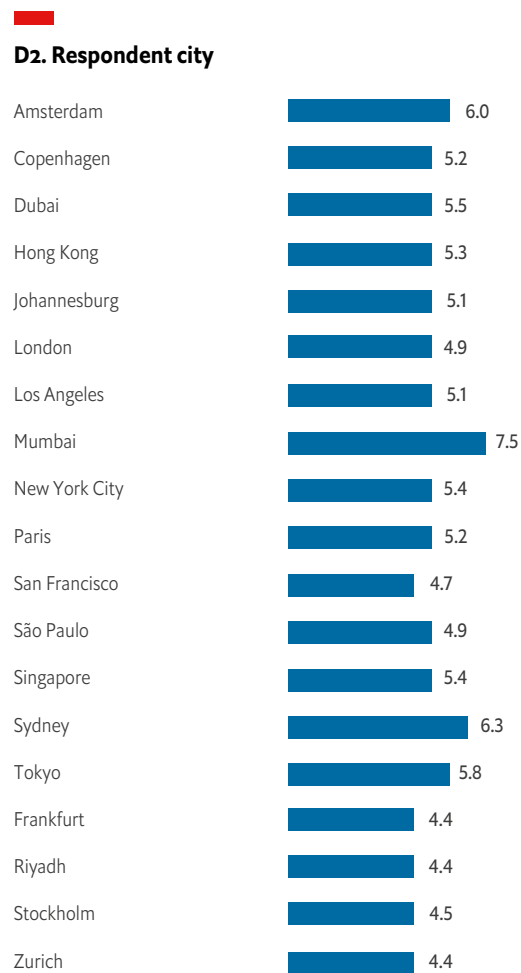
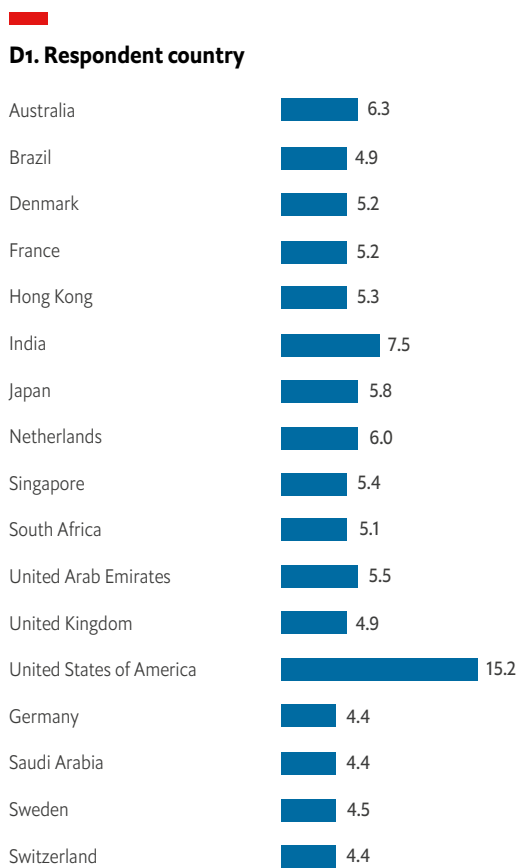


Q9. To what extent do you agree or disagree with the following statements?



Citizens

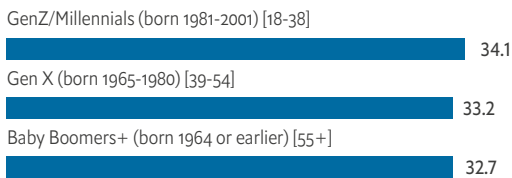
Demographic questions



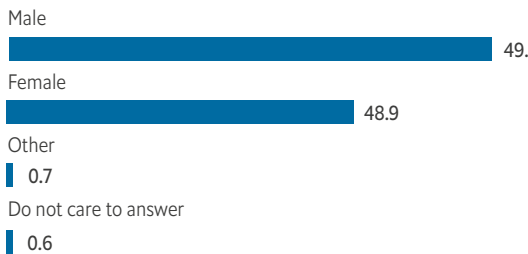
D3. Which of the following best describes the community in which you live?



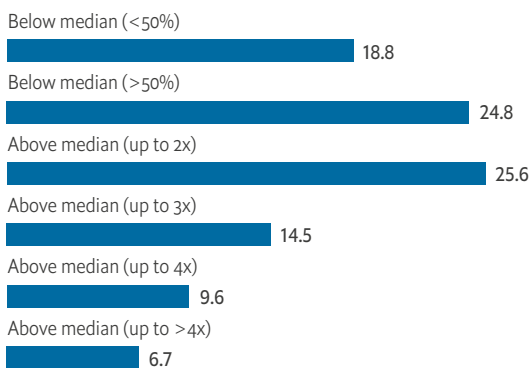
D4. In what year were you born?



D5. Which best represents your gender?

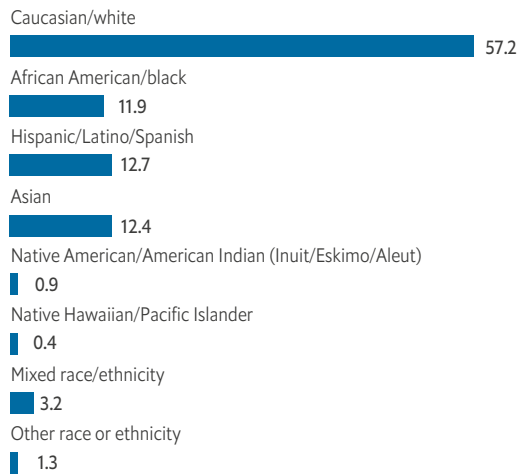


D6. Which of the following ranges best represents your household income?

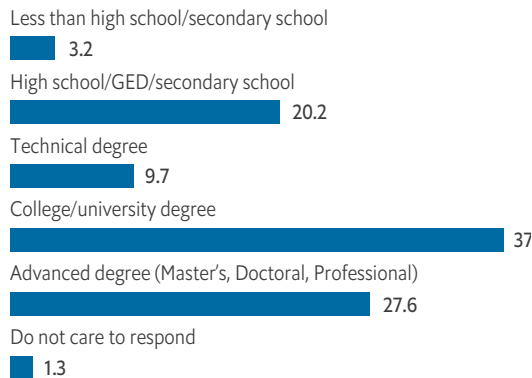


D7. Which of the following best represents your ethnicity or race?

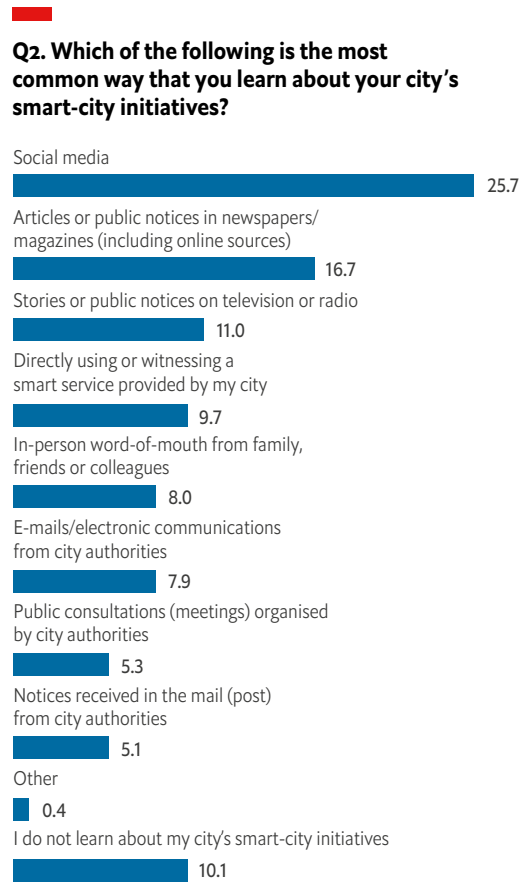
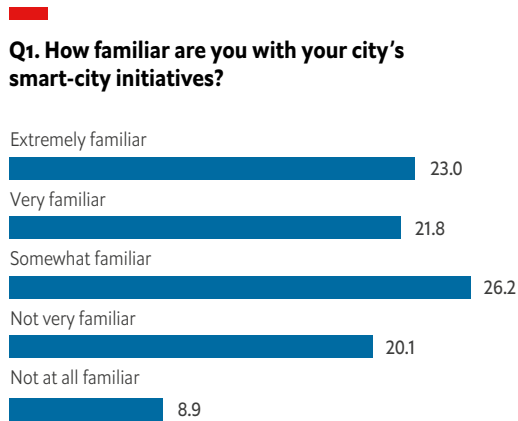
For US respondents only



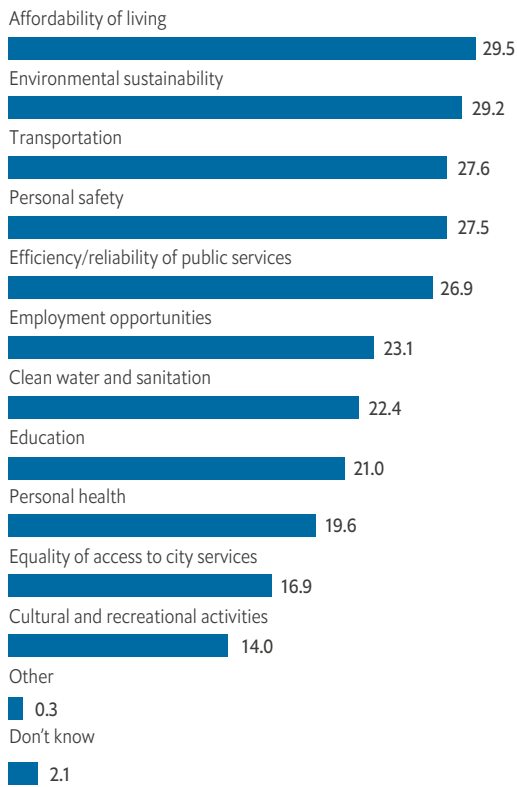
D8. What is the highest level of education you have completed?



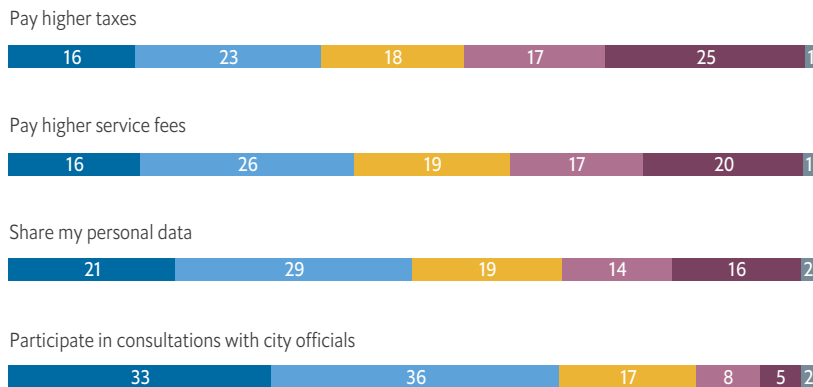
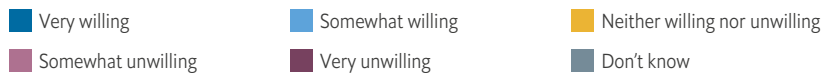
Content questions



Q3. What are the main benefits you would like your city's smart-city initiatives to deliver? Greater/better...



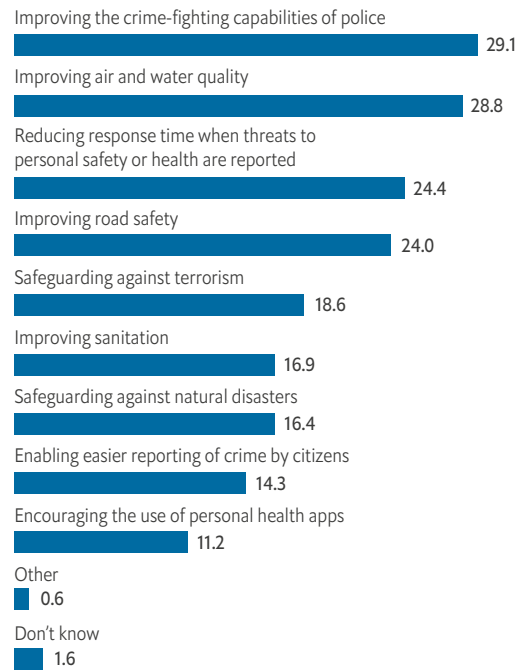
Q4. In exchange for the benefits resulting from smart-city initiatives, to what extent would you be willing to do the following?



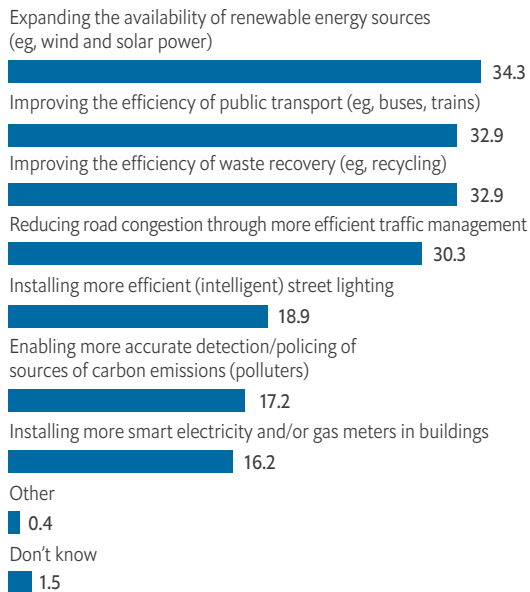
Q5. When it comes to developing smart-city initiatives, in which of the following area(s) does your city government need to improve the most?



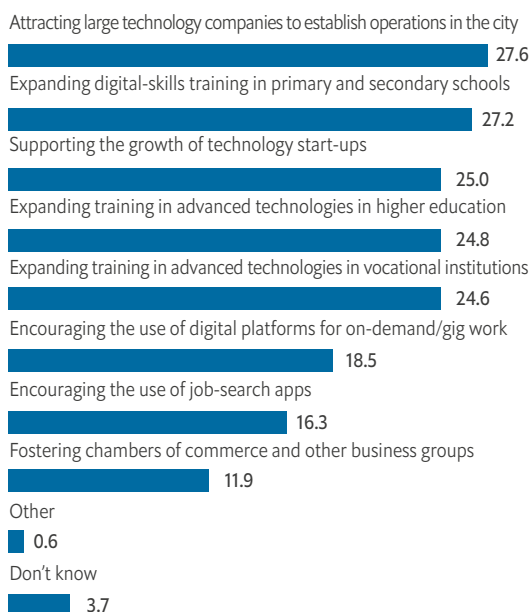
Q6. When it comes to the personal health and safety of you and/or your family, which of the following do you believe should be the main priorities of smart-city development?



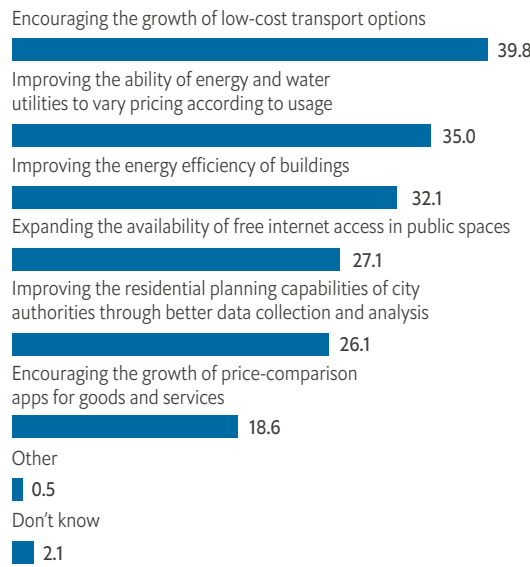
Q7. When it comes to your city's environmental sustainability, which of the following do you believe should be the main priorities of smart-city development?



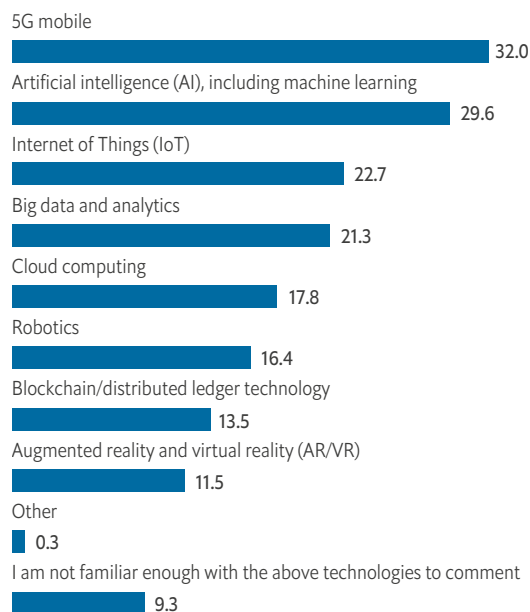
Q9. When it comes to your city's employment opportunities, which of the following do you believe should be the main priorities of smart-city development?



Q8. When it comes to your city's affordability, which of the following do you believe should be the main priorities of smart-city development?



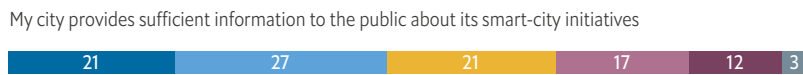
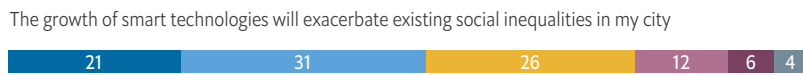
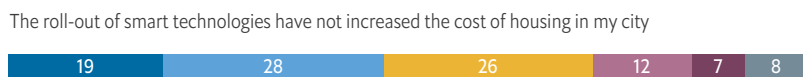
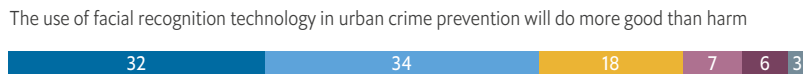
Q10. Which of the following emerging technologies do you consider most integral to the success of your city's smart-city initiatives?





Q11. To what extent do you agree or disagree with the following statements?

- Strongly agree
 Somewhat agree
 Neither agree nor disagree
- Somewhat disagree
 Strongly disagree
 Don't know



Q12. To what extent would you be comfortable with your city government using your personal data to improve smart-city initiatives for the following purposes?

■ Very comfortable
 ■ Somewhat comfortable
 ■ Neither comfortable nor uncomfortable
■ Somewhat uncomfortable
 ■ Very uncomfortable
 ■ Don't know

Reducing road and transport congestion by predicting travel patterns



Preventing or solving crime by improving personal identification (via facial recognition and other techniques)



Reducing energy costs by personalising energy tariffs



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