

TOWARDS URBAN DECOUPLING?

BRIEF / 10
May 2020

China's smart city ambitions at the time of Covid-19

by

Alice Ekman
Senior Analyst, EUISSCristina de Esperanza Picardo
Trainee, EUISS

INTRODUCTION

The term 'smart city' relates to the use of technology to improve urban infrastructure and services, from energy grids to systems for transport/mobility and parking, and includes water treatment, waste management and security aspects, among others. China has made the smart city part of its national development strategy: the concept was endorsed by President Xi Jinping at a national urbanisation convention in 2015, and later explicitly mentioned in the 13th Five-Year Plan (2016–2020), adopted in March 2016.¹ Since then, the central government has massively encouraged the development of smart cities across Chinese national territory – claiming in January 2019 to have a total of 500 “smart city pilot projects ready or under construction”.² It has also urged technology companies to become leaders at a global level, and to reach out to foreign cities in support of their own smart city development. China often promotes its smart cities through existing bilateral and regional frameworks (such as the China-ASEAN Summit or the China-Central Asia Cooperation Forum) and in particular under the banner of the ‘Belt & Road Initiative’ (BRI), as well as its

Summary

- › China is rapidly consolidating its expertise in building smart/safe cities, hoping to become the leading global provider in the field. China's competitiveness in this emerging market should not be underestimated: smart city development is a top governmental priority, and China already has national champions in the industry, able to provide infrastructure, services and training in a comprehensive and competitive way, both in terms of technological advancement and cost.
- › The Covid-19 crisis is not a game-changer, but has significantly accelerated China's testing of some of its smart city technologies and equipment (drones, robots, tracking apps, AI-enabled surveillance cameras, etc.). The crisis has also seen China step up its activism in the global promotion, donation and export of some of its smart city technologies with dual use capabilities (health/surveillance).
- › For Europe, the risk is that it leaves the development of the security dimension (surveillance/tracking systems) of smart cities to authoritarian regimes. Europe would gain by embracing rapidly, within a strategic and long-term perspective, the security dimension of smart cities, in line with its values, interests and priorities.

derivative, the 'Digital Silk Road', which are attracting a significant number of countries.³

If China is today investing in the smart city industry in a comprehensive way, including mobility and ecological aspects, it first and foremost developed a strong focus on and expertise in the public security dimension. In fact, China's definition of smart city was initially assimilated to 'safe city' and the development of surveillance networks for the state security authorities. It is mainly, but not exclusively, this 'safe' dimension of smart cities that a host of Chinese companies are offering to foreign countries and cities – and the one that will be analysed in this Brief.

How is China adjusting its safe city ambitions domestically and internationally during the Covid-19 crisis? And what are the challenges raised by China's recent safe city developments? This Brief identifies two main types: a normative challenge and a geopolitical one. Both of them will potentially lead to an 'urban decoupling', with the development of diverging types of cities and urban governance models in the future.

COVID-19: AN OPPORTUNITY TO PROMOTE CHINESE TECHNOLOGIES

The Covid-19 crisis is accelerating China's smart city development in three ways. First, since December 2019, the Chinese government, in cooperation with several tech companies, has stepped up the use and testing of several major smart city functions on its national territory: these include Artificial Intelligence (AI) surveillance cameras, drones, facial recognition technology, big data collection and analysis, tracking apps, and QR codes linking travel history and medical data. The Chinese government has also upped the pressure on private companies to hand over sensitive data for anti-epidemic purposes⁴ – something which the latter were often reluctant to do in recent years on the grounds that it could go against their commercial interests. In addition, tracking apps⁵ and devices, many of which were not fully functional before the crisis, have been streamlined and improved to some extent. With the onset of the crisis, the Chinese government was able to accelerate the collection and sharing of data from both public and private sources. Such sharing was already in place before, but the emergency has facilitated the further integration of data across different authorities and departments at both a local and central level. The coronavirus has also indirectly helped the local governments to further test and fine-tune the social credit system, which had started before the crisis in various provinces and is planned to be

fully implemented and unified nationwide by the end of 2020. This 'national reputation system'⁶ is likely to increasingly form part of China's smart city model.

Second, since February 2020, China has accelerated the international promotion of some of its smart city technologies. It heavily publicised the large-scale use of technologies in various cities and provinces to fight the virus, targeting both domestic and international audiences.⁷ Moreover, providing 'anti-epidemic solutions' has become the new selling point for several Chinese tech companies – such as the AI and facial recognition leader SenseTime and robot start-up Keenon⁸ – to promote their smart city products on international markets. At the same time, various technological tools have been donated to countries affected by the pandemic. For instance, Huawei has donated video conference equipment to the Kenyan government and the Pakistani Ministry of Health.⁹ The video surveillance company Dahua has donated cameras (AI-enabled temperature screening cameras) to Lebanon's Ministry of Health and various institutions in Thailand. Drones produced with temperature sensors, loudspeakers and disinfecting functions by DJI – China's global leader in the industry – have been promoted and used in municipalities in Spain, Italy and the Philippines. Disinfecting robots and drones, and AI and Cloud services (that primarily have a healthcare function but could also be used for broader surveillance purposes during and after the crisis) have also been sent abroad.

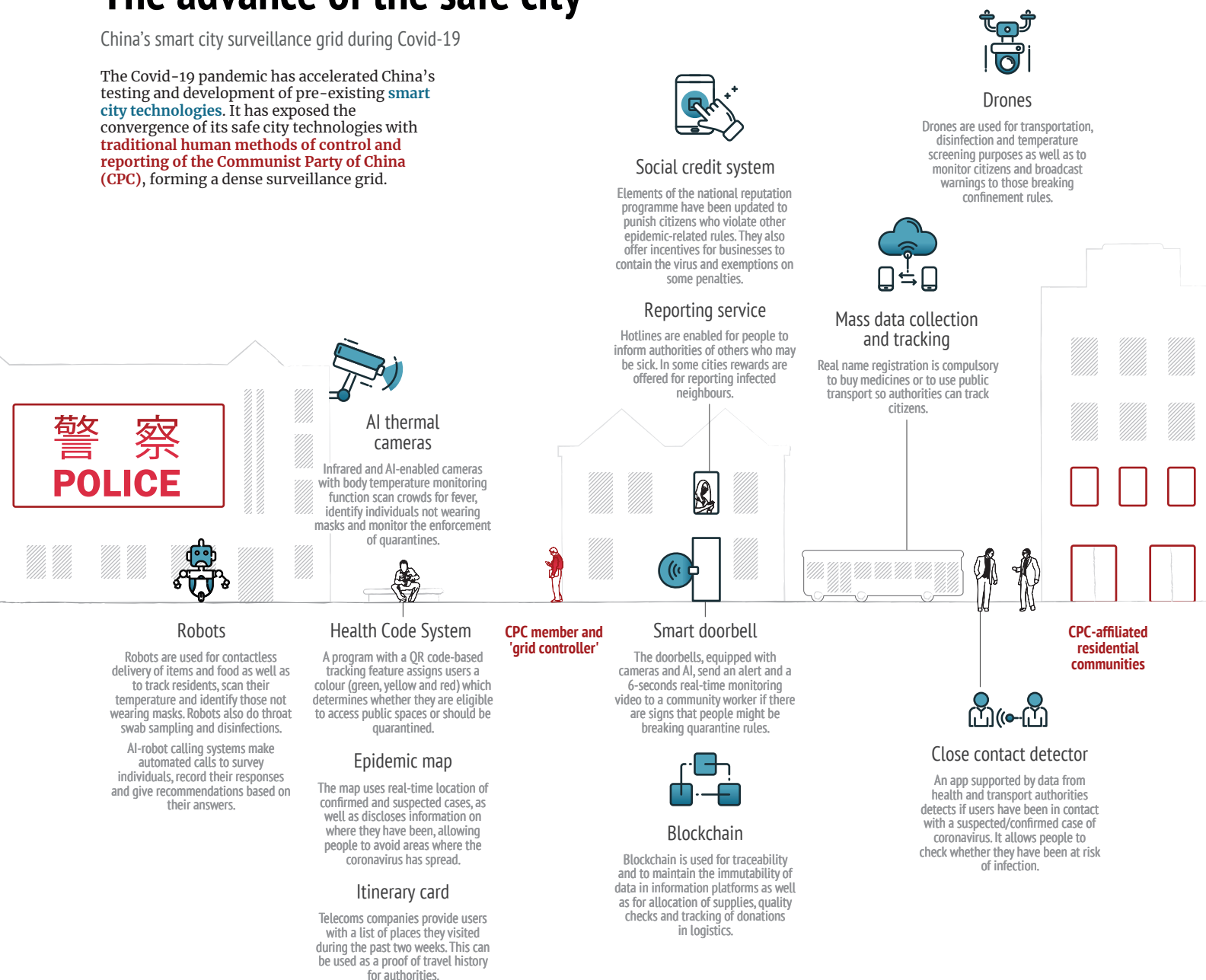
Third, in early March 2020, China's central government announced stimulus measures to help its economy recover from the crisis. Compared to the stimulus package Beijing announced following the global economic and financial crisis of 2008–2009, which focused largely on traditional infrastructure (transportation, energy, etc.), the new measures have a much stronger technological component. In particular, they include core components of the smart city ecosystem, something that the government calls "new infrastructure investments", i.e. investments supporting the rapid development of 5G base stations, big data centres, AI, the Internet of Things (IoT), etc. The building of smart cities themselves is also explicitly mentioned as part of the stimulus measures.¹⁰ Moreover, the 14th Five-Year Plan, to be released in 2021 and which will cover the period 2021–2025, is currently being drafted by the National Development and Reform Commission. This will certainly take into account these "new infrastructure investments" measures, be designed as a post-Covid-19 recovery plan and heavily emphasise technologies as a priority sector to support in the coming years.

While it is too early to assess the outcome of these measures in concrete terms, it is certain that the central government will not be able to inject the same amount of money into the economy that it did following the

The advance of the safe city

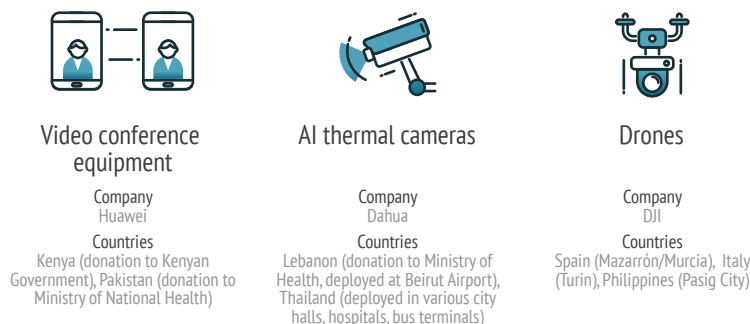
China's smart city surveillance grid during Covid-19

The Covid-19 pandemic has accelerated China's testing and development of pre-existing **smart city technologies**. It has exposed the convergence of its safe city technologies with **traditional human methods of control and reporting of the Communist Party of China (CPC)**, forming a dense surveillance grid.



Anti-epidemic tools

Since the emergence of the Covid-19 crisis, China has attempted to position itself as a global provider of technologies through the exportation and donation of "anti-epidemic" solutions, and to promote its urban governance model. Companies such as Huawei, Dahua and DJI have exported or donated anti-epidemic technologies to other countries. Here is a non-exhaustive list of technologies promoted and/or donated by Chinese companies to foreign countries or cities in March and April 2020.



Data: Cristina de Esperanza Picardo; Xinhua; Global Times; China Daily; South China Morning Post; BBC; The New York Times; Corporate websites and social media channels of Dahua, DJI, Huawei (all 2020)

2008–2009 crisis (4 trillion RMB or \$575 billion) due to high levels of debt and a growth rate probably close to 2% in 2020 (compared to an officially registered rate of 6% in 2019). Part of these new infrastructure developments will therefore be financed through special bonds issued by local governments,¹¹ in addition to public-private partnerships and credit support.

In any case, the three trends identified above all indicate that the Chinese government considers smart cities a national and international priority, indeed more than ever during the Covid-19 pandemic, and will continue to support their development through strong political and financial support. Recent declarations indicate that Beijing is pushing local governments to combine and apply as many emerging technologies as possible in the smart city ecosystem. For instance, in October 2019, Xi Jinping encouraged the use of blockchain technology to develop a “new type of smart city”,¹² and the use of such technologies by local and central governments has proliferated during the pandemic to aid a number of processes, including the tracking of medical supplies and information.¹³

THE NORMATIVE CHALLENGE: CHINA'S SMART CITY AS AN ALTERNATIVE FORM OF URBAN GOVERNANCE

China's promotion of smart cities increasingly poses a normative challenge, as it proposes a specific urban governance model based on the one developed on its own territory. China's smart cities architecture is basically shaped by the traditional urbanisation approach adopted by the Communist Party of China (CPC) since the creation of the People's Republic, which was influenced by the Soviet model of urbanisation. During the Covid-19 crisis, mutual surveillance among city-dwellers has been encouraged by the central government and implemented by local CPC committees and – at the lowest level – by ‘residential communities’. These are directly inherited from the Mao era, when the Party was present at all levels, and local representations served as a two-way interface: bottom-up surveillance at grass-roots level reported to the Party, and the top-down dissemination of the Party's key messages and rules was transmitted to grass-roots party representations. This grid-style social management system is now shaping China's smart city architecture, as well as the social credit system that is currently under development. China's smart city programme is now mixing the traditional human

surveillance grid with a technological surveillance grid (see diagram on p.3).

Since the end of the Hu Jintao era (2002–2012), the Chinese authorities have invested heavily in research on big data, and have developed a special approach which links big data with ‘social management’ (社会管理): in other words, the specific use of big data by government authorities for various purposes, including the anticipation and prevention of protest movements. Increasingly, cloud systems used by the police mine individuals' data – including social media accounts – in order to identify potentially threatening trends for predictive policing.

Under Xi Jinping, China has further accelerated the technological investments initiated under his predecessor. The current president advocates an evolving, adaptative form of Marxism, which “always develops along with the social realities and technology of the times”.¹⁴ The CPC will continue to invest in technologies for ideological and political reasons (it sees them as a useful tool to maintain the one-party system), as well as for economic reasons – China's tech companies are key for the national economy to continue to move up the value chain and for generating new sources of growth through their internationalisation.

The appeal and overall attractiveness of China's urban model are difficult to assess: reactions to it differ significantly from one country to another, and sometimes within countries, as well as between political elites and general populations. What is certain is that significant perception gaps exist and that there are diverging views on China's smart city technologies: while this model is increasingly perceived as a threat to liberal values in democratic environments, especially in the US and Europe, at the same time it appeals to a significant number of other foreign actors and countries. Some examples of safe city solutions provided by Chinese companies abroad include: Huawei's help to Saudi Arabia's Ministry of Interior to police the Hajj, the annual pilgrimage in Mecca, since 2016,¹⁵ or the partnership between Huawei and the Kenyan police in Nairobi since 2014 to provide video surveillance cameras and support.¹⁶ Huawei currently presents itself as “a leading provider of Safe City and Smart City solutions”¹⁷ and, by the end of 2019, the telecommunications company had signed 73 ‘safe city’ agreements for surveillance products or services across 52 countries.¹⁸ Some governments already appear interested in China's infrastructure and services as it may help them anticipate, shape, control and contain protest movements and social unrest – based on the experience the CPC has accumulated on its territory. But China does not only aspire to export its smart city concept to authoritarian countries – although these countries present the most fertile markets; it targets all political systems and regions, often through the BRI initiative and more recently under the ‘anti-epidemic’ label.

In Europe, the appeal of China's smart city model is rather limited. To date, the most noticeable Chinese smart city project, and named as such, on European soil is located outside of the EU, in Serbia. In April 2019, Huawei launched a 'smart city pilot project' in the city of Niš, which is planned to include smart lighting and mobility services. This follows another project in Belgrade, which saw the city sign a smart project-related Memorandum of Understanding (MoU) with Huawei. The Serbian capital is already equipped with Huawei's facial recognition surveillance cameras, and has been chosen by the Chinese company to host its regional innovation centre covering the Western Balkans. The centre is also partly dedicated to the development of smart city projects across the region.

While these developments should not be overestimated, and remain limited overall in the region, China certainly has strong ambitions to export its smart city model to the rest of the world, shaped by what it has developed on its national territory.

In addition to donations, China is promoting its smart city expertise through a set of training programmes provided to officials and engineers from foreign countries, particularly developing ones. For instance, in October 2019, the Chinese government offered the following courses:

- › 'Building Smart Cities under the Belt and Road Initiative': offered to senior officials from a large group of countries (which had signed a BRI MoU), which included lectures on 'Internet Security Solutions', 'Smart Tax Service Cloud' and 'Smart Transportation Solutions'. The course also included visits to Chinese cities.¹⁹
- › 'Urbanisation Infrastructure Planning and Development': offered to government officials and business professionals of developing countries, which included lectures on 'Smart Society and Smart City Construction in China', among other topics.
- › 'Telecommunications, New Technology & Equipment Maintenance for Developing Countries': sponsored by the Chinese Ministry of Commerce, which included lectures on 'China's communication network construction plan, 4G/5G mobile communication new technology, Internet of Things, smart city, cloud computing, big data, (...) new standards and technologies of optical fibre and optical cables', as well as other advanced technologies. In addition, the programme included visits to established Chinese tech companies such as CICT, Accelink and China Mobile.

In all of these programmes, China is clearly positioning itself as an example to follow and as 'a reference for developing countries to draw a new urbanisation infrastructure planning and development blueprint', according to the official syllabus.²⁰

An analysis of the training programmes also points at another significant development: China is not only training foreign officials on the technical dimension of smart cities (infrastructure, maintenance, etc.) but also, increasingly, on how the government can use this expertise for specific social, political or security purposes. For instance, 36 countries have received training on topics such as the 'positive energy public-opinion guidance system'; a euphemism for censorship.²¹ China also offers training courses to officials from developing countries on 'Ethnic Policies and Practices for Developing Countries'. This relates to counter-terrorism, an area where China makes heavy use of smart city tools and tries to position itself as an example for other countries.²² Xinjiang province²³ is becoming an incubator for high-tech surveillance in urban environments, which some consider as an application of 'the ideas of military cyber systems to civilian public security',²⁴ and which is sometimes showcased in defence industry fairs in China.

The Covid-19 crisis has revealed in clearer terms a trend that was emerging since 2013: increasing competition between national governance models and narratives pitting the presumed strength of the Chinese governance system against the presumed weaknesses of 'Western' models. With the promotion of China's smart city model abroad, this competition is also emerging at a local level between different methods of urban governance and different degrees and types of surveillance.

THE GEOPOLITICAL CHALLENGE: TOWARDS TECHNOLOGICAL DECOUPLING?

Smart city development not only raises normative challenges, but also security and geopolitical dilemmas due to the fact that they encompass significant amounts of critical infrastructure (from smart energy grids to telecommunication networks). The geopolitical dimension has become more prominent since the emergence of US-China trade and technological tensions two years ago, as many of the technologies concerned are key components of smart cities. 5G and next generation networks, in particular, will increasingly become key as they speed up data circulation and open up new possibilities for real-time big data analysis, for both corporate as well as government-related solutions. Already, 5G speeds have been predicted to be up to 100 times faster than mobile devices using 4G.

The 'entity list' issued and completed throughout 2019 by the Bureau of Industry and Security (BIS) of the US

Department of Commerce – a list of companies effectively banned from doing business with US firms – includes telecommunications corporations like Huawei, but also a host of Chinese tech and surveillance companies such as the video surveillance giants Hikvision and Dahua Technologies, and the facial recognition systems Megvii, Yitu and SenseTime. These companies are all central pillars of China's smart city ecosystem, and have been listed for two main reasons: because the US administration considers them as potentially able to conduct cyber-espionage and sabotage, and therefore to pose a security threat, but also because some of them are operating in Xinjiang – several US senators having welcomed the inclusion of some companies on the blacklist on the grounds that they are contributing to human rights abuses in China's western province.

Although the list does not automatically and systematically ban these companies, it has led to many of them taking preventative measures, such as stockpiling US/foreign components, readjusting their supply chains, and boosting investments in Research & Development (R&D) – partly with the help of state-supported investment funds – so as to be able in the medium term to replace foreign components with Chinese ones, and hence become more autonomous. This is the case, for instance, with Huawei, which is currently working on an alternative to Google's Android operating system (named 'Harmony').²⁵ Although in the short term, many Chinese tech companies are still dependent on the US and other foreign countries for core technologies (for instance, China makes only 16% of the chips supporting its technological development), in the long term, they are aiming at self-sufficiency through their accelerated R&D strategy. If they are successful in this endeavour and are supported by the Covid-19 stimulus package and the 14th Five-Year Plan, this may progressively allow China to be able to provide fully autonomous smart city ecosystems.

Even if deep US-China tensions over technology continue in the medium to long term, which is very likely, Chinese smart city providers may still gain significant presence in many overseas markets, including in countries which are traditional US allies or partners. This is foreseeable in particular in countries where Chinese companies can benefit from first mover advantage.²⁶ This matters, for instance, in South-East Asia, where Huawei is a well-established telecommunications player: several countries of the region – such as the Philippines,²⁷ Malaysia, Thailand, Laos and Cambodia²⁸ – remain interested in Huawei's offers, including 4G and 5G networks, in spite of US warnings about the company and the potential cybersecurity risks that accompany such offers. This is partly due to the fact that most US companies at this point in

time do not have 5G technological capabilities equivalent to Huawei's. But it is principally because Huawei is already present on the market and it makes sense to continue with the same provider for interrelated logistical, technological and financial reasons.

It is clear that Europe will increasingly be offered China's 'smart city solutions', partly packaged as 'anti-epidemic solutions' in the post Covid-19 era.

This development is also foreseeable because China is increasingly able to provide a 'comprehensive' smart city package which links components together, based on partnerships among its national tech companies. Data collection efforts are facilitated by the fact that China now has national champions in the internet and e-commerce sectors (Baidu, Alibaba, Tencent and Xiaomi among other 'BATX'), alternatives

to the American GAFAM which have a global presence and ambitions to expand beyond national borders. These companies, in particular Alibaba and Tencent, and their respective e-payment systems, Alipay and WeChat, now fully form part of China's smart/safe city architecture and represent strong assets in terms of data collection.²⁹ They are also currently joining forces to sell smart cities solutions at home and abroad. For instance, through the PATH China Smart City International Expo 2018 (P for Ping An, A for Alibaba, T for Tencent and H for Huawei),³⁰ four companies brought together different areas of expertise that are all valuable parts of an integrated smart city platform. During the Covid-19 crisis, several of these companies – including Alibaba – have been particularly active in providing tools and services to fight the epidemic on Chinese territory and beyond. They increasingly offer their services to foreign countries individually or in a collective manner.³¹

CONCLUSION: STRATEGIC QUESTIONS FOR EUROPE

All in all, China's endeavour to develop smart cities is likely to emerge enhanced in the wake of the Covid-19 crisis, in particular its surveillance and security dimension. For Europe, it is an economic and industrial challenge: many Chinese tech companies have already achieved leading positions and a larger share of the global market than their European (or American) competitors. Beyond business competition, China's smart city project poses a normative challenge, as it promotes an alternative model of local governance. This, in turn, creates a coordination challenge: European cities and other local authorities are increasingly being approached by Chinese counterparts to 'smarten' their infrastructure (smart cities, but also smart ports, airports, railways stations, etc.). The Chinese tech companies are conscious of the fact that this is a priority for

many authorities, and also aware that these partners tend to take decisions with fewer geostrategic/security concerns in mind than at the higher, national levels.

In this context, the subnational dimension of EU-China relations will become more strategic.³² Mayors and other local representatives are increasingly confronted with the development of technological projects in an array of sectors (health, transport and mobility, etc.) that have security and geopolitical implications for the rest of the region, country and, in some instances, the EU, and may need support in some cases. This support may be particularly needed as the Chinese central government is launching and developing city alliances and networks.³³ In recent years, the Chinese authorities have also sought to increase the number of 'sister cities' partnerships signed, and are promoting the local channel as an increasingly important one through which to promote economic, technological or diplomatic interests.³⁴

Overall, China's smart cities initiatives on European territory appear so far to be limited in scope and hard to quantify in concrete terms – only parts of the smart city ecosystem have been developed with the support of Chinese companies (ports, airports and railway stations in particular). But it is clear that Europe will increasingly be offered China's 'smart city solutions', partly packaged as 'anti-epidemic solutions' in the post Covid-19 era. Already before the pandemic, in December 2019, China's foreign minister Wang Yi explicitly mentioned smart cities as an area of future cooperation with the EU in a keynote speech in Brussels.³⁵ Two months before, in October 2019, the 4th 17+1 Ministerial Conference on Innovation, gathering key public and private tech industry actors from China and Central and Eastern European countries, had already placed 'smart cities and urban mobility' on its agenda.³⁶ It is also likely that China will propose the joint development of smart cities in third countries to several EU member states, as it has done with others in the past (the joint development with Japan of a smart city in Thailand, for instance). This short to medium-term development could be anticipated in a strategic manner.

China's smart city development also poses a geopolitical challenge: transatlantic tensions over Huawei's 5G network are likely to expand to other technologies that are part of the smart city architecture. In general terms, the modernisation of cities will be a cause for further international rivalry, as China positions itself as a leader in the field. It cannot be excluded that, as Chinese and American technologies may become increasingly incompatible in the context of these escalating tensions, two different types of smart cities will emerge in the future, some being developed by Chinese companies and their partners and following Beijing's smart city model, while others will be developed by US companies and their partners, following another model – which is still to be defined.

The pandemic has already accelerated the EU's and its member states' strategic discussions on the use of tech tools in an urban environment. In April 2020, the European Commission published guidance on the development of new apps – including tracing apps – that support the fight against the coronavirus while taking data protection into account.³⁷

These discussions would gain from being extended to cover other core tools and components of the smart city ecosystem. It is up to Europe to now shape and promote its own smart city model and standards in an ambitious way, with the aim of being competitive on a global scale, without disregarding the 'safe city' dimension, which is developing fast across the world and needs to be addressed strategically, in line with the EU's existing regulations on data, the Union's values, way of life and interests. Failure to do so may result in European cities having to rely on foreign technologies, but also in European cities becoming, steadily but surely, antiquated, uncompetitive and/or unsafe in comparison with cities in other regions which have fully integrated technologies into their functioning.

References

- 1 Central Committee of the Communist Party of China (CPC), *The 13th Five-Year Plan for economic and social development of the People's Republic of China (2016–2020)*, Beijing, March 2016, https://en.ndrc.gov.cn/newsrelease_8232/201612/P020191101481868235378.pdf.
- 2 Xinhua [China's state-owned news agency] referred to a 2018 report by the consulting company Deloitte ("Super Smart City – Happier Society with Higher Quality") in the article "China vies for smart city building: newspaper," Xinhua, January 2, 2019, http://www.xinhuanet.com/english/2019-01/02/c_137714396.htm.
- 3 Huang Yong, "Construction of digital Silk Road lights up BRI cooperation," *People's Daily*, April 24, 2019, <http://en.people.cn/n3/2019/0424/c90000-9571418.html>.
- 4 Yuan Yang, Nian Liu, Sue-Lin Wong and Qianer Liu, "China, coronavirus and surveillance: the messy reality of personal data," *Financial Times*, April 2, 2020, <https://www.ft.com/content/760142e6-740e-11ea-95fe-fcd274e920ca>.
- 5 Connecting people's names and IDs with their close contacts and whereabouts was promoted by the government.
- 6 The system intends to assess individuals' and business' reputation by granting them points ('personal credit score') based on their off- and online behaviour (such as payment/debt, online comments, etc.). Based on their score, which is constantly evolving, individuals may be rewarded (easier access to loans, schools, etc.) or punished (travel bans on the national railway service, exclusion from school, public display of their bad score, etc.). The system, using large big data analysis capability, is increasingly perceived by outside observers as a mass surveillance system.
- 7 See for instance, the state-owned news agency Xinhua on March 14, 2020: "Xinhua Headlines: China goes high-tech in fight against coronavirus," Xinhua, March 14, http://www.xinhuanet.com/english/2020-03/14/c_138877590.htm.

- 8 On SenseTime's smart anti-epidemic solution (official corporate webpage): <https://www.sensetime.com/en/news/view/id/140.html>; on Keenon's "Smart anti-epidemic, Supporting Epidemic Areas" plan see: Yunqi Partners, "Yunqi Partners and Others Inject RMB 200 million in B series Funding Round for Robot Company Keenon," *PR Newswire*, <https://www.prnewswire.com/news-releases/yunqi-partners-and-others-inject-rmb-200-million-in-b-series-funding-round-for-robot-company-keenon-301025258.html>.
- 9 According to Chinese state-owned media (*Xinhua*, *China Daily*), March 19–20, 2020.
- 10 According to Zheng Jiang, an official at the National Development and Reform Commission (NDRC), "China to stimulate private investment, accelerate 'new infrastructure' development," *Reuters*, March 21, 2020, <https://www.reuters.com/article/us-health-coronavirus-china-economy/china-to-stimulate-private-investment-accelerate-new-infrastructure-development-idUSKBN2180Co>.
- 11 China's local government special bonds worth about 1.02 trillion yuan (about 144 billion US dollars) had been issued as of March 19, according to a report from the China Securities Journal and Xinhua News Agency: "Chinese local gov'ts issue over 1 trln yuan new special bonds," *Xinhua*, March 21, 2020, <http://en.people.cn/n3/2020/0321/c90000-9670893.html>.
- 12 In particular, according to the state-owned news agency, Xi Jinping encouraged the application of blockchain technology in "people's livelihood", stressed that this technology should be used to "elevate the connectivity among cities regarding information, capital, talent and credit investigation to a larger scale." And demanded "the exploration of using the data-sharing model of blockchain to realize the trans-department and trans-regional maintenance and utilization of government services data." "Xi stresses development, application of blockchain technology," *Xinhua*, October 25, 2019, http://www.xinhuanet.com/english/2019-10/25/c_138503254.htm.
- 13 According to Chinese state-owned media (*Xinhua*, *Global Times*, etc.), February, 2020. See for instance: "SF Express deploys blockchain, big data to track medical goods supply," *Global Times*, March 30, 2020, <http://www.globaltimes.cn/content/1184152.shtml>; "China Focus: Blockchain technology improves coronavirus response," *Xinhua*, February 17, 2020, http://www.xinhuanet.com/english/2020-02/17/c_138791795.htm.
- 14 Xi Jinping, "Uphold and develop socialism with Chinese characteristics", speech before the new Central committee, January 5, 2013 (author's translation), original Chinese version: http://www.qstheory.cn/dukan/q5/2019-04/01/c_1124307480.htm.
- 15 Huawei's official website, consulted in January 2020.
- 16 Huawei's official website, consulted in January 2020. Other examples can be found in the following preliminary working paper: Alice Ekman, "China's Smart Cities: The New Geopolitical Battleground," *Etudes de l'Ifri*, Ifri, December 18, 2019, <https://www.ifri.org/en/publications/etudes-de-lifri/chinas-smart-cities-new-geopolitical-battleground>.
- 17 Huawei official corporate website, 2020 <https://e.huawei.com/en/>.
- 18 Jonathan E. Hillman & Maesea McCalpin, "Watching Huawei's 'Safe Cities,'" *CSIS Brief*, Center for Strategic and International Studies, November 4, 2019, <https://www.csis.org/analysis/watching-huaweis-safe-cities> The authors, who partly worked on information publicly disclosed by Huawei, acknowledge that these figures relate to projects of very different types and sizes.
- 19 Where "they will meet with local government officials, visit enterprises and exchange ideas with them so that they can get a better understanding of smart cities development in China and at the same time seek opportunities for further cooperation." Extract from the official description of the seminar, September 2019.
- 20 Extract from the official description of the "Seminar on Urbanisation Infrastructure Planning and Development," September 2019.
- 21 Paul Mozur, Jonah M. Kessel and Melissa Chan, "Made in China, Exported to the World: The Surveillance State," *The New York Times*, April 24, 2019, <https://www.nytimes.com/2019/04/24/technology/ecuador-surveillance-cameras-police-government.html>; in the report by Freedom House they note that these training courses are used to advance other concepts like internet sovereignty. See: Adrian Shahbaz, "Freedom on the Net 2018. The rise of Digital Authoritarianism," *Freedom House*, 2018, <https://freedomhouse.org/report/freedom-net/2018/rise-digital-authoritarianism>.
- 22 This is for instance the case in key bilateral and multilateral security forums – for instance at the Shanghai Cooperation Organisation or the Xiangshan Forum.
- 23 Province where the surveillance system has been reinforced through a denser and smarter CCTV cameras system including facial recognition capability and the development of a smartphone app now used by the police to enter data, and file information on individuals more quickly and comprehensively. The government spending on internal security in Xinjiang province has increased sharply since Xi Jinping came to power: it totalled \$8.4 billion in 2017, six times as much as in 2012, including funds for surveillance, personnel and the indoctrination camps.
- 24 Extract from the blog of Wang Pengda, a Chinese engineer from China Electronics Technology Corporation (state-run defence manufacturer who developed the surveillance system of Kashgar, Xinjiang) quoted in: Chris Buckley and Paul Mozur, "How China Uses High-Tech Surveillance to Subdue Minorities," *The New York Times*, May 22, 2019, <https://www.nytimes.com/2019/05/22/world/asia/china-surveillance-xinjiang.html>.
- 25 Abacus, "Huawei will release more phones without Google in Europe and beyond," *South China Morning Post*, February 18, 2020, <https://www.scmp.com/tech/big-tech/article/3051213/huawei-will-release-more-phones-without-google-europe-and-beyond>; according to ASPI, Huawei was considering using Russian Avrora OS. See: Samuel Bendett and Elsa Kania, "A new Sino-Russian

high-tech partnership," *The Australian Strategic Policy Institute*, October 29, 2019, <https://www.aspi.org.au/report/new-sino-russian-high-tech-partnership>. According to Clingendael, "China has become largely self-sufficient with regard to smart city technology. At this moment, China only relies on foreign-produced chips and chip-making machines." Sanne van der Lugt, "A smart Smart City plan: The importance of controlling the flow and storage of 'the new coal'," *Policy Brief*, Clingendael Netherlands Institute of International Relations, October 2019, https://www.clingendael.org/sites/default/files/2019-10/Policy_Brief_A_Smart_City_Plan_October_2019.pdf; there are plans to overcome this by 2025: Danny Vincent, "How China plans to lead the computer chip industry," *BBC News*, November 19, 2019, <https://www.bbc.com/news/business-50287485>.

26 In the long term, this also gives an advantage to China as AI grows on data, hence Chinese firms could be better developed and tend towards monopoly. Additionally, China has an advantage because there is collaboration between big tech companies and the state, which results in richer data and more opportunities to exploit it. Louise Lucas and Richard Waters, "China and US compete to dominate big data," *Financial Times*, April 30, 2018, <https://www.ft.com/content/e33a6994-447e-11e8-93cf-67ac3a6482fd>.

27 In July 2019, Philippines' Globe Telecom launched Southeast Asia's first commercial 5G fixed wireless internet service to provide high-speed broadband to households by using Huawei's equipment. In the country, Huawei is in a promising position since the country's leading telecom operator Globe Telecom's 4G networks already run entirely on Huawei equipment. Neil Jerome Morales, "Philippines' Globe Telecom launches 5G service backed by Huawei equipment," *Reuters*, June 20, 2019, <https://www.reuters.com/article/us-globe-huawei-tech/philippines-globe-telecoms-launches-5g-service-backed-by-huawei-equipment-idUSKCN1TL1YH>.

28 See: Shaun Turton and Tomoya Onishi, "Cambodia 5G set to leapfrog ASEAN rivals with Huawei and ZTE," *Nikkei Asian Review*, September 5, 2019, <https://asia.nikkei.com/Spotlight/5G-networks/Cambodia-5G-set-to-leapfrog-ASEAN-rivals-with-Huawei-and-ZTE>.

29 For instance, on Chinese territory, due to partnership between the government and major companies, users can pay for public services (public transportation, utility bills, medical services, etc.) through their phone payment app.

30 "A smart Smart City plan: The importance of controlling the flow and storage of 'the new coal'", op.cit.

31 See: "Alibaba offers AI diagnostic tool of COVID-19 to more countries," *Xinhua*, March 20, 2020, http://www.xinhuanet.com/english/2020-03/19/c_138895495.htm.

32 See: Adriana Skorupska and Justyna Szcsudlik (eds.), "The Subnational Dimension of EU-China Relations," *Polish Institute of International Affairs (PISM)*, August 26, 2019, https://www.pism.pl/publications/The_Subnational_Dimension_of_EUChina_Relations.

33 Such as the "Belt and Road Sustainable Cities Alliance" announced at the 2nd Belt & Road Forum in April 2019. See official "List of Deliverables of the Second Belt and Road Forum for International Cooperation" published by China's Ministry of Foreign Affairs on 27 April 2019, in particular deliverable n°10 under the category "Multilateral Cooperation Mechanisms under the BRF Framework": "The National Development and Reform Commission of China (China Center for Urban Development) jointly built the Belt and Road Sustainable Cities Alliance with the UN-Habitat, the WHO, UCLG-ASPAC, Eurocities and the Energy Foundation.", Ministry of Foreign Affairs of the People's Republic of China, *List of Deliverables of the Second Belt and Road Forum for International Cooperation*, Beijing, April 27, 2019, https://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1658767.shtml.

34 For instance, this trend was observable at the 2019 edition of the China International Import Expo, during which a 'Sister Cities Cooperation Forum' was organised.

35 For the official translation cf. "Partners, not rivals: Text of Wang Yi's speech at the European Policy Center," *CGTN*, December 17, 2019, <https://newseu.cgtn.com/news/2019-12-17/Partners-not-rivals-text-of-Wang-Yi-s-speech-in-Brussels-MuWTPswW4/index.html>.

36 Official title: "Fourth China-CEEC (17+1) Conference on Innovation Cooperation" and website: <https://china-ceed-innovation.com/about/> Panels covered the following topics: Innovation Infrastructure, Industrial Parks, Hi-Tech Parks and Universities, VC's, Advanced Manufacturing, Big Data, AI, Robotics, Smart Cities and Urban Mobility, among others.

37 European Commission, "Coronavirus: Guidance to ensure full data protection standards of apps fighting the pandemic", April 16, 2020, https://ec.europa.eu/commission/presscorner/detail/en/ip_20_669.