
Cities in a globalised world

Exploring trends and
the effect on urban
resilience



STUDY

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Cities are inevitably affected by shocks and disruptions, the pandemic being a case in point. The extent of the impact however depends on cities' preparedness and capacity to adapt. By thinking ahead, cities can explore emerging or plausible developments in order to anticipate them and contain potential disruption. Drawing on a report prepared by the European Strategy and Policy Analysis System (ESPAS), this EPRS paper explores the impact on and implications for cities of current global trends, such as climate change, population growth, urbanisation, economic growth, increasing energy demand, higher connectivity and a changing world order, that will have direct consequences for the future of cities and their inhabitants.

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Executive summary

Cities are inevitably affected by shocks and disruptions, the coronavirus pandemic being a case in point. The extent of the impact however depends on cities' preparedness and capacity to adapt. Forward thinking is needed to explore emerging or plausible developments so that they can be anticipated and their disruptive nature contained. Both short- and long-term challenges can be better overcome through the use of **foresight** analysis and **resilience**.

Taking the policy approach recommended by the European Commission's 2020 Strategic Foresight [Report](#) and drawing on the 'Global Trends to 2030: Challenges and Choices for Europe' [report](#) from the European Strategy and Policy Analysis System ([ESPAS](#)), this EPRS paper looks at developments expected in cities as a result of current global trends, and reflects on the impacts, implications, opportunities and challenges for urban resilience.

The **global trends** identified relate to climate change, population growth, urbanisation, economic growth, increasing energy demand, higher connectivity, and a changing world order. They will have direct consequences for the future of cities and their inhabitants and may affect their resilience in key areas such as: **urban governance, urban living, the urban economy and urban mobility**. A reflection on the future of **urban growth** in the world completes the analysis.

Some of the main lessons that can be drawn from the study are summed up below:

- **Urban governance:** cities need to be better able to act autonomously and better organised (through network cooperation, exchange of good practice, etc.) in order to tackle challenges such as climate change and migration. Growing urban populations, combined with digitalisation and populism, are shaping local democracy. Appropriate mechanisms and instruments to support the relationship between a city and its inhabitants have to be in place for the development of harmonious and inclusive cities.
- **Urban spaces and housing:** climate change has consequences for cities – for instance in terms of social, demographic and technological developments – that require urban planners and decision-makers to react. Making the best use of new technologies and digitalisation, while keeping in mind the social dimension, will be crucial for the future of urban life. By doing so, the ongoing urbanisation can lead to more socially equal cities, offering an energy-efficient environment.
- **Urban economy and work:** economies globally and at the level of cities are being affected by the digital and green transitions. This will bring opportunities for growth, innovation and diversification, potentially improving cities' ability to withstand economic shocks, but will also open economies to new vulnerabilities, such as network failures and cyber-attacks. These transformations will also likely come with significant disruptions in terms of job losses in sectors with a larger environmental footprint and in sectors where automation can replace tasks previously done by people. New services will also have a disruptive impact on a number of incumbent service providers. Social cohesion and urban resilience will depend to a large extent on how these transitions are managed through national governments' labour market policies, but can also be improved by cities themselves tackling inequality.
- **Urban mobility:** trends affecting urban transportation (climate change, digitalisation, technological advances) lead to developments with varying effects. New transport options (electric vehicles, automated vehicles, shared mobility, etc.) can be positive for the resilience of cities by providing alternatives in cases of systemic disruptions but can also be disruptive to the existing systems. Similarly, digitalisation allows for better access to mobility services, thereby bolstering cohesion and inclusiveness, but also makes transport systems more susceptible to network failures and cyber-attacks.

- **Urban growth in the world:** several issues and questions are raised by unabating urbanisation, with megacities continuing to expand, in particular in Africa and Asia. Despite a robust economic and financial outlook, megacities need to strengthen their sustainability in the face of multiple social and environmental challenges. Their scale exposes them to various crises, but they have shown remarkable resilience in recent times. Urban planners and decision-makers are also looking for alternatives by creating new cities from scratch, based on sustainability concepts.

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1. Introduction

The impact of the coronavirus pandemic on cities has triggered a debate on how much urban centres will be shaped by this crisis. Large densely populated urban areas have seen high rates of infection and reduced economic activity, altering the way people move and work.¹ While the first shock led to a degree of urban exodus, the shift seems to be more from city centre to suburbs and less densely populated parts of the cities than to rural areas.²

Cities are changing, but to what extent will shocks and disruptions like the pandemic influence their development? How ready are cities to anticipate and adapt to short- and long-term challenges? Finally then, how might cities evolve in response to the key changes that lie ahead?

1.1. Objectives

Increasingly, governments, and European and global actors, are using foresight analysis to expand their thinking on emerging and disruptive developments. This tool supports them in the conception and design of strategies and plans, helping to conceptualise the future shape of cities.

The aim is not to predict or provide definitive answers on the future but to expand and reframe the range of plausible developments. Foresight analysis involves horizon scanning (seeking out signals of change in the present and their potential future impact), identifying drivers of change, developing scenarios of how the future could look, exploring opportunities and challenges that could make it easier or more difficult to attain policy objectives. The goal is to equip policy makers with information on trends when making policy decisions and thereby also to avoid policy decisions that are out of step with those trends.³

The Commission's 2020 Strategic Foresight [Report](#) suggests on the one hand embedding foresight analysis in EU policymaking and on the other using resilience as a compass for EU policies. In line with this approach, this study aims to review some developments expected to affect cities as a result of global trends and to reflect on the opportunities and challenges these developments will bring for urban resilience.

1.2. Trends affecting cities

The study draws on research from the [European Strategy and Policy Analysis System](#) (ESPAS) – an interinstitutional European framework for cooperation and consultation at administrative level.⁴ The ESPAS [report](#) 'Global trends to 2030: Challenges and choices for Europe' identifies a number of [mega-trends](#), such as climate change, global population growth (with an ageing European population), urbanisation, continued economic growth, increasing demand for energy, higher connectivity (both physical and digital), and a changing world order. It also identifies [catalysts](#), more dynamic and short-lived trends, that can affect the pace of change. These include increased trade, scarcity of food and water, the changing nature of warfare, the persistence of terrorism, technological innovation, migration and populism.

¹ For the purposes of this study, cities are understood in accordance with the harmonised definition and methodological [manual](#) to define cities, towns and rural areas adopted by six international organisations or agencies in 2021. Further discussion of the size and density of cities can be found in Chapter 5 of this study.

² 'The new economics of global cities', *The Economist*, 9 September 2021.

³ See OECD, [What is foresight?](#).

⁴ ESPAS was set up to provide a European space to identify and analyse key trends and challenges that are likely to confront Europe and the world in the years ahead, and the resulting policy choices.

This paper explores the impact and implications of trends identified in the ESPAS report for the future of cities. Although the recent crisis induced many city dwellers to move out, trends point to a demographic increase in cities: by 2050 two-thirds of the global population will be urban. Cities will mostly be medium-sized and not megacities, especially in Europe. Most Europeans already live in small to medium-sized cities, and by 2030 Paris is expected to be the only megacity in the EU.

Demographic trends indicate that the age structure is changing in the EU generally. The urban population is growing older because of longer life expectancy and fewer births.⁵ However, net **migration** also contributes to population trends in the EU. In 2018, net inward migration increased the EU population by 726 000. Capital cities, the areas around them and other conurbations are particularly attractive to both national and international (mostly young) migrants. On average, younger (working age) people tend to make up a relatively high share of people living in cities, so city populations tend to be slightly younger than the EU average. However, while most large cities in the EU are continuing to see rising population numbers, there are cities whose populations are decreasing, such as those in declining industrial regions. Further urbanisation implies traffic congestion and additional pressures on housing and the urban environment. Cities worldwide, not only in Europe, also face challenges relating to inclusiveness.⁶ Growing urban population can exacerbate concerns around the provision of adequate and affordable housing, mobility solutions, urban services, the needs of the ageing population, urban health and social segregation.

More frequent extreme weather events attributed to **climate change** will affect urban infrastructure, while efforts to limit global warming are likely to change how we live and move in cities. In the face of this global challenge, cities have a dual role. They have a large carbon footprint, yet they are also places where key solutions will be implemented. Cities are responsible for 75 % of global [greenhouse gas emissions](#). How they are planned, built, managed and powered will determine the volume of greenhouse gases they release into the atmosphere. Cities are pivotal when it comes to the implementation of practical action towards achieving EU climate neutrality by 2050. This explains to some extent cities' growing tendency to assert themselves as stronger international players. They are key players in the development of a **new geopolitical order** where connections ('nodes') will be key factors of power and influence.

Advances in **technology, digitalisation and automation** will transform cities' economies and the way people work. The pandemic brought sudden change to where 'white collar' employees work, at least temporarily. It remains to be seen whether this will crystallise into a systemic change, allowing for example a Frankfurt-based consultant to work from a beach house in the Azores or in the Finnish countryside. Digitalisation and automation will also change the vehicles people use and will influence how people organise themselves and interact within communities.

The cities of the future will be shaped by their responses to these trends and challenges in the coming decades, as well as by their resilience in key areas. This, in turn, will affect citizens' expectations, political attitudes, participation and urban governance.

1.3. Understanding urban resilience

The resilience of cities has gained attention because of events, such as terrorist attacks in major cities (including Madrid, Paris, London and New York), hurricanes and floods, and the 2007-2008 financial

⁵ Eurostat, [Eurostat regional yearbook, 2020 edition](#), 2020.

⁶ I. Vandecasteele, C. Baranzelli, A. Siragusa and J. Aurambout (ed.), [The Future of Cities](#), European Commission, Joint Research Centre, 2019.

crisis.⁷ More recently the coronavirus pandemic has sharpened still further the focus on urban areas' capacity to cope and recover from shocks.

While these recent shocks offer some examples of the challenges facing urban resilience, the range of potential shocks and stresses may be considerably wider. Shocks and stresses come in many forms: natural – such as pandemics, drought, extreme weather or flooding; technological – such as oil spills, gas leaks or system breakdowns; and socio-economic, political or cultural – such as housing crises, energy crises, food crises, social conflicts, terrorism or political conflicts.⁸ Some of the key features of resilience are robustness and redundancy (i.e. the availability of alternative infrastructure), diversity (a high level of innovation and economic diversity), equity, decentralisation and flexibility.⁹ Resilience as a strategy for making urban areas safe focuses on assuming that adverse occurrences are inevitable and on developing a 'safe to fail' approach. This has been contrasted with sustainable development strategies that work towards a fail-safe form of urban development that might not take unforeseen events and trends into account.¹⁰

The concept of urban resilience can be defined in several ways. A common feature is the identification of urban resilience as the capacity to adapt to future shocks and stresses.¹¹ The term has been defined as encompassing recovery from a disturbance, resistance to stress and persistence over time, but also through the metaphor of 'bouncing forward', as opposed to 'bouncing back' – adaptation and reorganisation with a view to resisting future disturbances more successfully.¹²

The notion of resilience is used frequently in urban climate adaptation plans, emergency management and post-disaster plans. It has however been criticised for glossing over some areas, such as social inequality.¹³ Further studies in resilience focus on a number of different aspects. Some focus primarily on the livelihood conditions of households, in order to improve the capacity of families and individuals to withstand shocks and stresses. These also point out that many hazards affect minority and low-income households disproportionately, leaving them even more vulnerable to future crises and shocks. Another focus is societal well-being, stressing the importance of social capital for maintaining urban resilience.¹⁴ It is also argued that resilience can be improved, not only by seeking to build capacity to absorb the effects of natural disasters, but also by pursuing environmental and social quality.¹⁵ Since the outbreak of the coronavirus pandemic, studies have also been looking at ways to improve resilience with respect to pandemics.¹⁶

The Organisation for Economic Co-operation and Development (OECD) has proposed a broad approach that groups drivers of urban resilience into four dimensions: social, economic,

⁷ C. Kuhlicke, S. Kabisch, D. Rink, 'Urban resilience and urban sustainability', in M. Burayidi, A. Allen, J. Twigg and C. Wamsler (eds.), *The Routledge Handbook of Urban Resilience*, Routledge, 2020, pp. 19-20.

⁸ UN Habitat, [Urban resilience](#), Issue Paper 15, p. 3.

⁹ C. Kuhlicke, S. Kabisch, D. Rink, 'Urban resilience and urban sustainability', in M. Burayidi, A. Allen, J. Twigg and C. Wamsler (eds.), *The Routledge Handbook of Urban Resilience*, Routledge, 2020, p. 20.

¹⁰ Ahern in C. Kuhlicke, S. Kabisch, D. Rink, 'Urban resilience and urban sustainability', in: M. Burayidi, A. Allen, J. Twigg and C. Wamsler (eds.), *The Routledge Handbook of Urban Resilience*, Routledge, 2020, p. 20.

¹¹ L. Figueiredo, T. Honiden and A. Schumann, [Indicators for Resilient Cities](#), OECD Regional Development Working Papers, No 2018/02, OECD Publishing, p. 10.

¹² C. Kuhlicke, S. Kabisch, D. Rink, 'Urban resilience and urban sustainability', in M. Burayidi, A. Allen, J. Twigg and C. Wamsler (eds.), *The Routledge Handbook of Urban Resilience*, Routledge, 2020, p. 18.

¹³ A. Adil and I. Audirac, 'Urban resilience. A call to reframing planning discourses', in M. Burayidi, A. Allen, J. Twigg and C. Wamsler (eds.), *The Routledge Handbook of Urban Resilience*, Routledge, 2020, p. 37.

¹⁴ I. Vandecasteele, C. Baranzelli, A. Siragusa and J. Aurambout (ed.), [The Future of Cities](#), European Commission, Joint Research Centre, 2019, p. 123.

¹⁵ F. Moraci, M. Errigo, C. Fazio, T. Campisi, F. Castelli, 'Cities under pressure: Strategies and tools...', *op. cit.*

¹⁶ See for example F. Moraci, M. Errigo, C. Fazio, T. Campisi and F. Castelli, 'Cities under pressure: Strategies and tools to face climate change and pandemic', *Sustainability*, Vol. 12(18), 2020, p. 7743.

environmental and institutional (see Figure 1).¹⁷ Under this approach, the institutional drivers for resilience refer to clear leadership and long-term vision, collaboration with other levels of government, and open and participatory government. The social drivers refer to ensuring that society is inclusive and cohesive, citizen networks are active and people have access to opportunities. The economic drivers refer to the economic conditions of a city or community, as in employment levels, diversification of the economic base, the number of businesses, disposable household income and other factors. For example, working to tackle income polarisation is seen to improve resilience, as crises tend to affect poorer households, aggravating inequality, the risk of poverty traps and social stratification, and the associated social discontent and diminishing the ability of those households to recover ahead of future crises. The environmental drivers refer to structures that provide critical services for disaster response and recovery, such as communication, transportation, water and sanitation. They also involve making sure urban development is environmentally balanced so that development does not contribute to changes that reduce the conditions favourable for the smooth functioning of societies.

Figure1 – Urban resilience framework



Source: L. Figueiredo, T. Honiden and A. Schumann, Indicators for Resilient Cities, OECD Regional Development Working Papers, No 2018/02, [OECD Publishing](#), p. 18.

Rotterdam's integrated [action plan](#) for urban resilience offers an example of a wide-ranging strategy. It considers vulnerability to acute shocks, such as earthquakes, flooding or terrorist attacks, but also to chronic stresses, such as high unemployment, persistent deprivation and income inequality. It stresses the importance of social inclusion and the self-reliance of citizens in improving

Global and regional efforts for urban resilience

The United Nations (UN) [sustainable development goal No 11](#) is to 'Make cities and human settlements inclusive, safe, resilient and sustainable'. A number of global and regional initiatives have been set up to help cities develop resilience programmes. These include UN-Habitat's [city resilience profiling programme](#), the United Nations Office for Disaster Risk Reduction (UNDRR) '[making cities resilient 2030](#)' initiative, the [Resilient Cities](#) congress series run by Local Governments for Sustainability (ICLEI), and [URBACT's Resilient Europe Network](#).

¹⁷ L. Figueiredo, T. Honiden and A. Schumann, '[Indicators for resilient cities](#)', *op. cit.*, p. 18.

resilience. It considers how institutions can enable better connectedness between 'decision-makers and delivery agents across city government, the private sector and community groups'. Finally, as regards the vulnerability of infrastructure and urban ecosystems to chronic stresses, such as climate change, and acute shocks, such as cybercrime and terrorism, it examines how infrastructure can become more robust and adaptive, and how urban ecosystems can be restored and repurposed to provide multiple benefits.¹⁸

1.4. Structure

The following chapters do not seek to provide a comprehensive analysis of the future of cities. Rather they address a selection of key aspects, to give a flavour of how global trends may affect the future of cities and their resilience. Foresight analysis can indeed support the development of urban resilience strategies and plans. The sections on urban resilience will attempt to offer some initial pointers in this respect, by reflecting on key trends identified by foresight analysis on urban resilience and examining some of the ensuing opportunities and challenges.

Four chapters focus on cities in the EU, dealing with: (1) urban governance – looking at cities' interactions with both their citizens and other governmental organisations; (2) the urban economy and work; (3) how cities will fare in future in terms of urban spaces and housing; and (4) urban mobility. Each chapter looks first at the impact of global trends in the areas concerned, and then explores the implications for urban resilience.

A fifth chapter offers some global comparisons by exploring the future of urban growth around the world. It offers insights into the development of megacities and 'new cities'.

¹⁸ For more information about Rotterdam's Resilience Strategy, see: <https://www.resilientrotterdam.nl/en/>.

2. The future of urban governance and citizens

The local level constitutes the level of government closest to the citizens. City councils are the political bodies embodying this level, but the cities they are governing are themselves part of a wider multi-layered and global governance environment. The governance of cities is affected both by how citizens participate in the administration, political life and management of their cities, and by how these cities interact with the rest of the world as actors themselves. Two dimensions will be explored in this chapter:

- the relationship between a city and its citizens,
- the relationship between a city and its external governance environment.

The key question asked is what the voice and role of citizens and their cities is in future policy-making in view of the trends impacting urban governance.

A number of global trends will have an impact on cities' roles, governance and democratic participation. **Urbanisation** will affect cities globally, including EU cities. Population growth is bringing new people into cities. Integrating these newcomers is a key challenge for local authorities when it comes to preserving cities' cohesion and social fabric.

Digitalisation offers plentiful opportunities for developing new services, such as those allowing greater public participation. Technological developments facilitate more active and direct involvement. However, these developments must be considered in the light of other challenges faced by democracies, such as **populism** and new vulnerabilities relating to disinformation.

Trends such as **climate change** and **migration** have direct consequences for cities. These global challenges require international cooperation between states, but many of the responses need to be implemented at local level. Cities therefore have a major role and are increasingly becoming actors in their own right, establishing themselves as global players.

Multipolarity is emerging as a reality of the 21st century, but the 'poly-nodal' connections between the actors will determine their power more than their own nature and characteristics. Cities have a role to play in this world of nodes, providing they organise themselves to face the main challenges.

The following sections will look in greater detail at the impact of these trends on urban governance and on city inhabitants, before considering urban resilience.

2.1. How might the governance and role of cities evolve as a result of global trends?

Global challenges require global solutions, implemented locally. In the face of such challenges, but also opportunities, cities are becoming more autonomous and proactive. This can be observed, for example, in actions taken by cities against digital platforms, in climate change policies, but also in diplomacy. To reinforce their power, cities are organising themselves in networks. As such networks grow and multiply, they have consequences for the multilateral order and for cities themselves. The engagement of city inhabitants in community life and decision-making is increasing and the opportunities for participatory democracy are growing, thanks not least to digitalisation.

2.1.1. Increased competencies and role in tackling global challenges

A number of trends require policy action, but responses are often put in place at local level. Cities are increasingly being positioned as essential to tackling some of the world's major challenges, from

global environmental issues to economic development and political security'.¹⁹ The ESPAS report states that 'cities as well as regions will play a role in sectors previously reserved for states, such as diplomacy, conflict resolution – and crucially climate change'. This active international role of cities encourages the creation of specific organised structures. It also calls for improved decision-making and democratic systems within cities.

The main responsibility of cities in the EU decision-making process is to implement policies in many areas, such as the circular economy, digital and energy transition, air quality, building renovation, etc. Cities are both '*knowledge holders*' as they 'know what is politically and socially appropriate (and acceptable), but also what is technically feasible in respect of particular policy objectives/programmes', and '*watchdogs*' that can provide 'information about the implementation process, or, more precisely, about the "proper" application of rules'.²⁰

Within the EU, multi-level governance should help tackle urban challenges in various domains. Cities, Member States, EU institutions and other stakeholders all act together. The [Urban Agenda for the EU](#) initiative [set up partnerships](#) with action plans on 14 themes (e.g. housing, climate adaptation, digital transition, urban mobility, etc.). The challenges tackled by this agenda include limited resources, a lack of effective governance mechanisms and poor participation by smaller cities. The [New Leipzig Charter](#), with the new cohesion framework post-2020, has the potential to improve the delivery and impact of the Urban Agenda. Building on the previous charter, it [outlines](#) five key principles: urban policy for the common good, an integrated approach, participation and co-creation, multi-level governance and a place-based approach.

In line with their trust in this level of governance (see Figure 2), citizens favour a reinforcement of the competences of the authorities closest to them. According to the [European Committee of the Regions](#), Europeans overwhelmingly support greater influence of regional and local authorities over EU decisions. Topics such as health (45 %), employment and social affairs (43 %), and education, training and culture (40 %) are mentioned most often in this regard. Even though competences for health issues remain mainly national, closer cooperation could be envisaged and synergies found.

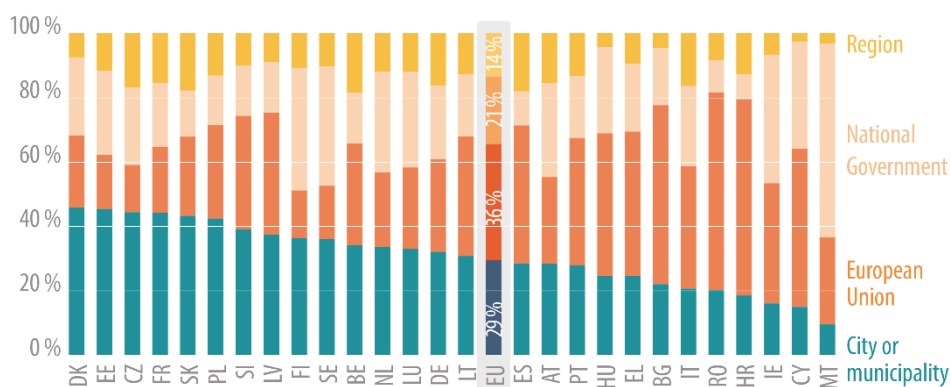
¹⁹ H. Bulkeley, A. Luque-Ayala, C. Mc Farlane, G. MacLeod, 'Enhancing urban autonomy: Towards a new political project for cities', *Urban Studies*, Vol. 55(4), 2018, p. 702.

²⁰ H. Heinelt and S. Niederhäfner, 'Cities and organized interest intermediation in the EU multi-level system', *European Urban and Regional studies*, Vol. 15(2), 2008, pp. 173-187.

Figure 2 – Trust in cities

Cities and regions – combined – are often perceived as the most trusted level of public authority in the EU. In a 2017-2018 participatory online [survey](#) by the European Committee of the Regions, almost a third of respondents (29 %) considered city governments to be the most reliable level of government, while 36 % felt they could rely most on EU-level, and 21 % on national governments. In all countries, cities and municipalities were considered to be more reliable than regions. Interestingly for a future-oriented reflection, the level of trust in local and regional levels is lowest among the younger generations and increases steadily with age.

Most reliable level of government, by country



Data source: European Committee of the Regions, [Reflecting on Europe. How Europe is perceived by people in regions and cities](#), 2018.

Trust in regional and local authorities [tends to be higher](#) in northern and western EU countries but this can evolve and the picture is usually relatively complex. Disparities can be explained by structural or situational factors such as the country's political structure and sharing of competences, the quality of life and services, political performance and approval ratings of leaders, perception of corruption, etc.

EU citizens' desire to see the empowerment of authorities perceived as the closest to them aligns well with the EU's principle of subsidiarity, laid down in Article 5 of the Treaty on European Union. The aim is 'to ensure that decisions are taken as closely as possible to the citizens of the Union'.²¹

2.1.2. More autonomous cities

In addition to being the final links between the state and its policies and the general public, cities are becoming 'more autonomous' and 'more proactive in policy-making at all levels'.²² Globally, progress in decentralisation can be observed, with local governments playing an increasingly significant role in urban governance. According to the [United Nations](#), local governments account for 24.1 % of public spending, 25.7 % of public revenue and 36.6 % of public investment. Indeed, cities have autonomous functions in areas such as social welfare, housing, childcare and culture, but with major differences from one country to another.²³ EU policies relating to migration appear to

²¹ Protocol No 2 on the application of the principles of subsidiarity and proportionality, Treaty on the Functioning of the European Union.

²² H. Heinelt, ['The role of cities in the institutional framework of the European Union'](#), Study for the European Parliament's Committee on Constitutional Affairs (AFCO), European Parliament, 2017, p. 7.

²³ For a detailed overview of local competences by country in Europe, see Council of European Municipalities and Regions, ['Local and Regional Governments in Europe Structures and Competences'](#), 2016.

have contributed to increasing the autonomy of cities by encouraging city networks and providing additional funds.²⁴

In addition to urbanisation, one reason for the growing role of cities is their ability to seize opportunities. Their responsiveness and the (admittedly varying) degree of autonomy they enjoy enable them to initiate practical action faster than other levels of governance. For example, cities reacted to the impact on the housing market of short-term rentals generated by online platforms. They adopted regulatory frameworks and refined these over time. Cities including Amsterdam, Berlin and Barcelona applied sometimes strict regulations, and other means including controls, registration and taxes were used to limit the negative consequences of this rapidly developing sector.²⁵ EU Court rulings from [2019](#) and [2020](#) about Airbnb shed light on cities' pro-active actions and their limits. Measures taken by cities need to be translated into further legislative acts. A coordinated approach across all levels of governance is needed to tackle complex emerging problems. From this perspective, cities began lobbying together for [better EU legislation on platforms offering short-term holiday rentals](#). A similar scenario was observed in the transport sector with the fast development of transportation network companies and their digital platforms, leading to protests followed by regulations and legal action by cities.

The immediacy of cities' response to emerging problems can help to justify the extension of their competences in some policy areas. In climate change policies, cities' leading role is easily explained, as they have competences in key areas such as housing, urban planning and transport (see Chapters 3 and 4 for more on housing and transport). The basis for the emergence of cities in the diplomatic field is less obvious. Diplomacy, traditionally a core element of nation state sovereignty, is now also being conducted by local leaders. As [Roderick Parkes](#) has stated, 'mayors are beginning to act like diplomats, brokering deals and defusing geopolitical disputes'. This is especially the case in the EU's eastern and southern neighbourhoods, and through the European Committee of the Regions. Such unexpected developments demand careful reflection. Fine tuning can be necessary to ensure complementarity between the EU and local levels. City diplomacy may well be better structured through a common envoy, but cities have already considerably expanded the direct connections between themselves, adding another challenge for the EU and its Member States.

2.1.3. Global actors through interconnections

Cities located close to each other tend to foster functional, cultural and institutional integration, 'to reap the benefits of agglomeration by jointly borrowing size from each other'.²⁶ This evolution is helped by the combination of urban growth and the emerging poly-nodal system. Connectivity between geographically close cities contributes to the development of metropolitan functions. It helps explain the good performance of small and medium-sized western European cities through 'borrowed size'.²⁷ Mutual integration allows them to gain in power and autonomy. It has implications for their governance, especially through the multiplication of new structures.

The EU's [Urban Agenda](#) has encouraged cities to organise better. Partnerships were conceived in the [Pact of Amsterdam](#) as instruments for 'multilevel and cross-sectoral (horizontal and vertical) cooperation'. Goals included streamlined cooperation, exchange of knowledge and good practices, and stronger networking. The EU has supported urban networks and town twinning through its

²⁴ K. Schönwälder, 'Diversity in local political practice', *Ethnic and Racial Studies*, 2020, Vol. 43(11), pp. 1929-1941.

²⁵ For a comparative overview of Airbnb regulation for some cities: D. von Briel and S. Dolnicar, 'The evolution of Airbnb regulation – An international longitudinal investigation 2008–2020', *Annals of Tourism Research*, Vol. 87, 2021.

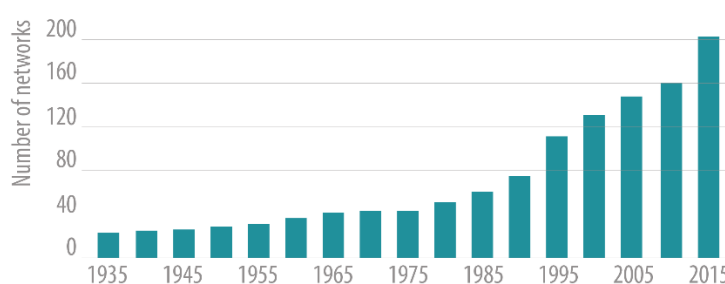
²⁶ E. Meijers, M. Hoogerbrugge and K. Hollander, 'Twin cities in the process of metropolisation', *Urban Research and Practice*, Vol. 7(1), 2014, p. 53.

²⁷ E. Meijers, M. Burger and M. Hoogerbrugge, 'Borrowing size in networks of cities: City size, network connectivity and metropolitan functions in Europe', *Papers in Regional Science*, 2016, Vol. 95, pp. 181-198.

'Europe for citizens' programme (2014-2020). The 'Democratic engagement and civic participation' strand, representing [60 % of the programme's budget](#), funded 'town-twinning' and 'networks of twinned towns' among other things. Town twinning started after the Second World War against the backdrop of strong efforts towards French-German reconciliation. These two countries still have the most twinning links today.²⁸ According to the Council of European Municipalities and Regions, the 38 European countries that are members of this umbrella organisation reached [39 816](#) twinings in 2010, with more than 6 000 in both France and Germany. Town twinning predates the European integration project, but it has prospered within the EU framework. Even if the original purpose of town twinning was more about [citizens' exchanges, building a peaceful Europe and creating opportunities for the younger generation](#) than about taking common action, 'we are witnessing a definite tendency toward a privileging of the politics of governance in town-twinning based exchange'.²⁹ The creation and exponential increase of such links has a similar dynamic to the continuous development of city networks.

Cities are often perceived as the 'lowest' level in the pyramid of multilevel-governance. Horizontal cooperation represents a way to increase clout vis-à-vis other levels. City networks are a formalisation of cities' desire to have a greater voice and take part in global governance. These networks are an even older worldwide phenomenon, but have gained momentum in recent decades and especially in the last few years, as illustrated by Figure 3. In the EU, organisations such as the Council of European Municipalities and Regions (CEMR) and Eurocities are well known and well established. The same is true at international level of United Cities and Local Governments (UCLG), C40, and the Covenant of Mayors, for instance.

Figure 3 – Numbers of city networks, per year



Source: E. Rapoport et al., [Leading cities: A global review of city leadership](#), UCL Press, 2019.

City networks can have very diverse bases: geographical, topical, cultural, historical, political, and so on. The size and degree of transnationalisation of networks also vary greatly. Some networks focus on single issues. Others deal with a wide and evolving portfolio. Studies show that environmental issues dominate, followed by topics such as poverty/inequality, gender and energy.³⁰ The evolution of the themes addressed by city networks over time is an indicator of their changing roles, and shows a steady diversification of the themes addressed.³¹ City networks will probably continue to diversify their activities and take up new areas, while continuing to grow and multiply.

What are the consequences of these developments for the multilateral order and for cities themselves? The multiplication of diplomatic channels through city diplomacy can represent an alternative, but it can send mixed messages and lead to a more fragmented foreign policy. City

²⁸ Bertelsmann Stiftung and Deutsch-Französisches Institut, [Les jumelages de collectivités territoriales – renforcer le sentiment citoyen européen](#), 2018.

²⁹ A. Langenohl, Town twinning, transnational connections, and trans-local citizenship practices in Europe, Palgrave Macmillan UK, 2015, p. 223.

³⁰ M. Acuto and S. Rayner, 'City networks: Breaking gridlocks or forging (new) lock-ins?', *International Affairs*, Vol. 92(5), 2016, pp. 1147-1166.

³¹ See Figure 3.1 in E. Rapoport et al., *Leading Cities: A Global Review of City Leadership*, UCL Press, 2019.

agendas are specific to the key issues the cities themselves are facing. The risk is that concerns of other territories will be given less attention and that diversity, for instance between urban and rural areas, will be neglected. Similarly, there are imbalances between and within networks, often related to the size and resources of the different members. Loose network structures can obscure underlying problems, and political changes can have immediate consequences for a network's functioning. The new generation of city networks – supported by strong philanthropic organisations – tends for example to be less representative, raising a democratic challenge. City networks 'need to put in place sufficiently democratic, transparent and agile internal governance mechanisms'.³²

Participation in city networks also has direct consequences for the policy measures that cities adopt. Research has shown that joining city networks correlates with an increase in the number of climate policies adopted.³³ This underlines the political importance for a city's choice of city networks. It also justifies close cooperation of international and European institutions with key groupings.

2.1.4. Increased engagement of citizens and the role of digitalisation

Demographic and economic concentration make cities places where social innovation and changes in democratic practices happen. In developed countries, participatory democratic initiatives have been on the rise since the late 1980s. They have been used at all levels of government and on diverse policy issues. Just over half of them (52 % in the 1986-2019 period) are carried out by local governments and on issues with a direct impact on city community life, such as urban planning.³⁴

New forms of democratic participation have been flourishing across the EU recently. This is often referred to as 'deliberative' or 'participatory' democracy. There is, however, a difference between the two terms.³⁵ Deliberative democracy is 'the wider political theory that claims that political decisions should be a result of fair and reasonable discussion among citizens'. Participatory democracy involves a transformation of democratic institutions to 'increase the capacities of citizens for meaningful participation'. The third term often used in this context is [direct democracy](#), which involves 'direct participation of citizens in democratic decision-making, in contrast to indirect or representative democracy'. In practice, citizens' democratic participation can take different forms. Figure 4 provides some examples of frequently used models of representative deliberative practices.

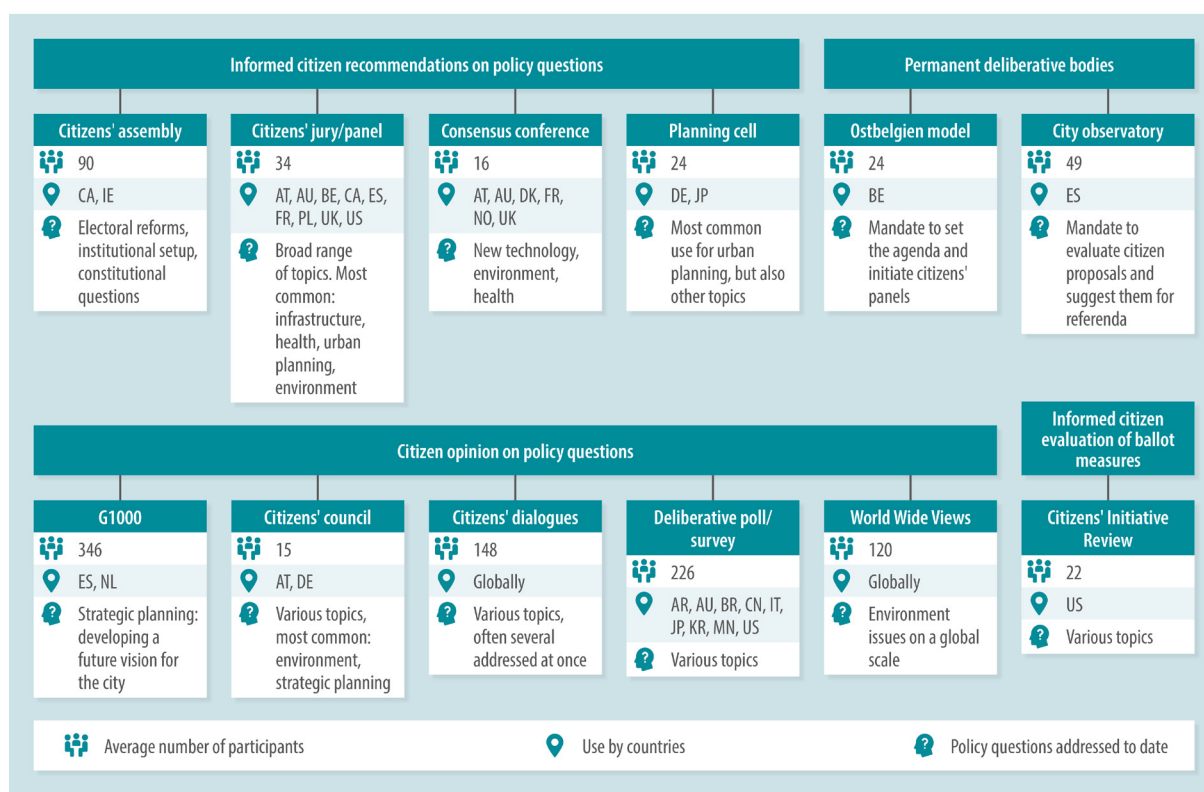
³² A. Fernández de Losada and H. Abdullah (coord.), [Rethinking the ecosystem of international city networks: Challenges and opportunities](#), CIDOB, 2019.

³³ K. Rashidi and A. Patt, 'Subsistence over symbolism: the role of transnational municipal networks on cities' climate policy innovation and adoption', *Mitigation and Adaptation Strategies for Global Change*, Vol. 23, 2018, pp. 507–523.

³⁴ OECD, [Innovative Citizen Participation and New Democratic Institutions: Catching the deliberative wave](#), Highlights, OECD Publishing, 2020.

³⁵ Idem.

Figure 4 – Models of representative deliberative processes



Key: AR=Argentina, AT=Austria, AU=Australia, BE=Belgium, BR=Brazil, CA=Canada, CN=China, DE=Germany, DK=Denmark, ES=Spain, FR=France, IE=Ireland, IT=Italy, JP=Japan, KR=Korea, MN=Mongolia, NL= Netherlands, NO=Norway, PL=Poland, UK=United Kingdom, US=United States.

Source: Based on OECD, [Innovative Citizen Participation and New Democratic Institutions: Catching the Deliberative Wave](#), OECD Publishing, 2020.

Some examples of initiatives that have taken place at local and regional levels in EU Member States include: the permanent citizens' dialogue organised by the Parliament of the German-speaking Community of Belgium (the 'Ostbelgien Model'); public involvement in developing Scotland's social security system; a dialogue on Europe launched by the Baden-Württemberg government in Germany; annual participatory budgeting in Paris; local dialogues on EU cohesion policy organised by the Council of European Municipalities and Regions (CEMR) in eight Member States (Belgium, Denmark, Germany, France, Italy, the Netherlands, Austria, and Sweden); and 18 citizens' panels organised by EUROCITIES in 18 cities in 12 Member States (Belgium, Germany, Spain, France, Greece, Italy, Latvia, the Netherlands, Poland, Romania, Finland and the United Kingdom). As part of the Conference on the Future of Europe, citizens' panels have been set up at national, regional and local level in addition to the four European citizens' panels. The latter are expected to provide input to the Conference plenary by formulating a set of recommendations for the Union to follow up on. The local, regional and national panels should meanwhile receive a public commitment to respond to or act on participants' recommendations 'in a timely manner', from the commissioning public authority.

Smart cities to address challenges posed by global trends

Digital and other technologies can help cities address multidimensional challenges. A smart city is a place where traditional networks and services are made more efficient and sustainable by means of technology for the benefit of local inhabitants and businesses. The European Commission is supporting the development of smart cities in the context of its digitalisation and sustainability efforts. Valued at nearly [US\\$100 billion in 2020](#) and expected to grow significantly in the coming years, the global smart cities market represents attractive opportunities for the private sector. Indeed, private sector companies are likely to become increasingly involved in developing, building and managing new city infrastructures and services, not least since governments lack resources to build and maintain urban spaces.

However, alongside the benefits, some fear that this involvement of start-ups, businesses and large corporations as city-shapers or even city-makers could have [negative implications](#) for society, for example aggravating social segregation and deepening inequalities.

New (digital) technologies foster new forms of citizen engagement and participation in politics – cities can be 'digital democracy workshops'.³⁶ Alongside the changes being made by governments and administrations, social media and new communication channels are also enabling unconventional forms of engagement. These are based on weak but impactful ties that can mobilise large crowds, as evidenced by global movements such as #MeToo and #BlackLivesMatter. Technologies and applications can be developed and deployed for various purposes,³⁷ such as (1) civic technology, facilitating direct interactions between residents and governments; (2) government technology, built to improve or innovate primarily within government and for government; and (3) community action technology, in the form of applications or platforms for crowdsourcing and peer-to-peer networking using data collected from residents and built for use by residents.

Local governments worldwide are embracing digital technology for a variety of purposes, including dissemination, communication and

consultation (e-government).³⁸ EU cities that have been surveyed have scored highly in terms of offering such services. Information about demand and engagement from the inhabitants' side is lacking however. In general citizens tend to interact more directly with local governments. However, the data for Europe concerning e-participation (provision of online information, consultation, or decision-making opportunities by governments) reveal that despite the increase in availability of opportunities since 2014, engagement on the citizens' side has not grown.

Community action technology empowers citizens to be city co-creators. As cities and those who live, work and move in them become more digitally interconnected, big data and AI-powered solutions can create further possibilities for citizens to engage in the management of their communities, while cities can become more responsive and adaptive.³⁹

The future of citizens' democratic participation in cities' governance is likely to combine offline and online interaction, as well as traditional and innovative approaches. For both types, the scale of the process, the issues of anonymity, privacy and cybersecurity need to be carefully considered.⁴⁰ Equality also requires special attention in regard to online civic engagement, in view of the digital

³⁶ G. Sgueo, [Digital democracy: Is the future of civic engagement online?](#), 2020.

³⁷ S. Greene et al., [Technology and equity in cities: Emerging challenges and opportunities](#), 2019.

³⁸ UN Department of Economic and Social Affairs, [e-Government survey 2020: Digital government in the decade of action for sustainable development](#), 2020.

³⁹ Future Agenda, [Future of cities – Insights from multiple expert discussions around the world](#), 2017, p. 35.

⁴⁰ G. Sgueo, [The practice of democracy: A selection of civic engagement initiatives](#), 2020.

divide, digital exclusion and digital illiteracy.⁴¹ Lastly, the spread of and susceptibility to disinformation is not limited to the online sphere and threatens democracy at all levels.

There are a variety of models for citizen participation and, despite their growing use, it is not always clear what they mean, how they work or what they add in terms of value.⁴² There are (mis-) understandings about concepts, aims and divergent expectations among those involved: politicians, citizens and other actors. To be able to participate effectively, citizens need support to contribute as experts. To be credible, new forms have to be built into existing institutional systems and decision-making processes, and suitable situations and topics have to be identified. An assessment of 22 e-participation tools at local, national and EU levels at different stages of political decision-making concluded that they are a successful civic but not a convincing policy instrument, because of their lack of political or policy impact.⁴³ The assessment went on to identify factors for successful e-participation. An OECD analysis⁴⁴ of 300 representative deliberative practices concluded that they work well for values-driven dilemmas, complex problems requiring trade-offs, or long-term issues (going beyond legislative terms). They should not be deployed, however, for urgent decisions, problems in the late stages of decision-making where possible solutions are limited, issues that involve national security, or for resolving binary questions.

2.2. Opportunities and challenges for urban resilience

Resilience in cities has been defined as the capacity to absorb and recover from shocks and stresses and prepare for future ones. The OECD favours a holistic approach to urban resilience – the capacity to resist and recover from shocks is a function of diversified economies, inclusive societies, good governance and environmentally balanced development (see [Introduction](#) for more on the dimensions of resilience).

Resilience to crisis and disruption is a continuous challenge for cities' institutions and citizens. According to the [OECD resilience framework](#), the institutional dimension requires clear leadership and long-term vision, sufficient public resources, collaboration with other levels of government, and an open and participatory government. These institutional aspects echo and question the trends and evolutions described above. The paragraphs below reflect on this in part through the prism of the coronavirus pandemic.

2.2.1. Supporting and trusting citizens for more responsive cities

Crises and disruptions are concrete tests of the resilience of cities. All natural hazards or man-made shocks and threats have consequences for the governance and policies of the city and its inhabitants. Being resilient depends indeed 'mostly on individuals and their various levels of aggregations (entities such as communities, cities, regions or even countries)'.⁴⁵

The recent coronavirus pandemic put local democracy under enormous pressure. A Council of Europe report on [Local and regional elections in major crisis situations](#) has observed that events like this undermine 'the capacities of authorities to hold elections in line with international standards'. The report concludes that 'not all electoral standards can be kept in face of a crisis'. Yet 'a minimum

⁴¹ G. Sgueo, [Digital democracy Is the future of civic engagement online?](#), 2020.

⁴² European Committee of the Regions, [From local to European: putting citizens at the centre of the EU agenda](#), 2019, pp. 86-89.

⁴³ STOA, [Prospects for e-democracy in Europe](#), 2018.

⁴⁴ OECD, [Innovative citizen participation and new democratic institutions](#): Catching the deliberative wave, highlights, OECD Publishing, 2020.

⁴⁵ A. Manca, P. Benczur, E. Giovannini, [Building a scientific narrative towards a more resilient EU society, Part 1: A conceptual framework](#), 2017, Publications Office of the European Union.

core of electoral principles have to be upheld'. These core principles are a good way to measure the resilience of cities. Mechanisms and instruments ensuring that these core principles are preserved – whatever the situation – can increase the resilience of city governance. It can also help to extend these principles.

The coronavirus pandemic has severely affected the liveability of some cities according to a [survey](#) by *The Economist*. European cities have slipped down in the rankings, most likely due to 'heightened stress on healthcare resources'. The crisis has however also provided opportunities by giving citizens more freedom for initiatives or even a central role in their development and management (bottom-up approaches). Practical measures and related best practices are easiest to develop at local level. In Belgium, for example, the platform [Impactdays.co](#) was originally created to allow schools, universities and neighbourhoods to volunteer for the community. When the pandemic hit, the platform was transformed to support social initiatives, organising volunteering for NGOs and cities and neighbourly help. This often occurred through the combined action of citizens and local authorities. Through its local participatory website [La fabrique citoyenne](#) the city of Rennes in France meanwhile [encouraged](#) the sharing of community-based civic initiatives set up in neighbourhoods, sometimes at street or even building level, to help those in need, especially isolated seniors.

Cooperation of this kind between cities and inhabitants fosters cohesion and trust. This is crucial for the resilience of cities. It requires well-developed participatory mechanisms, with the capacity to remain operational or with alternatives when disruptions occur. As recommended by the Commission's [2021 Strategic Foresight Report](#), institutions and administrations have to be responsive to societal concerns and effective in delivering policies. The 'need for participatory and inclusive governance to enhance trust and legitimacy' resonates strongly at local level.

2.2.2. Urbanisation and populism: Building stronger, anticipatory and inclusive institutions

The resilience of a city improves or decreases depending on how successfully democratic participation is addressed. This raises the question of what citizens' active involvement can bring, and what are its limits.

Against the backdrop of trends such as a growing urban population, relatively high levels of trust in local government in the EU, citizens' increasing desire to see the empowerment of authorities perceived as the closest to them, digitalisation, global decentralisation and cities' growing role in tackling global challenges, citizens may become more involved in local governance. Some areas are more amenable to citizens' involvement than others. Existing [civic engagement initiatives](#) cover areas ranging from environmental issues to culture, sport, social cohesion and quality of life. Recently, more sensitive aspects have been covered, as shown by trials of participatory budgeting. The essential step will be for policy-makers at all levels to legitimise various forms of public democratic participation.

The involvement of citizens in the creation of policies helps to forge a sense of ownership. At the same time, increased public participation has consequences for the representative democracy system and the authority of local leaders. At a time where representative democracy is often described as being in crisis, the local level appears as the most able to preserve close links with citizens. Not only can interactions between local leaders and their citizens occur more easily than with other levels of government. Local issues also affect citizens more directly and are thus easier to understand. Improving the relationship between a city and its citizens is a key opportunity to maintain and enhance the quality of urban democracy.

The [ESPAS report](#) points to similar voter turnout in local and regional elections in Europe, as compared with national, and much higher support for local than national governments. This suggests local politics and citizens' participation in local governance can be important factors in

fighting populism and anti-democratic threats. While the local level is perceived as the one that can best understand and tackle citizens' lives, concerns, and expectations, the question is whether this makes it the level of governance best equipped to overcome political disruptions. It is difficult to involve all segments of the population. If participatory instruments such as digital tools have biases, they can further increase social segregation, leading to greater instability.

Small towns and rural areas are no longer the only local territories affected by populism and illiberalism. The populist phenomenon and the democratic challenge posed by illiberalism also have urban roots. While initiatives such as the Pact of Free Cities⁴⁶ show a willingness to put cities at the forefront of the fight, 'cities represent a crucial terrain for political struggle in today's troubled present'.⁴⁷ The combination of migration, cultural and housing challenges are fertile ground for populist leaders. In addition to this, disinformation can damage the local level as much as other levels of governance. Civic education, support for non-governmental organisations and civil society, and support for ethical local media can help, as proposed in a recent [opinion](#) of the European Committee of the Regions.

Making cities resilient to populism involves solid local institutions, impartial administrative services, checks and balances, and an active dialogue with inhabitants using well-established participatory mechanisms. An anticipatory capacity can shed light on challenges that are not of immediate concern. Much strategic thinking is mid-term only, and lacks thorough consideration of alternative futures.⁴⁸ Some major cities and city networks have been using foresight, but capacities remain limited at local level.

2.2.3. Developing further vertical, horizontal and cross-border cooperation

In addition to the involvement of citizens, collaboration with other levels of government and with other cities is a major factor in cities' resilience. The coronavirus crisis has shown that (vertical) coordination among levels of governance is [believed to help](#) deliver effective policies. Horizontal cooperation on potentially disruptive issues, for instance relating to climate change, terrorism, or migration, can feed cities with ideas and best practice in a timely manner. Assistance might even be provided in this way in specific crisis situations. Moreover, cross-border cooperation can also support a city's resilience. Threats that have a transnational dimension, such as natural hazards, call for such cooperation.

Factors reinforcing the resilience of cities are themselves undermined by crises. The development of city diplomacy in migration policy was for example [threatened by](#) the coronavirus pandemic on account of short-term management, changes affecting the working methods of city networks and diminishing resources. Measures to preserve broader cooperation include promoting inclusive virtual city networking, breaking up silos between policy fields, and promoting cross-regional city diplomacy.

⁴⁶ Launched in 2019 by the mayors of Bratislava, Budapest, Prague and Warsaw, this city alliance aims to protect and promote democracy and transparency against populism and illiberalism. By September 2021, more than 20 cities had joined the pact.

⁴⁷ U. Rossi, 'The populist eruption and the urban question', *Urban Geography*, Vol. 39(9), 2018, pp. 1425-1430.

⁴⁸ C. Swain, [Foresight future of cities: Understanding current city foresight practice](#), Supporting paper for 'Foresight for Cities: A resource', UK Government Office for Science.

3. Future of urban economies and work

Multiple European and global trends will impact economies and working conditions in European cities. **Climate change** and related extreme weather events will challenge urban infrastructures that support cities' economies, such as transportation systems. Meanwhile, efforts to tackle climate change will likely spur innovation and growth and help create new jobs. **Advances in technologies**, digitalisation and automation are also rapidly changing economies. These developments are generating new jobs, for example in the sharing economy and fields such as automation-related engineering and cloud computing. However, the digital and green transitions have significant potential to disrupt labour markets and market conditions for incumbent operators. At the same time, changes in the way people live, work and shop have accelerated as a result of the pandemic, with digitally-enabled remote working transforming the traditional understanding of the workplace and introducing many to purchasing products and services online.

Demographic change, migration and urbanisation also affect economic opportunities, demand for goods and services and productivity. The pandemic meanwhile demonstrated how the greater **movement of people** facilitates the spread of contagious diseases with devastating effects on economies. This disruption has forced companies to rethink their supply chains. The movement toward a more poly-nodal global order has increasingly been leading countries and regions to seek **strategic autonomy** in the economic sphere, and promote the reshoring of supply chains with further implications for urban economies and jobs.

The following sections explore some of the implications of these global trends for urban economics and jobs and then address the impact of these developments on urban resilience.

3.1. Impact of global trends on urban economies

The green and digital transitions will drive changes in urban economies with the potential to spark substantial economic growth and job creation. However, many jobs could also be displaced or eliminated. Meanwhile, urbanisation, migration and demographic changes and efforts to develop regional strategic autonomy in the EU could play an increasingly important role in the economic landscape in cities.

3.1.1. Green transformation: Potential for growth and jobs

The energy and green transition resulting from efforts to tackle climate change should lead to the development of new sectors and jobs, for example in relation to climate change mitigation, improving energy efficiency and promoting the use of alternative fuels. The EU's [fit for 55](#) package of legislative proposals aims to promote energy efficiency in buildings, the production and use of alternative fuels, and the use of renewable energy in transport, heating and cooling, buildings and industry. Coupled with the [Recovery and Resilience Facility](#), the package will support climate investment and reforms, and is expected to deliver new jobs and growth in the EU. This is backed up by OECD analysis on the economic impact of environmental policies, which suggests that temporary increases in macroeconomic investments relating to low-carbon transition can lead to GDP growth.⁴⁹

⁴⁹ [Employment implications of green growth: Linking jobs, growth, and green policies](#), OECD report for the G7 Environment Ministers, June 2017, p. 4.

The OECD has forecast that green policies will expand employment in areas such as clean industry, renewable energy, sustainable construction, recycling and waste management, sustainable agriculture and forestry, and public transport.⁵⁰

Renewable energy is a key potential source of new jobs and growth. In 2017 the OECD projected that by 2030 up to 20 million jobs could be created worldwide. Energy efficiency can also lead to significant employment gains. New jobs will be created in environmental consultancies, to advise on improving energy efficiency and workers will be needed to insulate houses.⁵¹ Industries such as waste collection and treatment and pollution management and control employ several million people in the EU and also have the potential to generate new jobs.⁵² A number of these opportunities could emerge in cities.

According to a number of leading analyses, green energy and climate policies should not have a major impact on overall employment.⁵³ Job creation will occur in green and clean sectors, that could potentially diversify the urban economy and drive innovation in cities. However, significant job destruction is expected to occur in 'brown sectors' with large environmental footprints.

3.1.2. Technology, digitalisation and automation: Boosting growth and changing the ways people work and consume services

Maturing automation and artificial intelligence (AI) are predicted to have a significant positive effect on productivity and economic growth⁵⁴ while digitalisation is already generating new services and jobs and new opportunities to generate income for people, many in urban environments, for instance through ridesharing, micro-mobility or accommodation rentals.

Automation is predicted to double annual economic growth rates globally by 2035⁵⁵ with initial productivity gains expected to arise from automation of routine tasks in manufacturing through the use of robots, or in transport through more autonomous vehicles. AI technologies are also expected increasingly to assist workers to perform their tasks better and more efficiently.⁵⁶ It is estimated that 70 % of companies could adopt some form of AI technologies by 2030.⁵⁷ This is already having an impact in sectors such as marketing and sales, transport and logistics, supply chain management, logistics and manufacturing, automotive and technology.⁵⁸ The pandemic will likely cause automation to speed up.

However, automation and technological advancements are also predicted to lead to a significant shift in the labour market. According to the World Economic Forum Future of Jobs 2020 report, 43 % of employers will seek to reduce their workforces as a result of technological integration or automation. This contrasts with 34 % of employers indicating that they will seek to increase their workforce for the same reason. In the long term, the same [report](#) projects that the number of jobs lost because of advances in technology will be surpassed by the number of new 'jobs of tomorrow'. The WEF estimates that by 2025, 85 million jobs may be displaced by a shift in the division of labour

⁵⁰ *ibid.*, pp. 7-8.

⁵¹ *ibid.*, p. 9.

⁵² *ibid.*, p. 10.

⁵³ *ibid.*, p. 11.

⁵⁴ M. Szczepański, [Economic impacts of artificial intelligence \(AI\)](#), Briefing, EPRS, European Parliament, July 2019, p.3.

⁵⁵ *ibid.*

⁵⁶ *ibid.*

⁵⁷ [Notes from the AI frontier. Modeling the impact of AI on the world economy](#), Discussion paper, McKinsey Global Institute, September 2018, p. 24.

⁵⁸ M. Szczepański, [Economic impacts of artificial intelligence \(AI\)](#), Briefing, EPRS, European Parliament, July 2019, p. 6.

between humans and machines, while 97 million new roles could emerge e.g. in the data and AI economy, cloud computing, engineering, and product development.⁵⁹

Digitalisation has also perpetuated the emergence of what is variously referred to as the 'platform economy', 'gig economy', 'sharing economy' or 'crowd work', providing new opportunities for people to earn income. According to one 2018 study covering seven European countries, as many as 22 % of people have done some crowd work in Italy, 19 % in Austria, 10 % in Sweden and 9 % in Germany and the Netherlands.⁶⁰ This includes for instance providing driving services through platforms such as Uber, or finding work via platforms such as Upwork or Zoofy.⁶¹ This however constitutes a very occasional type of work to supplement other income; the figures are significantly lower for those who earn more than half of their income from crowd work (ranging from 1.6 % in the Netherlands to 5.1% in Italy).⁶² Other forms of participation in the online economy as a source of income appear to be showing similar uptake by populations in these countries – renting to a paying guest, e.g. via Airbnb (8 to 17 %), selling self-made products online (9 to 21 %). Reselling goods on online marketplaces such as Amazon is even more prevalent.⁶³ At the same time, these developments raise a variety of concerns, for instance about poor working conditions, a lack of social protection, the possible disruptive impact on incumbent service providers, e.g. taxi and public transport operators, and the impact on the availability and cost of long-term rental accommodation in cities.

The pandemic has accelerated the use of digital tools for working and changed shopping patterns, increasing the role of e-commerce. For example, retail sales in the EU from mail order firms or the internet were nearly 40 % higher in May 2020, compared with the previous year.⁶⁴ In July 2020 they were still 20 % higher than the year before. A July 2020 McKinsey survey showed that consumers in the EU are increasingly using digital tools to find information or use services ranging from banking, insurance and travel tickets to entertainment, and grocery and clothes shopping.⁶⁵

The pandemic has also normalised digital means of working remotely. The teleconferencing company Zoom experienced growth from 10 million users in December 2019 to 300 million by April 2020.⁶⁶ In a survey of employers in 2020, 84 % of those surveyed indicated that they were intending to speed up the use of videoconferencing and other digital tools, while 83 % indicated that they were planning to offer opportunities to work remotely.⁶⁷ A McKinsey [analysis](#) from February 2021, estimates that for remote work that could be done without a loss of productivity, 20 to 25 % of employees could work from home between three and five days a week. It also suggested that this change is great enough to prompt a move of individuals and companies out of large cities into suburban areas and smaller cities. During the pandemic, interest has also spiked in [digital nomadism](#), a 'location-independent, technologically-enabled' lifestyle that entails working from anywhere in the world.⁶⁸

⁵⁹ [The Future of Jobs Report 2020](#), World Economic Forum, October 2020, p. 8.

⁶⁰ K.Holts et al., [Work in the European Gig Economy](#), FEPS, UNI-Europa and University of Hertfordshire, January 2018, p. 16.

⁶¹ *ibid.*, p. 10.

⁶² *ibid.*

⁶³ *ibid.*, p. 16.

⁶⁴ [Covid-19 and e-commerce. A global review](#), UNCTAD, 2021, p. 40.

⁶⁵ [Europe's digital migration during COVID-19: Getting past the broad trends and averages](#), Article, McKinsey Digital, July 2020.

⁶⁶ [Covid-19 and e-commerce. A global review](#), UNCTAD, 2021, p. 38.

⁶⁷ [The future of jobs report 2020](#), World Economic Forum, October 2020, p. 14.

⁶⁸ J. Kelly, [The new trend of wanderlust, Work-from-anywhere digital nomads](#), Article, Forbes.

3.1.3. Demographic change and urbanisation: New opportunities for growth

Changes in the demographics of cities have occurred as a result of increased urbanisation and migration and may increase the availability of a working age labour force. An OECD analysis suggests that migrants fill niches both in fast growing sectors (healthcare, science and technology), contributing to more innovation, and in sectors that are less attractive to the domestic labour force (assemblers, machine operators).⁶⁹ Immigration of low skilled-workers can also increase the production of certain products and the provision of services that require low-skilled labour, expanding certain sectors of the economy.⁷⁰

The effect of migration on wages and employment depends on whether migrants have skills that complement or substitute those of existing workers.⁷¹ In the former case all workers experience an increase in productivity and can expect to receive higher wages, whereas in the latter, wage decreases can be expected in the short term due to increased competition.⁷² Nonetheless, most studies find that migration has a limited effect on average wages and employment, although some also find a negative impact on low-skilled workers' wages.⁷³

An ageing population meanwhile, in economic terms, can have an impact on economies' growth potential but can also have positive implications such as higher levels of senior entrepreneurship and the development of services aimed at the elderly, e.g. an increase in certain health services.⁷⁴

3.1.4. Countries and regions will reach for strategic autonomy

The ESPAS Global Trends [report](#) predicts a shift to a more poly-nodal system where the power of states will be determined by their relational influence and where 'strategic autonomy is no longer a mere option for Europe'. The ongoing geopolitical reordering has led to concerns over 'supply dependencies' and more discussion on developing strategic autonomy through reshoring of supply chains.⁷⁵ The pandemic has also exacerbated concerns over very long supply chains.⁷⁶ Reshoring continues to be contested as an efficient solution for security of supply as other resilience-enhancing measures could be employed while maintaining spatial distribution. However, pressure is expected to grow on companies to shorten their global value chains, for example through incentives to reshore or nearshore or through obligations relating to resilience that would cause highly dispersed value chains to become more costly.⁷⁷ There is also some evidence that greater use of digitalisation and automation may lead to manufacturing currently carried out outside the EU to return home.⁷⁸ Should this happen, it could also have an impact on the economic landscape and job opportunities in and around the EU's cities.

⁶⁹ [Is migration good for the economy?](#), Migration Policy Debates, OECD, May 2014.

⁷⁰ [The Labour Market Effects of Immigration](#), Briefing, The Migration Observatory, University of Oxford, February 2020.

⁷¹ *ibid.*

⁷² *ibid.*

⁷³ F. Jaumotte et al., [Immigration and economic prosperity](#), VOX, CEPR Policy Portal, January 2017.

⁷⁴ [New urban economies. How can cities foster economic development and develop 'new urban economies'](#), URBACT, April 2015, p. 7.

⁷⁵ [Post Covid-19 value chains: options for reshoring production back to Europe in a globalised economy](#), Study, Policy Department for External Relations, European Parliament, March 2021, p. 1.

⁷⁶ *ibid.*, p. 18.

⁷⁷ *ibid.*, p. 14.

⁷⁸ *ibid.*, p. 13-14.

3.2. Opportunities and challenges for urban resilience

The green and digital transformations, the reshoring of supply chains, and flows of new inhabitants to cities as a result of urbanisation and migration may provide opportunities for growth, diversification and innovation in urban economies, potentially preparing cities to withstand future economic shocks more effectively. However, the transformation of the urban economy will lead to a decline in demand for a number of jobs and have a disruptive impact on a number of sectors, potentially widening the social divide and increasing income polarisation, impacting negatively on cities' and their inhabitants' ability to withstand a number of stresses and shocks. (Read more on economic, social, environmental and governance dimensions of urban resilience in the [Introduction](#)).

3.2.1. Green and digital transition: More diverse economies open to new risks

By securing economic growth and a more diverse economy, the green and digital revolutions have the potential to bolster urban resilience to economic shocks. For example, the green transition is expected to lead to a number of new services and jobs in clean and renewable energy, sustainable construction, recycling and waste management and public transport. Digitalisation is taking place across many services – from banking to shopping – and new opportunities to earn an income are appearing in form of the platform economy. Automation will increase productivity and innovation and jobs across numerous sectors. Meanwhile, digitalisation may also be bolstering urban resilience by creating redundancies in the urban system that allow economic activities in the city to continue in the face of disruption, e.g. by diversifying urban transport and offering remote work options, such as has been seen during the pandemic.

However, rapid automation also has the potential to produce significant shocks to labour markets, which can result in a loss of consumption resulting from unemployment and high transition costs for the economy.⁷⁹ Greater reliance on technology will also make cities and their economies more vulnerable to network failures, such as loss of internet or power outages. Such risks will require greater attention to developing back-up systems and redundancy (e.g. decentralised powergrids and internet servers) and bolstering cyber security.⁸⁰

3.2.2. Ensuring inclusive growth for stronger communities

Working towards inclusive communities and tackling inequality are important when it comes to building urban resilience, making it possible to mitigate the risk of social strife and ensure that all parts of society are able to recover from shocks such as economic crisis or extreme weather events. The disruptions caused by the digital and green transitions will pose a challenge in this respect. While the empirical evidence is not yet conclusive, green policies do not appear to be having a serious impact on overall employment.⁸¹ However, while a net job gain is likely, job destruction will occur in those sectors with large environmental footprints.⁸² Digitalisation and automation are also expected to result in significant job displacement. While demand is expected to grow for data analysts and scientists, AI and machine learning specialists, big data specialists, digital marketing specialists and process automation specialists, for instance, demand is expected to fall for assembly and factory workers, accountants and auditors, data entry clerks and secretaries.⁸³ It is also feared

⁷⁹ [Notes from the AI frontier. Modeling the impact of AI on the world economy](#), Discussion paper, McKinsey Global Institute, September 2018, p. 21.

⁸⁰ [The Future of Cities](#), Report, Joint Research Centre, European Commission, 2019, p. 103.

⁸¹ [Employment implications of green growth: Linking jobs, growth, and green policies](#), OECD report for the G7 Environment Ministers, June 2017, p. 11.

⁸² *ibid.*, p. 5.

⁸³ [The Future of Jobs Report 2020](#), World Economic Forum, October 2020, p. 30.

that rising demand for high-skilled workers could push their wages up, while others could experience a wage squeeze and unemployment.⁸⁴ Meanwhile, the emergence of the sharing economy is raising concerns over its disruptive effect on some established service providers. In this context of both digital and green transformations, to ensure cohesion and maintain the resilience of urban populations, more attention will need to be paid to active labour market measures such as job-search assistance, training, public sector job creation and subsidised employment in the private sector.⁸⁵ Recognising the need to ensure the green transformation is fair and to be aware of the potential impact on more vulnerable households, the Commission has proposed the creation of a [social climate fund](#) within the 'fit for 55' package. However, cities can play a role in ensuring greater equality in a transforming economy. For instance cities can partner with governments to pioneer ways to tackle inequality and with schools and employers to find ways to offer better opportunities, especially for those most in need.⁸⁶

⁸⁴ M. Szczepański, [Economic impacts of artificial intelligence \(AI\)](#), Briefing, EPRS, European Parliament, July 2019, p. 7.

⁸⁵ [Employment implications of green growth: Linking jobs, growth, and green policies](#), OECD report for the G7 Environment Ministers, June 2017, p. 16.

⁸⁶ B. Clayton, [Five steps cities can take to tackle inequality](#), Article, Centre for Public Impact, March 2018.

4. Future of urban spaces and housing

A number of trends are having an impact on the built environment in cities and thus on the lives of residents, including climate change and efforts to adapt to it and tackle global warming, urbanisation, and demographic trends. These trends in particular will play a significant role in the future of housing and urban spaces.

With the power to shape future cities, **climate change** is pinpointed by the [ESPAS report](#) as 'the most important policy issue to address'. The society and economy of the present and future, and humankind as a whole, are dependent on the decisions taken today to address climate change. It is widely [recognised](#) that efforts to lead change need to happen at many levels, from supranational to the local or municipal level.

The long-term impact of extreme events, such as rising temperatures and related weather events, will in the coming years start to be felt with greater force. Cities in particular will be impacted by higher temperatures. With more darker and sealed surfaces, more heat generated by human activities and less vegetation than rural areas, cities already suffer from higher temperatures than their rural surroundings, an effect commonly referred to as the urban heat island (UHI) effect. Climate change and global warming will exacerbate this effect in the future, with increases in temperature projected for cities in Europe of up to almost 5 °C by 2050 and up to more than 7 °C by 2080.⁸⁷ In addition to higher temperatures and depending on their geomorphology and geographic situation, European cities will also be impacted by other extreme weather events, such as heavy precipitation, floods, water scarcity and wildfires.⁸⁸

The ESPAS report on global trends projects greater **urbanisation** in the coming decades around the globe. According to the UN, the percentage of the world population residing in urban areas is likely to grow from 56.2 % in 2020 to 68.4 % in 2050. In Europe, the degree of urbanisation might even rise to 83.7 % (from 74.9 % in 2020).⁸⁹ Increasing urbanisation can put additional pressure on sometimes already stretched housing markets, leading to rising house prices, house shortages and problems with housing affordability. At the same time, growing levels of urbanisation will also put urban infrastructure development to the test, in terms both of the need for new transport solutions (see also Chapter 4 on urban mobility) or other infrastructure investments. One prerequisite for a successful path to sustainable cities worldwide is therefore the strengthening of cities' planning capacity to address the challenges posed by urbanisation.⁹⁰

International and interregional **migration** is another factor that will influence future housing and infrastructure needs and urban planning in cities. As economic hubs, cities offer job opportunities for migrants and are generally better connected to international transport systems, while also offering a higher level educational infrastructure than smaller towns or rural areas.⁹¹ International migration has therefore already led to a concentration of foreign-born people in metropolitan and capital-city regions.⁹²

⁸⁷ C. Rosenzweig, W. Solecki, P. Romero-Lankao, S. Mehrotra, S. Dhakal and S. Ali Ibrahim, (eds.), Climate change and cities: Second assessment report of the urban climate change research network, [Annex II](#), Cambridge University Press, 2018.

⁸⁸ See the [European Climate Adaptation Platform Climate-ADAPT](#).

⁸⁹ United Nations, [World Urbanization Prospects](#).

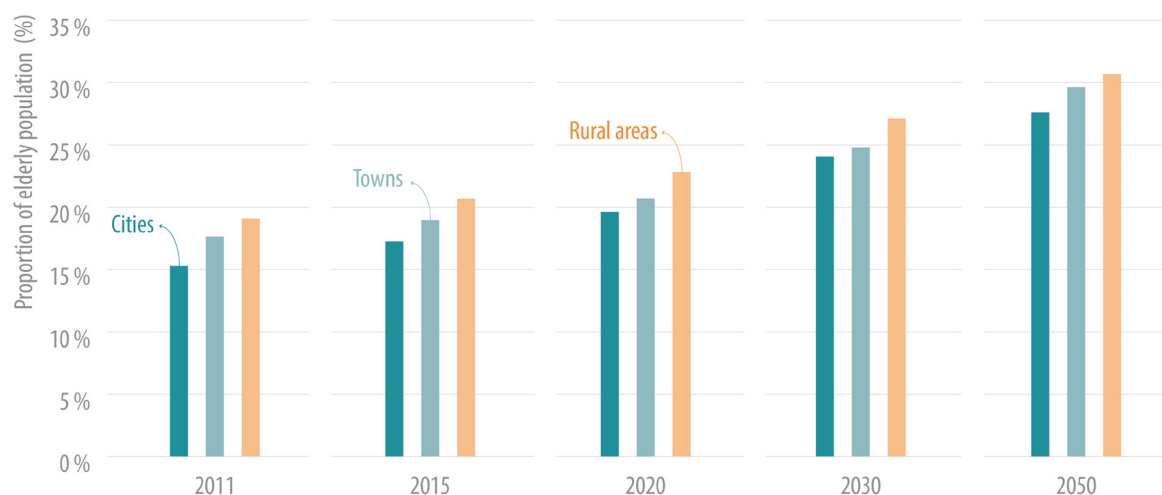
⁹⁰ See World Bank website on [Urban Development](#).

⁹¹ M. Lerch, [International migration and city growth](#), UN Population Division, Technical Paper No 10, United Nations, 2017.

⁹² [The integration of migrants in OECD regions](#), OECD, 16 January 2018.

Meanwhile, in the coming decades, **demographic ageing** will continue to affect all EU Member States and will thus result in changing housing and infrastructure needs, challenging urban planners. While cities' share of the population aged 65 and over is, and will continue to be, lower than in smaller town or rural areas, Figure 5 shows that the trend towards a higher proportion of elderly people will concern not only rural, but also urban areas.

Figure 5 – Evolution of the share of elderly people in cities, towns and rural areas up to 2050



Source: A. Goujon et al., 2021.

Note: The values are medians across approximately 98 000 local administrative units in the EU grouped according to the urban-rural regional typology.

The sections below will reflect first on the impact of these trends on the future of urban planning and housing and infrastructure, before then exploring how these developments could impact on urban resilience.

4.1. Global trends and evolution of the urban space and housing

Cities are already directing more attention to sustainable development and the mitigation of climate change related risks. They are engaging with new concepts such as ecodistricts and looking at ways to build sustainability into planning. At the same time, urbanisation, cross-border flows of capital and financialisation are raising concerns regarding the affordability of housing and the liveability of cities.

4.1.1. The climate dimension

As cities consume around 75 % of global primary energy and account for 50 to 60 % of global greenhouse gases emissions,⁹³ they must also play an important role in the fight against climate change. Efforts under the European Commission's [fit for 55 package](#) to curb the emissions will inevitably begin to affect city planners and infrastructure developers, challenging them not least to

Better urban planning through public involvement

It has been argued that urban planning as a method has the [potential](#) to play a major role in the development and implementation climate change related adaptive responses in urban systems.

Urban planning tools range from plan development, stakeholder engagement, development, and design standards that are available worldwide.

Nevertheless, urban planning has to operate on a number of different levels – local to regional, short-term to climate scale – and for this cities need to be prepared for short-term action while also being ready with strategies to be able to adapt to the extreme events that are expected to happen in the future.

It has also been [highlighted](#), that identifying climate change related risks and vulnerabilities at local level and developing projects to tackle them can lead to multiple benefits, such as: improving air quality, healthier and safer living conditions, noise control, and enhanced biodiversity, along with a better quality of life for the population.

This first step in identifying a city's risk and vulnerabilities is crucial for climate change adaptation and mitigation, and here citizens are considered to be of great importance. It has been [recognised](#) that citizens and local communities need to be involved in the decision-making process, as they know the territory and because they are key for the implementation phase of the proposed measures, making it more likely that social inequalities will be lessened.

make the building stock more energy efficient. The EU's [Territorial Agenda 2030](#) identifies climate change as one of the fields where action is required. The strategic document also suggests that the development and implementation of actions dedicated to mitigation and adaptation can bring new opportunities for cities, in the form of new agricultural possibilities, and the development of the bio-, green, blue and circular economies, and also through the production of renewable energy. At the same time, cities today are already having to deal with the consequences of past choices and actions. Changes in the climate are already driving city planners and decision-makers to deal with increased flooding, heavy rainfall with stormwater run-off, water scarcity, heatwaves, sea level rises, and also public health issues. The [Intergovernmental Panel on Climate Change \(IPCC\) 2021 report](#) suggests that an ever greater number of cities in Europe will be at risk of extreme weather events. Urban planners are focusing increasingly on tackling the vulnerabilities related to such events and are likely to direct even more attention to these efforts in the future. Factors such as connectivity, household size, population age, number of industries and population density all play a role in the final calculation of how much a city contributes to increased pollution and climate change. Meanwhile, each city has its own intrinsic vulnerabilities due to its geographical

location or natural/built physical characteristics, which will need to be considered when planning for mitigation actions. Many city planners are already focusing increasingly on these risks and vulnerabilities, with human health and well-being as drivers. They are also looking into how they can use technology and techniques to make their [urban settings](#) lively and verdant, by increasing the number of open spaces, to provide for cleaner air increase connections between people.

A number of EU initiatives exist to assist decision-makers and planners in sharing best practices and implementing their projects. The [Smart Cities Marketplace](#), launched in 2020, is a platform created by the European Commission to bring stakeholders together in the sharing process and seek out possible collaborations. The [Intelligent Cities Challenge](#) is another European Commission initiative

⁹³ See UN Habitat website on [energy](#).

that showcases 136 cities in their use of cutting edge technologies to achieve responsible, smart and green recoveries. Furthermore, both the [Urban Adaptation Support Tool](#) and the [European Urban Resilience Forum](#) were developed to close the data gap and to help urban planning practitioners in the implementation of climate adaptation practices.

Nevertheless, with increasing requirements to reduce the urban environment contribution to climate change, a new set of [tools](#) will have to be developed. These will need to be able to simulate the greenhouse gas implications of land use, transport and buildings in different scenarios, so as to serve climate change mitigation/adaptation-directed urban planning process more effectively.

With a direct effect on the distribution of human activities and infrastructure in the land, and also on spatial organisation, the use in urban planning of an [ecosystem approach](#) – based on ecosystem services – helps to give centre stage to [land use](#) in efforts to adapt to climate change and also to reduce risk and vulnerability.

The development of [ecodistricts](#) is a growing trend among urban planners and local decision-makers in some parts of the world. It is an approach aimed at reducing the ecological footprint of a development by combining sustainable development principles with urban planning tools and practices. Ecodistricts are based on the principles of multi-modality, water conservation, the use of alternative energy, the promotion of health and physical activity, the use of non-hazardous building materials, daylight equity through the use of large pane windows and also aesthetics as a way to spark interest, and a sense of identity and ownership.

The European Commission's [New European Bauhaus](#), an initiative launched by the EU on 18 January 2021, is designed to create a space where multiple disciplines can come together in order to re-imagine and shape the way Europeans live. It will support innovative ideas and products that can enhance European quality of life, improve sustainable living and strive for more affordable and accessible living spaces. In the last quarter of 2021 the design phase will give way to calls for proposals which will then see the application of projects in at least five places in the EU Member States.

Docks de Saint-Ouen-sur-Seine

The ecodistrict of the [Docks de Saint-Ouen-sur-Seine](#) on the banks of the Seine, north of the city of Paris is an ongoing project started in 2007 with plans ongoing until 2025. It comprises public services, housing, offices and businesses. The four initial major goals of the project were to renew the urban fabric of Saint-Ouen, to diversify land use, to reconnect with the Seine in an ecological, economic and social manner, and also to be recognised as a leader in environmental urban innovations in the city of Paris.

Requirements for this project included: the development of green roofs to collect rainwater, affordable housing for rent to comprise 40% of all available units, minimal energy consumption, and pneumatic waste management. The measure [considered](#) most innovative was the pooling of all public parking spaces and structures.

One of the key ways to reduce energy consumption in cities will be the further deployment of sustainable housing.⁹⁴ This concept has been embraced by various European policy initiatives (e.g. the [Renovation Wave](#)), focusing on reinforced long-term renovation strategies for EU countries, the construction of nearly zero-energy buildings, the introduction of energy performance certificates and the use of smart technology in new buildings.

The transition to sustainable and affordable housing and more environmentally sound housing and infrastructure construction can be supported by the use of **new construction technologies** and processes. Technologies such as 3D printing or drones can help build houses at a lower cost in a

⁹⁴ H. Lovell, 'Framing sustainable housing as a solution to climate change', *Journal of Environmental Policy and Planning*, Vol. 6(1), pp.35-55, 2004.

shorter period of time, generating less construction waste than traditional construction methods.⁹⁵ At the same time, the development and use of environmentally sound construction materials for 3D printing will be crucial to ensure the sustainability of buildings and physical infrastructure. One of the most mature digital construction technologies – building information modelling (BIM) – can for example help generate and manage digital representations of physical and functional characteristics of buildings and other construction projects.⁹⁶ In that way it covers the entire life cycle of construction projects, from the planning, to the construction and operation phase and the renovation or recycling of buildings or other construction sites.

4.1.2. Increasing pressures on housing availability and affordability

Future housing needs in cities are affected by a number of different demographic, geographic, and environmental factors. This section will focus on the demographic factors that are having an immediate impact on housing needs and affordability.

Many European cities have experienced [housing price increases](#) disproportionate to changes to income in recent years. This has been attributed to a number of factors, including a higher rate of investment in property, generally favourable financing conditions and the spread of short-term rental platforms in tourist destinations. The result may be more households suffering from housing cost overburden and overcrowding of apartments, indicators for which cities already today fare worse than smaller towns or rural areas. The problem of housing affordability has become even more prevalent during the Covid-19 pandemic, with many people having difficulty paying their rent. Increasing urbanisation will also likely lead to higher shares of people living in apartments, especially in those cities where house prices and rents have already experienced a strong increase in recent years. Already today, the majority of city dwellers live in apartments, with large differences between EU Member States (see Figure 6).

Meanwhile, the ageing population in European cities could lead to a situation where more and more elderly people live in under-occupied dwellings, while people in younger age groups struggle to find affordable housing in cities. While new builds have a positive impact on all age groups, younger adults might nevertheless face problems of housing affordability in cities.⁹⁷ In addition, the change in the age structure of cities will likely also trigger the need to adapt certain types of infrastructure (e.g. there will be a reduced need for schools and nurseries).

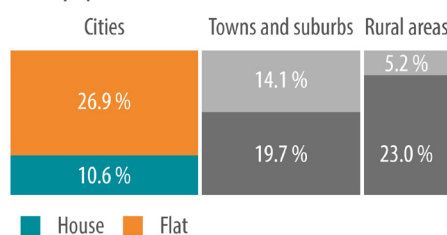
⁹⁵ I. Hager, A. Golonka and R. Putanowicz, '3D printing of buildings and building components as the future of sustainable construction?', *Procedia Engineering*, Vol. 151, pp.292-299, 2016.

⁹⁶ [Digitalisation in the construction sector](#), European Construction Sector Observatory, European Commission, April 2021.

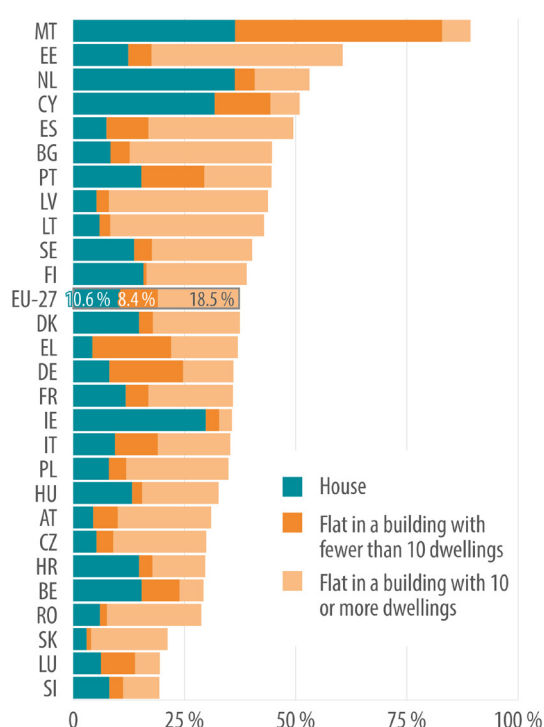
⁹⁷ Peter Karpestam, Who benefits from more housing? A panel data study on the role of housing in the intermunicipal migration of different age cohorts in Sweden, *The Review of Regional Studies*, Vol.48 (3), p.401-425, 2018.

Figure 6 – Urban dwelling types

Population by degree of urbanisation and dwelling type (% of total population)



Cities' population by dwelling types (% of total population)



Source: Eurostat, EU-SILC data.

It may seem obvious that migration – inter-regional or international – has an impact on the housing situation and infrastructure needs of cities. The impact of migration on housing prices is, however, open to argument in the academic literature. While some studies conclude that immigration leads to increased prices, other studies do not confirm a link between immigration and housing prices.⁹⁸ Nevertheless, it has been pointed out that an influx of migrants in cities can result in increased discrimination and voluntary or involuntary segregation, i.e. the spatial separation of different population groups within a city. Such effects can also concern migrants within the same country.⁹⁹

To tackle affordability, the UN suggested a people-centred approach already in 2017 in its 'integrated approach to a new urban agenda'.¹⁰⁰ The OECD has meanwhile called for government action in three specific areas, namely: (i) increased investment in affordable and social housing, (ii) improved targeting of public support for housing and (iii) more affordable private rental markets.¹⁰¹ The need for more affordable housing has also been acknowledged by the World Economic Forum, which made a series of supply- and demand-side recommendations in 2019.¹⁰² The city of Vienna is often cited as a [positive example](#) in the fight for affordable housing. In Vienna, more than 60 % of the population live in social housing, with the city also being the biggest landlord. Meanwhile, new construction technologies can reduce costs and address affordability (see Section 3.1.1).

4.2. Opportunities and challenges for urban resilience

Trends and subsequent developments in the area of urban planning, housing and infrastructure as described in the preceding sections will impact cities' resilience in a number of ways, encompassing

⁹⁸ H. d'Albis, E. Boultane and D. Coulibaly, 'International migration and regional housing markets: Evidence from France', *International Regional Science Review*, Vol. 42(2), 2019, pp. 147-180.

⁹⁹ S. Özüekren and E. Ergoz-Karahan, 'Housing experiences of Turkish (Im)migrants in Berlin and Istanbul: Internal differentiation and segregation', *Journal of Ethnic and Migration Studies*, Vol. 36(2), 2010, pp. 355-372.

¹⁰⁰ [Towards a city-focused, people-centred and integrated approach to the new urban agenda](#) – Regional report Europe, North America, and the Commonwealth of independent states, United Nations Habitat III, 2017.

¹⁰¹ See the online article by Mark Pearson, Deputy Director of Employment, Labour and Social Affairs, OECD, [Three Ways to Make Housing More Affordable](#), OECD Forum on Housing, 18 January 2021.

¹⁰² [Making affordable housing a reality in cities](#), World Economic Forum, June 2019.

social, economic and environmental dimensions. (See [Introduction](#) for more on dimensions of urban resilience). A greater focus on sustainable development in cities will bolster their ability to withstand disasters, such as extreme weather events, by avoiding the degradation that would make them more vulnerable and while also presenting an opportunity to make them more accessible for all citizens, improving social cohesion. Rising housing costs resulting from the financialisation of property and the cost of the green and digital transition can, however, exacerbate income polarisation, deepening the social divide and challenging the resilience of communities to withstand shocks and stresses. For on the economic, social environmental and governance aspects of urban resilience see the introduction to this paper.

4.2.1. Sustainable urban planning and urban resilience

A greater focus on sustainability and climate action in urban planning, the development of ecodistricts and a shift to sustainable housing will also help to boost cities' resilience by ensuring that urban development is balanced and does not contribute to changes that would decrease the favourable conditions for the functioning of society.

More frequent floods, heatwaves and storms pose a risk to cities' infrastructure and economic and other activities important for their functioning. Planning and construction that is focused more on reducing vulnerability to extreme weather events should help to build the resilience of urban areas. Better storm drainage and efforts to avoid watershed deterioration helps to reduce flood risk.¹⁰³ Increasing the number of trees in cities can also help. Trees capture rain, slow the movement of water and help with infiltration into the ground. More tree canopy cover also helps reduce temperatures, lessening the [heat island effect](#). Better planned cities that encourage active travel and offer more open space may also prove better able to cope with epidemic-related risks.¹⁰⁴

However, as has already been pointed out such plans often disregard the social dimension.¹⁰⁵ To maximise the positive impact on urban resilience, planning practice must [assess](#) the environmental and economic cost-benefit ratio of climate-sensitive urban planning measures, as these need to be developed and implemented with social and economic equality in mind, an objective that is not always easy to achieve. Efforts to develop sustainable urban plans that involve improving urban space accessibility, ensure equal access to services and focus on reducing social and spatial segregation can make it possible to hold off social tensions and also reduce the risk of poverty traps, enhancing the resilience of households to resist and persist in the face of economic or extreme weather-related crises. For example, ensuring that green investments and infrastructure upgrades prioritise poorer neighbourhoods has been suggested as a way to ensure greater equality in cities.¹⁰⁶ Meanwhile, greater involvement of citizens in developing urban spatial planning can contribute further to cohesiveness and inclusiveness. Ensuring that all stakeholders are fully aware of what the expected benefits of the measures envisaged will likely be key to successful implementation of the transition. (For more on this see Chapter 1 on governance).

¹⁰³ UN Habitat, '[Urban resilience](#)', Issue Paper 15; A. Veról, I. Bigate Lourenço, J. Fraga, B. Battemarco, M. Linares Merlo, P. Canedo de Magalhães and M. Miguez, 'River restoration integrated with sustainable urban water management for resilient cities', *Sustainability*, Vol. 12, 2020; S. Suriya and B. Mudgal, 'Impact of urbanisation on flooding: The Thirusoolam sub watershed – A case study', *Journal of Hydrology*, 2012, pp. 412-413.

¹⁰⁴ F. Moraci et al, [Cities under Pressure: Strategies and tools to face climate change and pandemic](#), Sustainability, September 2020.

¹⁰⁵ A. Adil and I. Audirac, 'Urban resilience. A call to reframing planning discourses', *The Routledge Handbook of Urban resilience*, p. 37.

¹⁰⁶ International Institute for Environment and Development, [Can we reduce urban poverty and inequality and achieve net zero cities?](#).

4.2.2. Housing affordability challenging inclusiveness in the urban population

Growing shortages of affordable housing resulting from a greater flow of cross-border investment, the financialisation of housing, increased tourist flows and changes in the short-term rental market enabled by digitalisation (the 'Airbnb effect') can result in greater social inequality and segregation, undermining urban resilience. However, increased attention to affordability by cities (e.g. greater attention to affordable and social housing development and limiting the number of days private dwellings can be rented) can help with housing affordability, with a favourable impact on resilience, ensuring that socio-spatial segregation in cities is not aggravated. Mixed-income housing has also been developed as a way to tackle segregation, while 'inclusionary zoning' makes planning permission dependent on the inclusion of affordable apartments in newly constructed buildings in order to increase affordability and reduce inequality.¹⁰⁷

The wider use of new construction technologies, if it reduces new-build prices, could prove to be an important tool for addressing housing cost overburden. This in turn could potentially reduce inequalities and contribute to cohesion and inclusiveness, thereby boosting urban resilience.

4.2.3. Energy transition: An opportunity to boost cities' economic resilience?

The development of new services relating to climate mitigation and sustainability in construction and energy efficiency also has the potential to improve resilience through diversification of the urban economy.

The 'fit for 55' package recognises the need for the energy transition to be conducted in an inclusive manner and proposes the development of a [social climate fund](#) to help poorer households and regions make the transition. However, if the transition leads to higher costs, without mitigating policy measures, it could result in further inequality, adversely impacting urban resilience. For example, the renovation of older buildings and districts (with or without new construction technologies) to make them more energy efficient is certainly a positive development. However, there is a risk that renovation could also push rents higher, driving some low-income groups out of their homes.

Meanwhile, developing more neighbourhood-based approaches, decentralising energy systems via digitalisation and renewables may help reduce energy-supply related vulnerabilities to urban economies. (See also [Chapter 2](#) on the economy and work).

¹⁰⁷ B.Clayton, [Five steps cities can take to tackle inequality](#), Centre for Public Impact, March 2018.

5. Future of urban mobility

Climate change and the increasing efforts to curtail it through a significant reduction in emissions combined with technological advances will be the key trends affecting urban transport in the near future. As technology sprints ahead and is changing the way we work, communicate and even do our shopping, it is also having an impact on how we move around cities. The pandemic has accentuated the trend towards greater use of digital communication tools to work from home. Meanwhile, a number of technologies are reaching a level of maturity that will lead to new products and services for the transport of people and for urban logistics (e.g. vehicle-sharing apps, mobility as a service, drone deliveries, package robots, automated vehicles, e-commerce delivery services). Maturing electric vehicle drive train technologies and batteries are beginning to modify cities and urban transport by offering new alternatives. [Other power sources](#), such as hydrogen, although probably less significant, may also enter into play and have an impact. New areas are beginning to be explored, such as the so-called third dimension – the delivery of goods and the transport of people in cities by air, using [drones](#).

Global temperature increases will mean rising sea levels and are also linked with more frequent extreme weather events. These will affect many cities around the world and their transport systems (e.g. increasing infrastructure damage, flooding etc.) Tackling climate change has become a key policy priority – something that is being addressed at global, regional but also local level. Transport in particular is set to be the focus of decarbonisation efforts, as it is the only economic sector in which greenhouse gas emissions are higher now than they were in 1990 – levels began growing again in 2013 despite the [mitigation efforts](#) taken. This will inevitably bring changes to mobility in cities. By way of example, the Green Deal promoted by the European Commission has set a key objective of a 90 % reduction in transport-related greenhouse gas emissions by 2050. The 'fit for 55' package of legislative proposals will meanwhile seek to increase the share of alternatively fuelled vehicles, promote use of digital tools for transport system efficiency and support greater use of other transport methods, such as walking and cycling. Meanwhile, cities are also exploring other ways to tackle climate change, developing cycling paths, creating urban access restrictions to promote the use of clean vehicles or abolishing car use in city centres completely.

Other trends likely to play a role include the **aging and growing urban population**, which may start to challenge existing transport networks. Resulting policy measures to tackle overcrowding and the urban sprawl can accelerate changes in transport such as the development and use of new means, while also fostering digitalisation to improve efficiency. Meanwhile ageing populations will present new challenges to policymakers to ensure accessibility for all. Global travel should soon recover from the pandemic and developed societies will continue to **'move more globally'** entailing further strains on urban mobility systems while the risk of spreading contagious diseases remains. The need to address pandemic risks has already led to the incorporation of UV disinfection in public transport. It has also led to a discussion about the benefits of using smaller vehicles and the modulation of public transport. Meanwhile, with a heightened sense of risk of contagious disease, passengers have been seeking alternatives – an increase in the use of private vehicles has been observed, but also an increase in bicycle sales.

This chapter explores the possible impact of these trends and challenges on urban mobility in the future. The effect on urban resilience will then be unpacked, looking specifically at changes relating to transport and the way its expected evolution may affect cities' capacity to withstand economic, societal and environmental shocks as well as slower moving disruptive changes.

5.1. How might urban mobility evolve as a result of global trends

With policy focused on tackling climate change, and certain technologies reaching maturity, there are likely to be numerous changes in urban transportation in the coming decades. These will include new power trains for vehicles, new services enabled by digitalisation and greater automation, all with the potential to change the patterns of urban mobility significantly.

5.1.1. Electrification of urban vehicles and increased use of alternative fuels

The emissions performance of vehicles is of increasing importance to policy-makers attempting to tackle climate change. The basket of measures presented by the European Commission in its [sustainable and smart mobility strategy](#) (SSMS) and 'fit for 55' package include a carbon trading scheme for road transport, tightening energy and fuel taxation measures. The measures also include extra funding for research and innovation in new technologies, the rollout of charging infrastructure, and incentives for cities to encourage the use of low- and zero-emission vehicles and a greater use of trains and trams.

Cities have also progressively been adopting policies supporting the use of alternatively fuelled vehicles. For example, city administrations have started putting in place low-emission traffic zones, providing free parking areas for alternatively fuelled vehicles and opening express lanes for low- and zero-emission vehicles.

While the numbers of electric chargeable passenger cars (battery electric cars and plug-in hybrid electric cars) still only account for less than 1 % of the total passenger car fleet, there has been rapid growth in new registrations of electrically chargeable cars in the EU in recent years. According to the European Alternative Fuel Observatory they accounted for nearly 10 % of all new registrations and 1 million new registrations in the EU in 2020, reaching a total of 2 million electrically chargeable cars. The leaders in the EU in terms of registrations are Sweden and the Netherlands, where close to 32 % and 24 % respectively of new registered cars were electrically chargeable in 2020. If developments in EU countries follow those of the leaders in electric car registrations globally – Norway and Iceland, where new registrations of electrically chargeable vehicles represented 70 % and 50 % of all new car registrations respectively in 2020 – this transformation would soon be palpable in many EU cities.

While the technology used for electric vehicles is mature, development of [hydrogen fuelled vehicles](#) using 'clean' hydrogen is still at an early stage and is not competitively priced.¹⁰⁸ Nonetheless, there has been some growth in vehicle models available recently and a significant increase in sales. The International Renewable Energy Agency (IRENA) suggests that with economies of scale, and combined with further cost reductions in renewable electricity, clean hydrogen could be produced at a competitive costs by 2030.¹⁰⁹

In comparison, liquefied petroleum gas (LPG) cars account for 3.25 % and compressed natural gas (CNG) cars for 0.51 % of the car fleet. However, the growth in new registrations for CNG and LPG cars appears to have levelled off in recent years (0.5 % of all new car registrations for CNG cars and 1.5 % for LPG cars).

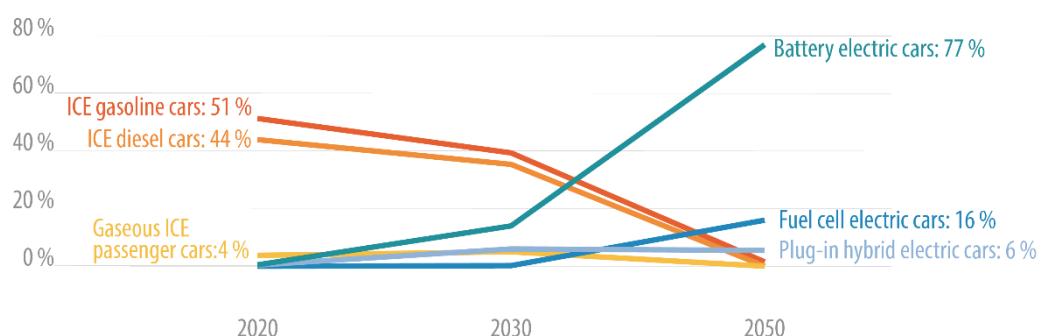
¹⁰⁸ Hydrogen produced today mostly is produced from fossil fuels, with the associated CO₂ emissions. Carbon capture and storage is not yet used to a large extent for this method and producing clean hydrogen via electrolysis is very limited because of its high costs. Hydrogen is produced mostly for industrial applications (oil refineries and ammonia industry), with only 0.1 % being produced for retail market use (such as hydrogen-fuelled vehicles).

¹⁰⁹ IRENA, [World Energy Transitions Outlook: 1.5°C Pathway](#) (2021), p.81.

The Commission has modelled the composition of vehicle fleets based on existing policy measures (up to the end of 2019) and base on further policy measures aimed at achieving the reduction in emissions envisaged in the climate target plan.¹¹⁰

With policies in place to achieve the emissions reductions set out in the climate target plan, the models suggests that in 2030, zero- and low-emission cars could account for 20 % of the overall car fleet, but market penetration would increase rapidly after that. In 2050, the car fleet would mainly consist of zero- and low-emission vehicles (ZLEVs), mostly battery electric vehicles (about 77 %), plug-in hybrid vehicles (about 5 %) and fuel cell electric vehicles (about 17 %)¹¹¹ (Figure 7).

Figure 7 – EU car fleet projected development with policies geared to climate targets



Data sources: [EAFO](#), [SWD](#) accompanying the sustainable and smart mobility strategy (2020).

Notes: The projections are from the highly ambitious scenario involving energy efficiency, having renewables and transport policies in place (the [REG scenario](#)).

It should be noted at this point that the Commission recognises that such predictions can only be approximations. For example, the industry predicts a far greater share of CNG vehicles in the total fleet than suggested by the European Commission's projections.

With advances in battery technology now offering the potential for electrification of heavier vehicles, and while still low in market share, [electric buses](#) and [electric trucks](#) also seem to be experiencing a surge in interest. The Commission modelling projects a mix of electric, hybrid, gaseous ICE power trains for trucks up to 2050, with an increase in the share of electric from 1 % in 2030 to 20 % in 2050. The modelling performed for the SSMS suggests that, with the measures to reach 2030 climate objectives in place, the bus fleet in the EU would consist mostly of electric buses (98 %) by 2050 (up from 20 % in 2030).

¹¹⁰ The climate target plan envisages a 55 % reduction in emissions by 2030 across the EU economy compared with 1990 levels to put the EU on the path to carbon neutrality by 2050. Scenarios focused on reaching the economy-wide reduction of 55 % would require transport emissions reductions (including aviation and maritime) of 21 to 23 % by 2030 relative to 2005. Reaching carbon neutrality by 2050 would require emissions reductions of 96 to 97 % in transport by 2050.

¹¹¹ The figures used are taken from the scenario that makes highly ambitious projections as regards to energy efficiency, renewables and transport policies (the REG scenario). A more detailed description of assumptions in the REG scenario can be found in the European Commission [staff working document](#) accompanying the sustainable and smart mobility strategy (December 2020), p. 245.

Challenges for electrification

A more widespread use of electric vehicles also entails the need to address new challenges relating to power supply, life cycle emissions and waste. Massive connection of electric vehicles to the grid for charging can lead to overloading, but [smartgrid](#) technology can reduce this problem by [balancing the demand](#). Large scale use of batteries also implies risks for the environment. A comparative study between EVs and internal combustion engine vehicles (ICEVs) in China corroborates the [ICTT report](#), indicating that infrastructure and efficient manufacturing techniques are the keys to reducing emissions during production. It [has been established](#) that Chinese EV battery manufacturers produce up to 60 % more CO₂ during fabrication than ICEV engine production, but could cut their emissions by up to 66 % if they adopted American or European manufacturing techniques. As such, the pollution created through the extraction process and production of batteries remains on par with or slightly higher than the manufacturing process for petrol or diesel-based engines. However, the end of life of the batteries needs also be taken into account, with recycling becoming key to reducing environmental impact. Electric vehicles provide a more pronounced advantage when looking at their complete lifetime, whereas combustion engine vehicles are unable to compete.

5.1.2. Digitalisation and automation of urban transport

Transport in cities is likely to be increasingly affected by new services enabled by digitalisation and developments in automation. New app-based **micro-mobility services** have emerged, such as electric and non-electric bike-, scooter- and moped-sharing. For example, in 2005 there were 17 bike [sharing programmes](#) globally, whereas by 2019 there were 2 900. E-scooters have experienced similar exponential growth in recent years. According to the data from the [new urban mobility agenda](#), as of July 2021 there were micromobility [service providers](#) in 23 countries in the EU in 511 towns and cities. Similarly, app-based **vehicle-sharing and ride-sharing services** have grown in many cities in Europe and across the world. Uber, Lift and Bolt, among others, are household names across cities globally for intra-urban travel, allowing people to use their smartphones and ridehailing apps to get in touch with drivers. Inter-urban solutions such as Bla-Bla Car are successfully used by many as an alternative to traveling by coach or train.

Micromobility and ridehailing – raising new concerns

The rapid increase in e-scooters has not been without its problems. For example, a spike in accidents, including fatal accidents, with e-scooters [has been reported](#) and dockless sharing systems have led to vehicles being parked on sidewalks and public spaces, causing a nuisance to other users of public spaces. Many cities started therefore defining zones where dockless micro-vehicles are allowed to be parked, while authorities have also issued [threats](#) to ban e-scooters, if service providers do not address speed limits and parking issues.

Ridehailing and ridesharing companies have also been facing opposition relating to safety concerns, and their competition with traditional taxi services. The issue of whether they should be seen as internet platforms facilitating ridesharing or transport service providers has been the subject of several [court cases](#) to determine whether ridesharing service providers should be regarded as online platforms – and therefore follow EU e-commerce rules – or as transport companies.

Furthermore, new ways of combining multiple modal options into one service, referred to as **mobility as a service (MaaS)** have developed. The aim of these concepts is to bring together different types of transport (e.g. public and private transport, shared mobility, micromobility) into one single digital entity.¹¹² Most of these platforms integrate public transport as a fundamental service alongside adjacent facilities such as uber-like, taxi and micromobility facilities.

¹¹² F. Callegati, S. Giallorenzo, A. Melis and M. Prandini, 'Cloud-of-things meets mobility-as-a-service: An insider threat perspective', *Computers & Security*, Vol. 74, 2018, pp. 277-295.

More advanced MaaS systems also include rental services, parking permits, and regional and interregional transit. Some achieve a high level of completeness, such as Whim – built and supplied by Transdev in Finland. Another example, the Jelby app launched in 2019 in Berlin was hailed as the largest MaaS solution yet, aiming to include 12 types of public transport and shared mobility services. The [app](#) allows users to access trams, trains, ferries, the metro, and shared mobility options such as bikes, e-scooters, car-sharing and taxis, with real-time routing designed to make it easy to plan, choose and pay for a journey. MobiCascais in Portugal also offers a digital means of combining different means of transport and services (see below).

Mobicascais – an integrated sustainable mobility management system

The municipality of Cascais in Portugal has developed the local [MobiCascais](#) project to promote individual and collective carbon footprint reduction. It is an integrated sustainable mobility management system that merges mobility service operations with a broad network of equipment and infrastructure. It seeks to promote both public transportation and smooth mobility, thus, becoming an efficient, economic, and sustainable model for all local mobility needs. It offers an unique, diverse, and flexible set of solutions to meet the transportation needs of all its 210 000 residents, workers, and over 1.2 million yearly tourists.

To help the project achieve its goal, public transportation on buses is free, as are all packages that include bicycle sharing and parking or any other related services. This includes connections with other regional transportation solutions for daily commutes. The service is affordable to ensure that public mobility in Cascais is more competitive than individual transportation.

MobiCascais offers over 90 different bus routes, a bicycle-sharing service, parking and electric car charging points. All these can be accessed through an intuitive app allowing users to select and personalise their preferred services. Furthermore, Cascais has added an innovative gamification system to its app where users can get 'citypoints' (later to be redeemed by prizes) for using MobiCascais services.

Efforts are now also being made to take advantage of developments in **artificial intelligence (AI)**. Some of the early AI applications in transport include increasing the logistics performance with just in time production and shop replenishment. Now numerous projects are under way to use AI in **traffic management**, to enhance transport efficiency. Meanwhile, AI also puts digital solutions at the disposal of passengers to help them find out how crowded transit centres and public transport vehicles are, or the level of congestion on urban and inter-urban roads. AI-enabled **vehicle automation** is also taking major strides forward with pilot projects across the world and in the EU, some funded by the European Commission. These are projects relating to private cars, but also to [small passenger vehicles](#) (most often running on alternative fuels). AI can offer efficiency gains by increasing road capacity through [coordinated traffic](#) between autonomous vehicles sharing information and adapting trajectories to one another, while light electric vehicles (bikes and scooters) enjoy priority or use their own lanes.

Novel uses of digitalisation and artificial intelligence for **logistics** are being tested around the world. For example, Starship Technologies is testing on-demand delivery of goods by [small package robots](#) in several cities in Europe and university campuses in the US. Concepts of [driverless pods](#) for transporting people and goods have also been developed. Meanwhile, app-based food delivery services put in place by restaurants and grocery stores have multiplied during the pandemic. Digitalisation and the use of autonomous vehicles for delivery to shops or to customers has the potential to improve the efficiency of transport, accommodating traffic and predicting delivery times much more effectively. This will likely continue to be explored. AI systems will also be able to re-calculate optimum delivery sequences, accommodating traffic conditions in real-time (solving the '[travelling salesman problem](#)' in a dynamic and adaptive way). More drastic solutions have also been contemplated for logistics, such as the use of [underground](#) tunnels or pipes for the transport of goods.

Advances in technology have spurred the development of **vertical-take-off and landing (VTOL) vehicles and drones**. The latter have already been tested in goods delivery (by companies such as [DHL](#) in China and [Amazon](#) in the UK) and [pilot projects](#) for passenger transport (both with pilots and without) [have grown exponentially](#). This has precipitated discussions around the potential of such vehicles and their usability to improve the efficiency of urban transport and reduce congestion. The EU is developing rules on integrating drone operations, while [discussions](#) are now taking place on societal acceptance of drones in the urban space. Meanwhile, the [energy efficiency of drone use](#) is also being analysed, which hints at savings for the delivery of small packages while questioning their applicability for larger loads.

5.1.3. Transformation of the urban transport system?

New technologies and decarbonisation policies are likely to lead to major changes in urban transportation, offering new, complementary services. They may also have a significant disruptive impact, however, with the potential to transform the traditional understanding of urban transport. The extent of the transformation will also depend on societal acceptance of the new technologies.

Policies to decarbonise transport may lead to a reduction in **car use** overall in the long term. A growing number of cities appear to be trying to limit access to passenger cars, with additional measures to dissuade people from car use in order to tackle emissions, air pollution and congestion. [Urban access restrictions](#) are increasingly being tested across the EU, with [some cities](#) even planning to ban most cars in urban centres. Meanwhile, the development of walking and cycling infrastructure accelerated during the coronavirus pandemic.

However, the Commission modelling results presented in the staff working document accompanying the sustainable and smart mobility strategy, suggested that even with ambitious climate policy measures in place private car use might start decreasing only gradually, with a 0.8 to 1.8 % decrease in cars' activity by 2030, relative to the scenario with [current policy measures](#) and a 6 % reduction by 2050.¹¹³ It has also been suggested that without appropriate regulation, vehicle automation could lead to a greater use of cars, rather than efficiency gains.¹¹⁴

There also seems to be little evidence that app-based ridesharing and micromobility services have reduced new car use. A recent study points out that the accessibility of ridesharing can, in fact, discourage commuters from using other means of transport, such as walking or cycling. While empty runs, or 'deadhead miles' without passengers, could contribute to an [increase in road congestion](#). Similarly, while [micromobility services](#) have been shown to provide a faster alternative to cars, they may not be [replacing private car usage](#) but rather substituting trips that would otherwise be made by walking, cycling or public transport.

Meanwhile, **public transport** is being challenged in new ways. The use of public transport [has been in decline](#) in recent years in wealthier cities across the world and in the EU, even before the pandemic. The pandemic has only exacerbated this trend, and a greater awareness of pandemic risks may contribute to continue it into the longer term. A [survey](#) by the consumer organisation BEUC points to people being less in favour of using shared or public means of transport since the pandemic. According to the Google [community mobility reports](#) analysing data of several EU countries, transit stations were still seeing fewer people in June 2021 than during the baseline period of early 2020, with many still showing 20 to 40 % fewer visits.

¹¹³ Commission [staff working document](#) accompanying the sustainable and smart mobility strategy, December 2020, p. 246.

¹¹⁴ [Runaway driverless cars will increase congestion and accelerate climate breakdown](#), Transport and Environment, September 2019.

Automated vehicles could become a more economical and convenient travel choice than public transport in the future, resulting in a decline in public transport use, and in a vicious circle where increased operating costs owing to a decrease in ridership further reduces the number of [services offered](#) and their attractiveness. Ridesharing has similarly been linked to the cycle of [declining public transport](#) ridership and service quality.

5.2. Opportunities and challenges for urban resilience

The resilience of urban transport systems to shocks and stresses is key to overall urban resilience, as demonstrated during the pandemic. People were unable to use the public transport system because of the risk of the spread of Covid-19 and had to improvise alternatives, such as walking or cycling. Other shocks, e.g. extreme weather events such as flooding, will challenge the ability to move people and goods around cities. Digitalisation and automation allow more alternatives for travel in cities and thereby can help cities continue to function in cases of such disruptions. They also expose cities to new vulnerabilities such as cyber-attacks however. New transport services and innovations can present an opportunity for growth, contributing to a more robust urban economy better able to withstand economic shocks. However, the disruption caused by these new services to existing operators and transport sector jobs and new accessibility issues can make social divisions worse, challenging urban resilience. (See [Introduction](#) for more on the institutional, economic, social and environmental dimensions of resilience.)

5.2.1. Electrification, digitalisation and automation: More mobility alternatives boost resilience but exposing cities to new risks

Some of the mitigation measures to bolster the resilience of transport systems in the face of more frequent extreme weather events focus on infrastructure, such as proposing the development of permeable paving and storm drains (see more in Chapter 3).

However, greater penetration of digitalisation and automation in transport (e.g. shared mobility, micromobility) together with the development of active travel infrastructure and initiatives to support walking and cycling, can also improve resilience by providing alternative travel options in cases of extreme weather events or other calamities affecting certain modes of transport in particular. This was the case during the pandemic, when people were unable to take public transport.¹¹⁵ Further technological developments may also help to tackle pandemic risks (e.g. UV cleaning of vehicles, new types of passenger vehicles, such as on-demand automated vehicles). As sufficient infrastructure is important for urban resilience, any efficiency gains in the transport system from digitalisation and automation, would help alleviate pressures on transport infrastructures that are increasingly under strain because of growing urban populations. However, increased reliance on networks will likely make the functioning of transport systems more vulnerable to breakdowns in digital networks and [cyber-attacks](#) (e.g. hacking automated vehicles to cause accidents).

Meanwhile, the digitalisation of work, and the resulting greater use of hybrid and tele-working methods is modifying habits by reducing the number of journeys but also altering their distribution during the day. This has the potential to mitigate possible negative effects on urban resilience related to overcrowding of the transport systems, and the associated risks of the spread of contagious diseases.

When it comes to logistics, AI-enabled solutions for the transport of goods can also help with health and safety by improving traceability. They can also help to ensure the replenishment of supplies and

¹¹⁵ F. Moraci et al, '[Cities under pressure: Strategies and tools to face climate change and pandemic](#)', *Sustainability*, Vol. 12(18), September 2020.

optimise deliveries.¹¹⁶ Meanwhile, logistics systems that strive for increased efficiency in the form of just-in-time deliveries, using digitalisation and automation, may make cities more susceptible to supply shocks.

The wider electrification of transport, resulting from efforts to reduce CO₂ emissions, may also carry with it new risks to resilience. A transport system that relies increasingly on electricity is subject to new energy supply risks. Meanwhile, electric vehicles can also help as sources of emergency power as demonstrated during the recent extreme weather-related [blackouts in Texas](#).

5.2.2. Innovation in transport services: An opportunity to diversify the economy but a challenge for existing job providers and inclusiveness

Urban transport and the transport sector in general are seeing the development of a number of new services. In the event of wider transformation and penetration of new services, developments in urban transport will help in terms of diversification the urban economy, potentially also contributing to cities' economic resilience.

Meanwhile, the widespread development of new services can jeopardise jobs in more traditional sectors and at the same time appear to offer alternatives which provide more precarious working conditions. As such they can provide a challenge urban resilience by deepening inequality, social divisions and weakening citizens ability to fend off economic crises.

If services and solutions offered by digitalisation and automation start challenging the functioning of public transport, reducing the public transport offer and basing transport pricing on fluctuations in demand, poorer households may be faced with higher costs and fewer transport options. Increasing investment in public transport networks is therefore crucial when it comes to tackling inequality in cities and thereby bolstering urban resilience.¹¹⁷

As urban resilience also depends on equality in access to services, digitalisation in transport may provide another new challenge. Those with lesser means or no access to digital tools may find themselves be excluded from new choices such as shared mobility, on-demand services and mobility as a service options if they do not receive sufficient guidance and training. (See also [Chapter 2](#) on the urban economy and work).

¹¹⁶ In the EU, around 88 million tonnes of [food waste](#) are generated annually with associated costs estimated at €143 billion. At the same time, [Eurostat data](#) (2018) indicates that 33 million people cannot afford a quality meal (including meat, chicken, fish or vegetarian equivalent) every second day.

¹¹⁷ B.Clayton, [Five steps cities can take to tackle inequality](#), Article, Centre for Public Impact, March 2018.

6. Urban growth in the world: Ever bigger cities or new cities?

The world is urbanising at pace and this trend is set to continue in the decades ahead. Over half of the world's population already live in cities ([55 %](#) globally compared with 74 % in Europe) and the share of the urban population is set to reach almost 70 % by 2050. This trend is driven by several factors, e.g. demographic growth in urban areas – particularly in Africa and southern Asia, migration from rural to urban areas for economic and demographic reasons, and migration driven by conflict ([most refugees](#) live in cities). Future urban growth will be concentrated mainly in Africa and Asia, with India, China and Nigeria [expected](#) to account for 35 % of projected growth by 2050. The 50 urban agglomerations in the world with populations already over 300 000 people and expected to experience the fastest population growth from 2020 to 2035 are all in Africa. Asia's cities however, particularly in China, India and Pakistan, will also continue to grow. This trend will pose new challenges and raise sustainability issues relating to poverty and social inequalities, pollution, city planning and land use. The question is whether megacities can continue to grow and multiply in number while respecting sustainability objectives and overcoming current challenges. Planners are meanwhile seeking ways to build new cities from scratch on the basis of sustainability concepts.

6.1. Megacities: An enduring success story?

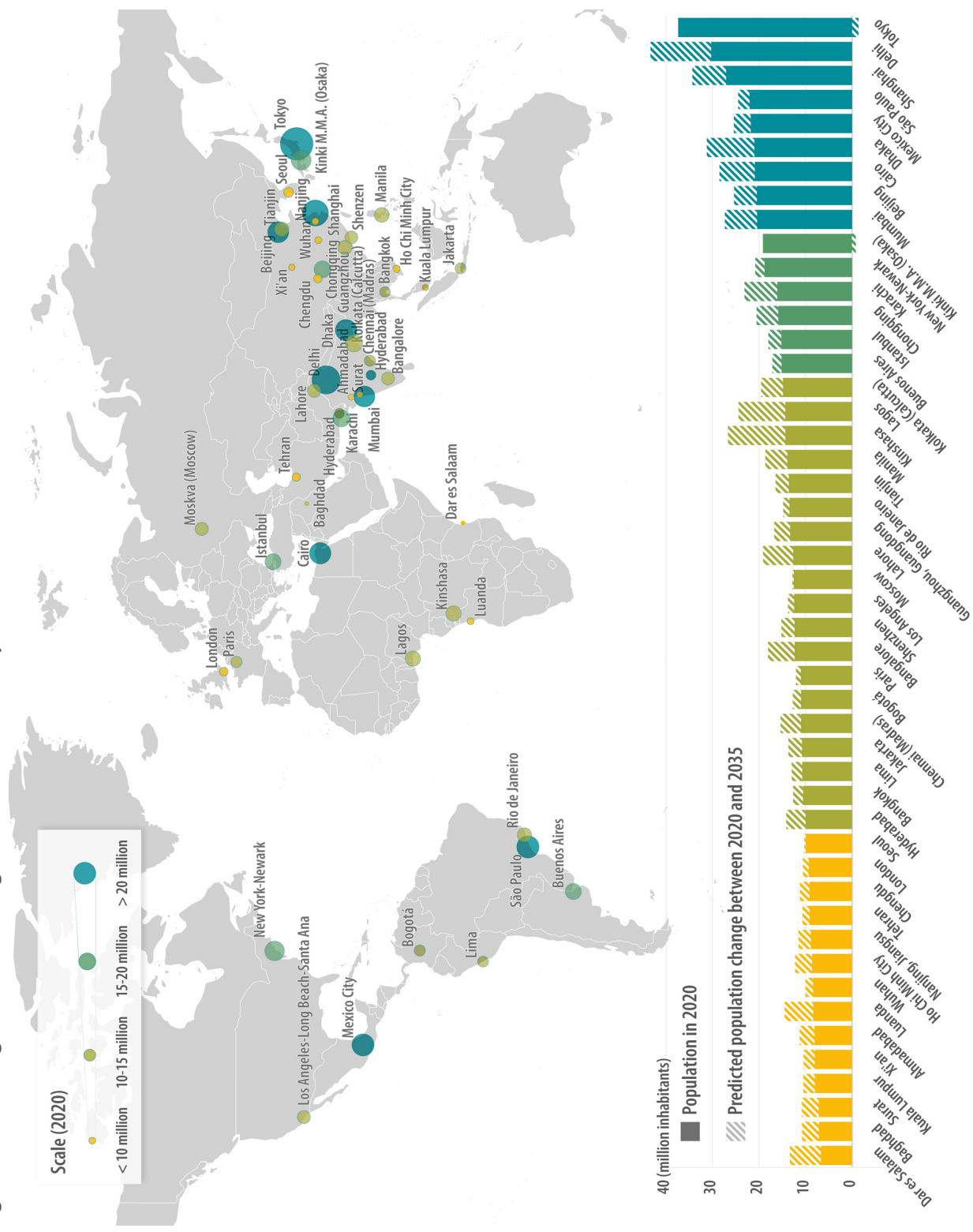
In less than a century, since the emergence of the first megacity – New York¹¹⁸ – megacities have spread all over the world, in developed and less developed countries (see Figure 8). According to UN estimates, there are 34 megacities in the world, distributed over four continents – Australia is the only continent with no megacity. China and India each have six megacities; Brazil, Japan, Pakistan and the United States each have two; the EU has one: Paris, as do Russia and Turkey – each with a megacity in their European part (Moscow and Istanbul).

With over 10 million inhabitants, megacities have populations greater than most EU countries and their economies are [comparable](#) to many medium-size or even large national economies (Tokyo's economy is comparable to that of Canada). They are important centres of finance, industry and services, but are also global or regional connectivity hubs, as well as engines of innovation and major centres of culture and education. To take two examples from the top and the bottom of the wealth scale, [Tokyo's metropolitan area](#) represents almost 20 % of Japan's GDP. [Lagos](#) in Nigeria contributes 25 % of Nigeria's GDP (as of 2018) and its GDP is equivalent to that of 24 African countries added together. Lagos also accounts for over 60 % of country's industrial and commercial activities. In the EU, Île-de-France, the region including Paris and most of its [metropolitan area](#) accounts for [31 %](#) of France's GDP and almost 4.6 % of the EU's GDP.

A megacity is usually defined as an urban entity with over 10 million inhabitants. This threshold is used, for example, by the UN Department of Social and Economic Affairs (UNDESA). Defining a city's boundaries in order to apply this threshold is not without difficulties however. There is no official definition of cities or urban areas at international level, which makes inter-country comparisons difficult. For this reason, according to the [UN Urbanisation Report 2018](#), 'it is advisable to base the measurement of a city's population on territorial boundaries that may differ from those established by administrative decisions'. The population data provided by the UN may thus differ significantly from population data provided by national authorities. Thus, Tokyo is considered to be world's largest megacity with over 37 million inhabitants based on UN data, but the population living in the area governed by Tokyo's [metropolitan government](#) is less than half of this.

¹¹⁸ While the city proper is smaller, the metropolitan area had reached the 10 million mark by the 1930 (see W. Cox, '[The world's ten largest megacities](#)', Huffington Post, 2015).

Figure 8 – Existing and future megacities in the world by 2035



Data source: [UN World Urbanisation Prospects, 2018.](#)

6.1.1. Social and environmental sustainability of megacities

Megacities have been powerful [engines](#) of economic and technological development. In the public awareness, they are iconic symbols of prosperity and cultural diversity, but this image obscures persistent social and economic cleavages. Despite a robust economic and financial outlook for megacities, there is a need to strengthen their future sustainability in the face of multiple social, but also environmental, challenges.

Most megacities will continue to grow at significant rates (see Figure 8). Of the megacities to qualify as such by 2035, the frontrunners in demographic growth between 2020 and 2035 are located in Africa in line with general urbanisation trends: Dar es Salaam and Luanda. Their growth will however slow down in comparison with the 15 years prior to 2020 when they more than doubled their populations. Overall, by 2035, the world is set to add another 14 megacities, of which four will be located in China: Chengdu, Nanjing-Jiangsu, Wuhan and Xi'an-Shaanxi, and two in India: Ahmadabad and Surat.

Numerous challenges result from the sheer magnitude of megacities, often relating to quick demographic growth. While some, particularly those in developed countries, recorded only modest population increases in the period 2005 to 2020 (Paris, Tokyo, New York-Newark, Los Angeles-Long Beach-Santa Ana, Kinki M.M.A. (Osaka) and Seoul – all less than 10 %), others – particularly those located in developing countries (see African examples above) – saw their populations increase by more than 50 %. The [New Urban Agenda](#), adopted at the 2016 United Nations Conference on Housing and Sustainable Urban Development (Habitat III) and endorsed by the UN General Assembly, highlights that the pressures of population growth and rural-to-city migration are increasing dramatically. Growing inequalities, economic exclusion and spatial segregation as well as environmental degradation remain major obstacles to sustainable development worldwide in cities.

Even if per capital GDP tends to be significantly higher in megacities than in the rest of the country where they are located,¹¹⁹ megacities are places of huge social inequalities, where extreme wealth cohabits with extreme poverty. Some of the world's megacities are among the cities with the [highest inequality index](#) (GINI index): London, Lagos and Rio de Janeiro. This problem is exacerbated by very high housing prices, which make access to adequate housing difficult for lower income households and newcomers. Social polarisation and persistent poverty in some of their parts are also the marks of megacities in developed countries, such as in [Paris](#) and the [Île-de-France](#) region. The poorest residents of megacities in developing countries often live in informal settlements, e.g. [Rio de Janeiro](#), [Mexico City](#), Lagos, Dhaka or Mumbai. Many of the residents of informal settlements have no access to electricity, drinking water or sanitation (this is a serious problem in [India](#)). Security of tenure and land rights are a major problem for inhabitants of informal settlements, according to [UN Habitat](#). Informal settlements are often faced with the problem of organised crime and weak law enforcement by state authorities. Under the [New Urban Agenda](#), UN member states pledged to transform informal settlements into proper urban areas. In China's megacities, the social polarisation problem takes a specific dimension, as urban migrants to large cities are often deprived of the right of residence and many other related rights (such as public education, medical care, and unemployment benefits). This is due to the [hukou system](#) that denies many newcomers legal resident status.

Megacities also face demographic challenges. While they absorb much of the population growth of rural areas, they witness very low birth rates. Shanghai has among the [lowest fertility](#) rates in the world, with one-third of the replacement rate, and other Chinese cities are suffering a similar fate.

¹¹⁹ Providing exact data is however difficult since urban agglomerations as defined by the UN do not necessarily overlap with national level statistical divisions and administrative boundaries.

This problem is particularly acute in the megacities of developed countries, such as [Japan](#), the [US](#) or South Korea. In Paris, however, the [fertility](#) rate is higher than in the rest of France. African megacities, including Cairo, are outliers, as they are expected to continue experiencing high fertility rates, which will contribute to the rise of their population possibly more than rural migration.¹²⁰

Megacities generate an important share of the world's GDP but at the expense of consuming many resources above the world average and causing significant pollution. A 2015 [Carnegie Council](#) report found that 'the 6.7 percent of the world's population that lives in megacities produces 12.6 percent of global solid waste, and consume 9.9 percent of global gasoline and 9.3 percent of global electricity'. New [research](#) by Frontier Inventories shows that 'Just 25 mega-cities produce 52 % of the world's urban greenhouse gas emissions'. This assigns to megacities a central role in humanity's efforts to achieve environmental sustainability.

Lagos, Africa's largest megacity

Lagos is Nigeria's economic heart. With already over 20 million inhabitants, it is Africa's largest city and will continue to grow significantly. Rapid [expansion](#) has brought the city growing slums and unplanned settlements, with very limited access to basic infrastructure and services. Land tenure in slums is insecure, with some of these being [suppressed](#) to make room for real estate projects. Traffic congestion is a major problem. The city has a limited public transportation network based mainly on buses (in 2008 it [introduced](#) Africa's first Bus Rapid Transit system). It has introduced water routes and has a [plan](#) to build urban railways.

Due to its geographic location on the coast, Lagos' streets are often flooded in the rainy season and the city is particularly vulnerable to rising sea levels. Makoko, an informal settlement, 'Africa's Venice', is built on stilts and people move around in canoes. Various [architectural designs](#) for floating buildings have been proposed to make the city more resilient.

The city is characterised by major [social cleavages](#) between rich and poor. Street criminality is a big challenge, but the police also uses disproportionate [violence](#).

6.1.2. Megacities: Resilience despite major challenges?

Large cities have been the drivers of new trends for centuries, whether in politics, economy, science and innovation, or culture and education. Today's megacities have been at the forefront of globalisation. Some of them are the world's most important financial centres (such as London or New York), others are the world's largest manufacturing hubs (particularly the Chinese megacities), while others are also important centres of services. This also exposes them more to negative trends and developments, as recent decades have shown. However, megacities have proven a remarkable resilience in overcoming crises:

The 2008 **financial crisis** began in London and New York before afterwards engulfing much of the developed world, but the two cities¹²¹ were quick to bounce back. Some of the megacities, because of their iconic image and economic importance, have been among those hardest hit by **terrorist attacks**, starting with New York in 2001, followed by London, Paris, Moscow, [Istanbul](#), [Mumbai](#) and [Bangkok](#). Megacities have also been on the front line during the Covid-19 pandemic, with New York, London, Paris and Delhi among the worst affected. The **pandemic** began in a large Chinese city, Wuhan, which, with its current 8.5 million inhabitants is not yet beyond the 10 million mark, but it will surpass it by 2035 to become a megacity. [Wuhan](#) has recorded quick demographic growth, more than tripling its population from only 2.5 million inhabitants in 1980. Its population density was one

¹²⁰ See L. Vastapuu, M. Mattlin, E. Hakala, P. Pellikka, [Megatrends in Africa](#), Ministry for Foreign Affairs of Finland, 2019.

¹²¹ See e.g., LSE, [The economic recession – Why London escaped lightly?](#), 2011.

of the [factors](#) that made it a breeding ground for viral diseases, but experts¹²² remain divided on whether population density predisposes cities to epidemics. Some have predicted an **urban exodus**¹²³ from the world's largest cities, particularly in developed countries in the aftermath of the pandemic, as many employees can take advantage of the new digital working methods implemented during the pandemic, but this has yet not happened. Until now, in their recent history, no megacity has experienced a Detroit-style continued economic and social [decline](#).

Megacities are also at the forefront of political change and **political protest**. Cairo's Arab Spring in 2011, New York's Occupy Wall Street movement the same year, the Yellow Vests protests in Paris (which began in smaller cities but took on their largest and most [violent form](#) in Paris), and the 2020 protests against police brutality in Lagos all demonstrate that megacities are places that galvanise people's discontent and political claims. Megacities in less democratic regimes, such as [Moscow](#), [Istanbul](#) and [Bangkok](#), have also been on the front line of public protests and civic action. Megacities are major destinations for international migration and are known for their **cosmopolitan** and tolerant culture. This is not only true of the developed world's megacities. The [population](#) of Lagos state comes from 19 African countries. Megacities have mostly been spared the rise of populist and nationalist movements, although worrying recent events such as the [violence in Delhi](#), or the [mistreatment](#) of Africans in the Chinese city of Guangzhou, both in early 2020, broke with this trend.

With their huge infrastructures, megacities are particularly vulnerable to **critical infrastructure failure**. The 2003 black-out left New York without electricity for a day, but its [harmful impact](#) was limited. With the increased digitalisation of urban infrastructures and services, the risks are becoming more significant. The future megacities could also pose unmanageable risks in terms of security in the event of a civil conflict or other military attack given their sheer size and complexity. A video produced by the Pentagon, published in 2016 by [The Intercept](#), warns that current military doctrine would be unable to deal with insurgency in a megacity. Many megacities are particularly exposed to the effects of climate change, such as sudden extreme weather events or rising sea levels, because of their coastal location.

With their economic and demographic weight, megacities inevitably also play an increasing role beyond the borders of the countries where they are located. Some experts¹²⁴ have been exploring the possibility that some might become independent city states – facilitated by the location of many megacities on the coast. Supporting this argument, some commentators point out that, historically, [cities](#) have endured much longer than states, with nation states a relatively new phenomenon. As big consumers of resources – from food and water to energy – megacities remain however reliant on their hinterlands. While independence remains a farfetched perspective, megacities are increasingly asserting their autonomy internationally, acting as [diplomatic actors](#) in their own right through increasingly influential city diplomacy. Large cities have established international networks to coordinate their action and learn from each other on issues of common interest such as the [C40 Cities Climate Leadership Group](#).

6.2. New cities: The right way to address urban challenges?

Against the backdrop of the complex challenges triggered by uncontrolled urban sprawl, building cities from scratch has appeared to some decision-makers as simpler and cheaper than [renovating](#) existing cities, notably because this avoids the need to work around existing houses and

¹²² 'COVID-19. Why cities are not as bad for you as you think', BBC, December 2020, and 'Population Density Does Not Doom Cities to Pandemic Dangers', *Scientific American*, September 2020.

¹²³ See e.g. 'The urban exodus out of New York City and San Francisco is more myth than reality', *Business Insider*, May 2021.

¹²⁴ On this point, see [City States – The Wave of the Future?](#), Futures Platform, 5 November 2019; Calls for independence among megacities first emerged in London after the Brexit referendum.

infrastructures, and to face opposition from existing inhabitants. Since the 1990s, more than [150 new cities](#) have either already been built or are being built from the ground up. Most are in emerging countries, mainly in Africa and Asia. In 2020, there were 20 new cities in the making in Morocco, 11 in Tanzania, and over 10 in Indonesia.

Governments and city planners often present new cities as a way to cope with fast demographic growth and environmental challenges. They are believed to ease mobility, be more resilient to climate change, and foster economic development, as well as being smart and improving their inhabitants' quality of life. However, before the dream can become a reality, massive investment is needed in a short amount of time. Private-public partnerships or even fully private undertakings, used to avoid too big an increase in public debt, often go hand in hand with relaxed urban planning rules, alternative economic regulations, and privatised local governance, enforced through private security agencies rather than regular police forces, as the following examples show.

According to [Sarah Moser](#), director of the Urban Studies programme at McGill University, 'evidence suggests that they are producing [social exclusions](#) on an unprecedented scale'. The seductive traits of several new city projects are an elusive dream for many. Some new cities have their privileged targeted populations, and 'by design' exclude social, ethnic or religious minorities, for example by not providing them with adequate places of worship or job opportunities. In addition, 'from scratch' does not mean that new cities are built on a no-man's land; their site is acquired from previous residents, herders, farmers, fishermen and women, who are separated from their sources of livelihood. Building new cities, despite [endeavours at sustainability](#), profoundly modifies local ecosystems. In addition, some new cities do not live up to initial expectations, mostly because the initial plans envisage amenities that few can afford, while failing to grasp the [complex needs and behaviours](#) that form the basis of social life.

A flagship of Chinese policies: Xiong'an in China

Since the 1980s, China has built or launched dozens of new cities, some have become major economic hubs, such as [Shenzhen](#) or [Pudong](#), other are more modest or [less successful](#). The share of population [living in the cities](#) has risen from 36 % in 2000 to 60 % in 2020 and is predicted to keep on this track at a steady pace. On 1 April 2017, China's government [announced](#) the building of a new city in Hebei Province, 100 kilometres southwest of Beijing, the congested capital with 22 million inhabitants. This city – in reality, like several 'new cities' in China, a new conurbation that will encompass existing villages – [Xiong'an New Area](#), is aimed at relieving Beijing of its '[non-capital functions](#)' – i.e. activities not directly related to national politics or international politics – such as businesses, universities and research. It is also well-connected with the capital, thanks a new [high-speed railway](#), inaugurated at the end of 2020, which brings the two cities within [less than one hour](#) of each other. Three other high-speed train lines and three airports will connect Xiong'an to other parts of the country.

Technological innovation is at the core of China's sustainable development policy, as described in its [voluntary national report](#) (a self-assessment) on implementation of the 2030 agenda. The Xiong'an New Area project also pledges to [preserve](#) the environmental assets and cultural heritage it encompasses on its [1 770 km²](#) territory, of which no more than 530 km² will be devoted to construction. This is in line with China's new [urban development policy](#) – and with the new doctrine of the Communist Party, which now values the '[excellence](#) of traditional Chinese culture' – The

Figure 9 – Map showing location of Xiong'an New Area



challenge is huge, as Hebei is one of [most polluted](#) provinces in China. Xiong'an New Area includes Baiyangdian Lake, the largest freshwater lake in north China; the lake however has been [polluted](#) by the former surrounding industries, now closed and displaced to other parts of the region. The lake is currently being depolluted while water from the Yellow river has been [diverted by 482 km](#) to regulate the lake's water level and improve its ecosystem. Xiong'an also intends to be a model city for [the post-Covid era](#): the winner of a 2020 international competition, Vicente Guallart, proposes to build a self-sufficient city, with mixed-use blocks offering housing, working spaces and services at walking distance, but also greenhouses and solar panels, so that possible future lockdowns do not disrupt food and energy supply.

Xiong'an New Area has the status of a [special economic zone](#), which typically combines economic opening and support for innovative industries. The investment that the city would draw has been estimated at between €150 billion ([2017](#)) and €600 billion ([2019](#)). Prominent firms Alibaba and JD (e-commerce), Tencent (the developer of some of the web services most used in China, such as Weibo, the 'Chinese Twitter', or QQ messenger) and Baidu (the 'Chinese Google') have announced that they will [set up branches](#) in the new city, a move that is expected to attract subcontractors and foster technological innovation. These firms and others are also involved in several artificial intelligence and [high tech projects](#) with the municipality: self-driving vehicles, unmanned supermarkets, automated goods delivery, intelligent traffic monitoring. The city will also experiment with the [digital yuan](#), based on blockchain technology (central bank digital currency – [CBDC](#)), for the payment of local workers. A 'smart city operating system' will [gather all the city's data in one place](#). Most innovations are based on facial recognition, a technology in which China has become a world leader, and that authorities have used elsewhere in the country, including for [surveillance and repression](#).

Xiong'an already has a population of 1.2 million and it is expected that 6 million people will be living in the new city by 2035. Like Shenzhen and Pudong under Deng Xiaopin, Xiong'an is a flagship of Xi Jinping's policy. A series of declarations – [collected](#) in 2018 by researchers at Brookings – highlight the strong commitment of the Chinese government and the Communist Party to Xiong'an. The municipality is closely monitored by President Xi, who has appointed new regional leaders based on their experience: the new governor of the region was the mayor of Shenzhen between 2010 and 2017, and the new head of Xiong'an New Area was previously an administrator in charge of supervising Beijing's high tech sector. This ensures that every effort will be made for the city to be a success, at least under [Xi Jinping's governance](#).

A sustainable city for the rich only? Neom in Saudi Arabia

In the northwest of Saudi Arabia, near Jordan's borders and opposite Egypt, Neom will stretch out over 26 000 km² – nearly the size of Belgium. The cost of the project, a flagship for [Vision 2030](#), the Saudi plan to reduce oil dependence, and to invest in new technologies, is estimated at US\$500 billion. The Neom area will include a [170-km-long linear city](#), The Line, expected to house a million inhabitants by 2030. [Futuristic by design](#), the city will experiment with drone delivery, flying taxis and automated cars. The oil monarchy has announced that solar panels, windfarms, tidal power stations and a [hydrogen plant](#) will provide for [the city's energy needs](#), which will be monitored in a sustainable way. This is a promise that might face [several challenges](#), given the nature of the terrain (sand and dust might impact on the functioning of solar panels and windfarms) and climate (temperatures reach up to 50°C might require massive use of air conditioning).

Figure 10 – Map showing location of Neom



What sets Neom apart still more is its governance: it is managed and financed by a [stock company run by a state fund](#) and might have its [own justice system](#) – compliant with Sharia law but more predictable than in the rest of the country. The cost of living in this car-free, AI-managed, highly secure, green city is not addressed in the abundant [promotional material](#): some fear that Neom, which will include [five palaces](#) for the royal family and is primarily aiming to attract [innovative firms](#) and [highly qualified staff](#), will not be a model of [social inclusiveness](#).

Neom's settlement has also generated [tensions with the Huwaitat](#), a tribe living in the area that is accusing the Saudi authorities of displacing them from their homeland. The European Parliament called on the High Representative of the Union for Foreign Affairs and Security Policy to [raise the case](#) of Abdul

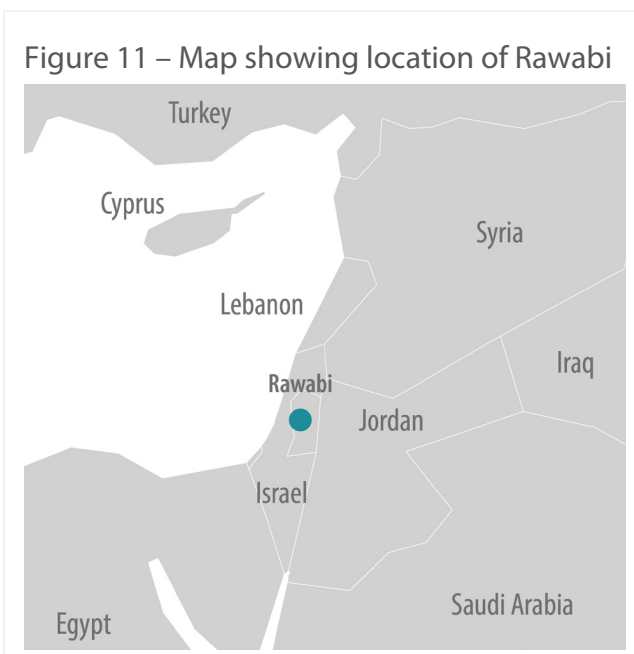
Rahim al-Huwaiti – an [activist killed](#) by the security forces while he resisted eviction in April 2020 – with the Saudi government.

Saudi Arabia has also proposed that Israel and Egypt invest in the project, as a way to strengthen [diplomatic ties](#) and to harness the viability of the project, located near key maritime chokepoints. The potential building of a [bridge](#) between Neom and Egypt, over the straits of Tiran, which separate the Gulf of Aqaba from the Red Sea, would need [Israel's agreement](#), in accordance with the 1979 Israel-Egypt peace agreement. To achieve this, Saudi Arabia might agree to [normalise](#) relations with Israel, as did Bahrain, the United Arab Emirates, Morocco and Sudan in 2020. [Russia](#) has considered investing several billion euros in the project, according to a media outlet considered close to the Russian government; investing in Neom would also be an opportunity for [China](#) to strengthen its ties with Saudi Arabia.

The Line was officially [launched](#) in January 2021, and hotels are expected to open in [2022](#). However, the [assassination](#) of Jamal Khashoggi in 2018 and the [impact of Covid 19](#) slowed down foreign investment and the [pace of work](#).

Reinforcing Palestinian identity or dependence on Israel? Rawabi on the West Bank

The West Bank, an area of 6 000 km² along the River Jordan, has been [occupied](#) by Israel since 1967. Aiming for a two-state solution, the Oslo Accords ([1993](#) and [1995](#)) established a Palestinian Authority and defined three areas in the West Bank (A, B and C). In area A (18 % of the territory), the Palestinian Authority is in charge of most policies, including police matters, however Israel maintains military control. In Area B (21 %), Israel is tasked with full control of security aspects. In Area C (61 %) most policies are controlled by Israel. While the Oslo Accords envisaged a transfer of powers to the Palestinian Authority, this has [not yet been realised](#). The West Bank (excluding East Jerusalem) is currently home to 430 000 Israeli Jews, living mostly in Area C, in 132 settlements and 124 smaller 'outposts'. The EU and most international players consider the [Israeli settlements](#) in the West Bank to be illegal under international law; but that fact is disputed by Israel. Outposts are unauthorised according to Israeli law, but Israel often regularises them retrospectively. At the same time, Israel declines most Palestinian requests for [building permits](#), and routinely orders [demolitions](#) or seizes Palestinian houses in Area C. The [displacement](#) of Palestinians because of demolition, seizures or home building prohibitions is ramping up [demographic pressure](#) all over the West Bank.



In this context, the construction of a Palestinian city in the West Bank has not gone unnoticed. This construction project was taken on in 2007 by the Palestinian entrepreneur [Bashar Masri](#), and work began in 2010. The new city, [Rawabi](#), now lies on a 6 km² area of the West Bank, 10 km north of Ramallah, and 30 km north of Jerusalem. In 2017, Rawabi had between [710 \(census figure\)](#) and [3 000](#) to [4 000](#) inhabitants; 40 000 are expected when the project is completed in around 2030. Rawabi has been financed mainly by a joint venture, one third owned by Masri's company and two thirds by [Qatar's sovereign fund](#) real estate branch. Other investors include private banks and the [Islamic Development Bank](#). While the city is mainly a private initiative, it has been supported by the Palestinian Authority and

is governed by an elected municipal authority. The Palestinian Authority did not follow through on its financial pledge.

Rawabi is in Area A, where the Palestinian Authority has the widest powers. However, part of the main connection to Ramallah is in Area C, under Israeli control. To be able to conduct the works, the Palestinian Authority and Rawabi's builders therefore needed [Israel's authorisation](#) to build a road and transport the materials. In addition, Israel, which *de facto* [controls water supply](#) in the West Bank, delayed [authorisation for a water pipe](#) until 2015, an issue that triggered a [European Parliament](#) question to the EU High Representative. This delay caused some future residents to pull out, and put the project on the edge of bankruptcy. The first residents eventually [moved in in 2016](#), three years behind schedule.

Rawabi has both supporters and opponents on both the [Israeli](#) and [Palestinian](#) sides. Israeli settlers worry about the consequences of the neighbourhood for their security, while Israel's Coordinator of Government Activities in the Territories on the contrary believes it 'would not affect the [security balance](#) and would provide an excellent solution to the housing shortage in the West Bank'. The

Israeli President at the time, Reuven Rivlin, in a speech at the [European Parliament plenary](#) on 22 June 2016, highlighted the role of the 'private sector as a stabilising factor free of political interests', and cited Rawabi as model for 'a life of dignity and wellbeing' that should accompany Palestinian economic development. Poorer Palestinian villagers in Rawabi's neighbourhood feel excluded from the project, which does not correspond to their way of life or standard of living. Furthermore, the Palestinian Authority allegedly [confiscated](#) former parts of the land where Rawabi is being built. Other critics point out that Rawabi is normalising the occupation, as its construction [involved Israeli materials and companies](#) and could not have been conducted without complying with Israel's demands. [Deeper economic relations](#) between Israel and Palestinians, seen by the Oslo Accords and Western donors as key to stability, are considered by opponents to be sidelining Palestinian rights 'in favour of economic gains for an [elite minority](#)'. The suspicion is all the stronger since Bashar Masri, founder of Rawabi, has been [chairman of PADICO](#) the largest Palestinian holding in the Palestinian Authority, reputed to be [influential](#) in Palestinian Authority policy-making. Masri argues that the works have created 6 000 jobs and that cooperation with Israeli firms is unavoidable since 'the cement comes through Israel; the electricity is [all Israeli](#)'. Supporters of the project contend that building Rawabi is a way to [prevent](#) the area from being confiscated by the ever-growing Israeli settlements 'maybe [10 times](#) what they used to be during Oslo'.

Rawabi is a strong symbol: situated on a hill opposite to Ataret, an Israeli settlement, it marks the willingness to build a Palestinian state on the West Bank. Rawabi is [advertised](#) as are many new cities: as green and smart. It aims to attract [high-tech firms](#) and middle class residents with real estate prices [cheaper](#) than in Ramallah, but beyond the means of many Palestinians. Rawabi is testing the universality of the new city model: for its supporters, Rawabi demonstrates that [Palestinian identity](#) is not a thing of the past, while some critics fear that the economic development envisaged in Rawabi will further reinforce [Palestinian dependence on Israel](#) – as it is based on imported products and the destruction of arable land – and advocate on the contrary for the [preservation of rural know-how](#) in order to develop [self-sufficiency](#) based on local resources.

A vision of the African city of the future departing from the mainstream smart city concept

[Sénamé Koffi Agbodjinou](#), a Togolese architect, is not (yet) involved in building a new city in Africa. He has however launched a project in Lomé, [HubCité](#), setting out his vision for the future of African cities, which departs from the [mainstream smart city concept](#). According to him, smart cities are targeted at [wealthy populations](#), as they are based on high-tech technologies whose maintenance risks generating indebtedness. Furthermore, if these technologies are not open to citizens, smart cities will not break away from the [centralised model of governance](#) and will devolve this governance to tech giants. He sees this as a concern for data protection and democracy.

On the contrary, Mr Agbodjinou thinks new cities should reproduce the characteristic traits of African villages, such as mutual aid and the sharing of resources. On the scale of a village, collective participation, for example, in building a house, creates a social debt for those benefiting towards their fellow villagers. At village level, this is traced in the collective memory; and this social debt or credit can be negotiated in further bartering arrangements. This is more difficult on the scale of a city, where social relations are not so intricate across the territory. New technologies, notably based on distributed models such as [blockchain](#), could help spread a more direct democratic decision-making system. In addition, while Western cities are not self-sufficient notably for food supply, new cities should embed their own rural reserves. This would at the same time create a better awareness of the impact of consumption on nature, while lowering it, notably reducing CO₂ emissions from transport.

The model of the new city advocated by Sénamé Koffi Agbodjinou is being tested in Lomé. It is based on a '[fab lab](#)' currently designed to develop solutions to manage a territory of 1 km². Thanks to a network of citizens, previously abandoned territories that had become waste dumps have been

transformed in collaborative vegetable gardens, which feed a central cellar. A collaborative database meanwhile helps to signal waste, which is then [collected and transformed](#). A local currency, the Woe, rewards participation in collective projects and allows people to pay for local products, e.g. from the central cellar, and services. The same system could be applied on a greater scale, Mr Agbodjinou believes, thanks to a network of fab labs of this kind. This would need political support however, which he has not yet secured. Sénamé Koffi Agbodjinou is now considering¹²⁵ promoting his vision standing for office in the 2025 presidential elections in Togo.

¹²⁵ Interview in [Big Bang magazine](#), April 2021.

7. Looking ahead

Exploring the impact and implications for the future of cities of the global trends identified in the ESPAS [report](#) offers insights into how cities might evolve in some key areas. In the governance area, cities' competencies will likely continue to increase, in particular in relation to global challenges. Cities will also gain in autonomy, affirming themselves as global actors through their established connections. Simultaneously, participatory mechanisms and related digital instruments will foster citizens' engagement. In urban planning and construction, sustainability and climate change risks will have greater influence, while housing becomes less affordable and scarcer. In the area of the urban economy, digital and green transformations will offer opportunities for economic growth and innovation, but labour market changes to the 'jobs of tomorrow' will require attention. In the transport sector, both private and public transport are evolving towards electrification, alternative fuels and automation, but the whole system of mobility might be subject to more fundamental change.

The global trends explored have a variety of positive and negative effects for each area and within them. The consequences of the trends will bring both challenges and opportunities for urban resilience. The resilience of cities will be determined by their ability to respond to expected developments, but cities would also do well to adopt 'safe to fail' strategies, in order to be prepared for unforeseen shocks and stresses.

Resilience to one kind of event or disturbance can however come at the expense of resilience of the system to another kind of disturbance.¹²⁶ For example, more frequent sudden shocks that are likely to affect cities, such as floods and storms, migration crises, or health epidemics, will put increased strains on cities to adapt and recover. Processes such as industrial transformation through digitalisation and automation can offer solutions. They can however also affect inclusiveness by reinforcing inequalities and reducing the accessibility of services for some. Digitalisation can have an ambivalent impact. It can help towards more efficient governance, but those parts of society that have not adopted digital tools can suffer exclusion. Efforts to address climate change will lead to transformations in the urban environment and infrastructure, with the potential to improve resistance to shocks and stresses. Simultaneously, changes can create new vulnerabilities (e.g. greater dependence on electricity and digitalisation, greater risks relating to network failures and cyber-attacks). How improving resilience in one area could adversely affect resilience overall or in another area deserves further consideration, in order to further the urban resilience discussion. Meanwhile, a comparison of European cases with global developments such as megacities and 'new cities' offers a different perspective and useful insights for the purposes of analysing urban areas in Europe.

The numerous trends that may shape cities and urban life call for greater use of foresight. Developing local foresight capacities or building the local dimension more effectively into global, European or national foresight analyses could help cities take strategic decisions to increase their resilience. At EU level, the European Commission's strategic foresight reports constitute a new instrument to study trends and resilience. The first annual strategic foresight [report](#), published in 2020, proposed to integrate strategic foresight into EU policy-making, introduced resilience as a new compass for EU policy-making and discussed the role of strategic foresight in strengthening the resilience of the EU and its Member States. As a follow-up, the Commission is also developing [indicators](#) to analyse resilience. The 2021 [report](#) frames the discussion around four megatrends: climate change and environmental challenges; digital hyper-connectivity and technological transformation; pressure on democratic forms of governance and values; and shifts in the global

¹²⁶ H. Thoren, 'Against general resilience', in M. Burayidi, A. Allen, J. Twigg and C. Wamsler (eds.), *The Routledge Handbook of Urban Resilience*, Routledge, 2020, p. 28.

order and demography. Additional input is provided by European Parliament studies that [map structural risks](#), identify [capabilities and gaps in the EU's capacity to address structural risks](#), and propose [options to enhance the EU's resilience to structural risks](#). Analysis of the relevance of such reflections and findings for urban resilience, including analysis of the usefulness of the indicators being developed by the Commission for urban resilience could provide some guidance for cities when preparing for the future. These various instruments could also offer an incentive and useful basis for cooperation between cities aiming to develop their own resilience indicators.

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Cities are inevitably affected by shocks and disruptions, the pandemic being a case in point. The extent of the impact however depends on cities' preparedness and capacity to adapt. By thinking ahead, cities can explore emerging or plausible developments in order to anticipate them and contain potential disruption. Drawing on a report prepared by the European Strategy and Policy Analysis System (ESPAS), this EPRS paper explores the impact on and implications for cities of current global trends, such as climate change, population growth, urbanisation, economic growth, increasing energy demand, higher connectivity and a changing world order, that will have direct consequences for the future of cities and their inhabitants.

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