URBAN DEVELOPMENT AND PLANNING IN THE AGE OF MEGACITIES
AN OVERVIEW OF GLOBAL TRENDS AND CURRENT PRACTICES
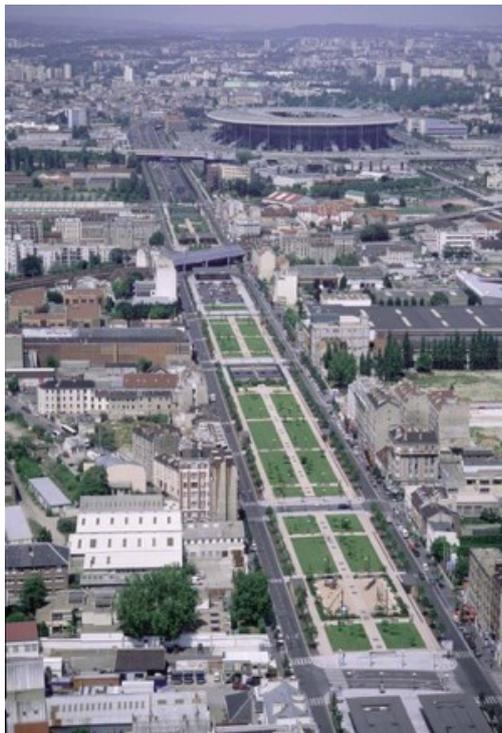
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Contents:

EXECUTIVE SUMMARY

Following an agreement between MUF and ISOCARP in 2015, a team of six international experts studied eleven cases of major international cities as a sample of the trends and issues in global urban development. Upon completion of the eleven separate reports, the key findings and conclusions have been compiled into a final, synthesis report. Its main outcomes are summarized here as the *Findings, Conclusion* and *Recommendations*.

The purpose of this research project was to produce a global overview of the key trends in urban development and urban planning of very large cities in a manner that would assist in the management of Moscow and other big cities in the Russian Federation. The particular focus of this project is the role of mega-projects and mobility in shaping the overall urban form of megacities.

The economic, cultural and environmental significance of very large cities keeps growing. The planning and management of large cities is generally recognized as one of the most difficult and important political and technical tasks imaginable. Megacities dominate all major national economies with their decision-making power and financial levers; they generate the emerging global culture which defines how millions live, work, consume and dream; and they consume the planetary ecosystem faster than any other human creation, while at the same time – because of their concentration of population and know-how - they are our best chance at preventing global ecological calamity.

In the coming decades, megacities will have to invest trillions of dollars into new and upgraded urban infrastructure. Proper targeting of this urban 'project of the century' will determine whether humanity successfully navigates the social, environmental and political challenges of the next few decades.

In an attempt to assist MUF and the Government of Moscow to be key players in global decision making about the future of big cities, we present here the *trends*, *issues* and *practices* in eleven global cities. They have been carefully chosen to be representative in a number of ways of the global urban scene:

• Paris
• Mumbai
• Hong Kong
• Wuhan
• New York
• Dubai
• London
• Johannesburg
• Gdansk/Gdynia
• Buenos Aires
• Auckland

THE KEY FINDINGS are that:

<u>Continued demographic, economic and physical growth</u> is the condition common to all eleven case studies. And while that growth generates an ever greater array of ever more complex problems, the ambition for more growth does not cease. The dominant objective in all cases is economic growth - more investment, more return on investment, more jobs. Social, cultural and environmental agendas are on the wish-list too, and sometimes even highlighted as a prime aspiration. However, the reality is that spatial development is mainly

driven by commercial investment, which the public sector readily supports with more infrastructure. Some developments are even plainly detrimental - in the way they exacerbate existing problems – yet, they go ahead anyway. In other cases, there are genuine attempts to produce socially responsible and environmentally restorative forms of urban growth.

Mega-projects are a prominent feature in all large cities, and megacities in particular. They come in two types: mega-projects which are site-defined – sited at a particular location in the city – and mega-projects which are function-defined – planned over the entire city (as is typical of large infrastructure projects, housing programmes, or urban greening and beautification). The role of strategic spatial master planning is critical in these projects. Master planning can either take note of the larger urban context and effectively assist in an overall strategy of polycentric development, or, it can ignore the context and focus on the project's narrow bottom line. The latter approach, however, hurts not only social and environmental agendas, but also the project's own long term viability and attraction. In some cases mega-projects have had a major positive impact on the transformation of the entire city - whether by plan, or accident. These cases show that one of the most effective strategies to implement a city-scale transformation – a notoriously ambitious endeavor because of its gigantic scale – is through a coordinated set of mega-projects.

Urban form and mobility continue to dominate the urban development discourse. Faced with the challenge of reducing their greenhouse gas emissions, many cities are combining their mobility and sustainability strategies. The 'compact city' has become the mainstream paradigm of an urban environment model which ticks all the boxes – liveable, prosperous, sustainable. Overall, *polycentric development* and *compactness* (density) of urban fabric seem to be the most common preferred spatial pattern, along with the aspiration to accomplish such re-configuration within the existing city rather than allowing more urban expansion. But aspirations are one thing, and the reality is another: megacities continue to grow both up and out. In fact, they grow out much faster than up and this is too often overlooked in the official planning's enthusiasm for density and 'intensification'. *Urban sprawl will not go away – most likely, we will see more of it.*

Urban infrastructure projects dominate the scene. The normalized 20th century view that 'you can never have too much urban infrastructure' still rules, despite the calls for recognizing and respecting the limits of the planet. Some projects are about supporting more real estate and little else, others are about improving public health, greening the city and restoring the ecosystem; yet, all of them invariably increase our cities' ecological footprint. *A radical revision of the whole idea of urban infrastructure is urgent* – the purpose, the spatial configuration and the technologies that enable it. Huge, centralized, fossil-fuel powered systems are increasingly problematic.

THE KEY CONCLUSIONS after reviewing the eleven case studies are that there are some salient *similarities*, as well as some prominent *differences*, among the study's megacities:

The Similarities are:

The enormous complexity of both the problems and the solutions. They involve multiple aspects and agents - political, governance, management, legal, economic, social, cultural, aesthetic, environmental, and security issues. This is why, typically, urban problems fall into the category known as 'wicked problems'.
Almost everywhere, urban political and economic leaders desire to be big players on the global stage and compete for investment and talent in the global race for a 'smart (knowledge) economy'.

Declarative promotion of social and environmental agendas along with the economic agenda is also a common practice. But the aspiration to attain balanced development rather than crude economic growth is rarely achieved in reality.

Dilemmas over compact growth vs urban sprawl, and public transport vs private mobility are common. In most cases the former is the norm and aspiration, but the latter is still dominant in reality.

The Differences are mainly about the preference for, or the dominance of:
- horizontal vs vertical growth;
- planned vs organic development;
- short-term interest and pressures vs long-term considerations and concerns;
- the economic/commercial vs environmental/resilience agendas.

It may be generally observed that the more mature megacities - which generally belong to the more developed nations and economies - prefer, and encourage by employing various planning instruments:
- intensification over expansion;
- strategic over ad-hoc planning;
- long-term vision over short-term gain;
- a serious concern about the environmental impacts of urban growth.

An additional point in this discussion is the uneven relevance of the eleven cases for Moscow. Arguably, cities need to be at least of similar size, shape and age to be comparable. Based on such criteria, it is probably fair to say that Paris, Wuhan, New York, London, Johannesburg and Buenos Aires have more significance for Moscow's conditions, than Mumbai, Hong Kong, Dubai, Gdansk-Gdynia and Auckland. Having said that, it is equally true that even these cities which are either smaller, or younger, or have a different topography, have something to offer Moscow (particularly Hong Kong with regard to transport, and Gdansk-Gdynia regarding what to do with derelict industrial sites and perhaps even Auckland with how *not* to plan for intensification!).

THE KEY RECOMMENDATIONS for the planning of all of the main subjects of this report – mega-projects; mobility strategies; urban metropolitan form; megacities themselves - are:

Regional Approach - Adopt a regional scale metropolitan master plan with explicit, balanced sustainable development goals and a clear spatial strategy. Megacities are not just cities - they are also regions. This is why the terms *'urban regions'*, *'regional cities'* and *'city-regions'* are ever more in common use. Planning for the full extent of megacities' territorial influence is the only way to maximize benefits and minimize costs – particularly social and environmental. Planning *satellite settlements* at well-connected locations outside the city proper is an important component of regional urban planning.

Urban Form - The *compact city* and *polycentric development* are the key concepts. They are not in contradiction; rather, they are complementary. They cannot eliminate urban sprawl, but they can ameliorate its excesses. We should let sprawl do what it can do well - a house-and-garden lifestyle for those who want it, and a high degree of self-sufficiency which the distributed technologies now make possible. Large cities need many centres; hence intensifying selected, well-connected locations makes sense economically, socially and environmentally. Some of these centres should be outside the city proper, as well-connected, but essentially independent satellite towns and villages.

Regeneration - Focusing on reshaping the city inside the existing urban area is an option superior to urban sprawl but neither will this stop urban expansion, nor should it exclude

self-sufficient satellite towns. Urban planning should identify and mobilise brownfield opportunities and foster capacities for triggering redevelopment projects in existing urban areas, as well as outside of them. A word of caution: redevelopment of disused urban sites is fraught with obstacles which are not obvious in the beginning. It requires an enormous amount of rigorous analysis before construction can begin.

Mega-projects - Large urban development projects are key tools in driving the overall megacity transformation, not just projects in their own right. When *coordinated across the city* and when master planned in harmony and synergy with the local context, they can achieve much more than just a short-term profit for the developer. They can regenerate areas much larger than their actual size; they can help in financing the public infrastructure; and they can act as models for progressive design agendas. However, it is possible that their golden era is over and that they need to be replaced by comprehensive strategies that engage with all sectors and scales of change in the city.

Sustainability and Resilience – Climate change is a serious and growing concern. The *sustainability (mitigation) agenda* is being superseded by the *resilience (adaptation) agenda* as the paramount concern in urban planning. This strengthens the case for polycentric development and a high degree of self-sufficiency in all decisions about urban form and urban infrastructure. At the same time, this shift weakens the argument for higher density, as compactness and concentration of people and assets in principle mean higher risk and more dependency on centralized provision of vital services. From an economic point of view, the sustainability-resilience shift opens new opportunities for innovation and business in the areas of technology, design and planning of decentralized infrastructure and distributed generation.

Overall, the effectiveness of urban planning largely depends on *how well integrated* the planning of land use is with the planning of transportation and other vital infrastructure. Coordination between all sectors and aspects of urban and regional planning is crucial, as is collaboration between the public and private sectors. A genuine *balance between the economic, social and environmental agendas* is crucial. *The environmental agenda is growing in importance and complexity*. It is showing a tendency to split into two distinct, though overlapping, agendas: Sustainability and Resilience. Until now, cities were the engines of ecological destruction. In the 21st century, they must become the *engines of ecological restoration*. Megacities have taken from nature more than other cities, so they should give back more. In the not too distant future, cities might become our principal vessels of survival on a damaged planet.

1. INTRODUCTION: BACKGROUND AND MISSION

In 2015, an agreement was reached between ISOCARP and the MUF about collaboration on the occasion of the Moscow Urban Forum 2016 (Московский урбанистический форум), to be held in Moscow from 30 June to 3 July 2016: http://mosurbanforum.com

Under the agreement, ISOCARP undertook to form a research team which would prepare a global overview of the key trends in urban development and urban planning of large cities, while focusing on successful practices that would assist current efforts to manage the growth and development of Moscow and other big cities in the Russian Federation.

The Moscow Urban Forum is a well-established annual 'international event for discussions between some of world's most acknowledged experts in city planning and urban development [focused on] the opportunities and challenges that are vital for modern megacities and the growth perspectives of global cities':
http://mosurbanforum.com/about

In terms of continuity with the earlier Forums, it is important to note that the immediately preceding Forum was only half a year ago, in December 2015, and that its main outcome was that 'flexible urban management' is the best way to deal with the 'co-existence of various interests' in the city.

This provided some continuity with the 2013 Forum, which considered the concept of the 'mega-city' and acknowledged that '*resolving the problems of the periphery is a key theme throughout the world*'. The Manifesto specifically stated that: *"Moscow has a very small centre, [while the] city is now ten times the size of what it was at the start of the twentieth century [and as a consequence the] hyper-development of the city centre has brought with it traffic jams, ecological and logistical problems."* The 2013 Manifesto went on to propose that: *"periphery is the main resource for our development; [that there were] two types of periphery — industrial zones and residential suburbs; [and that] industrial zones need to be transformed, [while] residential suburbs need to be reconstructed."* It concluded that: *"We need a programme to develop Moscow's periphery".*

The official theme of the Forum in 2016 is: *'Fast-Growing Megacities: Technologies of Dynamic Development'*. The intention is to put Moscow at the centre of global discussion about the future of megacities. The presentations ran over two days – 30 June and 1 July. The 1st day of the Forum addressed the challenges of fast urban growth in the era of technological revolution. The 2nd day was about cities and mega-projects, and cities as mega-projects.

The ISOCARP report was presented on the first day of the Forum, at the Research Session, held in the Bazhenov Hall from 12:00 to 12:45. The video of the presentation is available at https://www.youtube.com/user/mosurbanforum.

The overall aim and purpose of this research investigation is defined in the ISOCARP's Proposal as *"an overview of the global challenges and trends in the development of megacities"*. The words 'examples' and 'solutions' are not mentioned next to 'challenges' and 'trends', but are certainly implied.

This report's mission is to produce a practical and up-to-date review of the battles for coherence, efficiency and equity in a global sample of big cities – eleven of them in our case. We intend to particularly highlight examples of success that contain lessons for Moscow, for other major Russian cities, and for many other large cities worldwide.

2. CONTEXT: GLOBAL URBAN TRENDS

This report is about the key global trends in urban development and planning, with particular emphasis on very large cities and very large projects in them. For the purposes of our investigation, 'very large cities' are cities and city-regions with over 3 million people. We have not limited our case studies to cities above 10 million - as per the internationally accepted convention that a 'megacity' is *"a metropolitan area with a total population in excess of ten million people"*:
http://www.oxforddictionaries.com/definition/english/megacity
https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf
http://www.demographia.com/db-evolveterms.pdf

We took the position that the MUF would benefit more from a sample of all large global cities – cities above 1 million people – than from a rather limited category of 'megacities'. However, nine out of eleven cities in our sample of case studies are above 3 million, and at least six, when viewed as metropolitan areas, or city-regions, qualify as 'megacities' (New York; Mumbai; Wuhan; London; Buenos Aires; Paris).

The subject of 'megacities' and other very large cities, conurbations and city-regions, increasingly dominates the global urban discourse. This is hardly surprising, bearing in mind that megacities' size, number and significance keep growing, suggesting that by the end of the century they will be the dominant form of human existence on the planet. While this is not certain by any measure, the fact is that planning and managing these cities remains one of the most difficult and important political and technical tasks imaginable. Failures in the big city realm are sad spectacles with big political, social, economic and environmental consequences. At the other end, the successes of big cities are celebrated, and as much as possible, widely emulated.

The economic, cultural and environmental significance of very large cities is huge and growing. Economically, they lead growth and development in most countries these days. Socially and culturally, they create and propagate new ideas and have an influence far beyond their physical size. Environmentally, large cities are at the crux of climate change – they are its principal *drivers*, will be its main *victims* and are the principal *solution*. Big cities are the cradles of civilization. But their extravagant and still expanding metabolism pose the main threat to our civilized way of life. However, paradoxically, cities offer the only effective way to prevent global calamity.

Risk and security are becoming a big concern. At the most recent (June 2016) Chicago Forum on Global Cities, half of the agenda was dedicated to subjects named as 'climate change', 'global threats', 'food systems', 'disruptive technologies' and 'violence':
https://www.chicagoforum.org/agenda

The climate concern is growing. Recently, 200 cites, with a combined population of over 400 million, have signed a pledge to reduce their emissions following the Paris Agreement:
http://www.climateactionprogramme.org/news/200_cities_make_climate_pledges

Efforts to prepare cities for the worst impacts of climate change are underway via several international programmes of collaboration, one of which is funded by the Rockefeller Foundation:
https://www.rockefellerfoundation.org/our-work/initiatives/100-resilient-cities/.

A significant international gathering of urbanists in 2016 is the Venice Architecture Biennale, which this year, right after the MUF, included the conference Urban Age - Shaping Cities, staged by the London School of Economics in collaboration with UN-Habitat: https://urbanage.lsecities.net/conferences/shaping-cities-venice-2016
The conference – along with the exhibition - was largely focused on big cities and the unprecedented pace of urbanisation worldwide.

Whatever the exact agenda may be – and it certainly does vary from one city to another - the sheer size and complexity of large cities pose enormous challenges. From the more obvious problems like traffic congestion and housing shortages, to the more intricate and acute problems like the financialisation of the urban economy and the governance of institutional complexity, cities present us with giant, interwoven puzzles. Some problems require physical and spatial solutions, others are more functional, operational and legislative in nature.

According to the World Bank, the economic complexity of cities is now increasingly complicated - with their growing forcing of man-made climate change, while simultaneously increasing their own exposure to the consequences of that change:
" Cities are on the front lines of climate change. They are responsible for more than 70% of global greenhouse gas emissions and bear up to 80% of climate adaptation costs."
The same source, originally focused only on economic growth, now describes a functioning city as not just 'efficient' or 'prosperous' but also as 'inclusive, safe, resilient and sustainable': *"Building cities that "work" – inclusive, safe, resilient, and sustainable – requires intensive policy coordination and investment choices."*
http://www.worldbank.org/en/news/feature/2016/05/13/climate-hotspots-world-bank-climate-action-plan-supports-cities-urban-poor

The immensity of the urban problems is recognized in an editorial article in the MUF's magazine Urban Agenda. Under the section *Paradigms*, the lead article "The Giant Leap" addresses the 'knot of controversial issues' and summarises a 'list of nearly impossible problems':
http://2016.mosurbanforum.ru/special_projects/urban_agenda/urb2015/

The article singles out the issues of liveability in, and sustainability of, the big cities as the paramount problem. It then puts the spotlight on a colossal upgrade of urban infrastructure needed by year 2025 and quotes the global bill for all the new urban infrastructure at an estimated US$20 trillion annually. While it is easy to be impressed by the staggering financial scale of this effort, we should not forget the question that dangles above this global 'project of the century': What kind of urban infrastructure do we really need? One item of discussion at MUF 2014 addressed this important question and described the 'new-generation infrastructure' as multifunctional, flexible, intelligent and as 'infrastructure which forms entirely new urban landscapes, environments and forms of social interactions'.[1]

The possibility that this type of investment – investment into the innovation, development and construction of a new generation of urban infrastructure, targeted primarily at environmental outcomes – was only marginally addressed at MUF 2014.[2]

This is a pity, because such strategic orientation – a focus on *innovating in green urban infrastructure* - would not only bring benefits to Muscovites in terms of a better living

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[1] "Megacity Infrastructure and Redevelopment: New Technologies and Approaches". In Urban Agenda 2015, p 88.
[2] "Ecological Approaches as Drivers of Economic Growth". In Urban Agenda 2015, p. 92.

environment in the city, but *would position Moscow's economy as a future exporter of green urban environmental solutions to other cities in the Russian Federation and the rest of the world.*

This is an important opportunity at the time when the world's cities are increasingly concerned with the possible impacts of climate change, while Moscow is seeking its new economic development strategy, one based on its 'internal resources'.[3] In the words of Moscow Mayor, Sergei Sobyanin: "It is not only about improving the daily lives of Muscovites, but also about giving people confidence that the city is moving in the right direction." [4] While the Mayor did not elaborate on the 'right direction', it can be assumed from his full statement that this 'fight for people', (his words), is about the 'competition for human capital that will determine development of countries and cities', as professor Alexander Auzan defined it at the end of the 2014 plenary session.[5]

Within the above broad outline of urban problems, the megacities represent a particularly important category. Their number is expected to increase from 28 to 41 by 2030. Overall, urban growth is a given, and UN agencies suggest that the only policy option is to make sure that growth is *balanced* (in terms of different size categories and against extreme concentration), *equitable*, and *sustainable*.
https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf

Perhaps the best example of how even the largest cities can transform themselves with mega-projects is Tokyo, with its vision for the Olympic Games 2020:
http://www.climateactionprogramme.org/climate-leader-interviews/the_green_games_tokyo_2020

In this context, the 2016 MUF could significantly contribute to the global discourse on big cities in all three areas of expectation:
- megacities as the engines of economic prosperity;
- megacities as vehicles for social wellbeing; and
- megacities as the means of humanity's ecological salvation.

As part of the MUF 2016 programme of activities, ISOCARP hopes that this report will make a significant contribution to this effort.

3. THE CASE STUDIES

This report is a synthesis based on 11 case studies, produced by six international urban planning experts appointed by ISOCARP.

The cities studied are:
- a reasonably representative sample of the world's 100-odd cities above 3 million   (https://en.wikipedia.org/wiki/List_of_cities_proper_by_population) and 500-odd above 1 million (https://en.wikipedia.org/wiki/List_of_urban_areas_by_population);
- relatively evenly spread across the globe (east-west, north-south; all continents);
- in the range from about 1m to 20m inhabitants; and
- they belong to both developed and developing nations, as well as to diverse cultures.

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[3] "Moscow: Priorities for New Stage of Development" (Plenary Session, MUF 2014). In Urban Agenda 2015, p. 96.
[4] *Ibid.*
[5] *Ibid.*

The initial in the brackets indicate the authors of the case study reports:

Paris (EH)
Mumbai (EH)
Hong Kong (LW)
Wuhan (LW)
New York (TJ)
Dubai (TJ)
London (JB)
Johannesburg (JB)
Gdansk/Gdynia (DKZ)
Buenos Aires (DKZ)
Auckland (DB)

The case studies more or less had a similar layout and contents:

Introduction
Description (the past, the present, the trends, the projection)
Challenges (issues, problems, priorities)
Solutions (implemented>assessment; proposed>expectations)
Discussion (analysis and evaluation)
Conclusion (with recommendations)
References

Their methodologies of scoping, describing, interpreting, analysing and evaluating information differed, but in principle were based on a combination of personal experience (as a resident, participant, observer, or visitor), and on the study of available literature, planning documents, general media, and informant interviews.

The report was presented in a significantly abridged form as an oral, Powerpoint-based presentation at the 1st day of the Forum, as well as in the form of an Executive Summary in Russian and English:
http://isocarp.org/moscow-urban-forum/

The main findings and conclusions of each of the 11 case studies are here:

3.1. PARIS/ILE-DE-FRANCE REGION

The Paris region is changing radically its way of development through the regional master plan adopted in 2013 - *Schéma directeur de la region Ile-de-France* – SDRIF:
https://www.iledefrance.fr/competence/schema-directeur-region

Quality of life, resilience and climate change mitigation are key concerns driving the vision and urban solutions in this plan. The region is facing huge challenges and has now embarked on an ambitious endeavour to create, by 2030, 28,000 jobs and 70,000 housing units per year. While these are merely quantitative indicators, the more important elements of the strategy are the qualitative objectives. For example, in order to reduce the region's GHG emissions, the Plan envisages: less urban expansion, the compact city form, urban intensification and mixed use, poly-centrality, preservation of natural and heritage

resources, cancellation of motorways, and a new approach to mobility. The challenge is to reshape the existing city so that 80% of urban growth is accommodated by urban renewal and densification (today it is 2/3), rather than with more peripheral expansion.

Large urban projects are engines of development for cities. In that context, most of the large urban projects are located inside the existing city. In fact, a lot of opportunity exists due to the deindustrialization process. Saint-Denis Plain, the largest industrial premise in Europe, and the Renault production sites of Boulogne-Billancourt, were already part of a large scale transformation into 'eco-districts'. Currently, more than 1,600 large urban projects are reshaping the city. The regional master plan 2030 identified the main opportunities inside the city as a way of encouraging the local mayors to reshape the city itself and thus reduce urban expansion. It is a complete revision of the concept that was previously based on five new towns, motorways and mass transit, contributing to urban sprawl.

Today, large urban projects are supported by a 200km new ring of automatic metro system – the *Grand Paris Express* - to be implemented in the inner suburbs of Paris. In fact, due to the high price of land and real estate inside the city of Paris, firms are leaving the core part of the agglomeration. Thus the need for mobility and housing are increasing in the more central suburbs. But the Grand Paris Express metro system is not only a transportation mega-project: it is also about 69 new railway stations that are considered as new locations for centrality. The addition of each urban project around the stations is a mega-project itself, with several such locations already designated inside the city.

Urban expansion continues, but in a highly regulated way. For example, one of the mega projects is strictly limited to protect the quality of the regional Green Belt: *Saclay Plateau* is not conceived as a new town. It is based on a concentration of actors of a very high level of research and university institutions from the industrial sector. The objective is to create a powerful cluster of innovation. This part of the Paris agglomeration has the highest concentration of researchers in Europe (more than Boston) with famous research and universities like CNRS, CEA, Polytechnique, HEC, INRA, Supelec and ENS. Such a project cannot be implemented without these existing concentrations of institutional and human skills.

Recent experience with the Paris mega-projects is mostly about taking advantage of redevelopment opportunities inside the existing urban area as a priority. The projects are based on the existing capacities of the population and present economic activities. The mega-projects differ from place to place, leaning on the specific potential of each area. They are integrated in one global vision for the Ile-de-France region, jointly contributing to the international position of Paris.

The two main drivers of these projects are quality of life and climate change mitigation. They strive to make Paris more attractive for high level workers, but they also increasingly acknowledge that Paris should not expand its carbon footprint. However, after the flooding in June 2016, environmental awareness may have to shift from mitigation to adaptation in recognition that the Ile-de-France is already part of a warmer, wetter world. https://www.theguardian.com/cities/2016/jun/23/paris-seine-flood-of-the-century-disaster

3.2. GREATER MUMBAI

Mumbai is facing very big challenges regarding social housing, large infrastructures, quality of life and adaptation to climate change. Mumbai, with Dacca, has the highest population

density of all megacities in the world. The city and state authorities' targets are to create 8.5 million jobs and one million dwelling units in Greater Mumbai (the core part of the agglomeration), for a population that will reach nearly 14 million inhabitants by 2035. Their vision is driven by the economic position and attractiveness of Mumbai, in competition with other large metropolises. In fact, despite its high capacity for development, Mumbai's development is mainly focusing on land and real estate speculation, often in a manner that is counterproductive for the economic development of the City as whole. Without an integrated vision, the city is losing its attractiveness, to the benefit of competing Indian cities. The city needs stronger urban policies and finance if it is to produce social housing, preserve the environment and heritage, and enable energetic management of an urban development strategy. The *Draft Greater Mumbai City Development Plan (2014 to 2034*) is supposed to achieve that:
http://www.mcgm.gov.in/irj/portal/anonymous/qlddevplan?guest_user=english

Mega-projects could be key factors of integrated development when applied as part of comprehensive strategies. But when strategies are focused on investments and land prices, citizens and quality of life come last. This is then counterproductive for the economic development of the city. Empty office buildings and condominiums are not solving the problems, but are sad examples of the misallocation of investments by the market economy. They also often ignore Mumbai's environmental and infrastructure limitations, not only endangering the quality of life in the rest of the city, but putting a question mark on their own viability, such as in the example of the proposed and apparently approved Bhendar Bazaar project:
http://www.worldpropertyjournal.com/asia-pacific-commercial-news/mumbai-development-bhendi-bazaar-saifee-burhani-upliftment-trust-skyscrapers-construction-property-regeneration-7236.php

Urban regulations (land use, urban fabric, tax) are key tools in directing private investments towards the objectives of a collective city vision. A too flexible system (derogation for specific uses, transfer of development rights without specified location) is creating chaotic conditions at the larger scale, removing the city from the goal of being a 'world class city' and worsening the quality of life for most Mumbaikars.

The urban development policy of Mumbai should revert to giving solutions to the problems of its citizens: housing, basic services, accessibility to jobs and land, quality of life, identity. In fact, international experiences show that economic development could be robust when based on the existing human capital and functional and attractive urban environment.

The recent choices made by Greater Mumbai will create new opportunities for mega-projects and investments. Mega-projects can change the image of the city and provide access to world class city standards. But the main transformation of the city will be on larger policies of urban renewal in locations that are already identified in the new detailed development plan of Greater Mumbai 2034 – they will triple the capacity for real estate. Like other large metropolises, Greater Mumbai is prioritising large scale urban renewal (more than 3.000 hectares) in many locations. They themselves constitute a mega-project, with more effect than the new BKC business centres of the future Old Harbour Waterfront. An integrated spatial strategy is the precondition to achieve better living standards and reposition the metropolis in the international and national competition.

Private sector initiatives cannot drive city development without a global city strategy. The new development plan of Greater Mumbai opens the way for better integration of large scale development projects inside a coherent and sustainable vision, closely related to the new metro and mass transit transportation system.

14

3.3. HONG KONG

Hong Kong is famously one of the densest cities in the world, but is also well-known for its super-efficient public transport:
https://en.wikipedia.org/wiki/Transport_in_Hong_Kong

The public transport system is probably Hong Kong's main and most successful city-wide 'mega-project' of all time. Several factors have contributed to the success of public transport policy in Hong Kong, but the two main ones are: the successful integration of intensive land use and transportation planning, and its involvement in the private sector to shoulder the provision of public transport services.

The intensive land use policy discouraged the expansion of private automobiles. The persistence in private vehicles control since the early years laid the foundation for the inevitable development of the obvious alternative – the public transport network. The Hong Kong case vividly exemplifies the full play of a market economy in urban transport provision in which the quality of services and the high level of connectivity prevail, with the following observations:

First, to allow efficient transit services the operators must be able to make reasonable profits for their investment. Massive captive ridership and the close link between property development and transportation under an intensive urban land use pattern in Hong Kong, provide an ideal platform for a profitable urban transport market. City residents depend on private providers, whose profit is driven by massive trip volumes due to very high density and the very small size of dwelling units..

Whether public transport services should be privatised remains a fundamental issue for megacities like Moscow to ponder, as privatisation of a public service obviously would induce a series of social, economic and political repercussions.

Second, the free market economy in Hong Kong encourages keen competition and at the same time active cooperation among transit operators in carving out clearly defined market areas for each company to sustain a level of profitability. As a result, a hierarchy of public transport services is duly formed, each to meet the demand of a different community. The market thus maintains a spatial quasi-equilibrium. The sustainability of such an arrangement, however, is slowly being diluted by the emergence of MTR as the backbone of public transport services. Before that, buses, trains and paratransit each commanded almost an equal share of the market. A shift to rail may be a viable option, but the weakening of the other public transport sectors may not be conducive to a sustainable urban transport system in the long run. Notwithstanding, the ability to provide a good public transport service network spatially and socially is fundamental to (transit-oriented development) TOD in cities, regardless of their population and areal size. A re-examination and re-orientation of Moscow's public transport development policies and strategies may be the first step in solving its worsening traffic conditions.

Third, a high level of quality service is needed to sustain the growing trend of public transport in a city. With keen competition in an *open* market, operators are forced to enter into quality enhancement to compete for a desired market share. With different types of public transport services available in the market, Hong Kong was able to ensure a level field of competition until the arrival of MTR as a dominant service provider in recent years. The emphasis of quality service and carving deep into the community in the search for market enhancement are essential factors in business success. These are lacking in publicly-run transit operations. Unless they are politically and financially committed, megacities with

serious traffic challenges – like Moscow - may find it an impossible burden to upgrade their public transport services.

Fourth, the lack of automobile manufacturing and assembling facility in Hong Kong coupled with an intensive land use pattern allows the authority to sustain a private car control policy. Being a city with well-defined territorial jurisdiction, Hong Kong is able to control any inbound vehicles, a condition lacking in many other large cities. The implementation of car limiting policy means the number of moving vehicles is finite. Moscow does not enjoy such a privilege of vehicle population control. Vehicle reduction remains a viable policy if the city is supported with efficient public transport services.

Based on the above discussion, the success of public transport in Hong Kong much depends on its unique geographic conditions. This means it might not be suitable for duplication. Its profound determination to use market forces in providing high quality public transport however, deserves serious consideration in services provision. Coupled with this is Hong Kong's success in closely integrating land use and transportation planning, a classic textbook case that few cities have managed to effectively emulate.

3.4. WUHAN

Wuhan provides a vivid experience about how urban development and urbanisation serve as instruments of economic growth in China. Massive investment in land development as a production of space requires the support of a viable highway network, and later by the metro system:
https://en.wikipedia.org/wiki/Wuhan_Metro

First, these transport mega-projects in return generate more traffic than they can handle. This paradox creates a demand for further investment, eventually leading to further urban sprawl. In many other Chinese cities, the metro network is not sufficient to meet the mobility demand and train lines poorly serve the suburbs. Mass transit capacities remain weak and generate high demand on road traffic. Smart growth and sustainability, now emphasised by the City Government, may provide some food for thought on how to exit from the vicious circle.

Second, notwithstanding the challenges mentioned above, with the emphasis of public transport as the means of urban travel and the introduction of the TOD concept on and around metro and high speed railway stations, this may be the beginning of a new phase of urban design. This is in line with the smart growth and sustainable development promoted by the central government. This policy highlights the importance of pedestrian walkways, cycling and the neighbourhood concept in urban space development. Metro lines are concentrated in the core part of this large tri-city separated by very large rivers (more than 2km wide). A more polycentric development is conditioned by mass transit development at a larger scale.

Third, the promotion of public transport, particularly metro, as the lead mode of travel will eventually modify the distribution of urban activities. Focusing on transit nodes would give rise to a linear pattern of urban structure in the long run. This in return is conducive to metro ridership increase. Coupled with the control of parking space allocation on and around transit stations, vehicles will be slowly discouraged from entering these activity centres. Stringent measures may have to be introduced if the congestion continues to worsen. Concerted traffic demand management efforts are essential to congestion reduction

16

as proven in the case of Hong Kong. Should there be a strategy to limit the number of vehicles on the road, the situation could be further improved.

Fourth, it is important to redesign and maintain a road network structure to adhere to the normal 2:3:6 ratios to encourage a reasonably stable flow of traffic. In Wuhan this would involve the demolition of existing buildings to provide land for road realignment and construction, a move most challenging to the city government. A gradual improvement of the alleys and local streets may help to some extent to smooth traffic flow, as shown in other cities in the country. An increase in pedestrian walks and cycling paths, as well as the use of paratransit to reduce the first and last kilometre difficulties of public transport, may also help.

The report highlights transport development as a means to urban growth and spatial transformation in targeting economic growth in Wuhan. Serious traffic congestion and mismanagement as a consequence of growth incentive strategies are slowly being recognised. Equally stringent counterbalanced strategies in the form of public transport investment and traffic management are being introduced. It is envisaged that with the success in implementing public transport as the dominant mode of travel, the traffic situation of Wuhan will gradually return into normal, with perhaps a certain level of congestion to serve as stimulants of a vibrant city. Moscow also emphasises public transport as a mean to tackling urban traffic problems. The two cities are transforming themselves from a planned to a market economy and the challenges they face should reveal the strategic significance of good urban planning.

Chinese cities are fond of adopting a bold and quick decision making process. This may be criticised as impetuous, but one may also accept the fact that deeds and not words are needed in dealing with situations like those prevailing in Chinese cities. The massive investment in transport infrastructure may provide the basis for the emphasis of public transport as a means of urban travel. The deterioration of road traffic may serve as a forceful demand for change in collective travel behaviour under a top-down planning environment. Moscow, on the other hand, may have lost such quick responsiveness to its worsening traffic. However, exceptional approaches may be required to manage exceptional problems.

Another example of such turns in strategic planning is Wuhan's recent attempts to correct the imbalance in its development, resulting from decades of intensive urban growth at the expense of the natural environment. The city is now switching to ecological urban planning: http://isocarp.org/app/uploads/2014/05/Wuhan.pdf

3.5. NEW YORK

New York, one of the largest megacities in the world, has been facing all the classic urban challenges of our times: housing shortage, transit strains, climate risks, burdened financial sources and dated infrastructure. However, with its ingenuity, New York has made significant progress on most fronts, setting a great example for other megacities grappling with similar issues. Its *OneNYC* plan is widely regarded as a template for socially progressive and environmentally responsible strategic planning at the megacity scale: http://www1.nyc.gov/html/onenyc/index.html

The *OneNYC* document is just the latest in the long line of specific planning strategies that the city authorities have produced over the last decade to tackle an array of issues of urban quality of life and environmental security: http://www1.nyc.gov/site/planning/plans/city-wide.page

None of these documents stand in the way of some very ambitious projects in terms of economic development. NYC is 'unstoppable' in its development, as can be seen from more than a dozen billion-dollar-plus projects proposed or under construction at various locations in the city:
http://ny.curbed.com/maps/a-guide-to-all-the-megaprojects-transforming-new-york-city
http://gizmodo.com/the-billion-dollar-megaprojects-that-will-transform-nyc-1484387579
These projects are partly responsible for the urban structure of the city slowly shifting from a monocentric pattern to a composite pattern (towards polycentric pattern), with smaller emerging downtowns complementing central Manhattan. This resonates with the global trend where outer and middle suburbs are developing and supporting their own local centres. While agglomeration economies' supporters feel that concentrating most investment in the centre is efficient, many planners see the worth in developing dispersed centres as it reduces the need to travel further, supports the local economy and improves liveability in the suburbs. NYC has been struggling to provide inter-borough connectivity in the outer areas, but this is changing. NYC is supporting the development of such work-centres by providing new Select Bus routes to serve these workplaces. With the redevelopment of several brownfield sites across the city, NYC is attempting to integrate emerging work centres and affordable housing locations with transit networks.

The city has relied on innovative ways of budget spending and wielding financial resources to keep development ongoing, despite difficult fiscal times. New York has concentrated on energy efficiency projects, reusing old infrastructure such as brownfield land to deliver affordable housing and promote double use of infrastructure. Low-spend but high-impact projects include opening up schoolyards to communities, completing streets programmes, developing bike lanes and choosing BRT over subway expansions. Most of the big spend projects are for building public transportation capacity which has been named as 'essential' to supporting a million more residents by 2040. This frugal yet highly effective approach has enabled the city to pluck the low hanging fruit and deliver encouraging results while the city waded past the economic crisis. This is useful for megacities which are facing financial strains, both old and new.

New York, the world's first megacity, has served as a very good example of sustainable mobility choices. Belonging to a heavily car-oriented nation, New York City has shown that culture plays a big role in people's mode preferences and how they perceive various modes. The uprising, led by Jane Jacobs, against Robert Moses and his car-oriented plans, set a trend for choosing liveability against car-centred mobility in New York. Despite being in one of the most car-oriented countries in world, New York has somehow retained, and improved upon, walking and cycling numbers with dedicated policy planning.

Density is often termed as one of the prerequisites of sustainable mobility. New York has the highest population density among the megacities of the US (the same as Paris, but only one-third that of Hong Kong and Mumbai). High population density makes public transport investments feasible for both public and private investors and yields better results. On the other end of the spectrum, cities with the lowest population densities in the world, such as Melbourne, are struggling with justifying public transport investments, leaving cars as the only solution to navigate the sprawl.

With a warming climate, extreme weather events pose a significant risk to the infrastructure and activities that it supports. New York City has also been at the receiving end of extreme weather events. Hurricane Sandy in 2012 had a huge impact on the city's infrastructure and the government and authorities are still grappling with the financial impact of restoring infrastructure damaged by the storm. NYC has taken affirmative action to take steps to build resilience, including institutionalising the New York City Panel on Climate Change and the Climate Change Adaptation Force.

The city's plan to boost its resilience in the face of future challenges associated with the rising sea level and extreme weather events is recognized worldwide as one of the most proactive and comprehensive documents of this kind:
http://www1.nyc.gov/site/planning/about/dcp-priorities/resiliency-sustainability.page

Cities across the world need to be prepared for such unplanned expenses as extreme weather events are becoming more frequent with a warming planet. Advance planning is required to avoid massive rebuilding costs later. Megacities are well-oiled machines, which run around the clock, and any outages, in a globalised world, mean big losses to the economy and sometimes even loss of human life. Hence, one of the aims of planning in today's megacities should be to build resiliency systems to withstand economic, natural or manmade shocks, including terrorism. This has in fact been taken up as one of the main challenges by the 4th Regional Plan of New York:
http://charting-a-new-course.rpa.org

New York is also witnessing a change in its population composition. The changing nature of users, resilience to extreme events, withstanding economic pressures and an ever increasing demand for housing and travel, are issues not only true for New York. Most of the world's megacities are dealing with the same things in some shape or form. With New York's commendable run at solving its problems with some good results, its strategies certainly are an example for others to follow.

3.6. DUBAI

Even though Dubai is not a classic case of a world city such as New York, Paris and London, its rise in the past century is notable and significant. When talking of the world's megacities, Dubai cries out for mention with its fast-paced urbanisation, multicultural population and billions of dollars of investments in an aspiration to be a centre of the financial world.

Dubai can also be described as one huge 'mega-project' – the city has grown in just half a century from regional town to international city with over two million inhabitants today. In fact, Dubai is part of a larger metropolitan area, Dubai-Sharjah-Ajman:
https://en.wikipedia.org/wiki/Dubai-Sharjah-Ajman_metropolitan_area

However, Dubai is also famous for its flamboyant real estate mega-projects, such as the Burj-al-Khalifa complex, Palm Jumeirah and Dubai Marina:
https://en.wikipedia.org/wiki/List_of_development_projects_in_Dubai

Dubai really started thinking about prospective planning in the 1960's and its city building dreams revved up in the 1980s with the oil boom. Since then Dubai has grown rapidly, riding the globalisation wave. Its urban plans have consistently aimed at making Dubai an international city and a transport, trade and commerce hub. So Dubai has consistently been working to reinvest the income from the oil industry and to seek revenue from prime real estate. Most of these projects are built on the knowledge that oil will eventually dry up and Dubai must diversify its economy and become a major centre for leisure, trade and commerce. Dubai has invested in iconic architecture projects and global infrastructure projects geared towards the future, such as Dubai Media City, Dubai Internet City, Dubai International Financial Center, Healthcare City, Textile City and International City. This has attracted developers and investors from all across the globe.

The most notable statistic is that about 90 percent of Dubai's population are immigrants. These immigrants arrived to participate in Dubai's growth story. However, with the market reigning over everything else, key questions remain over social and environmental impacts.

In contrast to the urban development strategy of New York, Dubai's urban planning approach is more project-based. The plans are flexible, so they can be molded to the next big project on the market. In such circumstances, the comprehensiveness of the plan becomes questionable. Even though the plan documents have some wider aims and objectives, it is no exaggeration to say that urban planning in Dubai is more project-based than goal-based. Most of these projects are catering to a foreign market, hoping to attract investment. Hence the obvious priorities for the government are its nationals (10% of the population) and foreign investors (mainly Iranians). No doubt, a share of these financial transactions would qualify as 'money laundering'. Whether of suspicious or clean origin, foreign investment produces a large share of the city's empty buildings (before the 2008 financial crisis more than 50% of apartments were empty). Dubai's development is more geared towards speculation, than inhabitation.

The remaining 90 percent of the population - the immigrants and expats – work hard to afford a decent life. For many, with low wages and high competition, this remains a dream, as most of the services are market-based. With market speculation raising housing prices way beyond their reach, social justice and inclusiveness are absent.

Some planners have argued that a project-based planning approach has led to fragmented planning. The city itself is fragmented into mega-projects which are not accessible to everyone. It is also based on zoning for the separation of functions, which increases car use and urban segregation The outcome is isolated communities, surrounded by large car parks and vacant pieces of land separated by multi-lane highways. The massive scale of development, lack of walkways, and the hot, dry climate have also made cars necessary. The city's public transport is used by just 9% of the population. Those who cannot afford cars are usually limited to the informal parts of the city, which present quite a contrast to the high-rise glitzy development. These areas have time and again been threatened by market driven projects eyeing their land. Some have succumbed while others persist. This situation points to a general lack of comprehensive planning towards common social good.

Recently, Dubai has been on a building spree towards the 2020 World Expo. Several mega-projects are adding millions of square feet of luxury residential and retail space: http://www.arabianbusiness.com/revealed-top-12-dubai-expo-2020-projects-607516.html#.V2UhpWNuDFI
However, what will be the role of this infrastructure in the long term development of the city and *all* its residents is uncertain.

Dubai's growth has also had a major impact on its environment. The structure plan in the 1990s made no mention of sustainability, a 'buzzword' globally in that era. These impacts have both local and global repercussions as Dubai has one of the largest carbon footprints in the world. The government is beginning to realize these impacts, but positive action is awaited. It should also be noted that the city is a role model to several other cities in the Gulf region. They emulate what Dubai does and with investments pouring in, the whole region is growing very fast.

There are important lessons to be learnt from Dubai. The city is an enviable economic growth story and a reminder of man's power to build a successful city in a desert. The result is more about a good return on investment, than a liveable and sustainable community. This reminds us of the importance of comprehensive planning and policies for inclusive planning and environmental betterment. The looming possibility that the world is on a path to

accelerated climate change casts a shadow on Dubai's past achievements and future viability.

3.7. LONDON

When the Mayor of London asked the Outer London Commission to assist with the London Plan, it proposed a threefold approach to accommodating growth:
• greater efficiencies in the way existing capacity is used;
• sustainable intensification of selected parts of the city; and
• partnership working to realise the potential of the wider metropolitan region.

These recommendations refer to the current London Plan:
https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan
which is an updated version of the 2004 London Plan.

The Commission also recommended more polycentric development. This is not unique to London. More than 75 percent of recent spatial plans developed for large metropolitan areas in OECD countries consider polycentric development as the best strategy for managing urban development. The benefits are many: an economical, efficient transportation system, cleaner environment, and better access to education, jobs, amenities and decent housing.

Strategies for promoting polycentricity in London through the New London Plan include the following (Outer London Commission, 2016):

4.1 More efficient use of existing capacity, including:

a) Making better use of the existing housing stock through integrated planning, housing and social support policies to help address the present constraints; and
b) Unlocking the barriers to housing delivery to ensure that London is better equipped to consistently maintain necessary levels of housing output.

4.2 Selective, sustainable intensification within London, including:

a) Increasing densities in town centres through higher density, housing-led mixed use, comprehensive redevelopment of parts of town centres already susceptible to structural change and likely to be in need of regeneration;
b) Increasing densities in areas with good public transport in order to link development more closely to transport investment and emphasise the contribution of areas with higher public transport accessibility;
c) Intensification Areas, Opportunity Areas and Housing Zones: Development frameworks for Opportunity Areas have already proved an important mechanism for identifying additional development capacity.
d) Suburban intensification: This could be achieved through selective intensification of some suburban areas with reasonable public transport connectivity, through a variety of local incentives, especially in outer London;
e) Estate renewal: Combined with 'street based' development, this approach has attracted considerable attention nationally. It is already an established source of capacity in London;
f) Industrial and commercial relocation: The Commission is concerned that London should not lose capacity for 'industrial' type functions which are essential to its wider economy. It considers that there is a need for a firmer understanding of the importance of industrial

land for the London economy as a whole, particularly in relation to specific locational factors, and of its relative economic importance compared with that if used for housing;

g) Co-location of housing and industry: Towards achieving jobs-housing balance, co-location of housing and industry within London is an obvious way to provide a strategic increment to housing capacity;

h) Selective release of the Green Belt within London: A number of suggestions for review/release of Green Belt land, together with broader proposals for changes in Green Belt policy, already exits. So do many concerns. Pros and cons need to be considered very carefully;

i) Airports as catalysts for growth: While unlikely to yield large volumes of housing, this would impact on the economic and spatial structure of the city with significant potential for business and jobs.

4.3 Partnership working to realise the potential of the wider metropolitan region, including:

a) Growth Corridors linked to public transport within and beyond London. This calls for more explicit attention to cross-boundary interactions, as in the 'Corridors' identified in the current London Plan and in the Infrastructure Plan. The new London Plan should take account of the growth potential of existing and possible new Growth and Coordination Corridors within and beyond London.

b) Working with partners on the selective release of metropolitan Green Belt beyond London: The Commission considers that the same principles should apply in reviewing the metropolitan Green Belt beyond London as that apply within London. The Mayor could best 'add value' by working with willing partners to develop a strategic methodology/principles to inform local reviews of strategic transport investment and new or existing growth/coordination corridors proposed through the new London Plan.

c) Industrial and commercial relocation beyond London: As with the potential scope for relocation of industry within London outlined in 2f, there may be potential for relocation of industry beyond London in the wider metropolitan area to free-up selected industrial land within the capital for housing.

d) Intensification/extension to existing settlements and new settlements beyond London: Consideration be given to the potential contribution of intensification/renewal in some existing towns in the wider metropolitan area which need regeneration and have good access to London; and to urban extensions or even new settlements.

4.4. Integrated transport strategies in support of polycentricity, including:
a) Planning transport and land use together;
b) Providing environments that promote eco-mobility (in particular, walking and cycling);
c) Planning for the long-term (25–50 years)
d) Congestion charging and other forms of demand management
e) Planning the entire urban realm around PT nodes;
f) Extensive use of smart technologies.

In sum, the key strategies are: polycentric development; selective intensification; integrated transport; and collaborative partnerships outside the London area. While they have some social and environmental ambitions, in reality they are focused on return on investment. This ultimately supports the financial sector rather than the local communities and the majority of the citizens of London.

3.8. JOHANNESBURG

Johannesburg's future development plan is the "Joburg GDS 2040 Strategy":
http://www.joburg.org.za/index.php?option=com_content&view=article&id=7343&catid=73&Itemid=114

The vision is to "continue to lead as South Africa's primary business centre, a dynamic centre of production, innovation, trade, finance and services" and to become "a city of opportunities where the benefits of balanced economic growth will be shared in a way that enables all residents to gain access to the ladder of prosperity and where the poor, vulnerable and excluded will be supported out of poverty to realise upward social mobility". The long-term spatial form goals are to reduce urban sprawl; create a well-defined north-south and east-west development axis; and foster a well-defined urban boundary.

While mega-projects are not explicitly part of this strategy, there are a number of them in the pipeline:
http://www.fin24.com/Economy/Gauteng-launches-first-ever-post-apartheid-city-20150506

The renewal of the business district in the city centre is changing the image of the city despite the trend of urban segregation due to gated communities and market-driven housing market. TOD principles along new BRT are the next big challenge for Johannesburg, in other to develop new centres and reshape the city in a more polycentric pattern.

The city's Department of Development Planning and Urban Management aims to guide the spatial and settlement transformation by creating:
a city with an urban form that is efficient, sustainable and accessible;
a city with a quality urban environment providing for integrated and sustainable settlements and well-designed urban spaces;
an appropriate and efficient land use system that facilitates investment and continuous regeneration;
an efficient and effective spatial information service that meets the standards of a world-class African city.

An important segment of the planning policy is the promotion of EcoMobility. On show at the EcoMobility World Festival in October 2015, was an eco-mobile lifestyle promoted for cities all over the world based on transforming both the physical fabric of the neighbourhood and urban transportation culture: www.ecomobilityfestival.org.
The following recommendations are put forward for careful consideration and possible adoption by other cities around the world:
• Project plans are as good as they are implemented. The dreams of the mega-projects examined in this report, including the EcoMobility Festival, can only be achieved if the proposals put forward in the relevant master plans, and implementation strategies are thoughtfully implemented by all the relevant stakeholders.
• Cities should follow the principles of long-term asset management and A*sset Performance Measurement (APM)* (http://www.lnsresearch.com/research-library/asset-performance-management). These strategies allow cities to not just fix things as they break, but to take the actions necessary to preclude them from failing in the first place. An example is the Sandton mega-project, at risk of becoming a big parking lot and companies making losses if the current development fails.

3.9. GDANSK-GDYNIA

The Gdansk-Gdynia metropolitan area is an agglomeration made of three cities:
http://www.metropoliagdansk.pl
and is also referred to as the Gdansk Bay Metropolitan Area and the 'Tricity'.

Strategic planning belongs to the regional level – Regional Development Strategy for the Pomorska Region, 2020:
http://strategia2020.pomorskie.eu
…while the metropolitan plan sits within the Regional Planning Bureau:
http://pbpr.pomorskie.eu/konsultacje-spoleczne/-/asset_publisher/OuLqDcEDfaUg/content/projekt-planu-zagospodarowania-przestrzennego-obszaru-metropolitalnego-gdansk-gdynia-sopot

The urban region is affected by all processes typical of contemporary urbanisation in developed, post-industrial countries: suburbanisation; urban regeneration; urban densification. Transport is one of the key issues. The main planning strategy is polycentric development.

Currently, essential large-scale investments are made to improve accessibility and overcome deficits in the transport infrastructure system inherited from the former system. This approach is juxtaposed with new concepts of mobility and sustainability. This is starting to be seen not only with coherent visions in strategic documents to introduce more sustainable mobility concepts, but also with numerous large scale projects which are being implemented (such as metropolitan rail).

In this context, the importance of an integrated strategy for development should be stressed. A lot of effort is made to integrate different modes of transport - including non-motorised ones. Still, the most important challenge is integration of the transport system into the urban structure. Transport systems need to be integrated with planned urban development to create a polycentric structure of nodes of activities around public transport stops and to increase walkability of suburban residential districts. This is an area where the intervention of the public sector - even if only as a regulator and facilitator - is needed, as the market forces on their own will not deliver.

There is an increasing role of partnerships with all parties involved in development processes, starting from intercommunal cooperation up to the involvement of NGOs and local communities. They have a crucial role in the process of acceptance of all new large-scale projects, both infrastructural and mixed-use schemes.

Large-scale urban development projects – mega-projects – are mainly based on urban regeneration programs, and are seen as important instruments of polycentric, comprehensive development. They have also been instrumental in resolving the socio-economic and heritage issues common to post-socialist countries. Often they include large areas from where industry withdrew and where valuable historic inner city structures have been degraded. The best examples are the post-shipyard urban regeneration projects on both Gdynia and Gdansk waterfronts:
http://www.whiteburn.co.uk/portfolio-item/young-city-gdansk/
http://www.mlodemiastogdansk.pl
and the Baltic Arena/Energa Stadium with the Letnica suburb restoration and regeneration project area: http://letnica.pl.

3.10. BUENOS AIRES

The main strategic planning document for this South American city is called "Modelo Territorial – Buenos Aires 2010-2060":
http://www.buenosaires.gob.ar/planeamiento/herramientas-digitales/modelo-territorial

It is complemented by a sustainable mobility strategy:
http://www.buenosaires.gob.ar/movilidad

Buenos Aires has made an important step toward sustainability by supporting development of more sustainable modes of transport, increasing the share of voyages done by bicycles and improving walkability of the city centre. One cannot refute that 'the ambitious and comprehensive nature of Buenos Aires' Plan for Sustainable Mobility, and the joined-up thinking behind it, make this initiative an inspiring example for other cities to follow' (City Climate Leadership Awards 2013). Buenos Aires City government has demonstrated strong leadership by implementing well-planned BRT solutions, stressing the importance of political will and support, flexibility and an open mind in listening to the points of view of all stakeholders involved. Strong leadership and the unceasing effort of the City, to listen to the points of view of all stakeholders involved, are vital in this process.

Also, walkability of the city is developing steadily and with strong political support. These initiatives, combined with a strong focus on public spaces, are adding to the city's tourist attractiveness. Many of them are on the city waterfront, part of the city's biggest mega-project, Puerto Madero:
http://www.maderoharbour.com/en/puerto-madero/
https://en.wikipedia.org/wiki/Puerto_Madero

The large-scale development project of Puerto Madero has had a much stronger impact on the city in which it is situated, than urban regeneration projects in Europe or Northern America. By building the new mixed-use centre, Buenos Aires used the opportunity to consolidate its position as a competitive knowledge city with a diverse urban fabric based on port heritage. Puerto Madero is a good example of a mega-project which has strongly influenced the development of the entire city.

Unfortunately, at the same time, urban development in the delta suburbs, with several private harbours, is not planned in a comprehensive manner like Puerto Madero. This shows the dire need for a larger and more effective vision to support large-scale developments on urban expansions.

3.11. AUCKLAND

Auckland is NZ's largest metropolitan area (pop. 1.5 m) and continues to outpace the rest of the country with its relentless growth. Expensive housing land, traffic congestion and excessive urban sprawl are seen as the key issues, followed by a growing concern over climate change and other natural and quasi-natural hazards, and the increasing gap between the wealthy and the poor suburbs.

The city was recently amalgamated from seven municipalities into one council – Auckland Council. This local government body is near the end of the process of producing a new statutory plan – the Auckland Unitary Plan:
http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/plansstrategies/unitaryplan/Pages/home.aspx

The Unitary Plan is based on a vision document called The Auckland Plan: http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/plansstrategies/theaucklandplan/Pages/theaucklandplan.aspx

The first ever single strategic plan for the entire city-region has been deemed as a great achievement. However, its ambitious vision to make Auckland 'the world's most liveable city' has been questioned by independent reviewers who have found many gaps in the measures proposed to achieve this vision, particularly around the funding of infrastructure.[6]

Other critics have questioned the 'growth containment' approach. The Auckland Plan had chosen the 'compact city' model as its core spatial strategy. The idea behind it is that urban sprawl must be contained and therefore three-quarters of all future growth will be accommodated through the process of intensification of the existing city fabric. But the reality has subverted the Plan even before it has been officially adopted: urban sprawl is as present as it ever was; housing has become one of the most expensive in the world relative to incomes; local resistance to intensification is growing. The compact city paradigm is now questioned by a number of stakeholders, most vociferously by the young, poor and disadvantaged who are suffering the effects of a severe housing shortage, but also by local communities where intensification threatens to erode character, devalue heritage, ruin views, reduce sun and overload infrastructure. The Plan has now triggered a political crisis, leading to the central government threatening to suspend the council or bring about legislation which will force the Plan to free more land for expansion.

Parallel to the political crisis around housing affordability, the debate about the acceleration of climate change is shifting strategic priorities on the environmental front. The resilience/adaptation agenda now appears more pressing than the sustainability/mitigation agenda. From that angle, further concentration of people and assets seems unwise. This adds yet another reason to abandon the extreme version of the 'compact city' model.

What, then, are the alternatives? Some critics argue that Auckland is not a common metropolis which grows evenly in all directions, but is a linear city-region.[7] They point out that Auckland, regardless of any plan, is evolving into a 150 km-long regional linear city. This linear conurbation itself is the core part of a fast-growing, 300 km-long coastal arc at the top of NZ's North Island. Growth continues to trickle in inside both of these emerging quasi-urban formations. Unfortunately, this development is happening in a haphazard way, exacerbating traditional urban sprawl and extending commuting distances. Instead of the council's plans ignoring the pressure for dispersed growth, it would be wiser to acknowledge these forces and give them shape and direction. Linear form is good – why ignore a 'natural' tendency which offers extra efficiency? Linear cities are famously efficient, concentrating the cardinal infrastructure into a single corridor.

At the larger, regional scale, the polycentric regional urbanization pattern also offers opportunities. Not only is it more realistic, due to market pressures, and more liveable in the sense of offering an attractive lifestyle in an extraordinary landscape and climate, but is also more secure in the face of the vagaries of the 21st century. The compact city, on the other hand, is too vulnerable. The high concentration of population and assets means high exposure to a single natural disaster event, and too much dependence on urban infrastructure for the basic necessities of life.

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[6] SGS Economics and Planning: "Review of Auckland Urban Planning and Infrastructure", final report, February 2014.

[7] Bogunovich, D. Auckland, New Zealand 2040: A Resilient, Linear City-Region. *ISOCARP Review No 9*, 2013; pp 110-121. http://isocarp.org/product/2013-isocarp-review-09-brisbaneaus/

Auckland's mega-projects over the past decade are primarily about better transport, which is a reflection of the fast growth of the metropolitan area and the general perception that 'Auckland's biggest planning issue is slow moving traffic'. The two biggest projects are the *Waterview Connection* – a 3 km tunnel and motorway extension and the *Central Rail Link* – a 2 km tunnel under the CBD which will improve the overall efficiency of the entire Auckland railway network:
https://www.nzta.govt.nz/projects/the-western-ring-route/waterview-connection/
https://at.govt.nz/projects-roadworks/city-rail-link/

Other major projects are combined public-private redevelopment projects led by a specific area master plan provided by the council to guide a mix of private and public investment. Such projects are Aotea Quarter - Auckland's de facto civic centre, and Wynyard Quarter – Auckland's largest city waterfront redevelopment project:
http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/plansstrategies/Councilstrategies/Pages/aoteaquarterframework.aspx
http://www.panuku.co.nz/wynyard-quarter

The third category of major project are new suburbs (some greenfield, some brownfield), where the local government provides master planning, infrastructure and schools, and a large number of developers deliver the housing and commercial services. The best example is Hobsonville Point, a new suburb on the outskirts of the city, generally regarded as state-of-the-art urban and architectural design and environmental engineering:
http://www.hobsonvillepoint.co.nz

Common to these projects is that they take a long time to vision, plan, design and execute and that the final product is quite different from the original concept. Typically, they contain significant environmental provisions (sustainability and resilience), but these are often watered down due to pragmatic financial and political considerations.

Potentially the greatest lesson from Auckland is that the question of best urban form, with regard to functional efficiency and environmental impact, is far from settled. The threat of climate change has undermined an already suspect theory that more compact urban form means higher level of sustainability. Higher density certainly means less transport work, but since transport is only one component of the entire ecological footprint of a city and cars are getting ever cleaner, the importance of compact urban form is not as big as commonly assumed. At the same time the compact city form (high density) increases the exposure to climate change-related and other hazards, since higher concentrations of people and assets means greater damage in the case of a direct hit.

Arguably, low density, sprawling cities have a better chance of switching to renewable energy, along with more decentralized water harvesting and stormwater management. More roof and land surface per household means more capacity for power generation from sun or wind. This translates into self-sufficiency, a key component of resilience. This also means a higher level of sustainability, as the carbon footprint obviously shrinks if entire suburbs switch to clean electricity.

4. DISCUSSION

4.1. The Key Findings

4.1.1. <u>Continued growth</u> - demographic, economic, spatial – is the condition common to all eleven case studies. And as they grow, they face an ever greater array of ever more complex problems.

In the eyes and minds of the local government, the dominant objective in all cases is economic growth. More investment, more return on investment, more jobs – seems to be what everybody wants. But in reality, job creation is of secondary importance to investors; real estate profits are the primary motivation. Social, cultural and environmental agendas are regularly mentioned, and sometimes even highlighted as the prime aspiration. However, in reality, spatial development is mainly driven by commercial investment, which the public sector readily supports with new infrastructure. Some developments are positively detrimental in the way they exacerbate existing problems – socio-economic segregation, over-burdened public infrastructure, environmental degradation – and do not even try to ameliorate negative externalities.

As we get more signals 'from Nature' that the capacity of the planet is now full, *something will have to change profoundly*. Either urban growth – in all its dimensions – will have to be severely restricted, or the physical aspect of this growth will transition to forms of 'regenerative' or 'restorative' development, which repair the past environmental damage instead of inflicting more.

4.1.2. <u>Mega-projects</u> are a prominent feature of all large cities, and of megacities in particular. All of our case study cities have accomplished, or are implementing now, mega-projects of significant scale. There are two types. The mega-projects are either site-defined (sited at a particular location in the city, comparable to, for example, the *Moscow-City Center*)[8] or function-defined (planned over the entire city, as is typical of large infrastructure projects, housing programmes, or urban greening and beautification projects, comparable to, for example, the *Moscow River Project*)[9].

The role of strategic spatial master planning is critical in these projects. If the planning starts from the premise that the mega-project is part of a bigger picture – the entire city, or a major part of the city – then significant wider objectives can be achieved. For example, in a number of our cases mega-projects have effectively assisted an overall strategy of polycentric development by reducing the pressure on the city centre.

In less successful cases mega-projects were purely profit-motivated. This in the end hurts not only the social and environmental agendas, but also the project's own long term viability and attraction. In particularly bad cases, an excessive return-on-investment focus produced ghost cities and empty buildings, exhibiting a typical misallocation of the market economy.

Site-specific mega-projects are often the visible part of the iceberg; there is much more around and under them than one is aware of. They cannot deliver the full benefit without urban integration at local and city levels. To truly benefit the city as a whole, as well as maximize the developers' profit line, mega-projects should be based on surrounding assets (skills, technical capacity, strategic location, accessibility) and both reflect and support larger, city-wide policies and strategies.

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[8] https://en.wikipedia.org/wiki/Moscow_International_Business_Center
[9] Sergei Kuznetsov: "Moscow and the River: Four Roads to the Future". In Urban Agenda 2015, pp 40-47.

In some cases, mega-projects have had a major positive impact on the transformation of the entire city, whether by plan, or accident. These cases show that one of the most effective strategies to implement a city-scale transformation - a notoriously ambitious endeavour, because of its gigantic scale - is through a coordinated set of mega-projects. But whether this strategy has a future, is debatable. Mega-projects are only the most visible part of city transformation; in reality, there are numerous changes at other scales in the city. Today, *well-governed megacities are planned through comprehensive strategies that engage with all sectors and scales of change in the city*. The time of large mega-projects as drivers of change (new towns, waterfronts, CBD renewals) may be over. Megacities are changing with an array of policies and strategies acting on all scales.

4.1.3. <u>Urban form and mobility</u> continue to dominate the urban development discourse. Faced with the challenge of reducing their greenhouse gas emissions, many cities are combining their mobility and sustainability strategies. The 'compact city' has become the mainstream paradigm of an urban environment which ticks all the boxes – it is perceived as liveable, prosperous and sustainable. This has redefined investment priorities in many cities: there is now more money for public transportation and soft mobility, and less for motorways.

Overall, polycentric development and compactness (density) of urban fabric seem to be the most common preferred spatial patterns, along with the aspiration to pursue these strategies within the existing city rather than allowing more urban expansion. But aspirations are one thing, and the reality is another: megacities continue to grow both 'up' and 'out', and usually faster out than up.[10]

Urban infrastructure projects are strategically important in all cases. The normalised 20th century view that 'you can never have too much urban infrastructure' appears still dominant, despite calls for recognising and respecting the limits of the planet. Human needs are still taking precedence over the planet's capacity, and the programming of urban energy, water and waste systems starts with what the citizens and businesses need, what with what the nature in the surrounding region can provide. This Modernist outlook which assumes that there no limits to the natural capacity to support civilization, is now hitting tangible boundaries. The paradigm of progress will have to change: today's modernity should be about doing more with less, not more with more. Cities will have to think how to reduce the mobility needs (demand management); how to cope with fewer motorways; how to increase the efficiency of the public transport; and how to evolve towards polycentric/multimodal structure, mixed use and local self-sufficiency.

4.2. The Key Conclusions

In drawing the conclusions from this global investigation, we should first note some similarities and differences among the eleven case studies.

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[10] The findings of the global research project *Report from Cities: Conflicts of an Urban Age* by the LSE, exhibited at the 2016 Venice Biennale of Architecture and presented at the *Urban Age: Shaping Cities* conference in July 2016 at Venice, are clear on this: all megacities are expanding outward at a two to five times faster rates than they are grow up, or are growing in population. In other words, the overall average urban density is dropping all over the world's large cities:
https://urbanage.lsecities.net/events/conflicts-of-an-urban-age
http://citiscope.org/habitatIII/news/2016/07/lessons-habitat-iii-venice-architecture-biennale

The Similarities reflect the the general condition of 'globalisation' in the contemporary world, whereby quite different cities, in the different corners of the world, exhibit the same or similar conditions, challenges and aspirations:

> • enormous complexity - involving political, governance, management, legal, economic, social, cultural, aesthetic, environmental, and security aspects;
> • desire to be a big player on the global stage and compete for investment and talent in the global race for a 'smart economy';
> • declaring the importance of balancing social and environmental agendas with the economic agenda, but in the end favouring the latter;
> • the omnipresent dilemmas over compact growth vs urban sprawl, and public transport vs private mobility.

The Differences are mainly in the preference for, or the dominance of:
> • horizontal vs vertical growth;
> • planned vs organic evolution;
> • short-term interest/pressures vs long-term considerations/concerns;
> • economic/commercial vs environmental/resilience agendas;

Differences in urban planning are normal and should not stop us from comparing visions, objectives, methodologies and styles of presentation. Here are three examples of widely different approaches and outcomes which nevertheless permit meaningful comparisons and offer useful lessons:

Moscow's Genaral Plan/Urban Development Plan:
http://www.old.mos.ru/about/#block/6

Stefano Boeri's Draft Master Plan for Tirana:
https://vimeo.com/171432012/d90556efce

Canberra – clean by 2020:
http://www.iclei.org/details/article/australian-capital-territory-powered-by-100-renewable-energy-by-2020-on-zero-emissions-path-by-205.html

Increasingly the megacities planning agenda is becoming globally shared, as challenges are so similar. The looming climate crisis is bound the bring the agendas even closer: emergencies have the power to bring the hearts and minds together. Arguably, we already are in such an emergency:
https://www.theguardian.com/environment/2016/jun/17/shattered-records-climate-change-emergency-today-scientists-warn

A good example of how the sense that all cities have to face a common threat – and cannot wait for the national governments to act - is the case of 7000 cities signing a compact to battle human-induced climate change and bring about a low-carbon economy:
http://thinkprogress.org/climate/2016/06/23/3791744/cities-create-massive-climate-coalition/

City mayors are probably more aware than anybody else that all over the world cities are fighting the same list of challenges, as the recently signed *Global Covenant of Mayors for Climate & Energy* demonstrates:

30

http://citiscope.org/story/2016/merger-creates-worlds-largest-network-cities-fighting-climate-change

In a similar vein, more and more cities are adopting formal *resilience strategies*, having realized that adaptation is now getting more urgent than mitigation:
http://www.100resilientcities.org/strategies#/-_Yz43MjQ3MCdpPTEocz5j/

Yet another indication of the growing concern over the future and security in cities – particularly very large cities - is the outcome of the Megacity Security Conference in Mumbai, in November 2015:
http://www.atlanticcouncil.org/publications/issue-briefs/resilient-megacities-strategy-security-and-sustainability

The above references are about very recent developments. They leave us with the speculation whether some kind of a 'global megacities security strategy' might emerge in the coming years, reflecting an international effort to define the universal elements of environmental security for very large cities. This speculation could be extended to the question whether Moscow could be one of the leaders of such global project?[11]

4.3. The Key Recommendations

These recommendations refer to the main subjects of this report – mega-projects; mobility strategies; urban metropolitan form; megacities themselves.

<u>Regional Approach</u> – Effective planning for megacities can only take place at the regional scale. Megacities are not just cities - they are also regions. This is why the terms *'urban regions'*, *'regional cities'* and *'city-regions'* are ever more in common use. Planning for the full extent of megacities' territorial influence is the only way to maximize benefits and minimize costs – particularly social and environmental. All megacities need metropolitan master plans with explicit, balanced sustainable development goals and a clear spatial strategy. Planning *satellite settlements* at well-connected locations outside the city proper is an important component of regional urban planning.

<u>Urban Form</u> - The *compact city* and *polycentric development* are the key concepts. They are not in contradiction; rather, they are complementary. They cannot eliminate urban sprawl, but they can ameliorate its excesses. But *urban sprawl* will demand more attention in future, and a more tolerant and balance consideration in strategic decisions. We should let sprawl do what it can do well - a house-and-garden lifestyle for those who want it, and a high degree of self-sufficiency which the distributed technologies now make possible, while placing clear restrictions on its ecological performance. Large cities need many centres; hence intensifying selected, well-connected locations makes sense economically, socially and environmentally. Some of these centres should be outside the city proper, as well-connected, but essentially independent satellite towns and villages.

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[11] The idea is not replicate the UN-Habitat III effort and the coming summit in Quito, in September 2016, expected to adopt the New Urban Agenda, as this is clearly dedicated to all cities, not just megacities: https://www.habitat3.org and is its focus – at this stage - is sustainability, rather than resilience.

Regeneration - Focusing on reshaping the city inside the existing urban area is an option superior to urban sprawl. However, this position will neither will stop urban expansion, nor will reduce the need to plan for self-sufficient satellite towns. Urban planning should identify and mobilise brownfield opportunities and foster capacities for triggering redevelopment projects in existing urban areas, as well as outside of them. A word of caution: redevelopment of disused urban sites is fraught with obstacles which are not obvious in the beginning. It requires an enormous amount of rigorous analysis before construction can begin or even before any developers may be attracted to invest.

Mega-projects - Large urban development projects are key tools in driving the overall megacity transformation; they are not just projects in their own right, indifferent to the context. When *coordinated across the city* and when master planned in harmony and synergy with the local context, they can achieve much more than just a short-term profit for the developer. They can regenerate areas much larger than their actual size; they can help in financing the public infrastructure; and they can act as models which promote progressive design agendas. However, it is possible that the golden era of mega-projects is over and that they need to be replaced by comprehensive strategies that engage with all sectors and scales of change in the city.

Sustainability and Resilience – Climate change is a serious and growing concern. As we realise that it may be too late to mitigate some degree of global warming, adaptation may become more urgent than mitigation. We are already noticing that *sustainability (mitigation) agenda* is being superseded by the *resilience (adaptation) agenda* as the paramount concern in urban planning. This strengthens the case for polycentric development and a high degree of self-sufficiency in all decisions about urban form and urban infrastructure. At the same time, this shift weakens the argument for higher density, usually perceived as one of the key conditions for urban sustainability. The reason for this dilemma is obvious: compactness and concentration of people and assets in principle mean higher risk and more dependency on centralized provision of vital services. From an economic and commercial point of view, however, the sustainability-resilience shift opens new opportunities for innovation and business in the areas of technology, design and planning of decentralized infrastructure and distributed generation.

Final, General Recommendations:
Overall, the effectiveness of urban planning largely depends on *how well integrated* the planning of land use is with the planning of transportation and other vital infrastructure. Coordination between all sectors and aspects of urban and regional planning is crucial, as is collaboration between the public and private sectors. A genuine *balance between the economic, social and environmental agendas* is crucial. *The environmental agenda is growing in importance and complexity*. It is showing a tendency to split into two distinct, though overlapping, agendas: Sustainability and Resilience. The whole purpose of cities may need to be reinvented. Until now, cities were the engines of ecological destruction. In the 21st century, they must become the *engines of ecological restoration*. Megacities have taken from nature more than other cities, so they should give back more. In the not too distant future, cities might become our principal vessels of survival on a damaged planet.

32

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