We begin this chapter with a pair of fundamental questions facing the study of cities. Firstly, how did the early city become the contemporary metropolitan city and its variations that herald the primary urban form of the 21st century? Secondly, what are the most salient and consequential dimensions of the contemporary metropolitan city that shape its present and reshape its future? The first question calls for a long temporal perspective that has been provided in several chapters of Parts I and II of this book. We mainly address this question by focusing on the contemporary metropolitanization of the city to shed light on what drives the recent phasing and permutations of this process. While the second question invites a taxonomic look at the different aspects of the evolving metropolitan city, we focus on four major facets that capture its essence and complexity. By organizing our essay around this dual focus and through a broad comparative lens, we intend to offer both an essentialist and a relatively extensive treatment of the contemporary metropolitan city.

While cities have existed for over 6,000 years, the contemporary metropolitan city is young in its developmental stage, morphology, and function. Though data are sparse for earlier periods, it is likely that there were only a handful of cities that might be construed as metropolitan cities before 1800: thus Rome, Constantinople, Alexandria, Chang’an in ancient times; Baghdad, Hangchow (Hangzhou today), and perhaps Paris in the 11th–13th centuries; and Edo in Japan, Beijing, and London in the 18th century. While cities like Istanbul, Cairo, and Paris exercised some metropolitan functions for some earlier times, they were smaller.

As the renowned economic historian Paul Bairoch noted, ‘the emergence of a great number of very large cities … (with over half a million inhabitants) was in fact fundamentally related to the phase of development following the Industrial Revolution.’ By World War I Europe alone (excluding Russia) had twenty-nine cities with populations of over 500,000: it also had five centres with over two million (Berlin, St Petersburg, London, Paris, and Vienna), against three elsewhere in the world (New York, Chicago
and Tokyo). Taking one million as the basic threshold and significant marker for metropolitan cities during the long course of the 18th century through the earlier 21st century, we can see both the rapid increase in the number of big centres, but also the changing spatial distribution of them (see Table 41.1). As the share of the world’s million-plus cities in Europe and North America declines over time, both the number and proportion of such cities located in the developing world, most notably in Asia (especially in China and India) grow significantly. By 2020, the number of million-plus cities in Asia is projected to have risen ten times from 1950 and to have accounted for more than half of all these cities. This long retrospective and prospective view provides a clear picture of how far and fast worldwide urbanization has become defined by the surge of large cities.

The uneven distribution of mega-cities (above 10 millions) is also remarkable: already by 2000 there were nine in Asia, four in Latin America, but only one in the Middle East, one in Europe and two in North America. Looking through a contemporary lens, we see a dramatic process of scaling up and growth outward of the city into varied urban forms and shapes that defy the traditional definition and conception of what is a city.

Relative to London being the first modern city to have two million people in the 19th century, it would be a conceptual leap of faith to imagine that the Nagoya–Osaka–Kobe mega-region will be home to about 60 million people by 2015. Despite the one and a half centuries separating these points in time, this huge difference in scale forces us to think

**Table 41.1 Metropolitan Cities (above 1 million) 1800–2020**

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<td>30</td>
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<td>90</td>
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<tr>
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<td>7</td>
<td>50.0</td>
<td>31</td>
<td>36.9</td>
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<td>Latin America</td>
<td>7</td>
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<td>North America</td>
<td>428.6</td>
<td>13</td>
<td>15.5</td>
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<td>Middle East</td>
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<td>Oceania</td>
<td>61.5</td>
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<td>Total</td>
<td>1</td>
<td>3</td>
<td>14</td>
<td>84</td>
<td>232</td>
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**Note:** Data for 2010 and 2020 are projected by the United Nations and include the Middle East with Africa.
broadly and deeply about the complex dimensions and consequences of cities becoming so large that they change fundamentally in nature. While metropolis was the next logical term to describe the enlarged city, it has become increasingly insufficient and inaccurate for capturing the demographic and spatial spread of linked metropolitan areas. To describe the varied and ever growing scales of this phenomenon, scholars have coined a host of terms, often hyphenated, including mega-city, meta-city, hyper-city, super-city, networked-city, clustered-city, city-region, regional city, city-region, urban corridor, mega-region, mega-city region, and new city-states. While we will not deal with these terms in any great detail, we begin with an overview on both the fixed and moving features of the contemporary metropolitan city.

THE CITY IN METROPOLITAN FORM AND MOTION

Given the contemporary focus of our essay, we will refer to a metropolis as a spatial unit larger than the single central city. Arguably, there is an inherent metropolitan impulse in cities. In one sense, this means that all cities grow in size over time, even though some may shrink at a certain point in their development as indicated by the recent experience of some older industrialized cities in the United States like Detroit and Western Europe. In a different sense, the metropolitan seed inside the city refers to the varied form that a growing city may take. As cities have become larger over time, especially during the 20th and into the 21st century, they have unleashed that internal metropolitan impulse into the more visible metropolitan scale and structure. This process is characterized by the gradual, and sometimes accelerated, expansion of the spatial, economic, and political dimensions of the city. By no means linear and uniform, the metropolitanization of the city involves varied trajectories, contentious processes, disparities and lags, and simultaneous divergence and convergence across national contexts.

The United States is where the city has become most typically metropolitan in form and function, and serves as the reference case for discussing other national, regional, and local variations of the metropolitan city. In turning metropolitan, many American central cities not only grew larger, but also expanded out in a fashion characterized by the establishment of more separate settlements adjacent to and farther away from the central city. Over time, as some of these independent places gained more population, new ones appeared at even farther metropolitan edges. Generally known as suburbanization, this continued metropolitan expansion defines the American city as an endlessly shifting and fragmented agglomeration. This dynamic process has moved the American metropolis further beyond a size-based place to a network-based system that contains multiple interconnected nuclei or centres with both regional hinterlands and global ties.2
Beyond the Metropolitan City

The metropolis in constant motion has morphed into some sort of post-metropolitan phase of development in the United States and some other countries. Jean Gottman captured the most visible initial stage of this development in his classic book *Megalopolis: The Urbanized Northeastern Seaboard of the United States*, published in 1961. Derived from the same Greek origin as metropolis, the term megalopolis means ‘extremely large city.’ Besides its reference to a larger city than metropolis, megalopolis, as used by Gottman, refers to a much larger region stretching 500 miles from Boston in the north to Washington, DC, in the south, which became known as BosWash (for Boston and Washington). More than just one metropolitan area with more than one secondary centre, the megalopolitan region of BosWash encompassed multiple major functional centres separated by rural or under-built areas.

Gottman foresaw the shape of the metropolis to come as the Los Angeles region subsequently rose to represent the extreme of the sprawling American metropolis of the last several decades. In *Postmetropolis: Critical Studies of Cities and Regions*, published forty years after *Megalopolis*, Edward Soja portrayed this post-metropolitan complex in six themes that collectively reveal a fragmented, polarized, and globalized landscape dotted by edge or outer cities, gated communities, new ethnic suburbs, and other distinctive and contentious spaces. As the metropolitan motion in a post-industrialized context continues to churn, the settlement patterns in parts of industrializing Asia from the 1960s exhibit an extended metropolitan appearance of mixed urban and rural characteristics and processes. The comparative evidence points to further extensions and variations that we need to account for.

As the metropolitan force, in its centrifugal fashion, reshapes the metropolitan city to different and yet similar paths of evolution, it ironically pushes us back to re-examine the scaling effect and the scaled outcome of metropolitanization. Having grown further out and even into one another, filling out the empty spaces in the process, dominant and secondary metropolitan cities, adjacent to one another, have scaled up the more connected metropolitan region. This has triggered the use of a set of new descriptive terms such as mega-city, meta-city, super-city, city-clusters, city-region, regional urbanization, mega-region, and global city-region. By a broad international recognition including the United Nations, mega-city refers to cities with 10 million or more people. With less agreement and precision, meta-city or sometimes super-city, has recently been used for cities with over 20 million people by both the United Nations and major media outlets. According to Florida, Gulden, and Mellander, there are forty mega-regions that account for about 66 per cent of the world’s economic output and 85 per cent of global innovation. While a few of these mega-regions are located in industrialized countries and some even cross national boundaries in Europe, others are emerging in and across Asia and China such as the Yangtze River Delta region that contains 60–80 million people, in its very outstretched boundaries, and have become global economic drivers.
In the rest of this chapter, we examine four salient thematic dimensions of the contemporary metropolitan city from a comparative and global perspective: wealth and poverty, globalization, governance, and infrastructure.

**Wealth and Poverty across the Metropolitan City**

The spatial distribution of wealth and poverty within and across the metropolitan city is one of its key features. The metropolitanization of the city reflects the constant spatial shift of the coexistence of wealth and poverty in the urban core versus its periphery or hinterland. In differentiation from Allen Gilbert’s chapter on Social Relations, this section will focus more precisely on the social and spatial aspects of inequality at the metropolitan scale. While we will discuss the more familiar economic consequences of industrialization and deindustrialization in the American and European contexts, we will scrutinize the less known process by which accelerated urbanization and industrialization have produced a simultaneous sharp division and blurring of wealth and poverty in the populous metropolitan cities in developing countries. This comparative focus allows us to gauge a greater range of redistributed economic consequences as a result of metropolitan change.

The metropolitan city is inherently unequal because the original city, which became metropolitan, was an unequal place to begin with. Without tracing this early inequality in detail, we see a spatial redistribution of metropolitan wealth and poverty that evolves from territorial expansion and change in and of the urban core. For much of the long history of the city, wealth was concentrated in the spatial centre as the owners and creators of wealth—entrepreneurs and capitalists—worked and lived there. Even after they moved to the outlying areas that became known as suburbs and brought personal wealth with them, the productive assets—banks and factories—remained in the centre of the industrial city. There the concentration of wealth was striking against the geographic proximity of poverty, a massive industrial workforce earning a meagre wage and living in poor tenements. With the departure of manufacturing from the central city of American and West European metropolitan regions, the balance of wealth and poverty tilted to the suburbs as new centres of wealth, while the concentration of poverty in the urban core grew. Large numbers of poor residents were often unemployed and primarily ethnic minorities and new immigrants.

The shift of wealth from the centre to the periphery of the metropolitan region is not as clear and complete due to both countervailing and complicating forces. While much manufacturing has left the central city, the high-end service sector consisting of finance, insurance, and producer services has remained and even become more concentrated there, thereby keeping the centre relatively wealthy. This is mostly true of global cities like New York and London, which also finds a sort of parallel in a number of rising
financial centres in the developing world like Shanghai and Mumbai. As the growth of finance, real-estate, and entertainment has brought renewal and new wealth and vitality to the centres of some metropolitan cities, it exasperates the old divides of wealth and poverty by making them more striking. As Plate 41.1 shows, a wealthy gated (or walled) community rubs shoulders with a *favela* in San Paulo, Brazil. Beyond the central cities, suburban rings have also become more stratified and segregated in wealth and poverty. The metropolitan structure of wealth and poverty has evolved much beyond a simple dichotomy of rich centre and poor periphery, reversing itself in more developed cities.

**Newer and larger-scale inequalities.** As the mature metropolitan city in developed countries evolves into more spatially linked regions, the less developed metropolitan city in developing countries has been undergoing a faster growth and a wider spatial expansion. Both processes have not only reinforced some existing socio-spatial inequalities but also produced new ones. For the developed metropolitan city, post-crisis Detroit is an extreme example. By the time the crisis hit in 2008 and worsened in 2009, Detroit fell $300 million short of the funds needed to provide the basic municipal services and registered an unemployment rate of 28.9 per cent, the highest of any major city in the US. Today Detroit is the poorest major city in America, with a poverty rate of 34 per cent, nearly tripling the national average. To address this severe concentration of poverty will require Detroit to place its most dysfunctional agencies in receivership and to cooperate with its neighbouring suburban municipalities on issues that cross political

*PLATE 41.1* The Paraisópolis favela (Paradise City shantytown) borders the affluent district of Morumbi in São Paulo, Brazil.
boundaries. It also calls for the federal government to support the physical regeneration of Detroit through a new city plan for retrofitting economic and social activities to a much smaller demographic base, a city of more dense neighbourhoods, urban gardens, arts facilities, and entertainment parks built on old factory sites.6

In the European context, we see polycentric and decentralized urban systems anchored to supra-regional, corridor-shaped transport infrastructure that links the four metropolitan agglomerations (Berlin, Hamburg, Cologne, and Munich). Within this regionalized urban system, there has been clearly differentiated regional growth versus decline over the last two decades since reunification. The old heavy industrial city-region around Leipzig–Halle–Bitterfeld of the former East German experienced a population decline of -8.1 per cent during 1995–2004 due to out-migration, job loss, and suburbanization. On the other hand, the major metropolitan centres within and along the corridor stretching from Stuttgart to the Ruhr Basin in the south and south-west managed to keep a more or less stable population during the same time period. As the enlarged EU deals with the challenge of rebalancing the disparities between the older city-regions of Western Europe, it faces the challenging task of addressing new local–regional inequalities brought over by the incorporated member states from East and Central Europe and their immigrant populations.

For a state-driven model of metropolitanization, we turn to Shanghai. Bounded broadly, Shanghai municipality administers eighteen urban and suburban districts, some of which were agricultural counties, plus one county as second-level administrative units. In the Shanghai Master Plan (1999–2020), the municipal government aimed to reduce the population of 9.15 million in the central city in 2000 to about 8 million by 2020 by relocating 1.15 million people to the suburbs. The central piece of this plan was to build nine New Towns and one New City around Shanghai or ‘One City-Nine Towns’ (see Figure 41.1) in order to accelerate metropolitan development and to reduce the density of the central city. As part of this plan, a total of 140 small towns in the suburban area of Shanghai were proposed by their district governments to become part of the New Towns. The competition to become a New Town was actually a contest among towns for mega-projects such as university districts and foreign manufacturing plants. The New Towns were designed to follow certain places in Western European countries including the United Kingdom, Germany, Italy, Sweden, France, Spain, Australia, and the Netherlands. The physical building type and landscape would imitate the living conditions and life-styles of these developed countries. The connection of the New Towns to globalization thereby was established not only as economic production sites, but also as social and cultural domains where local governments and residents would embrace global symbols and identities.7

Although this planned suburban development has drawn some people out of the dense central city, those who have bought the expensive housing in the New Towns are wealthy Shanghai residents, Western expatriates, and speculative overseas investors. The Bauhaus-style apartments in the German Town in Anting average at least $1,000 per square metre, or more than $100,000 for a small two-bed room unit, while a single-family house in Thames Town in Songjiang costs approximately one million US dollars.
They have become rich enclaves in the middle of largely agricultural land. The lack of commercial facilities and social services, coupled with the speculative purchase and weekend use of these properties, has kept the New Towns largely empty of regular residents and gives them a ghost-town feel. The Shanghai metropolitan case illustrates a sort of unintended consequence of spatially redistributed wealth that stems from a purposeful state policy for rebalancing a metropolitan population.

**Globalization and Contemporary Metropolitan Cities**

While international influences were already important during the early period of metropolitan development, globalization has exerted a much more direct and intense impact on the recent metropolitan city through a configuration of transnational economic interdependence at the regional and local scales and advanced cross-border transportation and communications technologies. Accelerated globalization through increasing interactions between economies and cultures over the past three decades or
so has greatly influenced various aspects of the city, or in some cases completely reshaped them.

One of the pioneers of global perspectives on the metropolitan city is Peter Hall who first published *The World Cities* in 1966.\(^8\) In the mid-1980s, the geographer John Friedmann argued that world cities are a small number of massive urban regions at the apex of the global urban hierarchy that exercise worldwide control over production and market expansion. World cities would also be major sites for the concentration and accumulation of international capital. Sociologist Saskia Sassen, with the publication of the book *The Global City: New York, London, and Tokyo* in 1991, brought a definitive touch to the study of the global city through a sharp conceptualization and a systematic comparison of three such cities.\(^9\) According to Sassen, global cities function as (1) highly concentrated command points in the organization of the world economy; (2) key locations for finance and specialized services, which have replaced manufacturing as the leading industries; (3) innovative sites of production in these leading industries; and (4) markets for the products and innovations of these industries.

While the impact of globalization on and in New York and London is obvious, this influence is so pervasive and profound that it has invaded many cities and metropolitan regions including some where globalization has made a huge difference to local growth.\(^10\) On the outskirts of Kolkata, India, Rajarhat New Town has emerged as a new kind of local place with strong global connections. Planned as an integrated township with an expected population of one million, Rajarhat was conceived in the early 1990s as a self-contained growth centre that would help reduce the density of the core city of Kolkata. Spread over 7,598 acres (3,075 hectares) of land, the New Town is being developed as a major hub for business, trade, industries, IT, educational institutions, and cultural centres within its central business district. Thus, real-estate ventures and IT industry dominate the design, layout, and planning of township projects in Kolkata. Like the new towns near Shanghai, the high-income professionals in Rajarhat are expected to live in the luxury apartments behind gates and away from the local poor (see Plate 41.2).

As the city has gained a greater metropolitan scale, the local and inter-local influence of global forces begins to scale up regionally. In the traditionally more globalized Europe, two spatially expansive and cross-border European regions have taken shape (see Figure 41.2). Known as the ‘Blue Banana’ or vertical banana, one sprawling region originates from London in south-eastern England through northern France, the Benelux countries, Milan in northern Italy, and ends with the Rhine Valley in Switzerland. It features deeply regionalized historical, commercial, and cultural ties between neighbours as borders lost their barrier effects through the European Union (EU) integration. The other ‘horizontal’ banana or ‘Green Banana’ forms an arc from the Veneto in Italy, west through Lombardy and the Piedmont into the Rhône-Alps, across France’s Mediterranean coast and the hinterland, and into Catalonia.\(^11\)

In Africa, the kind of positive global–regional–local effect on cities in China and Europe is largely absent. Even taking into account the paucity and little spatial clustering of export-oriented manufacturing, the flow of trade between origin and destination cities across neighbouring countries is severely restricted by different kinds of barriers. In
the West African region of Burkina Faso, Ghana, Mali, and Togo, trucks carrying exports and originating from Mali’s capital city of Bamako have to face 4.6 checkpoints, pay $25, and waste 38 minutes for every 100 km on their way to Ghana’s port city of Tema on the Gulf of Guinea and Atlantic Ocean near its capital Accra. The high costs are added to by police bribes, regulatory rents, and large profits extracted by transport service providers along the transport corridor. Disadvantaged by their weak manufacturing capacities, these West African cities are further hampered by the lack of regional economic, spatial, and transport linkages that otherwise would and should bring about development benefits from geographic proximity.

As the above cases indicate, globalization has either strengthened or stalled certain metropolitan and regional dynamics around the city to the point that the metropolitan city and the world economy are mutually constitutive of, and shaping each other. There is rising tension between the constraints of the global, regional, and national urban systems and the flexibility or autonomy of individual metropolitan cities to grow in response to these constraints. This tension can lead to some cities doing better economically than others by overcoming these constraints or turning them into opportunities. It may even allow a few cities, especially those from low and marginal starting points to move up in the system and achieve more functional influence than expected of their scales.
Governing the Metropolitan City

As globalization exerts greater influence on metropolitan cities, governing them is becoming increasingly difficult. Cities are essential to social, political, and economic reproduction but exist within the larger contexts of surrounding regions, national administration, and global competition. With more than half of the world’s seven billion people now living in urban areas, some cities are facing challenges to governance associated with accelerated growth, and the emergence of massive concentrations of...
low-income populations. At the same time, others are witnessing growth just outside
their borders and conflict in the metropolitan region. It has never been clearer that the
economic and social welfare of the city and its surrounding metropolitan region are inti-
mately tied together. To be successful, cities must reassess traditional governmental
roles in an era of rapid change. This section evaluates the complex role that different lev-
els of government play in governing the metropolitan city, financing the services it
provides, and planning for its growth and redevelopment.

Levels and borders of government. A municipal government directly governs a central
portion of the metropolitan city. This area is often much smaller than the metro region
which encompasses elements like suburbs and satellite cities, and is bounded by specific
borders that are often difficult to expand. City governments provide services to residents
and businesses within these borders. These services may include policing, snow removal,
garbage disposal and other necessities of urban life. City Hall also administers planning
and policy to help organize the city and develop areas within its borders. As the urban
agglomeration spills over official city borders, so too does some influence of City Hall.
Downtowns and central business districts (CBDs) often remain a focal point of the met-
ropolitan city despite decentralization and growing suburban influence due to their cen-
tral location in the region, and function as a hub in transportation networks.

Above the local municipal government is commonly a county as in the US or small
regional government in other places. This government has the potential more closely to
fit the needs of the metropolitan city as its larger physical size can encompass an over-
grown metropolitan region. The role of this level of government can take on many dif-
ferent forms. In New York State for example, there is a ‘strong county’ system where
counties like Monroe act as redistributors of tax revenue from towns and cities within
their borders, providing services and investing in areas of strategic interest. Rochester,
the seat of Monroe County and primary metropolitan region, receives much of this
investment. Other areas of the United States like New England have ‘strong town’ sys-
tems where the majority of taxes and political power remain within municipal borders.
The uncooperative political nature of this type of metropolitan region has the potential
to perpetuate spatial inequality. For example, the governing body of Hartford County of
Connecticut was formally eliminated in 1960 during a period of substantial economic
prosperity. New regional governance and service provision zones have since been cre-
ated with overlapping or ‘messy’ boundaries, as seen in Figure 41.3. The outlying towns
around the City of Hartford remain among the richest in the nation, while Hartford
itself has become one of the poorest US cities. Given the huge disparities between a large
metro region with 1.2 million people and Hartford’s small municipal area of only
46.6 km² and 120,000 residents, the massive regional wealth is even more lopsided rela-
tive to Hartford’s local poverty. Towns like those surrounding Hartford continue to resist
contemporary attempts at regionalization, for fear of losing control of their tax base and
role in local affairs and service provision. In the United States, State governments have
the power to override town interests that challenge a regional approach to governance
and redistribution, but few have intervened. National governments oversee all lower
levels of governance and provide some, albeit decreasing, funding and support directly
to local governments. During the economic hardship of the late 2000s, the US federal government stepped in to rescue bankrupt local governments like Camden, New Jersey when the crime-riddled city had run out of funds to operate its police force. In contrast to the highly localized mode of governance in the United States, other countries have used forms of combined city–regional governance. For example, Chongqing became China’s youngest ‘direct controlled municipality’ in 1997 and now administers the entire municipal region of 82,000 km² and about 32 million people. With the ambitious goal of doubling the current population of 10 million in the urban core by 2020, the over-bounded Chongqing metropolitan region is experimenting with an orchestrated rural–urban conversion scheme that is historically unprecedented. Cases like Chongqing tend to be strategically important economic areas that receive special funding and planning efforts.

**Figure 41.3** The Hartford region, US showcasing multiple borders of service delivery and ‘messy governance’.
As is evidenced by these examples, the borders of governance often do not match the needs of a changing metropolitan city. This is especially true of the American context where cities face resistance and economic competition from towns and villages that border them. Decentralization has created the 'exopolis,' metropolitan regions like Hartford with many residents and much of the wealth located outside the city limits. Developing cities, especially those in a more top-down government environment like China have an easier time expanding their borders. Failure to expand urban borders has contributed to the malaise of cities like Detroit and Hartford (see earlier), which struggle with evaporating tax bases and severe social issues like urban violence and failing school systems. Cities with the ability and flexibility to extend their borders with the expanding metropolitan region have been the most successful in adapting to the current urban form.

With decentralization and globalization, the trend of urban governance over the last twenty years or so has been towards neoliberal policy and development. Generally speaking, neoliberal policies push the city to be a fiscally responsible and market-conscious economic entity. They stand in opposition to and move away from Keynesian redistributive policies, and advocate increased privatization and ‘entrepreneurialization’ of government. During the second author’s summer work in the City of Rochester’s Department of Neighbourhood and Business Development, the neoliberal policy and market-oriented approach was evident in both the projects the city supported and their emphasis on revenue creation. The Director of the department emphasized the need to balance projects focused on building tax base and more socially conscious neighbourhood development initiatives. In the end, earmarks on County and State development funding determined where much of the money was spent.

Today, businesses across the world are increasingly informed and mobile due to advances in information and transportation technology. They take into account numerous elements including taxes, services, amenities, infrastructure, and cost of living in choosing where to locate. This leads to intense competition between cities within and across national borders. Local governments increasingly act as business entities, evaluating their costs, revenue, and the quality of the services they provide. While investing in large-scale development and infrastructure projects can make a city more attractive to potential businesses, it requires large-scale funding and planning that is increasingly difficult to obtain from any source at the local level.

**Infrastructures of the Metropolitan City**

Cities are a testament to human knowledge, evolution, and ingenuity. They are the height of our ‘built environment,’ complex places that rely on advanced infrastructure systems that humans have developed. This section looks at two categories of the physical infrastructure to clarify the important role that each plays in the activities and reproduction
of the metropolitan city. Utilities infrastructure facilitates daily urban life through waste management and the delivery of essential utilities like electricity and water. Transportation infrastructure helps make the metropolitan city viable through the efficient movement of people and goods, and by connecting it to other metropolitan regions. (Information infrastructure is also becoming increasingly important in and for cities, but due to its primarily private ownership, we leave it out of this discussion.) In order to manage their high population densities and compete economically on a global scale, cities must constantly maintain and update their infrastructure systems. Growth of cities and metropolitan regions can overburden older systems, and challenges local government to develop infrastructure to accommodate population growth. Economic and social resources however often determine the location and quality of infrastructure development, contributing to inequality in the metropolitan city. A look at the source of planning and funding for infrastructure in the metropolitan city sheds light on its characteristic forms as well as economic and social implications.

Public utility infrastructure encompasses the provision of running water, energy, and waste management. For the purposes of this discussion we only deal with utilities infrastructure with large-scale physical elements as opposed to service based infrastructure like garbage collection. Large infrastructure elements like water mains are commonly buried underground in cities for the sake of saving space, and safety concerns. This however makes maintenance, development, and redevelopment of public utilities costly and cumbersome in these locations. In large developing cities, public utilities infrastructures are often located above ground and visibly exposed. This can contribute to safety and physical well-being as critical elements of the urban experience and quality of life in these cities. In these ways, the extent and quality of utilities infrastructure is intimately associated with the size and health of the metropolitan city.

Lags in the growth of municipal infrastructure when compared to population growth can have adverse effects including pollution of the environment and threats to public health (see above, Ch. 37). This can be seen in many developing cities, especially in Asia and Africa, where populations are growing at staggering rates due to rural-to-urban migration. Migrants often form slum communities that lack planned infrastructure. These communities have limited or no access to clean water, sewers, or waste removal and are often overlooked or intentionally excluded from development projects. The massive Dharavi slum in Mumbai is a classic example of infrastructure inequality, featuring open sewers, limited access to electricity, and inflated prices for clean drinking water. These elements contribute to the impoverished conditions and health concerns that slum dwellers all over the world live with on a daily basis. While many slums like Dharavi seem to persist and are tolerated by government, investment in municipal infrastructure has been shown to directly contribute to reduction in poverty in slum communities in Nigeria and South America. In this way investment in infrastructure can reduce income inequalities and transform slums and incorporate some of their vibrant informal and underground economies into the larger synergies of metropolitan cities in the long run.

Lags in infrastructure can also hinder real-estate development and growth of planned residential areas. ‘New Town’ development exhibits a prime example of this phenomenon.
Urban planners in many countries have pushed these artificially developed satellite cities as a solution to overpopulation in dense urban areas, directing populations away from overpopulated central cities. Infrastructure has been slow to catch up to real estate for some of these projects causing major delays or completed buildings to remain vacant for long periods of time. Perception and reality about the lack of infrastructure in these formerly rural areas have combined to dissuade some businesses and residents from moving to new towns (see Shanghai earlier).

While utility infrastructure plays an integral part in the health and welfare of the residents of the metropolitan city, transportation technologies are essential to commerce and travel within and between metropolitan regions. Within their downtown areas, many cities have public transportation systems such as trolleys or subway systems. Extending into the metropolitan region, public transport can take the form of light rail, bus lines, or other transport infrastructure. Private transportation also plays a major role in the metropolitan city and region, in terms of cars using more and more of urban roads and freeways. Expressways and turnpikes snake across the United States connecting a vast network of metropolitan economies. While European and Asian metropolitan cities also have extensive private highway networks, they utilize public transport systems to a much higher degree than their US counterparts.

Public transportation systems play an important role in many metropolitan cities. Early public transit systems were designed to help circulate residents and workers within downtown areas, and later to help connect residential areas in the region to jobs and amenities in the city centre. As urban areas have become increasingly polycentric, a phenomenon especially prevalent in the United States, public transit struggles to serve a more complex metropolitan region. Compared to private transport, public transportation has the potential to be more environmentally sustainable, cost effective, and essential in limiting traffic congestion and pollution in cities. High density ensures that the demand for public transport options is maximized, and creates the potential for individual fares to be minimized. Public transportation systems are also a major resource to the urban poor who are unable to afford private cars, and allow for commutes of greater distances than walking or riding bicycles. According to Liu and Guan, under ideal flow conditions public transit best serves commutes of 3–8 km in Chinese cities, and 4–9 km in congested scenarios. In New York City, public transport is used to complete about a third of all trips. Despite their advantages, public transport infrastructures require a high degree of public planning and funding to build and operate. Because of their high costs, public transportation projects are often achieved through public–private partnerships where the private sector receives toll revenue or other exclusive rights after assisting in the initial investment.

The US highway and road system has stood as the epitome of private transportation infrastructure for decades but will very soon be overtaken by China’s national trunk highway system in total length. The need for paved high-speed roads in America grew with the widespread use of the automobile that began in the early 1900s with the introduction of affordable cars like Henry Ford’s Model T. As the automobile became cheaper, more reliable, and faster than other modes of travel, the urban physical form was forced to adapt through street widening projects and other innovations. Access-limited highways would become
the dominant method to get cars in and out of the city quickly and efficiently. Eisenhower’s Federal-Aid Highway Act of 1956 put forth the first major federal funding for highway construction, initially designed to connect America’s cities for strategic military purposes. The highway system helped connect America’s metropolitan regions in a tighter network of trade and commerce aided by the growth of the trucking industry. The amount and proportion of goods transported by 18-wheelers has grown substantially since the 1950s. The highways also had the unintended effect of separating home and work into greater distances. Easier commutes, combined with new home financing options helped create a powerful draw to suburban single-family real-estate. (See Ch. 42 for more on this topic.)

Like municipal infrastructure, good transportation infrastructure has the power to draw investment and development. For firms and industry, it means easy transportation for workers, potential customers, and shipping. Urban residents need a good transport system to get to and from work as well as getting to other locations. Service business and retail tend to locate themselves close to these two groups. Development has been shown to cluster near transportation infrastructure, especially in close proximity to key points like highway exits, interchanges, and train stations. Within local and regional contexts, suburban shopping malls are often built near highway interchanges, and have outcompeted traditional retail corridors through ease of access by car to a large variety of stores.

While it can foster development and investment, transportation infrastructure can also have negative consequences for the urban physical form. Due to the nature of federal financing, most of the original planning and development of America’s highways came down to engineers and high-level state and federal officials. While providing some input, city planners and politicians watched as urban and interstate highways were built through cities with little thought for the undesirable consequences including the loss of historic neighbourhoods and displacement of disadvantaged groups. In downtown Hartford, Connecticut, I-91 runs along the Connecticut River cutting the city off from the riverfront. Infrastructure like highways and rail lines can serve as physical and psychological barriers that divide up spaces in cities, often isolating poor residents. During the 1960s, highway expansion contributed to rising racial tensions in America’s cities as sections of low-income African American neighbourhoods were seized and demolished through eminent domain law for highway right of way construction. Similarly, China’s urban highways have been built with little regard for its poor and powerless residents who live in the way.

Since municipal and transportation infrastructures are critical for the sustainability and health of a metropolitan city, financing them can be especially difficult for cities in demographic and economic decline. Growing cities on the other hand have a greater ease in financing their infrastructure projects through a healthy tax base and other revenue sources, but must plan for and anticipate growth before it happens. No matter the type of city and its larger context, it can be difficult to convince short-sighted politicians and investors to commit to projects without tangible benefits or returns. A long-term, big picture outlook is required for infrastructure development and redevelopment.

Transportation infrastructure redevelopment is a major challenge facing the United States today given its aging and under-maintained highways, subways, and bridges, broadcasted to the nation by the collapse of the I-35West bridge in Minneapolis in 2007.23
Efforts to expand and repair the US highway infrastructure have been met with political opposition, budgetary restrictions, and decreasing federal support. Alternative funding options are needed to produce the capital necessary for maintenance and construction. Road tolls are one of the oldest methods, extracting small fees from travellers for each use. Public-private development of highways has also been experimented with in some parts of the United States and in other countries. Typically this involves partnering on initial investment and agreements on splitting future toll revenue. Other highway systems have been funded by groups that receive exclusive advertising or naming rights.

Chinese cities are overpopulated and recent increases in private automobile ownership are causing serious congestion problems. China is now the largest market for automobiles in the world, and while its freeway system may soon be longer than that of the United States, it is still inadequate to meet the rapidly growing demand. Lasting ten days and stretching 100 km, the Beijing–Zhangjiakou freeway traffic jam in 2010 made all too clear the lagging road system relative to the massive volume of vehicle flow. The number of traffic accidents in developing cities is proportionally high due to high population density, rapidly increasing vehicle traffic, and weak enforcement of traffic regulations. In Mumbai alone, about thirteen pedestrians die each day crossing dangerous interactions and streets. Policy favouring the growth of private cars while investing in some public transport infrastructure is setting developing countries onto the same path that has limited efficient metropolitan integration in developed countries.

**Concluding Thoughts**

In the contemporary era, we cannot understand cities and their challenges fully without understanding their increasingly complex metropolitan contexts. The most obvious reason for rethinking the city as the metropolitan city is the broad importance of scale, especially in developing countries where the largest cities or mega-cities have been experiencing accelerated metropolitan expansion. Regardless of the focused attention on the tremendous size of developing mega-cities, scale by itself reveals little about the underlying challenges facing these cities. That is why we have used scale as a mere launching pad to explore four salient dimensions of the contemporary metropolitan city.

With growing metropolitan scale, the distribution of wealth and poverty has become more regionally differentiated and fragmented. For developed countries, metropolitan inequality has undergone a more complex spatial reconfiguration through the shifting balance between the further decline of manufacturing and uneven vitality of advanced services in central cities versus suburban rings. The Detroit and New York metropolitan regions appear to represent the two polar ends of a wider and longer spectrum of spatial inequality. In developing countries, wealth remains more concentrated in the urban core of very large cities but finds more company with poverty due to a greater influx of rural migrants. Early metropolitan extension has begun to draw some wealth out to mix with less developed hinterlands, as exemplified by Shanghai.
While globalization can be seen as a macro-structural economic force capable of reshaping the contemporary metropolitan city, it makes more sense to view it as penetrating the city from below and the city-region sideways. The bottom-up pressure from global forces, in conjunction with local factors like government policy, can open up new development opportunities for cities that were once non-global at all. The horizontal influence from globalization manifests itself through the accentuation of the regional tendencies and outcomes of urban development, both within and between national boundaries. Both effects, illustrated through the examples from China, India, Europe, and Africa, help embed the metropolitan city more deeply into the spatial nexus of global-local economic ties.

In the face of sharper and more complex spatial divisions of wealth and stronger local and regional effects of globalization, the traditional role of municipal government in redistributing resources is never more challenged and eroded. The highly localized municipal government in the United States confronts the greater challenge of how to govern more regionally as capital flows intensively across local political boundaries and services need to be delivered more efficiently at the larger regional scale. While this is an acute problem for cities and towns in the State of Connecticut, which no longer has county government, the misalignment of transnational and trans-local economic flows and local administrative boundaries and powers is more widespread, reinforcing the tension between the autonomous locality as a competitor in the marketplace and the growing imperative of cooperating between local governments.

Finally, the growing metropolitanization of the city poses greater challenges to the provision and integration of the infrastructure of both utilities and transportation. We have seen the irony of many developed economies like the United States falling behind in building and maintaining physical infrastructure, while developing economies such as China race ahead with a massive build-up of railroads and highways. The reality however is more complex. The wealthy government of China may be to able finance all the infrastructure build-up, but it has not ensured its quality (exemplified by the recent deadly accidents involving high-speed trains) and nor has it resolved the coordination with the rapid growth of other sectors such as the rapid expansion of automobiles to avoid severe traffic congestion.

Through the four analytical lenses, we have extended our understanding of the metropolitan city from its simpler past, as portrayed by a number of other chapters in this book, to its more complex present. This integrated framework should also help us follow the trajectory of metropolitan development as it unfolds in the rest of the 21st century.

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NOTES

17. Rusk, Cities Without Suburbs.
20. Marianne Fay and Mary Morrison, Infrastructure in Latin America and the Caribbean: Recent Developments and Key Challenges (World Bank, 2007).
23. K. Duchschere, 'I-35W Bridge Collapse: The Aftermath,' Star Tribune (4 Aug, 2007), A.7. While it has been determined that the I-35 collapse was due to a critical design flaw, it brought about national concern over infrastructure maintenance and oversight.

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