CHAPTER 11

URBAN SYSTEMS AND URBAN STRUCTURES

Hong Kong, China, the world's most densely populated city.
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AP Learning Objectives

- Explain the processes that initiate and drive urbanization and suburbanization.
- Explain how cities embody processes of globalization.
- Identify the different urban concepts such as hierarchy, interdependence, relative size, and spacing that are useful for explaining the distribution, size, and interaction of cities.
- Explain the internal structure of cities using various models and theories.

- Explain how low-, medium-, and high-density housing characteristics represent different patterns of residential land use.
- Explain how a city's infrastructure relates to local politics, society, and the environment.
- Identify the different urban design initiatives and practices.
- Explain the effects of different urban design initiatives and practices.

- Explain how qualitative and quantitative data are used to show the causes and effects of geographic change within urban areas.
- Explain causes and effects of geographic change within urban areas.
- Describe the effectiveness of different attempts to address urban sustainability challenges.

Cairo was a world-class city in the 14th century. Situated at the crossroads of Africa, Asia, and Europe, it dominated trade on the Mediterranean Sea. By the early 1300s, it had a population of half a million or more, with 10- to 14-story buildings crowding the city center. A Cairo chronicler of the period recorded the construction of a huge building with shops on the first floors and apartments housing 4,000 people above. One Italian visitor estimated that more people lived on a single Cairo street than in all of Florence. Travelers from all over Europe and Asia made their way to Cairo, and the shipping at its port of Bulaq outdistanced that of Venice and Genoa combined. The city contained more than 12,000 shops, some specializing in luxury goods from all over the world—Siberian sable, chain mail, musical instruments, luxurious cloth, and exotic songbirds. Travelers marveled at the size, density, and variety of Cairo, comparing it favorably with Venice, Paris, and Baghdad.

Today, Cairo (also known as Al-Qahirah) is a vast, sprawling metropolis, plagued by many of the problems common to rapidly urbanizing developing countries where population growth has outpaced economic development. The population of Egypt grew from 35 million in 1970 to more than 93 million by 2017, thanks to improved health care in general, a dramatic drop in infant mortality, high total fertility, and longer life expectancies. An estimated 19 million people reside in the Cairo greater metropolitan area. Cairo continues to grow, spreading onto valued farmland and decreasing food production for the country's increasing population. The United Nations projects that Cairo will reach 24.5 million people by 2030.

A steady stream of migrants arrives daily in Cairo, where, they hope, opportunities will be available for a better and brighter life. The city is the symbol of modern Egypt, a place where young people are willing to undergo deprivation for the chance to "make it." But real opportunities continue to be scarce. The poor, of whom there are millions, crowd into row after row of apartment houses, many of them poorly constructed. Tens of thousands more live in rooftop sheds or small boats on the Nile; a half million find shelter living between the tombs in the Northern and Southern Cemeteries—known as the Cities of the Dead—on Cairo's eastern edge. On occasion, buildings collapse; the earthquake of October 12, 1992, measuring 5.9 on the Richter scale, did enormous damage, leveling thousands of structures.

One's first impression when arriving in central Cairo is of opulence, a stark contrast to what lies outside the city center. High-rise apartments, regional headquarters buildings of transnational corporations, and modern hotels stand amid clogged streets, symbols of the new Egypt (*Figure 11.1*). New suburban developments and exclusive residential communities create enclaves for the wealthy, whose posh apartments are but a short distance from the slums housing a largely unemployed 20 percent of Cairo's population. Like cities nearly everywhere in the developing world, Cairo has experienced explosive growth that finds an increasing proportion of the country's population housed in an urban area without the economy or facilities to support them all. Street congestion and idling traffic generate air pollution comparable to Mexico City, Bangkok, and other highly polluted megacities. Both the Nile River and the city's treated drinking water show dangerous levels of lead and cadmium, the unwanted by-products of the local lead smelter.

Cairo is a classic case of the urban explosion in which more than half of the world's population lives in cities. This chapter introduces **urban geography,** which is divided into two broad categories of approach. The first looks at systems of cities, examining how cities support themselves economically, the functions that they perform in regional, national, and global economies, and how they exist in regular spatial patterns, networks, and hierarchies. Among their many purposes, cities serve as concentrations of people and activities to facilitate social interaction and the efficient exchange of information, goods, and services. Manufacturing, trade, and the exchange of ideas often require concentrations of workers, managers, merchants, and supporting institutions. Cities exist as functional nodes within a broader, hierarchical system of cities. The second approach to urban geography looks inside cities at their internal arrangements. Cities are unique places, with complex patterns of land use and social groups. In this chapter, we begin by examining the nature and evolution of cities, then we look at systems of cities, and finally, we turn our attention to life inside cities in different parts of the world.

Figure 11.1 Metropolitan Cairo, Egypt's remarkable population growth—from some 3 million in 1970 to an estimated 19 million today—has been mirrored in most developing countries. The rapid expansion of urban areas and populations brings housing shortages, inadequate transportation and other infrastructure development, unemployment, poverty, and environmental deterioration.

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11.1 An Urbanizing World

In 2007, the world reached a major turning point. As seen on **Figure 11.2,** after astounding urban growth in the 20th century, the world's urban population surpassed the rural population. Some 436 metropolitan areas had in excess of 1 million people ("million cities") by 2015; in 1900, there were only 12. Expectations are for 662 "million cities" in 2030. A total of 29 metropolises had populations of 10 million or more people in 2015; the United Nations calls them *megacities* (**Figure 11.3**). In 1900, no city was of that size, and in 1950, there were just 2 (**Table 11.1**). It follows, of course, that because the world's total population has greatly increased over the centuries, so too would its urban component—from 3 percent in 1800 to more than half today. The urban share of the total has grown everywhere as urbanization has spread to all parts of the globe. Virtually all of the world's population growth in the first half of the 21st century will take place in cities—specifically, the cities of the developing world (**Figure 11.4**). Thus, the location of the world's largest cities will shift from Europe and North America to Asia, Latin America, and Africa.

The degree of **urbanization** differs from continent to continent and from region to region (**Figure 11.5**), but in nearly all countries, the proportion of their population living in cities is rising. The United Nations projects that urban majorities will exist in all regions of the world by 2030 (**Table 11.2**). While Africa and Asia are the least urbanized continents, cities are growing particularly fast there. While some cities will grow into megacities, cities with less than 1 million residents will grow faster than the very largest cities.

Industrialization spurred the rapid urbanization in the highly developed regions of Western Europe and North America. In many of the still-developing countries, however, urban expansion is only partly the result of the transition from agricultural to industrial economies. Rather, in many of those areas, people flee impoverished rural districts; by their numbers and high fertility rates, they accelerate city expansion. Even the high-income, highly developed states—with low or negative rates of natural population increase—will experience growing cultural diversity as international migrants seek opportunities in their cities. As Ernst Ravenstein's studies of migration suggested (see Chapter 3), international migrants—whatever their destination country—tend to settle in large cities. The result everywhere is growing urban cultural diversity, with attendant challenges of social fragmentation, segregation, isolation, and poverty.
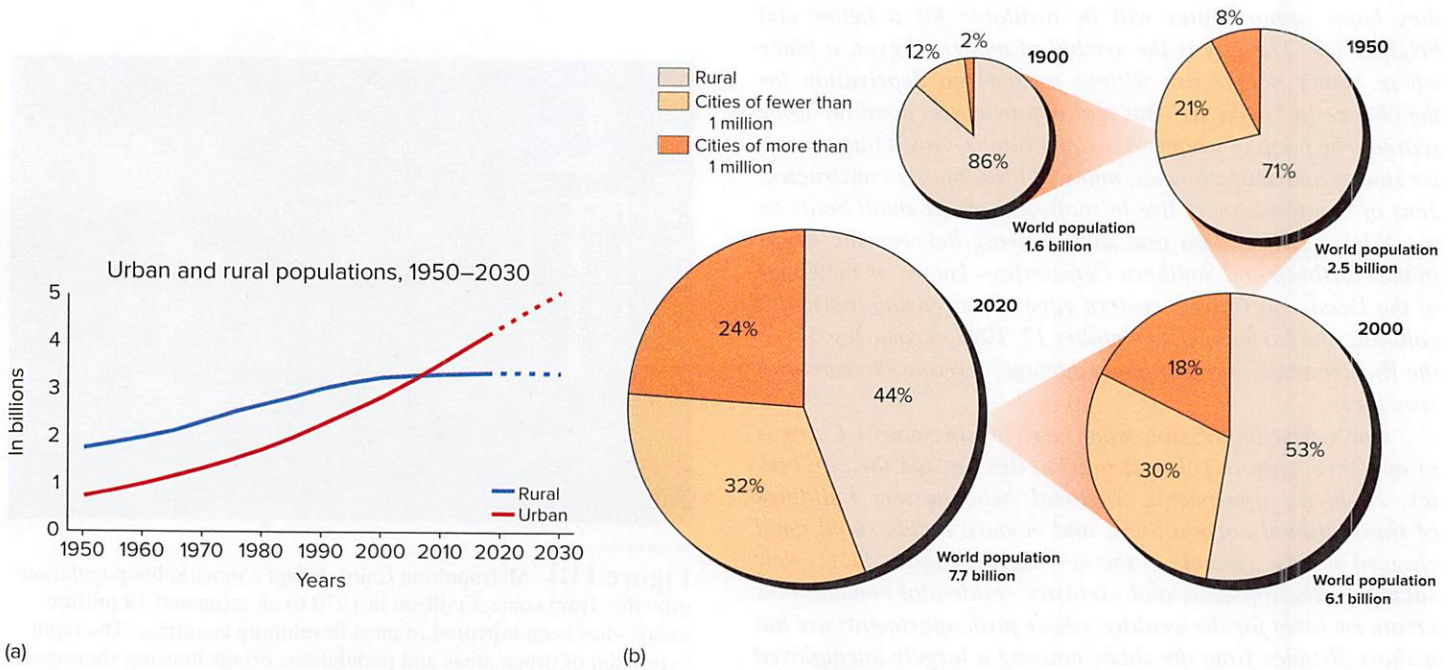
Figure 11.2 Trends of world urbanization document the steady decline in rural population proportions throughout the 20th century. *(a)* Since 1950, the growth rate of the rural component has slackened compared to the urban rate; by 2007, world urban numbers overtook the rural.

Source: United Nations, World Urbanization Prospects: The 2014, 2009 Revision and 2003 Revision, *Population Reference Bureau, and other sources.*
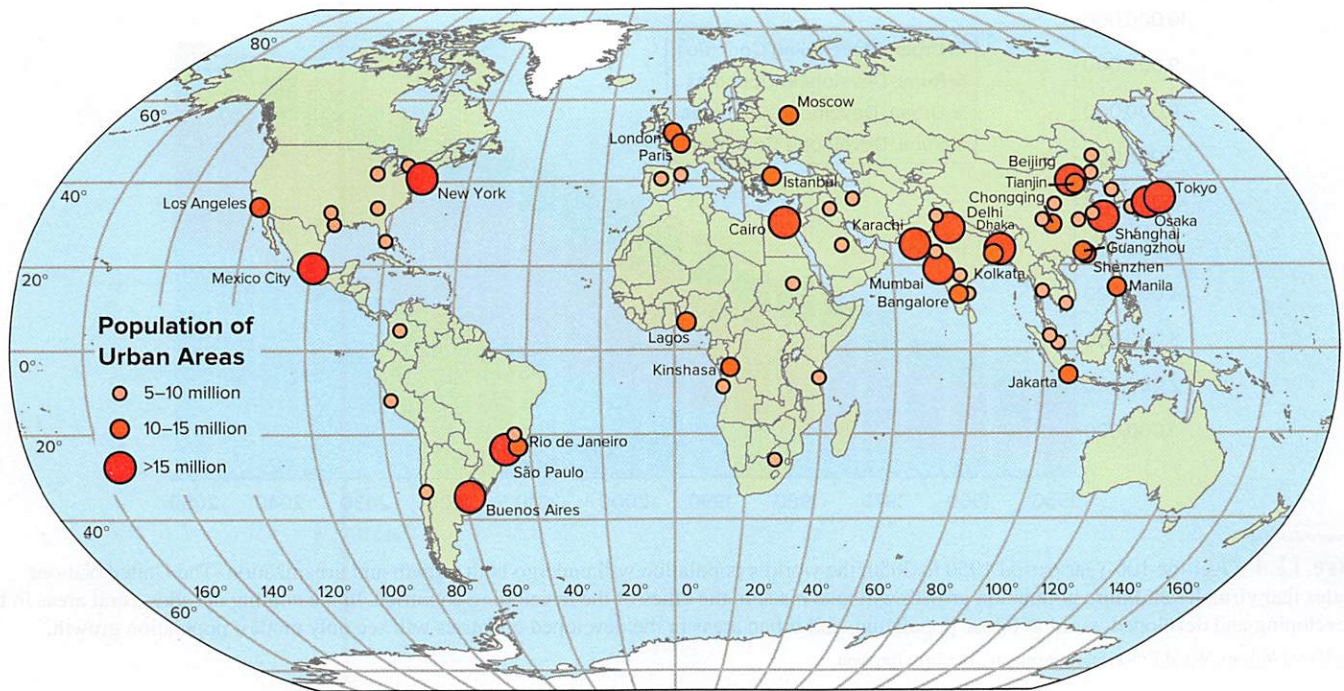
Figure 11.3 Metropolitan areas of 3 million or more in 2006. Only metropolitan areas with a population of 5 million or more are named. Massive urbanized districts are no longer limited to the industrialized, developed countries. They are now found on every continent, in all latitudes, as part of most economics and societies. Not all cities in congested areas are shown.

*Source: Data from United Nations Population Division.*

Table 11.1

### World's Largest Urban Areas, 1900–2030 (Population in Millions)

1900		1950		2015		2030	
London	6.5	New York	12.3	Tokyo	38.0	Tokyo	37.2
New York	4.2	Tokyo	11.3	Delhi	25.7	Delhi	36.1
Paris	3.3	London	8.4	Shanghai	23.7	Shanghai	30.8
Berlin	2.7	Paris	6.5	São Paulo	21.1	Mumbai (Bombay)	27.8
Chicago	1.7	Moscow	5.4	Mumbai (Bombay)	21.0	Beijing	27.7
Vienna	1.7	Buenos Aires	5.1	Mexico City	21.0	Dhaka	27.4
Tokyo	1.5	Chicago	5.0	Beijing	20.4	Karachi	24.8
St. Petersburg	1.4	Kolkata (Calcutta)	4.5	Osaka-Kobe	20.2	Cairo	24.5
Manchester	1.4	Shanghai	4.3	Cairo	18.8	Lagos	24.2
Philadelphia	1.4	Osaka-Kobe	4.1	New York	18.6	Mexico City	23.9

Sources: *United Nations,* World Urbanization Prospects: The 2014 Revision, and Four Thousand Years of Urban Growth: An Historical Census, *Tertius Chandler. 1987, St. David's University Press.*
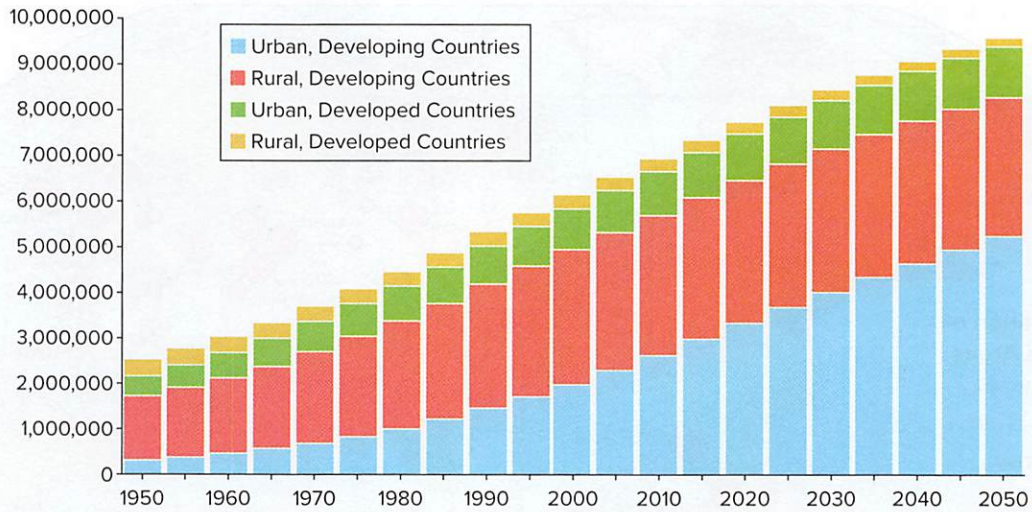
Figure 11.4 Over the 100-year period 1950 to 2050, the world's population will undergo both growth and urbanization. The United Nations estimates that virtually all future population growth will take place in the cities of the developing countries. In the coming decades, rural areas in both the developing and developed world will lose population, and urban areas in the developed countries will see only modest population growth.

Source: United Nations, World Urbanization Prospects: The 2014 Revision.
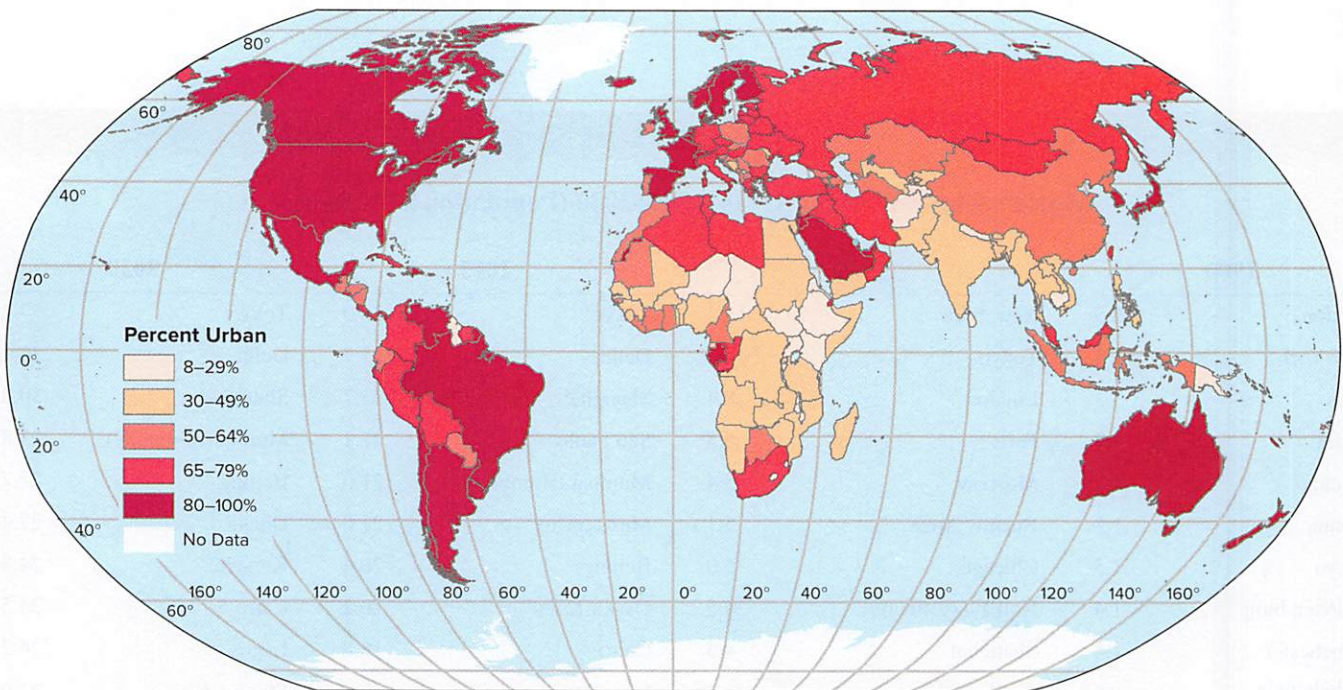
Figure 11.5 Percentage of population classified as urban, 2017. While Africa and South Asia lag behind other world regions in urbanization, they have the highest rates of urban growth.

Source: Population Reference Bureau, 2017.

Table 11.2

Estimated Urban Share of Total Population, Selected Areas: 1950, 2015, and 2050

Region or Country	1950	2015	2050
North America	64	82	87
Latin America and Caribbean	41	80	86
Europe	52	74	82
Oceania	62	71	74
Asia	18	48	64
Africa	14	40	56
More developed	55	78	85
Less developed	18	49	63
World	30	54	66

Sources: United Nations, World Urbanization Prospects: The 2014 Revision.

Merging Urban Regions

When separate major urban complexes expand along the superior transportation facilities connecting them, they may eventually meet, bind together at their outer margins, and create the extensive urban regions or **conurbations** suggested in Figure 11.3. No longer is there a single city with a single downtown area, set off by open countryside from any other urban unit in its vicinity. Rather, we must now recognize extensive regions of continuous urbanization made up of multiple centers that have come together at their edges.

A major North American example, *Megalopolis* was the term used by geographer Jean Gottmann to describe the nearly continuous urban string that stretches from north of Boston (southern Maine) to south of Washington, D.C. (southern Virginia). Other North American conurbations shown on **Figure 11.6** include the southern Great Lakes region, stretching from north of Milwaukee through Chicago and eastward to Detroit, Cleveland, and Pittsburgh; the Coastal California zone of San Francisco–Los Angeles–San Diego–Tijuana, Mexico; the Canadian "core region" conurbation from Montreal to Windsor, opposite Detroit, Michigan, where it connects with the southern Great Lakes region; the Vancouver–Willamette strip ("Cascadia") in the West; and the Piedmont, Gulf Coast and the Coastal Florida zones in the Southeast. Outside North America, examples of conurbations are numerous and growing, still primarily in the most industrialized European and East Asian (Japanese) districts, but forming as well in the other world regions where urban clusters and megacities emerged in developing countries that still were primarily rural in residential pattern.


Figure 11.6 Megalopolis and other North American conurbations. The northeast U.S. Boston-to-Norfolk urban corridor comprises the original and largest *Megalopolis* and contains the economic, political, and administrative core of the United States. A Canadian counterpart core region anchored by Montreal and Toronto connects with U.S. contributions through Buffalo, New York, and Detroit, Michigan. For some of their extent, conurbations fulfill their classic definition of continuous built-up urban areas. In other portions, the urban areas are interspersed with land uses that are primarily rural.

11.2 Settlement Roots

The major cities of today had humble origins in the simple cluster of dwellings that was the starting point for human settlements everywhere. People are gregarious and cooperative. Even Stone Age hunters and gatherers lived and worked in groups, not as lone individuals or isolated families. All cultures are communal for protection, cooperative effort, sharing of tasks by age and sex, and for more subtle psychological and social reasons. Communal dwelling became the near-universal rule with the advent of sedentary agriculture wherever it developed, and the village became the norm of human society.

In most of the world, rural people still live in nucleated settlements (that is, in villages or hamlets), rather than in dispersed dwellings or isolated farmsteads. Only in North America, parts of northern and western Europe, and in Australia and New Zealand do rural dwellers tend to live apart, with houses and farm buildings located on land that is individually worked. Elsewhere in the world, villages and hamlets were and are the settlement norm, though size and form has varied by region and culture (**Figures 11.7 and 11.8**).
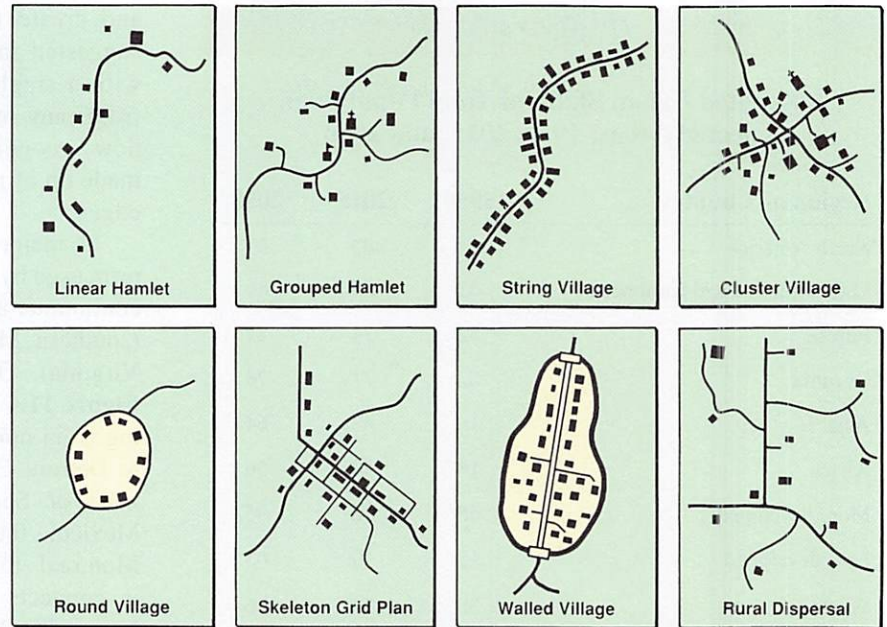
Figure 11.7 Basic settlement forms. The smallest organized rural clusters of houses and nonresidential structures are commonly called *hamlets,* and may contain only 10–15 buildings. *Villages* are larger agglomerations, although not as sizable or functionally complex as urban *towns.* The distinction between village and town is usually a statistical definition that varies by country. The rural dispersal settlement pattern is relatively rare, being found mostly in northern and Western Europe, North America, Australia, and New Zealand.

Source: Redrawn from Introducing Cultural Geography, *2nd ed., by J. E. Spencer and W. L. Thomas. 1978 John Wiley & Sons, Inc.*

Figure 11.8 Shirakawa village, Japan. Most of the world's rural population lives in small, agricultural villages rather than in dispersed farmsteads.
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Rural settlements in developing countries are often expressions of subsistence economic systems in which farming and fishing cultures produce no more than their individual families can consume. When trade does develop between two or more rural settlements, they begin to take on new physical characteristics as their inhabitants engage in additional types of occupations. The villages lose the purely social and residential character of subsistence agricultural settlements and assume urban features. The beginnings of urbanization are seen in the types of buildings that are erected and in the heightened importance of the main streets and of the roads leading to other settlements. No longer are the settlements self-contained; they become part of a system of towns and cities engaged in urban activities and exchange.

11.3 Origins and Evolution of Cities

Cities and civilization are inseparable; indeed, the words *city* and *civilization* have the same Latin root, *civis*. Dating from at least 8,000 years ago, cities originated in—or diffused from—the early culture hearths that first developed sedentary agriculture (see Figure 2.15 in Chapter 2 and **Figure 11.9**). As centers of cultural, economic, religious, and political life, they are among humanity's greatest achievements. Cities abound with contradictions, simultaneously displaying the extremes of luxury and misery, beauty and squalor. In cities, diverse peoples come together to exchange goods, services, and ideas and yet also stratify by race, ethnicity, and social class.

The earliest cities depended on the creation of agricultural surpluses. Many early cities included farms within their walls, but the main distinction between the city and the countryside stemmed from the nonagricultural work of most urban dwellers. This meant that food had to be provided to the urban population by the **hinterland**—the productive area surrounding a population center. Those in the newly emerging town who were not farmers were free to specialize in other activities—metal working, pottery making, cloth weaving, among others—producing goods for other urbanites and for the farm population on which they depended. Still others became scribes, merchants, priests, and soldiers, providing the services and refining the power structure on which the organized urban and rural society depended.

Social organization and a defined power structure, as reflected in a religious hierarchy and civil administration, were essential in urban development. Ancient cities centered on a temple or palace district housing the priests, the ruler, public storehouses and granaries, public baths, perhaps schools, and certainly a central marketplace. Cities became the seats of local and regional power, exercising control over the rural hinterland and extracting agricultural surplus from it for redistribution in the city. If possible, ancient cities were located in spots easy to defend—often on hilltops—but they were nearly always enclosed within protective

Figure 11.9 Aerial view of Erbil, Iraq. The site of modern Erbil—the ancient Assyrian city of Arabilu—has been continuously inhabited for about 8,000 years. The debris of millennia of urban settlement gradually raised the level of the land surface, producing a mound on which the city sits. The city—one of the oldest in the world—literally was constantly rebuilt at higher elevations on the accumulation of refuse from earlier occupants.

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walls (**Figure 11.10**). The massive protective walls of early cities, however, could also limit the expansion of prospering, growing communities. Some cities, like Rome, went through multiple rounds of wall construction, with each new outer wall extending the urban area within which functions could be located and workers housed.

Figure 11.10 By Europe's Middle Ages, the ancient need for city protection remained, but fortifications and defensive structures had assumed elaborate and massive forms that were unknown and unneeded before siege weapons and siege warfare put all cities in jeopardy. The walls of Ávila, Spain, shown here, were built in the 12th century, extending 2,500 meters (8,200 feet) and encircling the entire city at that time; the modern part of Ávila lies outside.

©Pixtal/AGE Fotostock

Among those functions and workers were those engaged in long-distance trade, exchanging local goods and materials for raw materials and special products not obtainable locally. Merchants, wholesalers, clerks, scribes, carters, river men and sailors, and those who produced the vessels and supplied the necessary trade support services that came to characterize and dominate the functional base of the city. The importance of city location on navigable waterways, always a key to urban economic success, became ever more important.

In Europe and Asia, from about the 11th to the 18th century, local and distant trade, production of consumer goods by craftsmen organized into protective guilds, and increasing use of water-powered mills for grinding grain, making cloth, and sawing timber moved cities into intricate involvement in nearly modern forms of interregional and international economy. Massive trade fairs, international banking houses, and cooperative leagues of cities were precursors of today's global marketing, stock exchanges, and regional trade alliances (**Figure 11.11**).

With the Industrial Revolution, another shift in cities took place. Industrialization accelerated the rate of urban growth, initially in Europe and then elsewhere, where European control or influence was extended. Powered by water or steam, the new factories—operated by paid laborers, not by independent guild members—introduced mass production of standardized goods. Industrialization fundamentally changed cities, creating staggering economic and social stratification and, in many early industrial cities, dreadful conditions for the working classes. Cities, once centered on the temple, palace, marketplace, or waterfront wharves, and once surrounded by walls, were changed utterly; they had become places of industrial production centered on factories, canals, and railroads.

As industrialization diffuses around the globe, cities in the newly industrializing countries of Asia or Latin America have witnessed some of the same explosive growth and social polarization that historically accompanied industrialization. Meanwhile, in the more developed countries, the transition to a service economy has caused cities to take on a postindustrial character.

Figure 11.11 The densely built historic medieval section of Florence, Italy, is dominated by the Cathedral Santa Maria del Fiore. Florence prospered in the late Middle Ages as a center for textiles, artisanal craft industries, trade, and banking. It reached a population of 95,000 in 1300 before the plague decimated its population. In the 15th century, it was the center for the rediscovery of classical culture and was home to artists such as Sandro Botticelli, Leonardo da Vinci, and Michelangelo.

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Smokestacks have disappeared and former factories, railroad yards, and industrial waterfronts have been redeveloped for parks, housing, and commercial uses. Consumption and service sector activities, rather than heavy industry, dominate the postindustrial city.

The Nature of Cities

Whether ancient or modern, all cities must perform functions—have an economic base—in order to generate the income necessary to support themselves. Second, no city exists in a vacuum; each is part of a larger society and economy with which it has essential relationships. That is, each is a unit in a system of cities and a focus for a surrounding rural area. Third, each urban unit has a more or less orderly internal arrangement of land uses, social groups, and economic functions. Because all urban functions and people cannot be located at a single point, cities themselves must take up space and organize the uses of that space. These arrangements may be partially or completely planned by central authorities or determined by individual decisions and market forces. Finally, all cities, large or small, ancient or modern, have experienced problems of land use, social conflict, and environmental quality. Yet cities, though flawed, remain the capstone of our cultures, the driving force in contemporary societies and economies, and the magnet for people everywhere.

All urban settlements exist for the efficient performance of functions required by the society that creates them. They reflect the saving of time, energy, and money that the agglomeration of people and activities provides. The more accessible the producer to the consumer, the worker to the workplace, the citizen to the town hall, the worshiper to the place of worship, or the lawyer or doctor to the client, the more efficiently they can perform their separate activities. Because interconnection is essential, the transportation system will have an enormous bearing on the total number of services that can be performed and the efficiency with which they can be carried out. The totality of people and urban functions constitutes a distinctive cultural landscape whose similarities and differences from place to place are the subjects for urban geographic analysis.

The Location of Urban Settlements

Urban centers are functionally connected to other cities and to rural areas. In fact, cities exist not only to provide services for themselves, but for others outside of it. The urban center is a consumer of food, a processor of materials, and an accumulator and dispenser of goods and services. But it must depend on outside areas for its essential supplies and as a market for its products and activities.

In order to adequately perform the tasks that support it and to add new functions as demanded by the larger economy, the city must be efficiently located. That efficiency may be marked by centrality to the area that it serves. It may derive from the physical characteristics of its site, or placement may be related to the resources, productive regions, and transportation network of the country, so it can effectively perform a wide array of activities.

In discussing urban settlement locations, geographers usually distinguish between site and situation, concepts already introduced in Chapter 1 (see Figures 1.6 and 1.7). You will recall that **site** refers to the exact terrain features associated with the city, as well as—less usefully—to its absolute (globe grid) location. Classifications of cities according to site characteristics have been proposed, recognizing special locations. These include *break-of-bulk* locations, such as river crossing points where cargoes and people must interrupt a journey; *head-of-navigation* or *bay head* locations, where the limits of water transportation are reached; and *railhead* locations, where a railroad ended. For ancient and medieval cities, security and defense—islands or elevated sites—were considerations in choosing a location for a city. Waterpower sites and later coalfields were the prime city-building locations during the Industrial Revolution, as noted in Chapter 9.

If *site* suggests absolute location, **situation** indicates relative location in relation to the physical and cultural characteristics of surrounding areas. It is important to know what kinds of possibilities and activities exist in the area near a settlement, such as the distribution of raw materials, market areas, agricultural regions, mountains, and the places to which it is connected through rivers, oceans, and transportation systems. The functions and growth potentials of cities are more determined by their situation than their site.

The site or situation that originally gave rise to a city may not remain the essential ingredient for its continued growth and development. Agglomerations originally successful for whatever reason may by their success attract people and activities totally unrelated to the initial localizing forces. By what has been called a process of "circular and cumulative causation" (see Chapter 10), a successful urban unit may acquire new people and functions attracted by the existing markets, labor force, and urban facilities. In the same way, a site that originally favored the success of the new urban unit—on a navigable river or coal field, perhaps—may with the passage of time no longer be important in supporting any or all of its current economic activities.

Transportation Epochs

Break-of-bulk and head-of-navigation sites demonstrate the importance of transportation to the location of urban settlements. Whenever a new transportation system emerges, it changes the optimal locations for urban growth. Geographer John Borchert identified four epochs of inter-city transportation that shaped the location and growth rates of U.S. cities: (1) sail and wagon, 1790–1830; (2) iron railroads, 1830–1870; (3) steel railroads, 1870–1920; and (4) automobile and airplane travel, 1920–present. During the sail and wagon epoch, the major U.S. cities were all Atlantic ports such as New York City and Boston. These port cities served relatively small rural hinterlands. Canals helped expand the size of the hinterland. During the iron railroad era, inland waterway ports such as Chicago emerged as hubs of

regional railroads that collected and distributed resources from the vast interior of the continent. During the steel railroad era, transcontinental railroads allowed westward expansion and the growth of Pacific port cities such as San Francisco and Seattle. In the era of automobile and airplane travel, urbanization dispersed to new areas, especially those with natural amenities. The Sun Belt regions in the southern and western United States have grown particularly fast in this epoch.

The Economic Base

We saw that from their ancient beginnings, cities depended on close relationships with their hinterlands. They provided the market where rural produce could be exchanged for the goods produced and the defense or religious functions performed by the city. Such rural service functions remain important. However, not all of the activities carried on within a city are intended to connect that city with the outside world. Some are necessary simply to support the city itself. Understanding the growth or decline of cities hinges on grasping the relationship between the two sectors.

Economic base theory was developed by noticing that the economic well-being of small, remote, resource-dependent towns was proportional to the value of goods they sold to outside markets. Part of the employed population of a city is engaged either in the production of goods or the performance of services for areas and people outside the city itself. They are workers engaged in *export* activities, whose efforts result in money flowing into the community. Collectively, they constitute the **basic sector** of the city's total economic structure. According to economic base theory, the basic sector makes up the **economic base** of the community and is essential to the health of the local economy.

Other workers support themselves by producing goods or services for residents of the city itself. Their efforts, necessary to the well-being and the successful operation of the settlement, do not generate new money but comprise a **nonbasic sector** of its economy. These activities circulate money within the community and are responsible for the internal functioning of the city. They are crucial to the continued operation of its stores, professional offices, city government, local transit, and school systems.

The total economic structure of an urban area equals the sum of its basic and nonbasic activities. In actuality, it is difficult to classify work as belonging exclusively to one sector or the other. It is often assumed that most manufacturing work is basic, although services today are increasingly traded. Some part of most jobs involves financial interaction with residents of other areas. Doctors, for example, may have mainly local patients and thus are members of the nonbasic sector, but the moment they provide a service to someone from outside the community, they bring new money into the city and become part of the basic sector.

Most centers perform many export functions, and the larger the urban unit, the more functions it performs. Nonetheless, even in cities with a diversified economic base, one export activity or a very small number of activities tends to dominate the economic specialization within a system of cities (**Figure 11.12**).

Assuming that it was possible to divide the employed population of a city into totally separate basic and service (nonbasic) components, a ratio between the two employment groups could be established. This *basic/nonbasic ratio,* shown in **Figure 11.13**, indicates that as a settlement increases in size, the number of nonbasic personnel grows faster than the number of new basic workers. The graph suggests that service sector jobs, most of which are nonbasic, will be more common in larger cities. In cities with a population of 1 million, the ratio is about two nonbasic workers for every basic worker. This means that adding 10 new basic employees expands the labor force by 30 (10 basic, 20 nonbasic). The resultant increase in total population is equal to the added workers plus their dependents. Thus, a **multiplier effect** exists, in which every new basic sector job creates additional nonbasic jobs. When news media report that a new manufacturing plant will create a certain number of new jobs in addition to those at the plant, they are referring to the multiplier effect. The size of the multiplier effect is determined by the community's basic/nonbasic ratio.

The changing numerical relationships shown in Figure 11.13 are understandable when we consider how settlements add functions and grow in population. A new industry selling services to other communities requires new workers who increase the basic workforce. These new employees in turn demand certain goods and services, such as clothing, food, and medical assistance, which may be provided locally. Those who perform such services must themselves have services available to them. For example, a grocery clerk must also buy groceries. The more nonbasic workers a city has, the more nonbasic workers are needed to support them. The reason that the size of the city influences the basic/nonbasic ratio is because money circulates more efficiently in large cities. In a town too small to support a clothing store, grocery store, or hospital, worker paychecks will be spent purchasing those goods and services from other communities, with no increase in the small town's nonbasic employment. On the other hand, large cities are more self-sufficient and can meet more of their needs internally, so that each new basic job generates additional nonbasic jobs.

The growth of cities may be self-generating—circular and cumulative as industries that specialize in the production of material objects for export, like automobiles and paper products, bring money into a community and set off chain reactions of additional economic activity, much of it involving *service* activities. In recent years, service industries have developed to the point where new service activities serve older ones. In addition to the spending by firms and their workers, the property taxes that they pay support public services such as schools, parks, and transportation systems. These public investments make the city an attractive place to live and do business, in turn attracting more new firms and residents.

In much the same way as settlements grow in size and complexity, so do they decline. When the demand for the goods and services produced by a city falls, less money comes into the community, and both the basic and nonbasic components are affected. Cities that experience deindustrialization often undergo a spiral of decline, losing additional nonbasic jobs and having less money to pay for local public services.
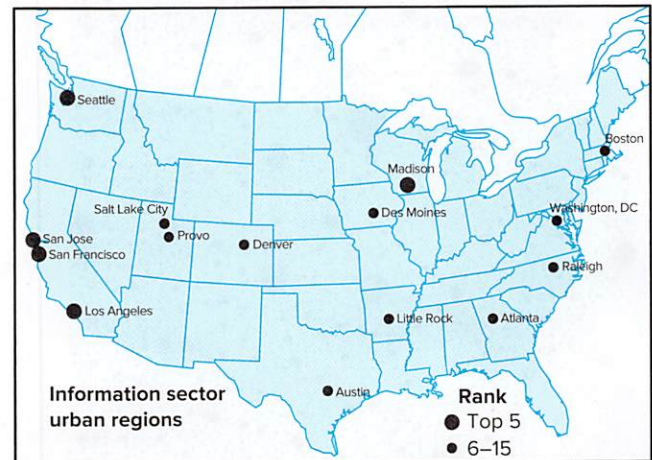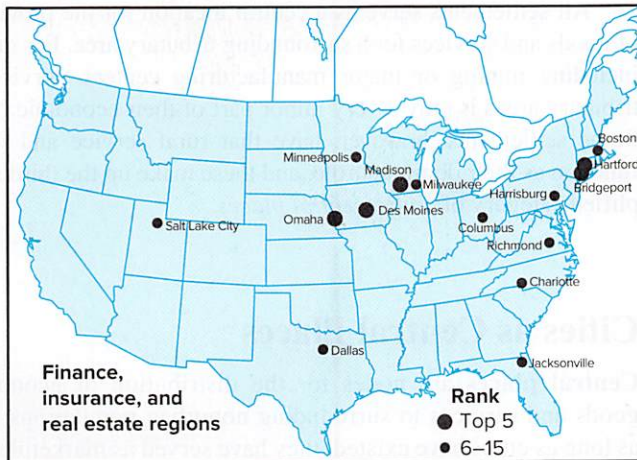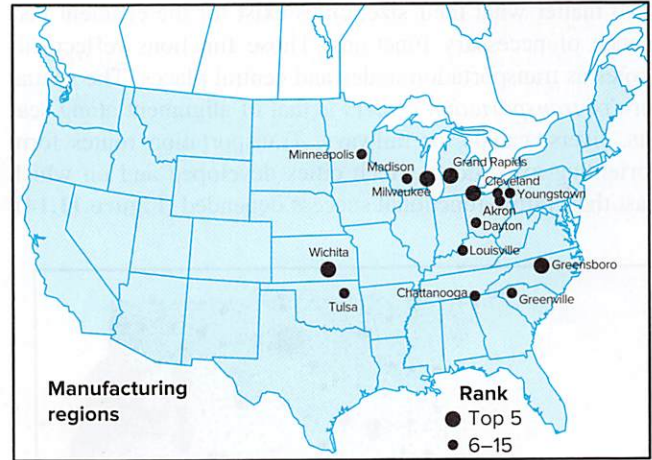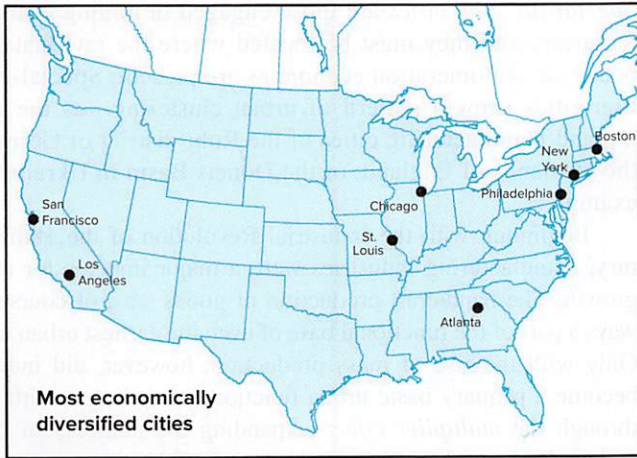
Figure 11.12 Functional specialization of selected U.S. metropolitan regions. Three categories of employment were chosen to show patterns of specialization for some U.S. metropolitan areas. In addition, the category "Most Economically Diversified" includes representative examples of cities with a generally balanced employment distribution. Note that the most diversified urban areas tend to be the largest.
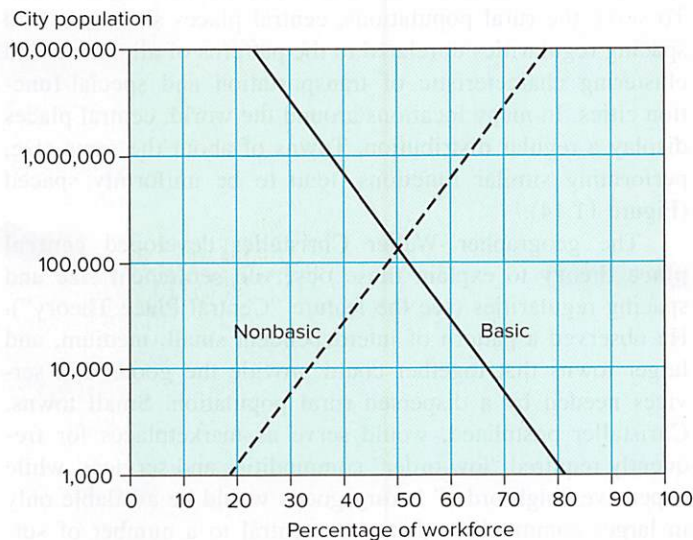
Figure 11.13 Generalized relationship between city size and the proportion of the workforce in basic and nonbasic activities. As settlements become larger, a greater proportion of the workforce is employed in nonbasic activities. Larger centers are, therefore, more self-contained.
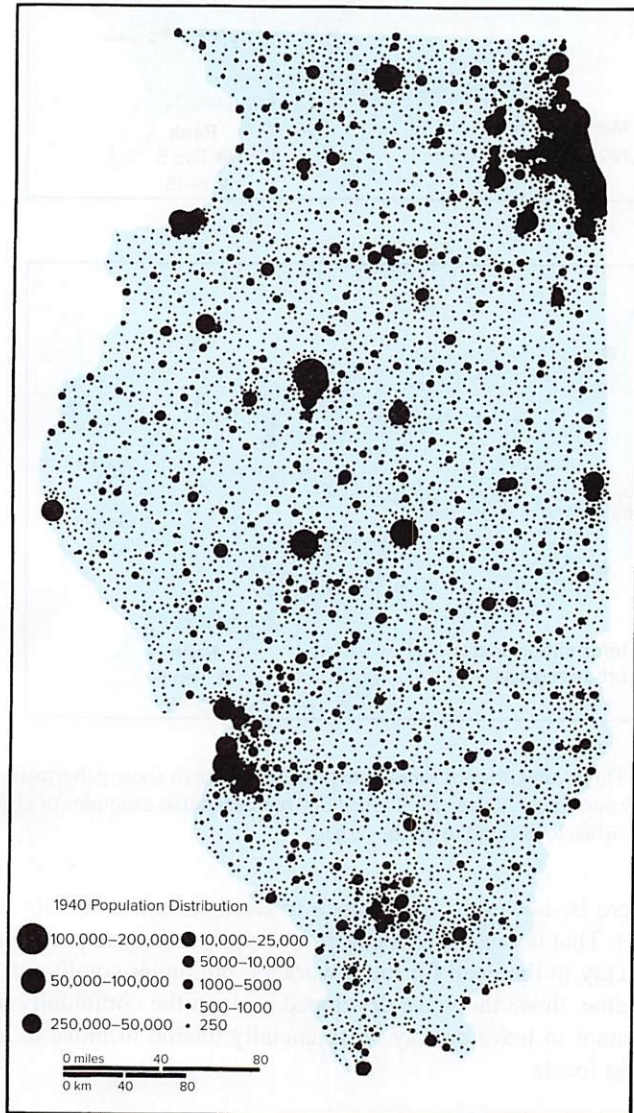
There is, however, a resistance to decline that delays its impact. That is, settlements can grow rapidly as migrants respond quickly to the need for more workers, but under conditions of decline, those that have developed roots in the community are hesitant to leave or may be financially unable to move to another locale.

11.4 The Functions of Cities

Urban-based economic activities account for more than 50 percent of the gross national product (GNP) in all countries and up to 80 percent or more in the more urbanized states. Modern cities take on multiple functions. These include manufacturing, retailing, wholesaling, transportation, public administration, housing cultural and educational institutions, and, of course, the housing of their own citizens. Most cities, however, specialize in, or are dominated by, only one or a very few of the full range of economic activities. Only a relative few very large members of a national system of cities are importantly multifunctional and truly diversified.

No matter what their size, cities exist for the efficient performance of necessary functions. Those functions reflect cities' roles as transportation nodes and central places. The spatial pattern of *transportation centers* is that of alignment along seacoasts, rivers, canals, or railways. Transportation routes form the orienting axes along which cities developed and on which at least their initial functional success depended (**Figure 11.14**).

1940 Population Distribution

● 100,000–200,000 ● 10,000–25,000
  ● 5000–10,000
● 50,000–100,000 ● 1000–5000
  · 500–1000
● 250,000–50,000 · 250

0 miles 40 80
0 km 40 80

Figure 11.14 Urban alignments in Illinois. Railroads preceded settlement in much of the U.S. and Canadian continental interior, and urban centers were developed—frequently by the railroad companies themselves—as collecting and distributing points expected to grow as the farm populations increased. Located at constant 8- to 10-kilometer (5- to 6-mile) intervals in Illinois, the rail towns were the focal points of an expanding commercial agriculture. The linearity of the town pattern in 1940, at the peak of railroad influence, unmistakably marks the rail routes. Also evident are such special-function clusterings as the Chicago and St. Louis metropolitan districts and the mining towns of southern Illinois. In addition to the linear and cluster patterns, the smallest towns show the uniform distribution characteristic of central places.

Special-function cities are those engaged in mining or manufacturing, and they must be located where the raw materials occur, or agglomeration economies are present. Special-function cities show a pattern of urban clustering—as the mining and manufacturing cities of the Ruhr district of Germany, the Midlands of England, or the Donets Basin in Ukraine, for example.

Beginning with the Industrial Revolution of the 18th century, manufacturing industries were a major impetus for urban growth. The handicraft production of goods was, of course, always a part of the functional base of even the earliest urban units. Only with the rise of mass production, however, did industry become a primary basic urban function, producing wealth and, through the *multiplier effect,* expanding the numbers of basic and nonbasic workers through the export of manufactured goods throughout the larger economy.

All settlements serve as a central location for the provision of goods and services for a surrounding tributary area. For many, including mining or major manufacturing centers, service to tributary areas is only a very minor part of their economic base. Some settlements, however, have that rural service and trade function as their dominant role, and these make up the third simplified category of cities: *central places.*

Cities as Central Places

Central places are nodes for the distribution of economic goods and services to surrounding nonurban populations. For as long as cities have existed, they have served as marketplaces, not only for their own residents, but also for the population beyond the city limits. Small cities provide a range of goods and services that suffice for most everyday needs. But specialized, "higher-order" expensive or unique commodities and skilled specialized services can be found only in the largest cities. To serve the rural populations, central places show size and spacing regularities unrelated to the patterns of alignment and clustering characteristic of transportation and special-function cities. In many locations around the world, central places display a regular distribution. Towns of about the same size, performing similar functions, tend to be uniformly spaced (Figure 11.14).

The geographer Walter Christaller developed **central place theory** to explain those observed settlement size and spacing regularities (see the feature "Central Place Theory"). He observed a pattern of interdependent small, medium, and larger towns that together could provide the goods and services needed by a dispersed rural population. Small towns, Christaller postulated, would serve as marketplaces for frequently required "low-order" commodities and services, while expensive "high-order" luxury goods would be available only in larger communities that were central to a number of surrounding small towns. That is, people would have to travel only short distances for low order items, such as gasoline, convenience groceries, or haircuts, and longer distances for

expensive and infrequently demanded goods and services, such as art museums, professional sports, luxury automobiles, or specialized medical treatments.

Christaller's explanation and description of the urban size and spacing regularities he observed have been shown to be generally applicable in widely differing regions of the world. When varying incomes, cultures, physical landscapes, and transportation systems are taken into consideration, his theory holds up rather well. It is particularly applicable, of course, to agricultural areas with a uniform distribution of consumers and purchasing power. If we combine a Christaller-type approach with the ideas of industrial location that help us understand the cluster patterns of special-function cities (see Chapter 9) and the alignments of transportation-based cities, we have a fairly good understanding of the distribution of most towns and cities. Central place theory is less relevant, of course, to arid regions such as the southwestern United States, where the lack of water prevented a uniform rural settlement and urban growth is much more concentrated.

The interdependence of small, medium, and large cities can also be seen in their influence on one another. A small city may influence a local region of some 1,000+ square kilometers (400 square miles) if, for example, its newspaper is delivered to that district. Beyond that area, another city may be the dominant influence. **Urban influence zones** are the areas outside a city that are still affected by it. As the distance away from a community increases, its influence on the surrounding countryside decreases (recall the idea of distance decay that was discussed in Chapter 3). The sphere of influence of an urban unit is usually proportional to its size.

For example, a large city located 100 kilometers (62 miles) away from a small city may influence that and other smaller communities through its banking services, TV stations, professional sports teams, and large shopping malls. There is an overlapping hierarchical arrangement, and the influence of the largest cities is felt over the widest areas, a *market area* dominance that is basic to central place theory.

Intricate relationships and hierarchies are common. Consider Grand Forks, North Dakota, which for local market purposes dominates the rural area immediately surrounding it. However, Grand Forks is influenced by political decisions made in the state capital, Bismarck. For a variety of cultural, commercial, and banking activities, Grand Forks is influenced by Minneapolis. As a center of wheat production, Grand Forks and Minneapolis are subordinate to the grain market in Chicago. Of course, the pervasive agricultural and other political controls exerted from Washington, D.C., on Grand Forks, Minneapolis, and Chicago indicate the size and complexity of urban zones of influence.

11.5 Systems of Cities

The systems of cities approach to urban geography considers the functions that cities perform in regional, national, or international economies, their relationships with the surrounding rural land and other cities, and how they are arranged in spatial patterns, networks, and hierarchies.

The Urban Hierarchy

Perhaps the most effective way to recognize how systems of cities are organized is to consider the **urban hierarchy,** a ranking of cities based on their size and functional complexity. One can measure the numbers and kinds of functions that each city or metropolitan area provides. The hierarchy is, then, like a pyramid; a few large and complex cities are at the top and many smaller, simpler ones are at the bottom. There are always more smaller cities than larger ones.

When a spatial dimension is added to the hierarchy as in **Figure 11.15,** it becomes clear that an areal system of metropolitan centers, large cities, small cities, and towns exists. Goods, services, communications, and people flow up and down the hierarchy. The few high-level metropolitan areas provide specialized functions for large regions, while the smaller cities serve smaller districts. The separate centers interact with the areas around them, but because cities of the same level provide roughly the same services, those of the same size tend not to serve each other unless they provide some very specialized activity, such as housing the political capital of a region or a major hospital or university. Thus, the settlements of a given level in the hierarchy
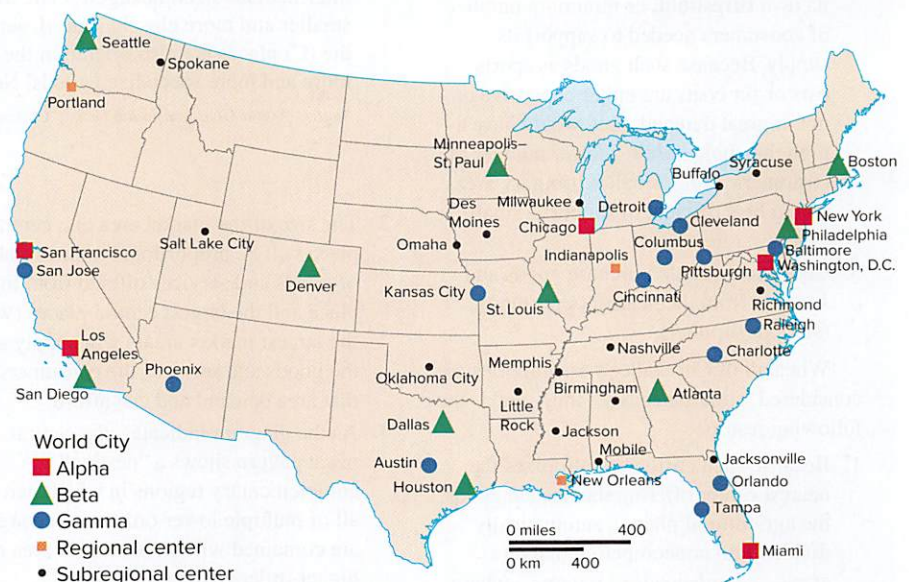
Figure 11.15 A functional hierarchy of U.S. metropolitan areas. With globalization, many former regional centers have become world cities. The hierarchy includes smaller urban centers (not shown) that depend on or serve the larger centers.

Source: Redrawn from P. J. Taylor, et al. The World According to GaWC 2016. Globalization and World Cities Research Network and P. L. Knox, ed., The United States: A Contemporary Human Geography. Harlow, United Kingdom. Longman, 1988, Fig. 5.5, p. 144.
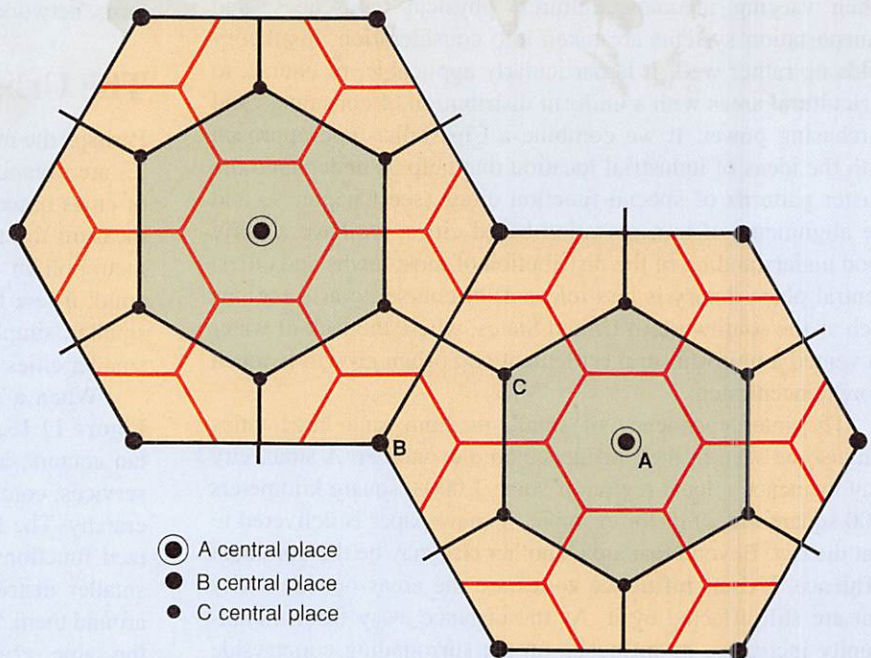
Central Place Theory

In 1933, the German geographer **Walter Christaller** attempted to explain the size and spacing regularities he observed for towns in Southern Germany. In doing so, he developed a framework called *central place theory,* which provided the descriptive understandings that he sought. Christaller did recognize that his explanatory theory would best describe an idealized and somewhat artificial situation with the following characteristics:

1. Towns that provide the surrounding rural agricultural population with such fundamental goods as groceries and clothing would develop on an **isotropic plain,** that is, one with no topographic barriers, channelization of traffic, or variations in farm productivity.

2. The rural population would be dispersed in an even pattern across that uniform plain.

3. The characteristics of the people would be uniform; that is, they would possess similar tastes, demands, and incomes.

4. Each kind of product or service available to the dispersed population would have its own **threshold,** or minimum number of consumers needed to support its supply. Because such goods as sports cars or fur coats are either expensive or not in great demand, they would have a high threshold, while a fewer number of customers within smaller tributary areas would be sufficient to support a small grocery store.

5. Consumers would purchase goods and services from the nearest opportunity (store or supplier).

When all of Christaller's assumptions are considered simultaneously, they yield the following results:

1. Because each customer patronizes the nearest center offering the needed goods, the agricultural plain is automatically divided into noncompeting market areas—*complementary regions*—where each individual town (and its merchants) has a sales monopoly.

2. Those market areas will take the form of a series of hexagons that cover the entire plain, as shown in the diagram. There will be a central place at the center of each of the hexagonal market areas.

○◉ A central place
● B central place
• C central place

AP **Figure 11A** Complementary regions and the pattern of central places. The two (A) central places are the largest on this diagram of one of Christaller's models. The (B) central places offer fewer goods and services for sale and serve only the areas of the intermediate-sized hexagons. The many (C) central places, which are considerably smaller and more closely spaced, serve still smaller market areas. The goods offered in the (C) places are also offered in the (B) and (A) places, but the latter offer considerably more and more specialized goods. Notice that places of the same size are equally spaced.

Source: Arthur Getis and Judith Getis, "Christaller's Central Place Theory." Journal of Geography, 1966.

3. The size of the market area of a central place will be proportional to the number of goods and services offered from that place and the largest central places (with the largest market areas) will supply all the goods and services the consumers in that area demand and can afford.

4. As the diagram indicates, the central place pattern shows a "nesting" of complementary regions in which part or all of multiple lower-order service areas are contained within the market area of a higher-order center.

In addition, Christaller reached two important conclusions. First, towns at the same size (functional level) in the central place system will be evenly spaced, and larger towns (higher-order places) will be farther apart than smaller ones. This means that many more small than large towns will exist.

In the diagram, the ratio of the number of small towns to towns of the next larger size is 3 to 1. This distinct, steplike series of towns in discrete classes differentiated by both size and function is called a **hierarchy of central places**.

Second, the system of towns is interdependent. If one central place were eliminated, the entire system would have to readjust. Consumers need a variety of products and services, each of which has a different minimum number of customers required to support it. The towns containing many goods and services become regional retailing centers, while the smaller central places serve just the people in their immediate vicinity. The higher the threshold of a desired product, the farther, on average, the consumer must travel to purchase it.

are not independent but interrelated with communities of other levels in that hierarchy. Together, all centers at all levels in the hierarchy constitute an urban system.

World Cities

Standing at the top of national systems of cities are a relatively few places that may be called **world cities** (or global cities). These large urban centers are command and control points for the global economy. When manufacturing dominated the economy, much of what an individual company did—production, management, sales, accounting, etc.—took place in a single city, often in the same building. Now, the globalized economy and transnational corporations (TNCs) have scattered those functions and jobs across the world. But all those activities must be coordinated somewhere, and that place is the world city.

London and New York, the world's two largest cities in 1950, are generally recognized as the two most dominant world cities today. They are no longer the world's two most populous cities, but they contain the highest number of producer services offices and TNC headquarters, and they dominate commerce in their respective parts of the world. Each is directly linked to a number of other primary- and secondary-level world cities. All are bound together in complex networks that control the organization and management of the global system of finance, production, and trade. **Figure 11.16** shows the links between the dominant centers and some of the major and secondary world cities, which include Paris, Dubai, Hong Kong, Singapore, Beijing, Shanghai, and Tokyo. These cities are all interconnected by advanced communication systems between governments, major corporations, stock and futures exchanges, securities and commodity markets, major banks, and international organizations.

World cities are home to society's most powerful and elite members, and thus they are centers for arts, culture, and the consumption of luxury goods. Some critics suggest that the forces of economic globalization that create world cities also increase inequality. Certainly, the incredible wealth generated in world cities leads to high costs for housing, creating affordability problems for lower-wage service workers.

Rank-Size and Primacy

In addition to considering city systems on a global scale, urban geographers also inquire about the organization of city systems within regions or countries. The observation that there are many more small than large cities within an urban system ("the larger the fewer") is itself a statement about expected city hierarchies. In some countries, especially those with complex economies and a long urban history, the city size hierarchy is summarized by the **rank-size rule.** It tells us that the *n*th largest city of a national system of cities will be 1/*n* the size of the largest city. That is, the second-largest settlement will be 1/2 the size of the largest, the 10th biggest will be 1/10 the size of the first-ranked city, and so on. Although no national city system exactly meets the predictions of the rank-size rule, that of Russia, Canada, and the United States closely approximate it.
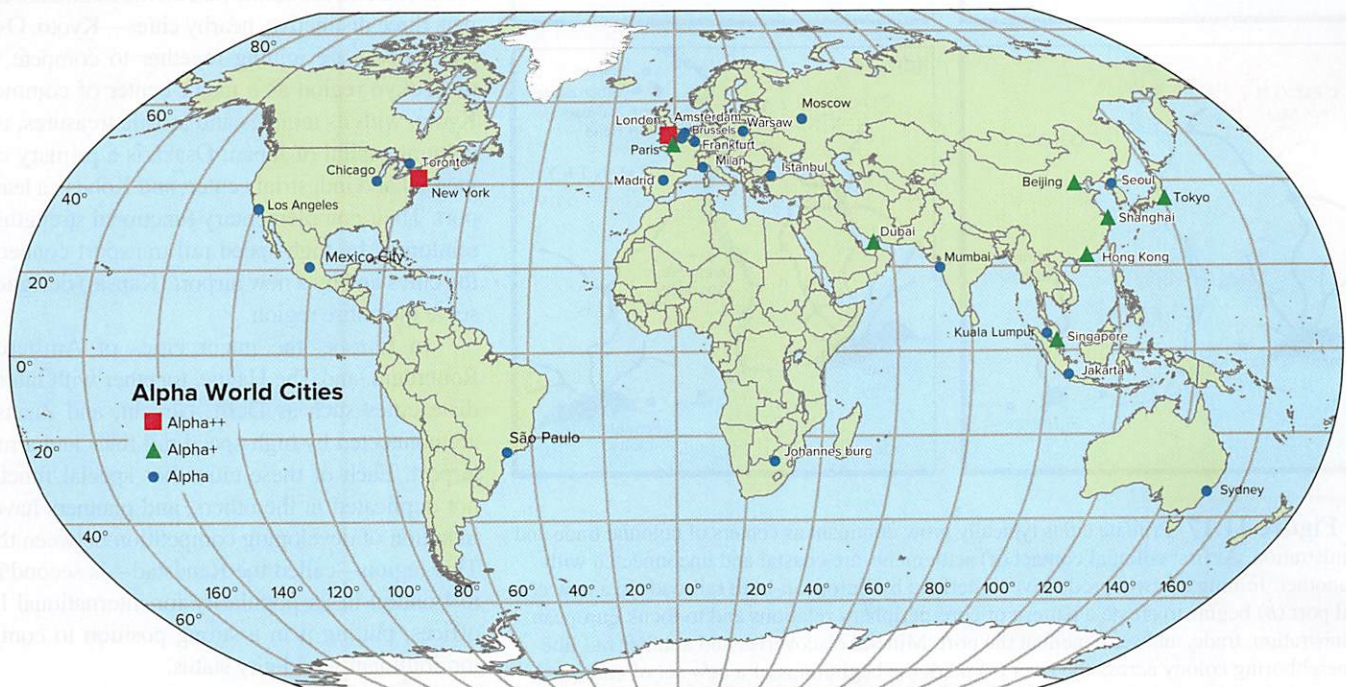
Figure 11.16 This classification of world (or global) cities is based on international business services of advertising, accounting, banking, and law. Compare this map to Figure 11.3. The location of the alpha world cities shows the greater economic power of the developed countries and the rising importance of newly industrializing Asian cities. These cities are bound together in complex networks, all interconnected by the flow of financial and economic information. A classification based on a different set of economic activities would yield a slightly different list but a similar hierarchy. Beta and gamma world cities are not shown.

Source: Adapted from P. J. Taylor, et al. The World According to GaWC 2016. Globalization and World Cities Research Network.

Rank-size ordering is less applicable to countries with developing economies or where the city system is dominated by a **primate city,** one that is far more than twice the size of the second-ranked city. In fact, there may be no obvious "second city" at all, for a characteristic of a primate city hierarchy is one very large city, few or no intermediate-sized cities, and many subordinate smaller settlements. For example, Seoul (at 9.8 million in 2010) contains about 20 percent of the total population of South Korea, and Luanda, Angola, and Bangkok, Thailand, are each home to about 40 percent of their country's urban population.

The capital cities of many developing countries display that kind of overwhelming primacy. In part, their primate city pattern is a heritage of their colonial past, when economic development, colonial administration, and transportation and trade activities were concentrated at a single point (**Figure 11.17**); Nairobi (Kenya), Dakar (Senegal), and many other African capital cities are examples.

In other instances—Egypt (Cairo) or Mexico (Mexico City), for example—development and population growth have tended to concentrate disproportionately in a capital city whose very size attracts further development and growth. Many European countries, such as Austria, the United Kingdom, and France, also show a primate structure due to the historic concentration of economic and political power in a capital city that was the administrative and trade center of a larger colonial empire.

Network Cities

The history of urban growth includes episodes of intense competition between cities, often over dominance of transportation networks. In recent years, a new kind of urban spatial pattern, the network city, has begun to appear as nearby cities work together. A **network city** evolves when two or more previously independent cities with potentially complementary functions develop high-speed transportation corridors and communications infrastructure to facilitate cooperation.

For example, since the reunion of Hong Kong and China proper in 1997, an infrastructure of highway and rail lines and communications improvements has been developed to help integrate Hong Kong with Guangzhou, the huge, rapidly growing industrial and economic hub on the mainland. In Japan, three distinctive, nearby cities—Kyoto, Osaka, and Kobe—are joining together to compete with the Tokyo region as a major center of commerce. Kyoto, with its temples and artistic treasures, is the cultural capital of Japan; Osaka is a primary commercial and industrial center; and Kobe is a leading port. Their complementary functional strengths are reinforced by high-speed rail transport connecting the cities and by a new airport (Kansai) designed to serve the entire region.

In Europe, the major cities of Amsterdam, Rotterdam, and The Hague, together with intermediate cities such as Delft, Utrecht, and Zaanstad, are connected by high-speed rail lines and a major airport. Each of these cities has special functions not duplicated in the others, and planners have no intention of developing competition between them. This region—called the Randstad—is second only to London in its popularity for international head offices, putting it in a strong position to compete for dominant world-city status.

No similar network city has yet developed in the United States. The New York–Philadelphia, Chicago-Milwaukee, San Francisco–Oakland, or Los Angeles–San Diego city pairings do not yet qualify for network city status because there has been no concerted effort to bring their competing interests together into a single structure of complementary activities.
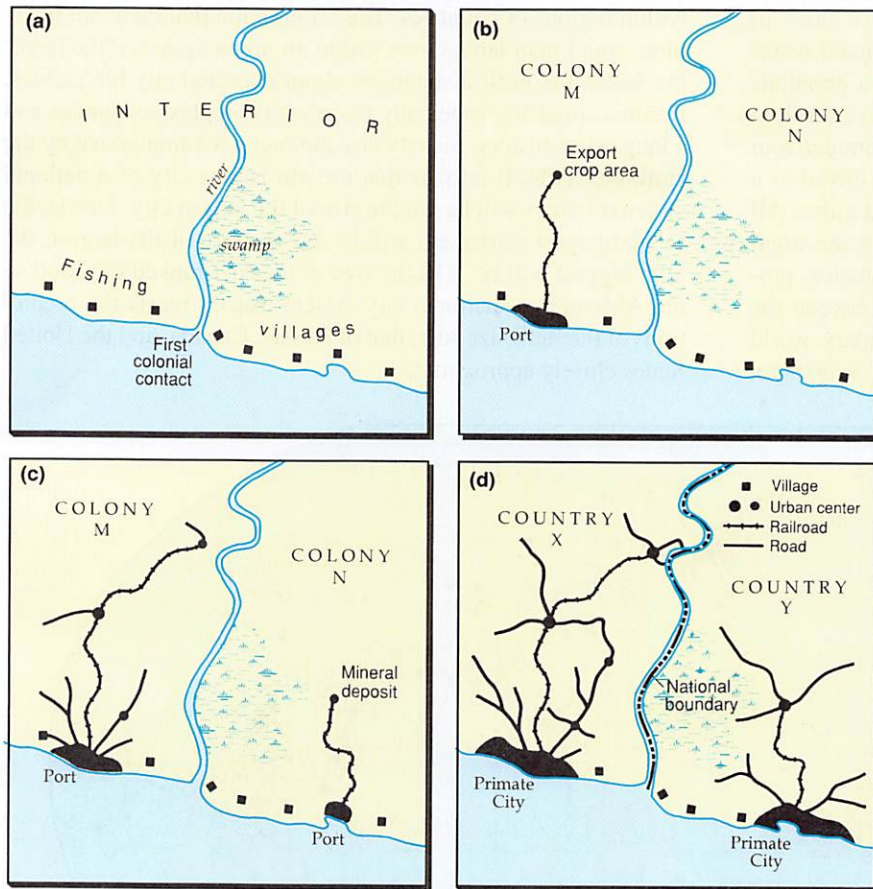
AP **Figure 11.17** Primate cities typically grow dominant as centers of colonial trade and administration. At first colonial contact (a) settlements are coastal and unconnected with one another. Joining a newly productive hinterland by European-built railroads to a new colonial port (b) begins to create a pattern of core-periphery relations and to focus European administration, trade, and settlement at the port. Mineral discoveries and another rail line in a neighboring colony across the river (c) mark the beginnings of a new set of core-periphery relationships and of a new multifunctional colonial capital nearby but unconnected by land with its neighbor. With the passage of time and further transport and economic development, two newly independent nations (d) display *primate city* structures in which further economic and population growth flows to the single dominating centers of countries lacking balanced regional transport networks, resource development, and urban structures. Both populations and new functions continue to seek locations in the primate city where their prospects for success are greatest.

Source: Adapted from E. S. Simpson, The Developing World: An Introduction *(Harlow, Essex, England: Longman Group UK Limited, 1987).*

11.6 Inside the City

The location, structure, patterns, and spatial interactions of systems of cities make up only half of the story of urban settlements. The other half involves the distinctive cultural landscapes of cities themselves. An understanding of the nature of cities is incomplete without knowledge of their internal characteristics. So far, we have explored the origins and functions of cities within hierarchical urban systems. Now we look into the city itself to better understand how its land uses are distributed, how social areas are formed, and how institutional controls such as zoning regulations affect its structure. We will begin on familiar ground and focus our discussion primarily on U.S. cities. Later in this chapter, we will review urban land-use patterns and social geographies in different world settings. First, however, it is important to understand the common terms that we will use throughout this section.

Defining the City Today

Urban settlements come in different sizes, shapes, and types. Their common characteristic is that they are nucleated, nonagricultural settlements. At one end of the size scale, urban areas are hamlets or small towns with at most a single short main street of shops; at the opposite end, they are complex multifunctional metropolitan areas or megacities (**Figure 11.18**). The word *urban* is often used to describe such places as a town, city, suburb, and metropolitan area, but it is a general term, not used to specify a particular type or size of settlement. Although the terms designating the different types of urban settlement, like *city,* are employed in common speech, not everyone uses them in the same way. What is recognized as a city by a resident of rural Vermont or West Virginia might not be by an inhabitant of California or New Jersey. One should keep in mind, as well, that the same term may be understood or defined differently in different parts of the world. In the United States, the Census Bureau describes an *urban* place as having 2,500 or more inhabitants. In Greece, *urban* refers to municipalities in which the largest population center has 10,000 or more inhabitants, and Nicaragua uses the term to denote administrative centers with streets, lights, and at least 1,000 inhabitants. It is useful in this chapter to agree on the meanings of common terms with different usages.

The words **city** and *town* denote nucleated settlements with multiple functions, including a central business district (CBD) and both residential and nonresidential land uses. **Towns** are smaller in size and have less functional complexity than cities, but they still have a nuclear business concentration. **Suburb** implies a subsidiary area, a functionally specialized segment of a larger urban complex. It may be mostly residential, industrial, or commercial, but by the specialization of its land uses and functions, a suburb is not self-sufficient. A suburb, however, can be an independent political entity with its own local government. A **central city** is the principal core of a larger urban area, separately incorporated and ringed by its dependent suburbs.

Some or all of these urban types may be grouped into larger composite units. An **urbanized area** is a continuously built-up landscape defined by building and population densities, with no reference to political boundaries. It may be viewed as the *physical city* and may contain a central city and many contiguous cities, towns, and suburbs. A **metropolitan area,** on the other hand, is a large-scale *functional* entity, perhaps containing several urbanized areas, discontinuously built up but nonetheless operating as an integrated economic whole. The edge of the urbanized area is visible as the boundary where urban development meets the open countryside, By contrast, the boundary of the metropolitan area is often just a line on a map that is not apparent on the ground. **Figure 11.19** shows these areas in a hypothetical American metropolitan area.
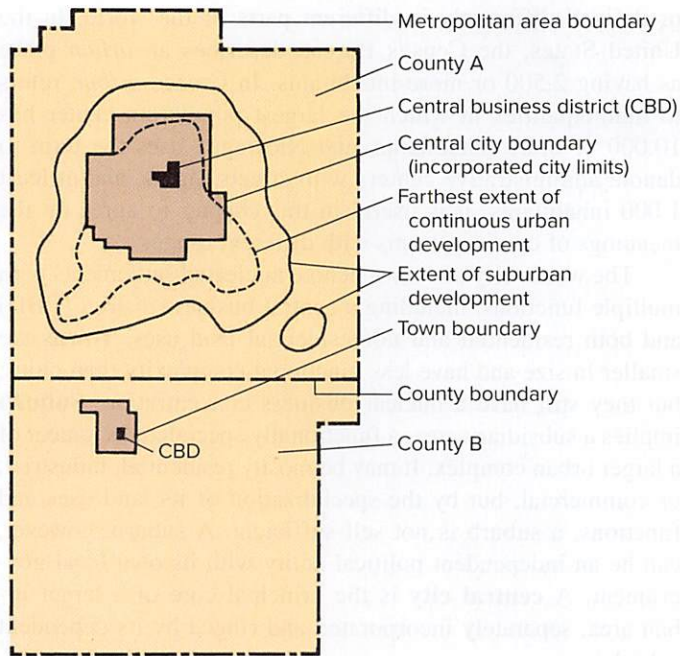

(a)

(b)

Figure 11.18 The differences in size, density, and land-use complexity are immediately apparent between *(a)* a city (New York City) and *(b)* a town (Shepherdstown, West Virginia). Clearly, one is a city and one is a town, but both are *urban* areas.

(a) ©TongRo Images/Alamy Stock Photo; (b) ©Mark Bjelland

Figure 11.19 A hypothetical spatial arrangement of urban units within a metropolitan area. Sometimes official limits of the central city are very extensive and contain areas commonly considered suburban or even rural. On the other hand, older eastern and midwestern U.S. cities (and others, such as San Francisco in the west) more often have restricted limits and contain only part of the high-density land uses and populations of their metropolitan or urbanized areas as shown in this diagram. In this diagram, County B is part of the same metropolitan area as County A because of strong commuting and socialization ties between the counties.

The Bureau of the Census has redefined the concept of *metropolitan* from time to time to summarize the realities of the changing population, physical size, and functions of urban regions. The current *metropolitan statistical areas* are comprised of a central county or counties with at least one urbanized area of at least 50,000 residents, plus adjacent outlying counties with a high degree of social and economic integration with the central county as measured by commuting volumes. A list of the largest U.S. metropolitan statistical areas in 2017 is given in **Table 11.3**. Using similar criteria, the U.S. Census Bureau also defines micropolitan areas, where the urban core has between 10,000 and 50,000 residents.

Classic Patterns of Urban Land Use

Recurring patterns of land use and population density exist within urban areas. There are regularities in the way cities are internally organized, especially within one particular culture region, such as North America or Western Europe. Accessibility, a competitive market in land, and the innumerable individual residential, commercial, and industrial locational decisions made over time have shaped unplanned internal urban land-use patterns. Giving rise to three sharply different urban land-use layouts were the dominant transportation modes—first, walking, then mass transit

Table 11.3

The 30 Largest U.S. Metropolitan Statistical Areas, July 2017

Rank	Metropolitan Areas Identified by Their Principal Cities	Population
1	New York	20,321,000
2	Los Angeles	13,354,000
3	Chicago	9,533,000
4	Dallas–Fort Worth	7,400,000
5	Houston	6,892,000
6	Washington, D. C.	6,217,000
7	Miami	6,159,000
8	Philadelphia	6,096,000
9	Atlanta	5,885,000
10	Boston	4,837,000
11	Phoenix	4,737,000
12	San Francisco	4,727,000
13	Riverside–San Bernardino	4,581,000
14	Detroit	4,313,000
15	Seattle	3,867,000
16	Minneapolis–St. Paul	3,601,000
17	San Diego	3,338,000
18	Tampa–St. Petersburg	3,091,000
19	Denver	2,888,000
20	Baltimore	2,808,000
21	St. Louis	2,807,000
22	Charlotte	2,525,000
23	Orlando	2,510,000
24	San Antonio	2,474,000
25	Portland	2,453,000
26	Pittsburgh	2,333,000
27	Sacramento	2,325,000
28	Las Vegas	2,204,000
29	Cincinnati	2,179,000
30	Kansas City	2,129,000

Source: U.S. Bureau of the Census.

systems, and later the automobile—available during successive periods of urban growth.

The pedestrian and pack animal movement of people and goods within the small, compact pre-industrial walking city could no longer serve the increasing number of people and functions seeking accommodation within the expanding industrial city of

the late 19th and early 20th centuries. Mass transit lines—horse car, cable car, electric streetcar lines, and eventually elevated and subway rail systems—were successively installed and extended; they controlled the development and layout of cities in, particularly, the northeastern United States, southeastern Canada, and older cities of the interior and west. Radiating outward from the town center, the transit systems immediately gave differential accessibility to the different areas of the growing city. Properties along and near the lines were usable and valuable because reachable; land beyond easy walking distance of the radial transit lines was unusable and left vacant. Transit lines generally converged at a hub in the CBD, making the central area the most valuable in the entire region. The result was a compact, high-density city with a single dominant center and sharp break at the boundary between urban and nonurban uses (**Figure 11.20**).

The Central Business District

Within the older central city, the radiating mass transit lines focused on the original city center (downtown), giving that area the highest accessibility within the growing urban complex. The center, therefore, held the greatest attraction for those functions profiting most from accessibility to the whole region. Building lots within the emerging **central business district (CBD)** could command the highest rental and purchase prices. The intersection where the major mass transit lines converged was called the **peak land value intersection.**

In a market system, the value of urban land was determined by competitive bidding among potential users. Public uses—parks, municipal buildings, schools—were allocated land according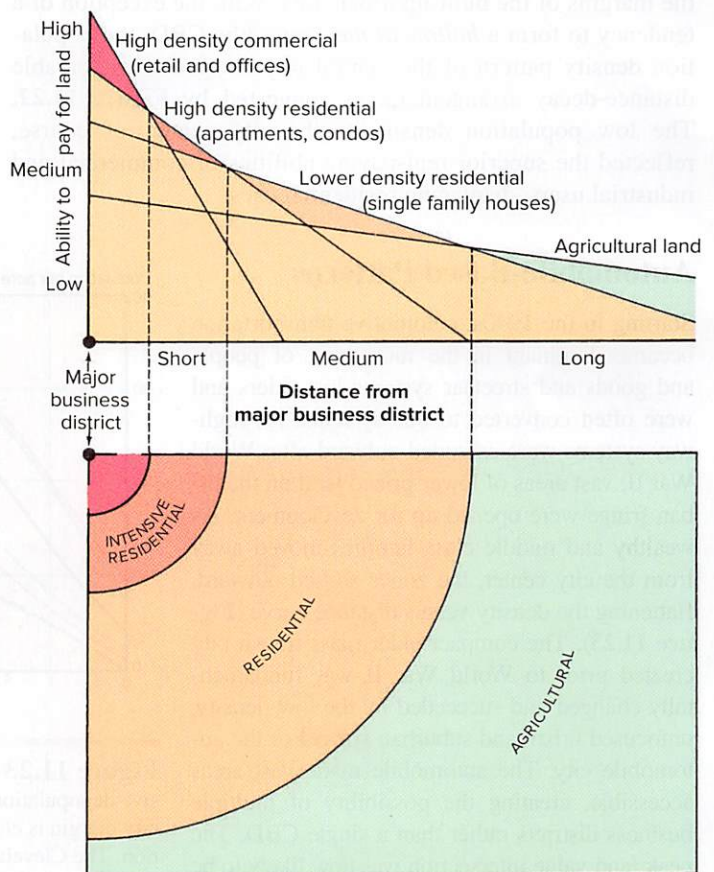 to criteria other than ability to pay. In the private market, however, uses with the greatest need and demand for accessibility bid most for, and occupied, the most central parcels within the CBD. Those uses were typically the department stores and other retail outlets catering to the shopping needs of the majority of urban residents. The urban core, that is, became the highest-order central place, offering the full range of low-order and high-order goods. Parcels a short distance from the peak land value intersection generally became sites for tall office buildings (skyscrapers), the principal hotels, and similar land uses that helped produce the distinctive skyline of the older, high-order commercial city.

Outside the CBD

Just outside the core area of the city, industry controlled land next to essential cargo routes: rail lines, waterfronts, rivers, or canals. Lower-order commercial centers developed at the outlying intersections—transfer points—of the mass transit network. Strings of stores, light industries, and high-density apartment structures could afford and benefit from location along high-volume transit routes. The least accessible locations within the city were left for the least-competitive bidders: low-density residences. A diagrammatic summary of this repetitive allocation of space among competitors for urban sites is shown in **Figure 11.21.**

Figure 11.20 Townhouses, such as these in Boston's Back Bay area, as well as apartment buildings and duplexes, were a characteristic response to the price and scarcity of developable urban land in the era before automobiles became widely available. Where detached single-family dwellings were built, they were typically on smaller lots than became the norm once widespread automobile use allowed cities to spread outward in the second half of the 20th century.
©Mark Bjelland

Figure 11.21 Generalized urban land-use pattern. The model depicts the location of various land uses in an idealized city where the highest bidder gets the most accessible land.
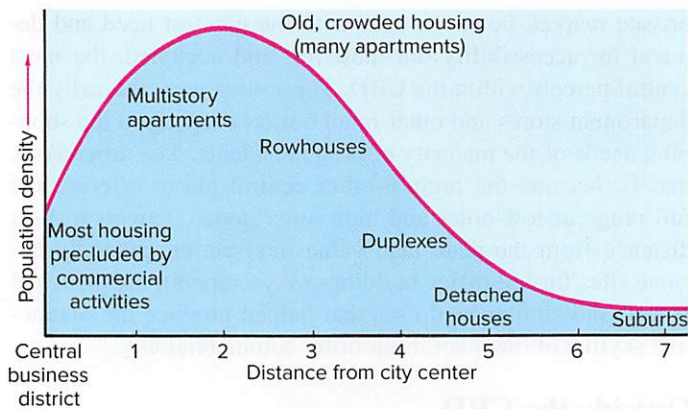
Figure 11.22 A summary population density curve. As distance from the area of multistory apartment buildings increases, the population density declines.

The competitive bidding for land should yield—in theory, at least—two separate but related distance-decay patterns: both land values and population densities decrease as distance from the CBD increases. Land values decline in a distinct pattern: within the CBD, there is a sharp drop in values a short distance from the peak land value intersection, the most accessible and costly parcel of the CBD; then the values decline less steeply to the margins of the built-up urban area. With the exception of a tendency to form a *hollow at the center,* the CBD, the population density pattern of the central city showed a comparable distance-decay arrangement, as suggested by **Figure 11.22**. The low population density at the city center, of course, reflected the superior rent-paying abilities of commercial and industrial users, displacing residential uses.

Automobile-Based Patterns

Starting in the 1940s, automotive transportation became dominant in the movement of people and goods and streetcar systems lost riders and were often converted to bus systems. As highway systems were extended outward after World War II, vast areas of lower-priced land on the urban fringe were opened up for development. As wealthy and middle class families moved away from the city center, the zones shifted outward, flattening the density versus distance curve (**Figure 11.23**). The compact older mass transit city created prior to World War II was fundamentally changed and succeeded by the low-density, unfocused urban and suburban **sprawl** of the automobile city. The automobile made vast areas accessible, creating the possibility of multiple business districts rather than a single CBD. The peak land value intersection was now likely to be the intersection of a major radial highway with a circumferential (beltway) highway or even an entire highway corridor. Still, the concepts of accessibility and competitive bidding for land shown in

Figure 11.21 apply. In newer automobile-based development, major commercial uses occupy the most accessible and most expensive land along major highway corridors. Higher-density housing, such as apartments, townhouses, and condominiums, often border these commercial districts, and lower-density single-family housing is found in more secluded, less accessible locations. In most communities, these patterns are not the product of pure free market bidding but are dictated by land use and zoning plans that try to anticipate the results of competitive bidding for each piece of land.

Regional Differences

The timing of an urban region's growth determines the relative mix of walking city, mass-transit city, and automobile city. Only the oldest parts of eastern cities such as Old Quebec and Boston's Beacon Hill still display remnants of the walking city. Cities in the East and Midwest, such as Philadelphia and Chicago, have large areas that developed when mass transit was dominant. The density and design of the newer cities of the West and Southwest, as well as the suburban growth areas of older centers, have been influenced primarily or exclusively by the automobile and motor truck, not by mass transit and railroads. The land use contrast between regions is not absolute, of course, as older cities have adapted to the automobile and rapidly growing cities in the West and Southwest have added light-rail transit systems. Even so, the different patterns have not been totally erased because cities, like other cultural landscapes, are built up over time, layer upon layer. Thus, the ever-changing 21st-century American city shows the intermingling of influences from different eras of city building. What the future holds for
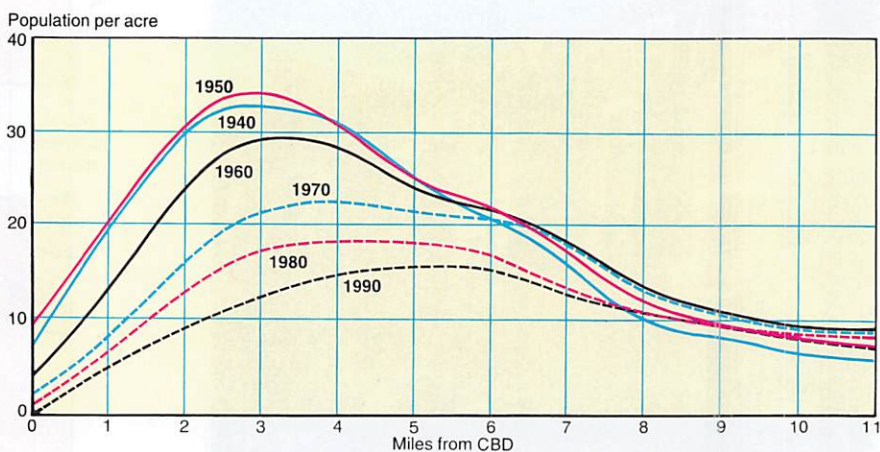
Figure 11.23 Population density gradients for Cleveland, Ohio, 1940–1990. The progressive depopulation of the central core and flattening of the density gradient over time to the city margin is clearly seen as Cleveland passed from mass transit to automobile domination. The Cleveland pattern is consistent with other cities where widespread adoption of the automobile caused density gradients to flatten over time. Some cities, such as Chicago, Toronto, Seattle, and Vancouver, have partially reversed this trend by increasing the amount of downtown housing.

Source: Anupa Mukhopadhyay and Ashok K. Dutt, "Population Density Gradient Changes of a Postindustrial City—Cleveland, Ohio 1940–1990," GeoJournal 34(4):517, 1994.

our cities is hard to say, but many urban geographers and planners are arguing for a return to the transit-oriented pattern of urban growth for reasons of energy conservation and environmental sustainability.

Models of Urban Form

We all have mental maps that help us summarize and make sense of the diverse places we've experienced in large cities. The meanings we associate with terms such as *inner-city* or *West End* reflect the content of those mental maps. Simple, graphic models of urban growth and land-use patterns began to appear during the 1920s and 1930s. Those models generalized the varied urban universe and helped explain some regularities in city growth and structure. More recently, urban geographers have begun to offer models that address the newer patterns of the decentralized automobile city.

The common starting point of the early models is the distinctive CBD found in every older central city. The core of the CBD displays the intensive land-use development already discussed: the major shopping concentration, tall office buildings, and streets crowded by pedestrians. Framing the core is a fringe area of warehousing, transportation terminals, and light industries. Just beyond the fringe, residential land uses begin.

The **concentric zone model** (**Figure 11.24a**) was developed by University of Chicago sociologists to explain the structuring of U.S. cities, specifically ethnically diverse, mass transit–based

cities like Chicago in the 1920s. It describes the urban community as a set of nested rings of mostly residential uses at increasing distances in all directions from the CBD fringe. The first, a zone of transition, is characterized by change and deterioration and contains warehouses and factories mixed in with high-density, low-income slums, rooming houses, and perhaps ethnic ghettoes. Moving outward, the next ring is a zone of workers' homes, usually smaller, older homes on small lots. The third zone houses better residences, single-family homes or higher-rent apartments for those able to exercise choice in housing location and afford the longer journey to CBD employment. Finally, just beginning to emerge when this model was proposed, was an outer zone of low-density suburban development.

The concentric zone model is dynamic. Each type of land use and each residential group tends to move outward into the next outer zone as the city matures and expands. That movement was seen as part of a ceaseless process of invasion and succession that yielded a restructured land-use pattern and population segregation by income level. The least attractive housing is in the inner-city zone of transition where smelly factories are interspersed with aging, crowded apartments. As one travels outward, the housing is progressively newer and more spacious, and the social and economic status of the residents rises accordingly.
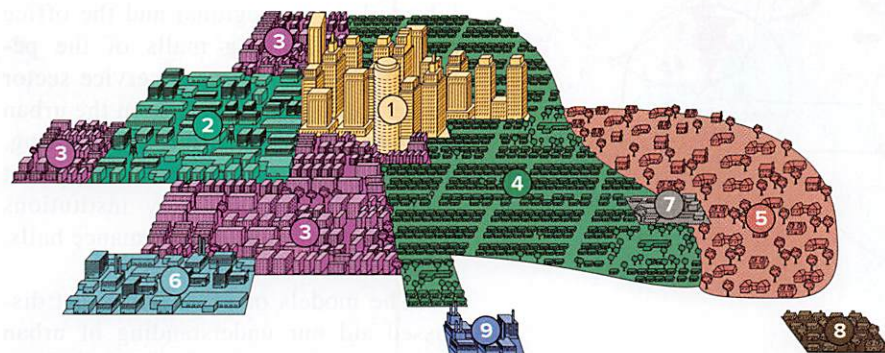
The **sector model** (Figure 11.24b) was devised in the 1930s by the land economist Homer Hoyt, who mapped housing values in major U.S. cities. The sector model posits that high-rent
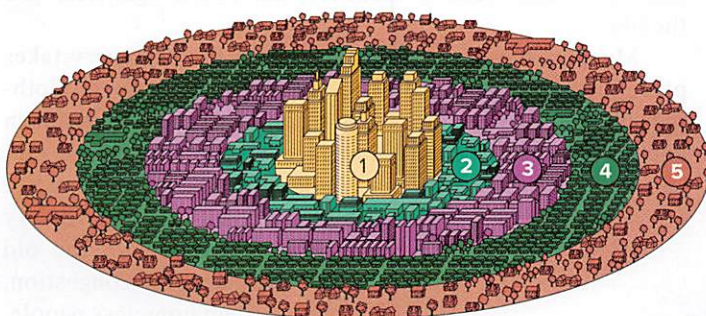
(a) Concentric zone model
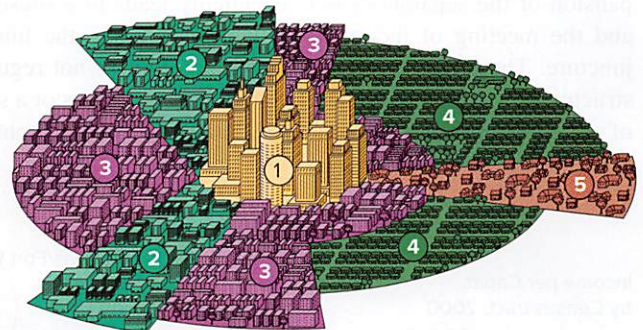
(b) Sector model

(c) Multiple-nuclei model

1	Central business district
2	Wholesale, light manufacturing
3	Low-class residential
4	Medium-class residential
5	High-class residential
6	Heavy manufacturing
7	Outlying business district
8	Residential suburb
9	Industrial

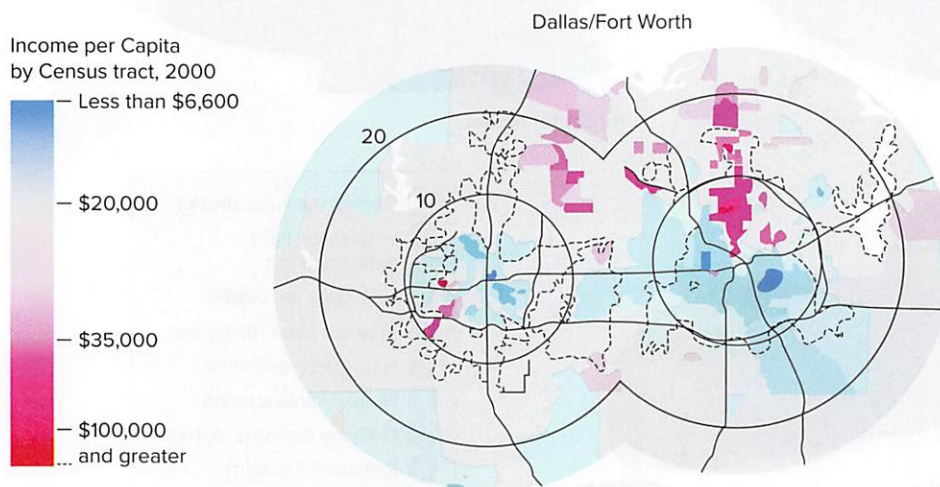**AP** **Figure 11.24** Three classic models of the internal structure of cities.

residential areas are dominant in city expansion. The high-rent sector is typically established in areas of natural amenities such as lakeshore, large parks, or prominent ridges or hills. The high-rent sector grows outward from the city center along major transportation routes such as streetcar and elevated railroad lines or suburban commuter routes. Low-income populations occupy districts adjacent to the areas of industry and associated heavy transportation corridors, such as freight railroad lines. Middle-income housing fills in between the low-income and high-income districts.

The sector model is also dynamic, marked by a *filtering-down* process as older areas are left behind by the outward movement of their original higher-income inhabitants, with the lower-income populations moving into the recently vacated areas. The expansion of the city is radial, shaped by radial transportation systems. The social status of inner-ring neighborhoods extends outward into the suburbs. The accordance of the sector model with the actual pattern observed in Dallas–Fort Worth, Texas is suggested in **Figure 11.25**.

The basic assumption of the concentric circle and sector models—that urban growth and development proceeded outward from a single central core—was countered by the **multiple-nuclei model** (Figure 11.24c) proposed by geographers Chauncy Harris and Edward Ullman. In their view, large cities developed outward from several nodes of growth, not just one. Certain activities have specific locational requirements: the retail district needs accessibility; a port function needs a waterfront site; heavy industry requires level land adjacent to railroads. Peripheral expansion of the separate centers eventually leads to coalescence and the meeting of incompatible land uses along the lines of juncture. The urban land-use pattern, therefore, is not regularly structured from a single center in a sequence of circles or a series of sectors but based on separately expanding clusters of contrasting activities.

Although there have been many social, economic, and technological changes since these three models were developed, the patterns that they explained remain as vestiges and controls on the current landscape of older central cities. North American cities prior to 1945 resembled the concentric zone or sector models with a clearly defined and dominant CBD, but both new and expanding older cities grew more sprawling and complex in the automobile era following World War II. The multiple-nuclei model gives a better insight into the urban structure of the more recent past, but should be supplemented by newer visualizations of contemporary metropolitan complexes or *galactic cities*.
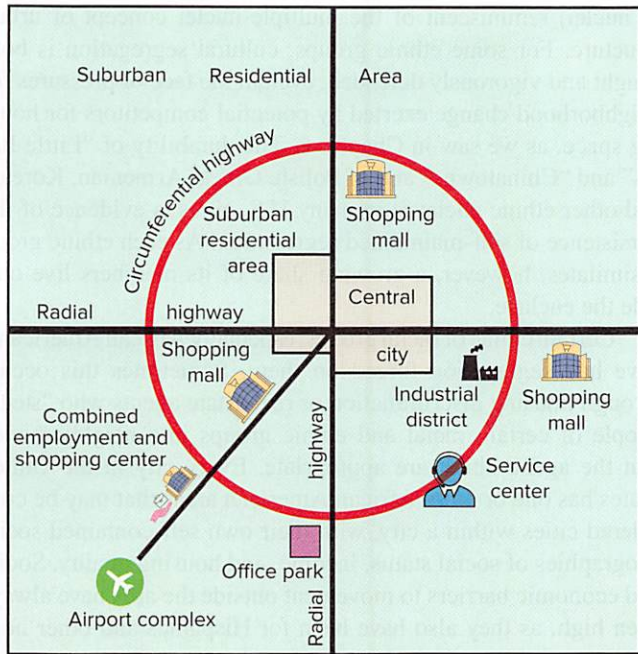
The **peripheral model** (also known as the **galactic city model**) as shown in **Figure 11.26** takes into account the major changes in urban form that have taken place since World War II, especially the suburbanization of what were once central city functions. The peripheral model focuses on the peripheral belt that lies within the metropolitan area, but outside the central city itself.

In these models, circumferential highways and expressways outside the central city make large tracts of land available for development in the low-density sprawl characteristic of individual rather than mass-transit movement of people. Residences are segregated by price level into relatively homogenous suburban clusters, and individual nodes in the peripheral belt are centers for employment or services: shopping malls, industrial parks, distribution and warehouse concentrations, office parks, airport-associated clusters containing hotels, meeting facilities, car rental agencies, and the like.

Much of the life of the residents of the periphery takes place outside the central city, as they shop for food, clothing, and services in the shopping malls, seek recreation in country clubs and entertainment complexes, and find employment in outlying industrial or office parks. While residents of the periphery may feel no need to travel to the old CBD with its problems of congestion, expensive parking, and homeless people, the periphery, however, remains a functional part of the metropolitan complex. Job markets are regional and the office parks and shopping malls of the periphery rely on low-wage service sector workers who often travel from the urban core where they find affordable housing. The urban core also retains an important cultural role, housing key institutions such as art museums, performance halls, universities, and stadiums.

The models of urban form just discussed aid our understanding of urban structure and development, but it must be stressed that a model is not a map, and that many cities contain elements and characteristics of more than a single model.

Income per Capita
by Census tract, 2000
— Less than $6,600

— $20,000

— $35,000

— $100,000
... and greater

Dallas/Fort Worth

Figure 11.25 Incomes in Dallas–Fort Worth, Texas, 2000. The high-income sector extending more than 20 miles north from downtown Dallas (east side of map) illustrates the applicability of the sector model. The inner rings of low-income residents are consistent with the concentric ring model.

Source: Cartography by Bill Rankin, data from the U.S. Census Bureau.

11.7 Social Areas of Cities

Vestiges of the ring and sectoral features depicted in the early models of U.S. cities are evident in the observed social segregation within urban areas. The larger and more economically and socially complex the city, the stronger the tendency for residents to sort themselves into groups based on *social status, family status,* and *ethnicity.* In a large metropolitan region with a diversified population, this territorial behavior may be a defense against the unknown or the unwanted, a desire to be among similar kinds of people, a response to income constraints, or a result of social and institutional barriers. Most people feel more at ease when they are near those with whom they can easily identify. In traditional societies, these groups are the families and tribes. In modern society, people tend to group according to income or occupation (social status), stages in the life cycle (family status), and language or race (ethnic characteristics); see the feature "Birds of a Feather" in Chapter 7.

Many of these social area groupings are fostered by the size and the value of available housing. Land developers, especially in cities, produce homes of similar quality and type in specific areas. Of course, as time elapses, there is a change in the condition and quality of that housing. Land uses may change and new groups may replace previous tenants, leading to the evolution of new neighborhoods with different social characteristics.

Social Status

The social status of an individual or a family is determined by income, education, occupation, and home value, although it may be measured differently in different cultures. In the United States, high income, a college education, a professional or managerial position, and high-value housing confer high status. High-value housing can mean an expensive rental apartment, a spacious loft in a former warehouse, or a large suburban house with extensive grounds. A good housing indicator of social status is persons per room or floor area per person. A low number of persons per room tends to indicate high status. Low status characterizes people with low income and lower levels of education, living in low-value housing.

Patterns of social status agree with the sector model. In most cities, people of similar status are grouped in sectors that fan out from the innermost urban residential areas (**Figure 11.27**). If the number of people within a given social group increases, they tend to move away from the central city along an arterial connecting them with the old neighborhood. Major transport routes leading to the city center are the usual migration routes out from the core. Chicago's elite Gold Coast along Lake Michigan and its low-income Southside neighborhoods display the extremes of social status (**Figure 11.28**).

Today, social status divisions are often perpetuated by political boundaries between separate municipalities or school districts. Communities on either side of the divide may differ greatly in income. Many residential developments are also
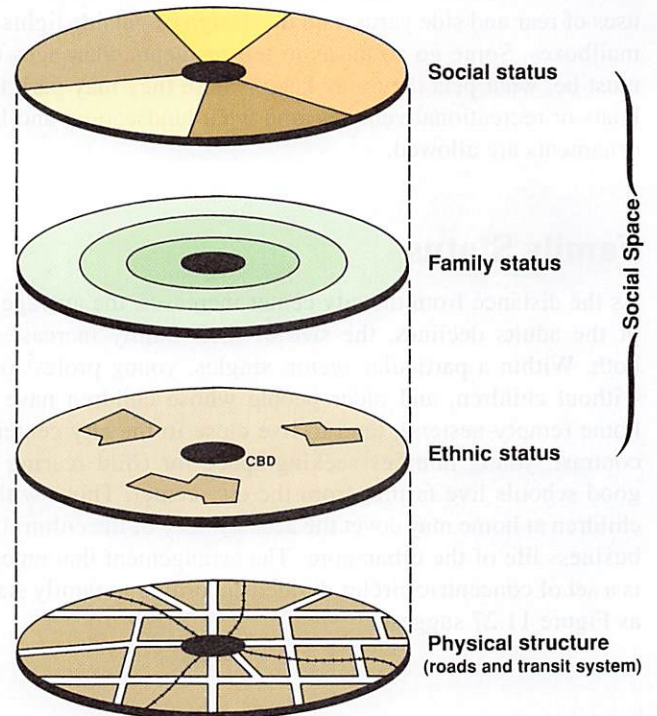
Figure 11.27 The social geography of American and Canadian cities.

Source: Redrawn from Robert A. Murdie, Factorial Ecology of Metropolitan Toronto. Research *Paper 116. Department of Geography Research Series, University of Chicago, 1969.*
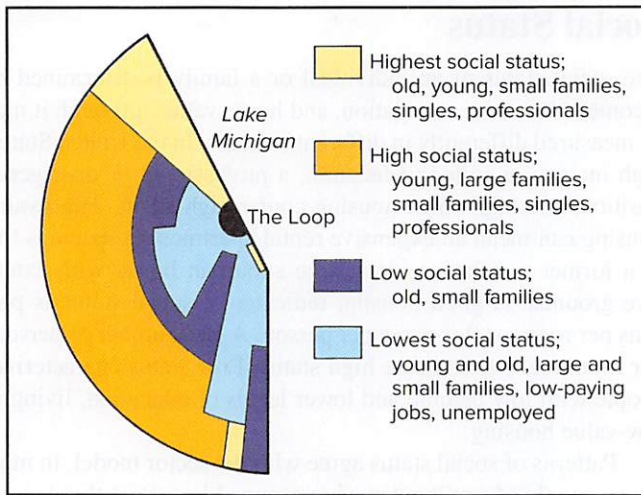
Figure 11.28 A diagrammatic representation of the major social areas of the Chicago region. The CBD of Chicago is known as the "Loop."

Source: Redrawn from Phillip Rees, "The Factorial Ecology of Metropolitan Chicago," M. A. thesis, University of Chicago, 1968.

Legend from figure:
- Highest social status; old, young, small families, singles, professionals
- High social status; young, large families, small families, singles, professionals
- Low social status; old, small families
- Lowest social status; young and old, large and small families, low-paying jobs, unemployed

income-segregated because their houses are of similar value. To preserve the upscale nature of a development and protect land values, self-governing community associations may be formed to enact and enforce land use restrictions (see the feature "The Gated Community"). Pervasive and detailed, these restrictions may specify such things as the size, construction, and color of exterior walls and fences, the size and permitted uses of rear and side yards, and the design of outside lights and mailboxes. Some go so far as to tell residents what ages they must be, what pets they may keep, where they may park their boats or recreational vehicles, and what landscaping and lawn ornaments are allowed.

Family Status

As the distance from the city center increases, the average age of the adults declines, the size of their family increases, or both. Within a particular sector, singles, young professionals without children, and older people whose children have left home (empty-nesters), tend to live close to the city center. In contrast, young families seeking space for child rearing and good schools live farther from the city center. Those without children at home may covet the accessibility of the cultural and business life of the urban core. The arrangement that emerges is a set of concentric circles divided according to family status, as Figure 11.27 suggests.

Ethnicity

For some groups, ethnicity is a more important factor in residential location than social or family status. Areas of a single ethnic group appear in the social geography of cities as separate clusters

or nuclei, reminiscent of the multiple-nuclei concept of urban structure. For some ethnic groups, cultural segregation is both sought and vigorously defended, even in the face of pressures for neighborhood change exerted by potential competitors for housing space, as we saw in Chapter 6. The durability of "Little Italys" and "Chinatowns" and of Polish, Greek, Armenian, Korean, and other ethnic enclaves in many U.S. cities is evidence of the persistence of self-maintained segregation. As each ethnic group assimilates, however, a growing share of its members live outside the enclave.

Certain ethnic or racial groups, especially African Americans, have had segregation forced on them. Sometimes this occurs through housing discrimination or real estate agents who "steer" people of certain racial and ethnic groups into neighborhoods that the agents think are appropriate. Every city in the United States has one or more African American areas that may be considered cities within a city, with their own self-contained social geographies of social status, income, and housing quality. Social and economic barriers to movement outside the area have always been high, as they also have been for Hispanics and other non-English-speaking minorities.

As whites and Asians increase their household incomes, they tend to move to neighborhoods that match their economic standing. Due to persistent residential segregation, as Census data document, blacks with similar income growth are less able to move to integrated neighborhood settings. Although segregation has moderated somewhat, at the start of the 21st century, the average African American city resident lived in a census tract that was more than 75 percent minority and three-fifths black. Figure 6.19 in Chapter 6 illustrates the concentration of whites, blacks, Hispanics, and other ethnic groups in Chicago. Elsewhere, black segregation varies by region. Black-white separation is highest in metropolitan areas in the Northeast and Midwest in cities such as Milwaukee; greatest integration is found in the metropolitan south and west and, notably, in military towns like Norfolk, Virginia, and San Diego.

All three factors in the social geography of cities have undergone widespread change in recent years. The diversity of household types has proliferated. Two-parent families with children living at home make up less than one-fourth of all U.S. households. Today, the suburbs house large numbers of singles and childless couples. Areas near the CBD have become popular for young professionals, some of whom have no plans to have children. Lesbian and gay couples and families often choose to live in urban centers, but increasing numbers are choosing suburbs as well. With more women in the workforce than ever before, and as a result of multiple-earner families, residential site selection has become a more complex undertaking. The heavy losses of manufacturing jobs and the rise of the service sector with its extremes of high-paying jobs (finance, insurance, and law, for example) and low-paying jobs have led to greater extremes of wealth and poverty and fewer middle-income neighborhoods. Immigration continues to diversify cities, but many immigrant groups now head directly to the suburbs. The city structure is constantly changing, reflecting changes in family and employment makeup.

The Gated Community

Approximately one in six Americans—some 50 million people—lives in a master-planned community. Particularly characteristic of the fastest-growing parts of the country, most of these communities are in the south and west, but they are increasingly common everywhere. In many regions, more than half of all new houses are being built in private developments. Master-planned communities in the United States trace their modern start back to the 1960s, when Irvine, California, and Sun City, Arizona, were built, but their roots can be found much earlier. Tuxedo Park, New York, for example, was planned and built in 1886 as a fully protected, socially exclusive community, and in the 1920s, Kansas City's Country Club District was established as a restricted residential development with land use controlled by planning and deed restrictions and a self-governing homeowners association providing a variety of governmental, cultural, and recreational services.

A subset of the master-planned community is the **gated community,** a fenced or walled residential area with checkpoints staffed by security guards and access limited to designated individuals and identified guests. More than 10 million Americans live in these middle- and high-income gated communities within communities. With private security forces, surveillance systems monitoring common recreational areas such as community swimming pools, tennis courts, and health clubs and—often—with individual home security systems, the walled enclaves provide a sense of refuge from high crime rates, drug abuse, and other social problems of urban America.

Gated and sheltered communities are not just an American phenomenon; they are increasingly found in all parts of the world. More and more guarded residential enclaves have been built in such stable Western European states as Spain, Portugal, and France. Developers in Indian cities have also used gated communities to attract wealthy residents. Trying to appeal to Indians returning to that country after years in areas like the Boston high-tech corridor and Silicon Valley, developers have built enclaves with names like Regent Place and Golden Enclave that boast American-style two-story houses and barbecues in the backyards.

Elsewhere, as in Argentina or Venezuela in South America, Lebanon in the Near East, or Ghana in Africa—with little urban planning, unstable city administration, and inadequate police protection—not only rich but also middle-class citizens are opting for protected residential districts. In China and Russia, the sudden boom in private and guarded settlements reflects a new form of post-communist social class distinction, while in South Africa, gated communities serve as effective racial barriers.

Figure 11B This gated community near Orlando is one of many in Florida.
©Ilene MacDonald/Alamy Stock Photo

Institutional Controls

Over the past century, and particularly since World War II, institutional controls have strongly influenced the land-use arrangements and growth patterns of most U.S. cities. Indeed, the governments—local and national—of most Western urbanized societies have instituted myriad laws to control all aspects of urban life, with particular emphasis on the ways in which individual property can be developed and used. In the United States, emphasis has been on land-use planning, subdivision control and zoning ordinances, and building, health, and safety codes. All have been designed to assure an orderly pattern of urban development, and all are based on broad applications of the police powers of municipalities to ensure public health, safety, and well-being, even when private property rights are infringed.

These nonmarket controls on land use are designed to minimize incompatibilities (residences adjacent to heavy industry, for example), set aside appropriate locations for public uses (the transportation system, waste disposal facilities, government buildings, parks, and so on), and private uses (colleges, shopping centers, housing, and so on) needed for a balanced, orderly community. In theory, such careful planning should prevent the emergence of slums, so often the result of undesirable adjacent uses, and should stabilize neighborhoods by reducing market-induced pressures for land use change.

However, zoning ordinances and land-use planning have frequently been criticized as being unresponsive to contemporary needs or unduly restrictive. To keep factories out of neighborhoods, zoning rules often strictly separate different kinds of land uses. In practice, this strict separation of different land uses can lead to sprawling developments where walking, biking, and transit use are quite difficult.

Zoning and subdivision control regulations that specify large lot sizes for residential buildings or forbid apartments have been criticized as devices to exclude the poor from upper-income areas. Some zoning laws have been criticized as discriminating against particular forms of residences: apartments, special housing for the aged, halfway houses, homeless shelters, and so forth. As a consequence, housing for society's least fortunate often ends up highly concentrated in less desirable areas (**Figure 11.29**). Bitter court battles have been waged, with mixed results, over "exclusionary" zoning practices that allegedly discriminate against the poor.

In most of Asia there is no zoning, and it is quite common to have small-scale industrial activities operating in residential areas. In both Europe and Japan, neighborhoods have been built and rebuilt gradually over time to contain a wide variety of building types from several eras intermixed on the same street. In North America, such mixing is rare.

Figure 11.29 Concentration of homeless shelters in Vancouver, Canada. Zoning regulations and resistance by established middle-class neighborhoods leads to a concentration of shelters in the least desirable or least powerful parts of cities. The west side of Vancouver has always been the more desirable side of the city. The west side waterfront is a continuous line of public beaches stretching from Kitsilano Beach to Wreck Beach. By contrast, the east side waterfront is home to heavy industry, the container ship port, and grain terminals. The concentration of shelters shown here is on the Downtown Eastside, the poorest neighborhood in Vancouver, Canada.

11.8 Changes in Urban Form

The 20th century started with mass transit dominating the physical and social structure of the U.S. city. It ended with the automobile controlling the movement of people everywhere and determining the pattern and fate of cities and metropolitan areas. In the course of that century, new technological and institutional structures fundamentally changed the frameworks within which metropolitan areas developed.

First, the improvement of the automobile increased its reliability, range, and convenience, freeing its user from dependence on fixed-route public transit for access to work, home, or shopping. The new transport flexibility opened up vast new acreages of nonurban land to urban development. That flexibility of movement of people and, through semitrailer and pickup trucks, of heavy and light freight, was augmented by the substantial completion during the 1970s of the interstate highway system and its supplements, the major metropolitan expressways. The improved routeways made 30- to 45-kilometer (20- to 30-mile) commutes acceptable.

Second, during the 1930s and after World War II (1939–1945), both the Federal Housing Administration (FHA) and the Veterans Administration (VA), by easing the terms of home mortgage requirements, vastly increased the number of persons eligible to own their home rather than rent. Those agencies stimulated a housing boom by offering much more generous mortgage loan terms. Previously, buyers had to provide large down payments (sometimes 50 percent or more) and repay their high-interest loans within a short time, often 10 years or less. The VA program permitted veterans to purchase homes with virtually no down payment, and both the VA and FHA lengthened low-interest repayment periods to 15 to 25 years or more. Further, the acceptance of a maximum 40-hour workweek in 1938 guaranteed millions of Americans the time for a commuting journey not possible when 6-day workweeks, and 10-hour workdays were common. Tax deductibility of home mortgage interest and tax exclusion of capital gains on profits from the sale of a home were further inducements for Americans to purchase their own houses.

These structural and economic changes altered the prevailing patterns of accessibility and behavior and significantly modified the land value curve and population density gradient established in the mass-transit city. Over the past half century or more, U.S. metropolitan areas have experienced massive decentralization of people and activities as residents, businesses, and industries moved outward into suburbs. The end of the 20th century and early years of the 21st, however, have witnessed a modest reversal of those trends, with some population and economic rebound in the core areas of many cities.

Suburbanization and Edge Cities

Demand for housing, pent up by years of economic depression and wartime restrictions, was loosed in a flood after 1945, and a massive suburbanization altered the existing land-use and functional patterns of urban America. In the second half of the 20th century, the two most prominent patterns of change were *metropolitan growth* and, within metropolitan areas, *suburbanization* (**Figure 11.30**).
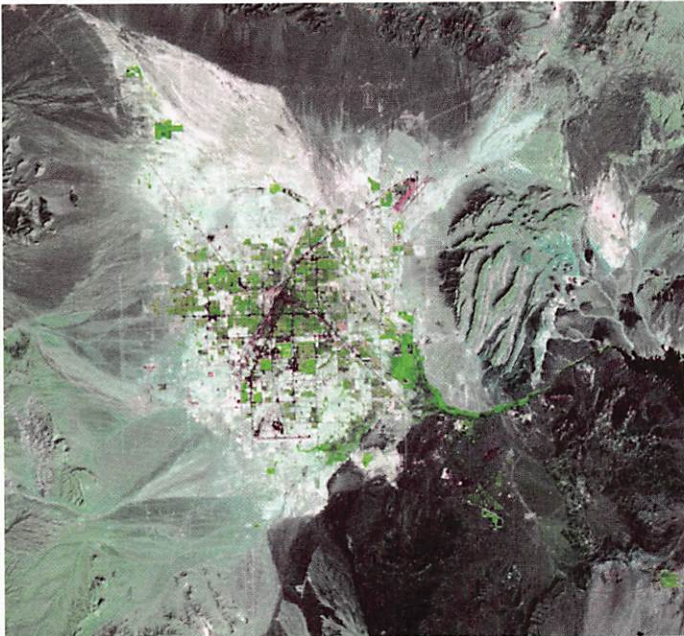
Figure 11.30 Satellite images of urban growth. Las Vegas, Nevada is among the fastest growing metropolitan regions in the United States. The region was home to 273,000 people in 1972 when the first image was captured. By 2017, the city had sprawled outwards into the desert and was home to 2.2 million residents.

Source: U.S. Geological Survey/Earthshots: Satellite Images of Environmental Change, 2017.

Suburban expansion reached its maximum pace during the decade of the 1970s when developers were converting open land to urban uses at the rate of 80 hectares (200 acres) an hour. Residential land uses led the initial rush to the suburbs. Typically, uniform but spatially discontinuous housing developments were built beyond the boundaries of older central cities. The new design was an unfocused sprawl, not tied to mass transit lines. It also represented a massive relocation of purchasing power to which retail merchants were quick to respond. The planned major regional shopping center became the suburban counterpart of the higher-order central places of the central city. Smaller shopping malls and strip shopping centers gradually completed the retailing hierarchy.

Faced with a newly suburbanized labor force, industry followed the outward move, attracted as well by the economies derived from modern single-story plants with plenty of parking space for employees. Industries no longer needed to locate near railway facilities; freeways presented new opportunities for lower-cost, more flexible truck transportation. Service industries were also attracted by the purchasing power and large, well-educated labor force now present in the suburbs, and complexes of office buildings developed, like the shopping malls, at freeway intersections and along freeway frontage roads and major connecting highways.

In time, in the United States, new metropolitan land-use and functional patterns emerged that could no longer be satisfactorily explained by the classic ring, sector, or multiple-nuclei models. Yet traces of the older-generation concepts remained applicable. Multiple nuclei of specialized land uses appeared, expanded, and coalesced. Sectors of high-income residential use continued their outward extension beyond the central city limits, usurping the most scenic and most desirable suburban areas and segregating them by price and zoning restrictions. Middle-, lower-middle-, and lower-income groups found their own income-segregated portions of the fringe. Ethnic and racial minorities are increasingly locating in suburbs. The share of minorities in suburbs of major cities is the same as their share in the overall U.S. population. By 2010, more than half the African American and Hispanic population in large metropolitan areas lived in the suburbs. Asians are even more likely than African Americans or Hispanics to live in suburbs, often in affluent *ethnoburbs.*

By the 1990s, a new urban feature had emerged on the perimeter of most major metropolitan areas—the **edge city.** Edge cities are defined by their large nodes of office and commercial buildings and characterized by having more jobs than residents within their boundaries. No longer dependent on the central city, select suburbs were reborn as vast collectively self-sufficient outer cities, marked by landscapes of industrial parks, high-rise office clusters, massive retailing complexes, and a proliferation of apartment and condominium districts and gated communities.

The new suburbia began to rival older CBDs in complexity and the amount of office and retail space. Collectively, the new centers surpassed the central cities as generators of employment and income. Together with the older CBDs, the suburbs perform the many advanced producer services that mark the postindustrial metropolis. During the 1980s, more office space was created in the suburbs than in the central cities of the United States. Tysons Corner, Virginia (between Arlington and Reston), for example, became the ninth-largest business district in the United States. Regional and national headquarters of leading corporations, banking, professional services of all kinds, major hotel complexes and recreational centers—all formerly considered immovable keystones of CBDs—became part of the new outer cities.

Edge cities now exist in all regions of the urbanized United States. The South Coast Metro Center in Orange County, California; the City Post Oak-Galleria center on Houston's west side; Bellevue and Redmond, east of Seattle; King of Prussia and the Route 202 corridor northwest of Philadelphia; the Meadowlands, New Jersey, west of New York City; and Schaumburg, Illinois, in the western Chicago suburbs are only a few examples of this new urban form. Location factors for edge cities include proximity to major highway corridors, international airports, and areas of high social status. Often, edge city development takes place in the more affluent sector of the metropolitan region because corporate headquarters often relocate in the direction of its executive's home.

The metropolis has become polynucleated and urban regions are increasingly *galactic*—that is, galaxies of economic activity nodes organized primarily around the freeway systems, as suggested in Figure 11.26. Commuting across the galaxy is far more common than journeys to work between suburbs and central cities. In recent years, suburban outliers and edge cities have been coalescing, creating continuous metropolitan belts in the pattern shown in Figure 11.6.
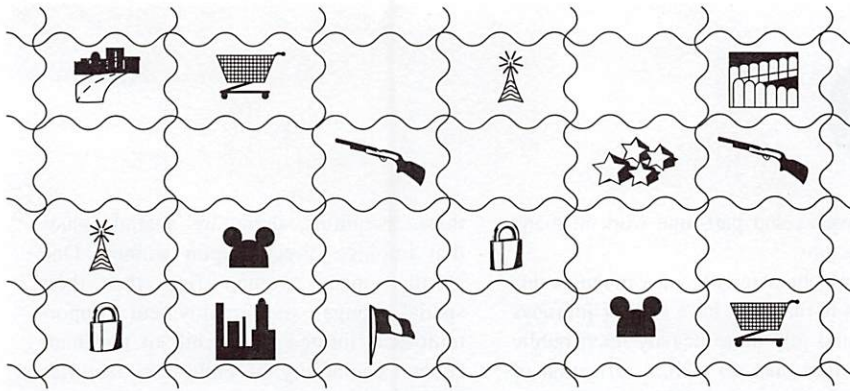
On the leading edges of that pattern are the outer suburbs or *exurbs,* vast sprawling areas of centerless growth beyond the pull of central cities or edge cities. That unfocused low-density development continues and increases population segregation by income and further disperses places of employment and the intermittent commercial developments that always follow purchasing power. While minority groups are rapidly suburbanizing, the exurbs are overwhelmingly white. The aging inner suburbs that were developed in the first decades after World War II are now beginning to suffer the transfer of wealth and erosion of functions that earlier afflicted the center cities themselves.

Geographers studying Los Angeles have proclaimed the obsolescence of the older models of urban structure, most of which were based on Chicago with its dominant CBD and concentric rings of growth. Instead, they describe what they call postmodern urbanism: an urban region with no center, no edge, and no coherent pattern. It is a metropolitan area marked by radical fragmentation into a collage of theme parks, gated communities, corporate citadels, ethnoburbs, street warfare zones, consumption opportunities, spectacle sites, and edge cities—with only a communications network and highway system to hold it together (**Figure 11.31**) .

Central City Decline

The superior accessibility that determined the success and internal structure of the mass-transit city faded with the advent of the cheap and reliable automobile and motor truck and development of interstate highways, metropolitan expressways, and air transportation. The dominance of the CBD was based on its being the focus of urban mass-transit (streetcar, subway, elevated) systems

Figure 11.31 The postmodern city. This model created by M. Dear and S. Flusty was inspired by Los Angeles and depicts an urban expanse without a center, edge, or coherent pattern. Instead, the city is fragmented into various independent zones, held together by highways and telecommunications.

Source: Michael Dear and Steven Flusty, 1998. "Postmodern Urbanism," Annals of the Association of American Geographers 88 (1): 66.

and intercity rail lines. When its accessibility eroded with the decline or abandonment of those carrier networks, central cities lost their primary situational advantage and the foundation of their internal land-use patterns. The dynamic that provided functional superiority to central cities increasingly worked to their detriment. Populations moved out, functions and jobs dispersed to the fringes following the relocating labor force and its purchasing power, and the central city was increasingly viewed as aging, congested, and inefficient. Once vibrant industrial districts were left behind as blighted, polluted sites—**brownfields.**

The redistribution of population caused by suburbanization resulted in both spatial and political segregation of social groups. The upwardly mobile—younger, whiter, wealthier, and better educated—took advantage of the automobile and the freeway to leave the central city. The poorer, older, least-advantaged urbanites were left behind in declining neighborhoods (**Figure 11.32**). The central cities and the suburbs became increasingly differentiated. Large areas within those cities now contain only the poor and minority groups, including women (see the feature "Women in the City"), a population little able to pay the rising costs of the social services that their numbers, neighborhoods, and condition require.

The services needed to support the poor include welfare payments, social workers, extra police and fire protection, health delivery systems, homeless shelters, and subsidized housing (see the feature "The Homeless"). Central cities, by themselves, are unable

Figure 11.32 Abandoned housing is common in Gary, Indiana as a result of white flight and deindustrialization. Some areas of cities have witnessed significant disinvestment and population decline. Properties in such neighborhoods have such weak resale and redevelopment potential that owners abandon them. Buildings left to decay become a source of danger and blight for those that remain. Since its peak in 1960, Gary has lost more than half its population.
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Women in the City

Cities are not viewed or experienced in the same way by men and women; fear of sexual harassment or rape, for example, may restrict women's mobility in certain places or at certain times of day, denying them the access to public space enjoyed by men. Maurice Yeates has noted that women's needs, problems, and patterns with respect to urban social space are quite different from men's:

> In the first place, women are more numerous in large central cities than are men. Washington, D.C. is one of the most female-dominant (numerically) of any city in North America, with a "sex ratio" of 112 females for every 100 males. In New York City the ratio is 111 females per 100 males. The preponderance of women in central cities is related to an above-average number of household units headed by women, and to the larger numbers of women among the elderly.

> A second characteristic is that female-headed households with children constitute the bulk of the poor. This feminization of poverty among all races is a consequence of the high costs of child care combined with the low wages and part-time work in many "women's jobs."

> A third characteristic of women in urban areas is that they have shorter journeys to work and rely more heavily upon public transportation than do men, a reflection of the lower incomes received by women, the differences in location of "female jobs," and the greater involvement of women in childrearing. Women on the whole simply cannot afford to spend as much on travel costs as men and make greater use of public transportation, which in the United States is usually inferior and often dangerous. The concentration of employment of women in clerical, sales, service jobs, and nursing also influences travel distances because these "women's jobs" are spread around the metropolitan area more than "men's jobs," which tend to be concentrated. It might well be argued that the more widespread location of "women's jobs" helps maintain the relative inaccessibility of many higher-paid "men's jobs" to a large number of women.

> Given the allocation of roles, the resulting inequities, and the persistence of these inequities, there are spatial issues that impinge directly upon women. One is that many women find that their spatial range of employment opportunities is limited as a result of the inadequate availability of child-care facilities within urban areas. A second spatial issue relates to the structure of North American metropolitan areas that reflects a particular set of assumptions about family life and male and female roles. Suburbs, in particular, reflect a male-paid work and female-home/children ethos. The suburban structure confines women to places with few meaningful choices. It has been argued that suburban women really desire a greater level of accessibility to a variety of conveniences and services, more efficient housing units, and a range of public and private transportation that will assure higher levels of mobility. These requirements imply higher-density urban areas.

to support such an array of social services because they have lost the tax base represented by suburbanized commerce, industry, and upper-income residential uses. Lost, too, were the job opportunities that were formerly a part of the central city structure. Increasingly, the poor and minorities are trapped in a central city without the possibility of nearby employment and are isolated by distance, immobility, and unawareness—by *spatial mismatch*—from the few remaining low-skill jobs, which are now largely in the suburbs.

In an effort to help struggling central cities, the federal government, particularly after the landmark Housing Act of 1949, initiated urban renewal programs that remade inner city areas in the 1950s and 1960s. Under a wide array of programs, slum areas were cleared, public housing was built (**Figure 11.33**), cultural complexes and industrial parks were created, and city centers were reconstructed. Critics bemoan the federal bulldozer's destruction of heritage architecture and tightly knit working-class communities during urban renewal. Sadly, the modernist public housing projects that were constructed during urban renewal often became places of concentrated poverty and high crime. Many have since been torn down.

With the continuing erosion of the urban economic base and the loss of residents, the battle to maintain or revive the central city is frequently judged to be a losing one, at least in cities with a declining industrial base and concentrated poverty. Detroit, Michigan, is a classic example of decline, having dropped from a peak population of 1,800,000 in 1950 to just 670,000 in 2017 (meanwhile, the broader metropolitan area population of 4.3 million residents has been relatively stable since 1970). The experience in the western United States has been rather different. The fastest-growing U.S. metropolitan areas are concentrated in the west and south (**Figure 11.34**).

For the most part, these newer "automobile" metropolises placed few restrictions on physical expansion. That unrestricted growth has often resulted in the coalescence of separate cities into ever-larger metropolitan complexes. Unlike cities in the east and midwest, cities in the west were usually allowed by their state legislatures to expand their borders so that central cities were able to capture new growth taking place at the urban periphery. This allowed western cities to grow into ever-larger metropolitan complexes, but it also meant that central cities had a mixture of both new and older housing and poor and middle-class residents within their borders.

The speed and volume of growth in the west means city governments face the economic, social, and environmental consequences of unrestricted outward expansion. Scottsdale, Arizona, for example, covered a single square mile (2.6 square kilometers) in 1950; by the end of the 1990s, it had grown to nearly 200 square miles (500 square kilometers), four times the physical size of San Francisco. Phoenix, with which Scottsdale has now coalesced, is 70% larger in area than New York City, which has five times as many people.
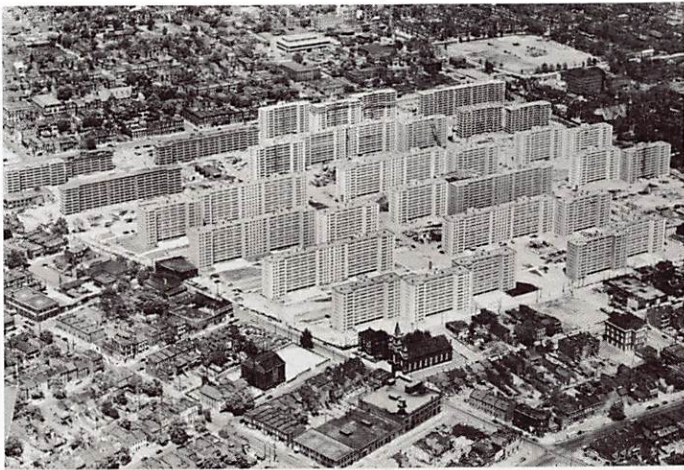
Figure 11.33 Many elaborate—and massive—public housing projects have been failures. The Pruitt-Igoe complex in St. Louis was built in the early 1950s to replace crowded, deteriorating tenement buildings. The project was designed in the modernist international style by Minoru Yama-saki, who went on to design the World Trade Center towers in New York City. The complex of 33 nearly identical 11-story buildings was praised by *Architectural Forum* magazine as the "best high apartment" of the year and called "vertical neighborhoods for poor people." It quickly became a dangerous, crime-ridden complex and was demolished in the 1970s. The growing awareness that it was a mistake to segregate poor people in high-rise developments in neighborhoods lacking economic opportunities led to the U.S. Department of Housing and Urban Development's Hope VI program. That program funds the demolition of severely distressed public housing, replacing it with mixed-income housing. The Hope VI program has led to the demolition of more than 100,000 public housing units in cities around the country, including many well-known projects such as the Robert Taylor Homes in Chicago and the Desire Projects in New Orleans.

(a, b) ©Bettmann/Getty Images
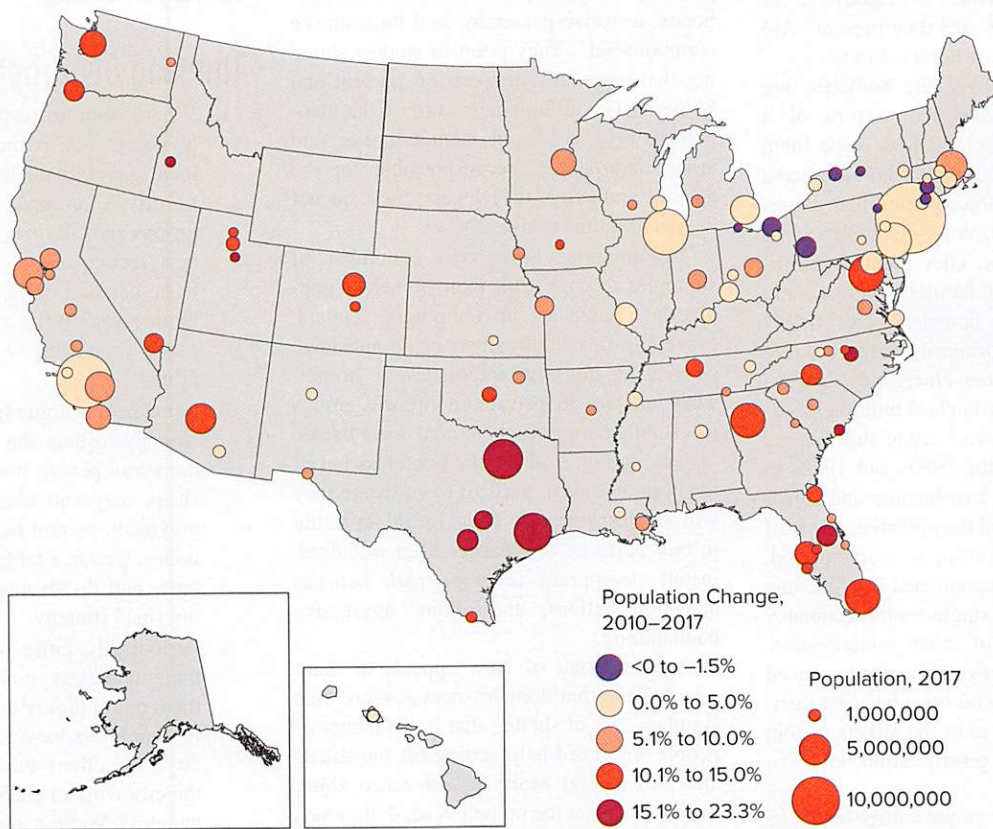
Figure 11.34 The pattern of metropolitan growth and decline in the United States, 2010–2017. Shown are the 100 largest metropolitan areas in 2010. The cities of the southern and southwestern Sun Belt showed the greatest relative growth. Modest growth or stability marked most metropolitan regions of the Northeast and Midwest. Meanwhile, deindustrializing regions in the Manufacturing Belt witnessed actual population decline.

Source: Data from U.S. Bureau of the Census.

The Homeless

The United States has a large homelessness problem. Every large city is apt to have hundreds, or even thousands, of people who lack homes of their own. One sees them pushing shopping carts containing their worldly goods, lining up at soup kitchens or rescue missions, and sleeping in parks or doorways. Reliable estimates of their numbers simply do not exist; official counts place the numbers of homeless Americans at more than 550,000 on any given night. The rates of homelessness are highest in urban areas with high housing costs such as Washington D. C., and Honolulu.

Their existence and persistence raise a multitude of questions; the answers, however, are yet to be agreed upon by public officials and private Americans. Who are the homeless, and why have their numbers increased? Who should be responsible for coping with the problems they present? Are there ways to eliminate homelessness?

Some people believe the homeless are primarily the impoverished victims of a rich and uncaring society. They view them as ordinary people, but ones who have had a bad break and been forced from their homes by job loss, divorce, domestic violence, or incapacitating illness. They point to the increasing numbers of families, women, and children among the homeless, less visible than the "loners" (primarily men) because they tend to live in cars, emergency shelters, or doubled up in substandard buildings. Advocates of the homeless argue that federal government cuts in the 1980s and 1990s in budgets for building low-income and subsidized housing reduced the potential supply of affordable housing. During the same period, city governments demolished low-income housing, especially single-room-occupancy hotels in the name of urban revitalization. In addition, federal regulations and reduced state funding for mental hospitals cast institutionalized patients onto the streets to join people displaced by gentrification, job loss, or rising rents.

A contrary view is presented by those who see the homeless as responsible for their own plight. In the words of one

Figure 11C A homeless encampment in Los Angeles, CA.
©Mark Bjelland

commentator, the homeless are "deranged, pathological predators who spoil neighborhoods, terrorize passersby, and threaten the commonweal." They point to studies showing that nationally between 66 percent and 85 percent of all homeless suffer from alcoholism, drug abuse, or mental illness, and argue that people are responsible for the alcohol and drugs they ingest; they are not helpless victims of disease.

Communities have tried a number of strategies to cope with their homeless populations. Some set up temporary shelters, especially in cold weather; some subsidize permanent housing and/or group homes. They encourage private, nonprofit groups to establish soup kitchens and food banks. Others attempt to drive the homeless out of town, or at least to parts of town where they will be less visible. They forbid loitering in city parks or on beaches after midnight, install sleep-proof seats on park benches and bus stations, and outlaw aggressive panhandling.

Neither point of view appeals to those who believe that homelessness is more than simply a lack of shelter, that it is a matter of people who need help getting off the streets and into mental health or substance abuse treatment. What the homeless need, they say, is a "continuum of care"—an entire range of services that includes education, treatment

for drug and alcohol abuse and mental illness, and job training.

Thinking Geographically

1. Where should responsibility for the homeless lie: at the federal, state, or local government level? Is it best left to private groups, such as religious groups and charities? Or is it ultimately best recognized as a personal matter to be handled by homeless individuals themselves? Write a two-page position paper supporting your stance on this issue.

2. Some people argue for a "housing first" strategy to help the homeless. Once a homeless person has a stable place to sleep, they can begin to address employment, mental health, and addiction issues. Create a table listing the advantages and disadvantages of this "housing first" strategy.

3. Periodically, cities will crack down on their homeless population and push them out of highly visible areas. Should the homeless have a right to be in the city? Do others have a right to enjoy the city without encountering homeless persons? Write a one-page essay supporting your postion.

Figure 11.35 Urban sprawl characterizes growth in the Las Vegas, Nevada, metropolitan area. As in many desert cities, urban growth in Las Vegas has strained the region's limited water resources.

Source: Photo by Lynn Betts, USDA Natural Resources Conservation Service

The phenomenal growth of Las Vegas, Nevada, has similarly converted vast areas of desert landscape to low-density urban use, straining water resources and the environment (**Figure 11.35**). Seeking an alternative to endless outward sprawl, some metropolitan areas seek to restrain rather than encourage physical growth. Portland, Oregon, drew a growth boundary line around itself in the late 1970s, prohibiting conversion of surrounding forests, farmlands, and open space into suburbs (see the feature "Sustainable Cities").

Central City Renewal and Gentrification

Central cities hit their low point in the 1970s when New York City went bankrupt, the Bronx was burning, and crime was at an all-time high. More recently, pundits proclaimed the end of cities as the latest digital communications technologies (fax machines, the Internet, wireless devices, and so on) would eliminate the need for face-to-face interaction. Instead of replacing face-to-face interactions, digital communications have become centralizing forces by facilitating the growth of knowledge- and creativity-based industries and activities such as finance, law, design, advertising, and corporate consulting. These industries seem to prefer geographically centralized locations. Cities—particularly large metropolitan cores—provide the first-rate telecommunications and fiber optics infrastructures and the access to skilled workers, customers, investors, research, educational institutions, and cultural institutions needed by the modern, postindustrial economy. As a reflection of cities' renewed attractions, employment and gross domestic product (GDP) in the country's 50 largest urban centers began

to grow in the 1990s, reversing a pattern of stagnation and decline in the preceding decades. Demand for downtown office space was met by extensive new high-rise and skyscraper construction and urban renewal.

Urban centers became attractive places of consumption, promoted by popular television shows and movies. Some of the new office workers chose to live in central city neighborhoods that offer well-built, character housing stock in highly accessible locations, spurring a central city residential revival called **gentrification.** Gentrification is the rehabilitation of housing in older, deteriorated inner-city areas by middle- and high-income groups (**Figure 11.36a**). Welcomed by many as a positive, privately financed force in the renewal of depressed urban neighborhoods, gentrification also has serious negative social and housing impacts on the low-income, frequently minority families that are displaced. Gentrification is another expression of the continuous remaking of urban land-use and social patterns in accordance with the rent-paying abilities of alternate potential occupants. Yet the rehabilitation and replacement of housing leads to inflated rents and prices that push out established residents, disrupting the social networks they have created.

The districts usually targeted for gentrification are those close to downtown jobs, with easy access to transit, low housing costs, and interesting older architecture (Figure 11.36b). Gentrification is often led by artists who lack financial resources but exert a great deal of cultural influence. The artists are in turn replaced by an influx of younger, wealthier professionals who have helped revitalize and repopulate inner city zones. Nearly all large North American cities have witnessed a significant increase in the residential population in the neighborhoods adjacent to the central business district. Individual home buyers and rehabbers opened the way; commercial developers followed—but often only after local, state, or federal governments made the first investments in slum clearance, brownfields cleanup, and construction of new infrastructure, parks, and cultural facilities.

The reason for that growth lies in both changing tastes and demographics. Young professionals are marrying and having children later or, often, are divorced, never-married, or same-sex couples. For them, suburban life and shopping malls hold few attractions, while central city residence offers high-tech and executive jobs within walking or biking distance and cultural, entertainment, and boutique shopping opportunities. The younger group has been joined by empty-nesters, couples who no longer have children living at home, who find big houses on suburban lots no longer desirable. By their interests and efforts, these two groups have largely or completely remade and upgraded such old city neighborhoods

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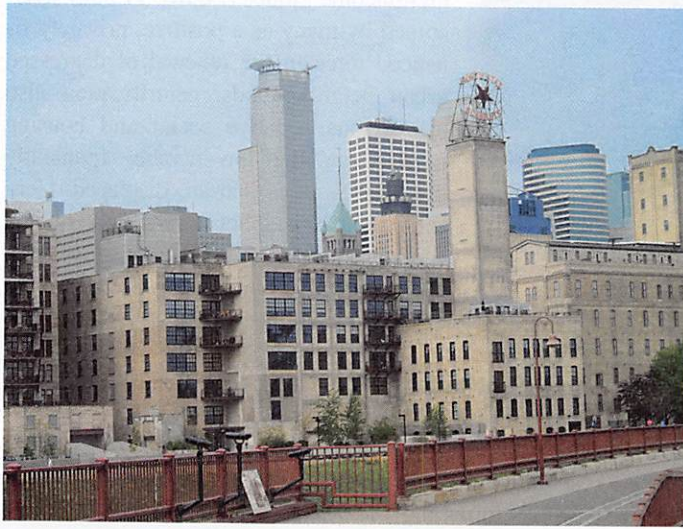
(b)

Figure 11.36 *(a)* Gentrified historic housing in Old Town in Alexandria, Virginia, near Washington, D.C. *(b)* Former mills along the Mississippi River in Minneapolis, Minnesota, have undergone gentrification through conversion to trendy loft-style condominiums. The City of Minneapolis initiated the conversion of derelict mills by cleaning pollution and building riverfront parks and trails.

(a, b) ©Mark Bjelland

as Williambsurg in Brooklyn, Denver's LoDo, Minneapolis' Mill District and North Loop, Portland's Pearl District, Seattle's Belltown, Vancouver's Yaletown, and virtually all of San Francisco.

Another important part of the renewed vigor of central cities comes from new immigrants who spread beyond the usual coastal *gateway* cities. Immigrants have become deeply rooted in their new communities by buying and renovating homes in inner-city areas, spending money in neighborhood stores, and most importantly establishing their own businesses (**Figure 11.37**). They also are important additions to the general urban labor force, providing the skilled and unskilled workers needed in expanding office-work, service, and manufacturing sectors.
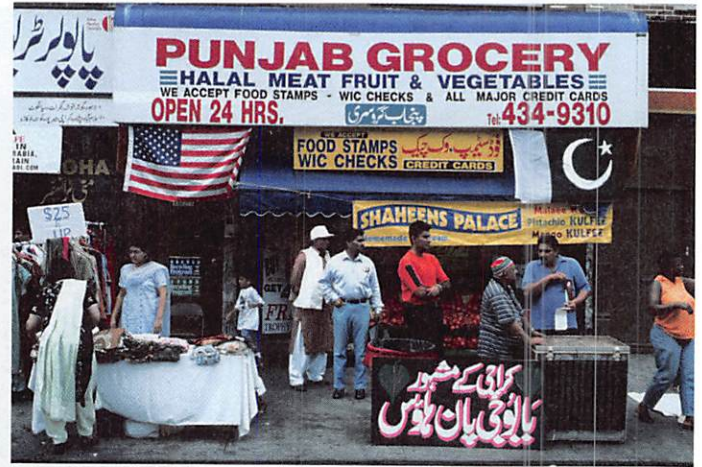
Figure 11.37 Immigrants from all over the world, but especially Latin America and Asia, have established their own businesses, fixing, making, or selling things, adding to the vitality of central cities. By purchasing and renovating houses in struggling neighborhoods, immigrants have helped revitalize many inner-city neighborhoods.

©David Grossman/Alamy Stock Photo

11.9 World Urban Diversity

The city, Figure 11.3 reminds us, is a global phenomenon. It also varies among regions, reflecting diverse cultural heritages and economies. The categories and models that we have used in this chapter to study the functions, land-use arrangements, suburbanization trends, and other aspects of the U.S. city do not always apply to cities in other parts of the world. Those cities have been created under different historical, cultural, and technological circumstances. They have developed different functional and structural patterns, some so radically different from our U.S. model that we would find them unfamiliar and uncharted landscapes indeed. Even Canadian cities differ significantly from their counterparts in the United States (see the feature "The Canadian City"). The city is universal; its characteristics are cultural and regional.

The West European City

Although each is unique historically and culturally, Western European cities share certain common features. They have a much more compact form and occupy less total area than U.S. cities of comparable population, and most of their residents are apartment dwellers (except the United Kingdom, where most live in rowhouses). Residential streets of the older sections tend to be narrow, and front, side, or rear yards or gardens are rare.

European cities also enjoy a long historical tradition. Medieval origins, Renaissance restructurings, and industrial growth have given the cities of Western Europe distinctive features. Despite wartime destruction and postwar redevelopment, many still bear the impress of past occupants and technologies, even back to Roman times in some cases. An irregular system of narrow streets may be retained from the random street pattern developed in medieval times of pedestrian and pack-animal movement. Main streets radiating from the city center and cut by circumferential "ring roads" tell us the location of primary roads leading

Sustainable Cities

Most people associate environmentalism with wilderness, not cities. But what if living in large, dense cities was actually better for the environment? Some scholars and city planners think so. They point to the fact that residents of New York City use the least energy per capita and have the lowest per capita greenhouse gas emissions in the United States. The explanation is simple: the high density of New York City makes walking, bicycling, or transit use the most effective way to get around the city. Rowhouses and apartments have fewer sides exposed to the outside, where they can gain or lose heat. As a result, they are much more efficient to heat and air-condition than detached houses. In contrast to the sprawling, low-density residential pattern that became the norm after World War II, Manhattan has a population density of 27,000 people per square kilometer (69,000 per square mile). However, to suggest that city living is good for the environment goes against the grain for most people, who still associate big cities with smog, noise, and garbage barges.

Cities can be made more sustainable by designing buildings and landscapes with the environment in mind. Green roofs, solar panels, and pavements that allow water to infiltrate are just a few of the many techniques to reduce a city's impact on the environment. Cities can also become more sustainable by developing neighborhoods at higher densities, adding sidewalks, and making sure basic services such as grocery stores and schools are within walking distance. The **New Urbanism** movement draws together city planners, architects, designers, and developers who favor dense, mixed-use neighborhoods. Transportation is one of the most important sources of pollution, but many trips can be replaced by bicycling if safe routes are available. In parts of the Netherlands and Denmark, bicycling is the dominant mode of transportation. Bicycling is also increasingly popular in North American cities such as New York, Minneapolis, and Portland. Cities can also become more

Figure 11D Greenwich Millennium Village is located near the Docklands in East London. This neighborhood was sponsored by the U.K. government as a model of environmentally sustainable urban development. The former heavy industrial site was cleaned of pollution and converted to parks, trails and a high-density community scaled to walking and bicycling.
©Mark Bjelland

sustainable by transforming their polluted industrial waterfronts into attractive postindustrial spaces. In cities across Europe and North America, derelict, contaminated brownfield sites have been cleaned up and redeveloped for parks, housing, and retail (see Figure 11.36b and the feature "The Canadian City").

In London, the heavily polluted former site of a plant that manufactured gas from coal was turned into a model community for sustainable urban development. Called "Greenwich Millennium Village," the project was built by the British government to demonstrate the highest standards for energy efficient and environmentally sustainable development. According to the British government, building high-density housing on former brownfield sites is a

necessity to preserve the much-loved countryside that surrounds British cities. At Greenwich Millennium Village, wood waste from tree trimming is used to generate electricity and heat the buildings. Housing for different incomes is mixed together. The streets in the core of the village are limited to pedestrians and bicyclists. A dedicated bus lane bisects the development, connecting it to the London Underground (subway). More than three-quarters of the residents use public transit to commute to work, about twice the London average and five times the national average. A continuous belt of landscaped parks line the River Thames waterfront and a pond and ecology park occupy what was once one of the most polluted pieces of land in the United Kingdom.

into town through the gates in city walls now gone and replaced by circular boulevards. Broad thoroughfares, public parks, and plazas mark Renaissance ideals of city beautification and the esthetic need felt for processional avenues and promenades.

European cities were developed for pedestrians and still retain the compactness and character appropriate to walking. The sprawl of U.S. suburbs is generally absent. At the same time, compactness

and high density do not necessarily mean skyscraper skylines. Much of urban Europe predates the steel frame building and the elevator. City skylines tend to be low, three to five stories in height, sometimes (as in central Paris) held down by building ordinance (**Figure 11.38**), or by prohibitions on private structures exceeding the height of a major public building, often the central cathedral. Where those older restrictions have been relaxed, however, taller

The Canadian City

Even within the seemingly homogeneous culture realm of the United States and Canada, cities in the two countries show subtle but significant differences. Although the urban expression is similar in the two countries, it is not identical. The Canadian city, for example, is more compact than its U.S. counterpart of equal population size, with a higher density of buildings and people and less suburbanization of populations and functions.

Space-saving and multiple-family housing units are more the rule in Canada, so a similar population size is housed on a smaller land area, with much higher densities, on average, within the central area of cities. The Canadian city is better served by and more dependent on public transportation than is the U.S. city. Because Canadian metropolitan areas have only one-quarter as many miles of expressway lanes per capita as U.S. metropolises—and at least as much resistance to constructing more—suburbanization is less extensive north of the border than south.

The differences are cultural as well. Cities in both countries are ethnically diverse (Canadian communities, in fact, have the higher proportion of foreign-born residents), but U.S. central cities exhibit far greater internal distinctions in race, income, and social status, and more pronounced contrasts between central city and suburban residents. That is, there has been much less "flight to the suburbs" by middle-income Canadians. As a result, the Canadian city shows greater social stability, higher per capita average income, more retention of shopping facilities, and more employment opportunities and urban amenities than its U.S. central city counterpart. In particular, it does not have the rivalry from well-defined competitive edge cities of suburbia that so spread and fragment United States metropolitan complexes.

Figure 11E Vancouver, British Columbia has embraced high-density living and a strong CBD as solutions to the traffic, land-use, and environmental problems of urban sprawl. The commercial and civic buildings of Vancouver's CBD are nearly obscured by the high-rise condominiums and apartments that have been built on former brownfield sites along the waterfront. Vancouver's CBD is well served by public transit and walking and bicycle trails. On average, Canadian metropolitan areas are almost twice as densely populated as those of the United States. Further, on a per capita basis, Canadian urbanites are two-and-a-half times more likely to use public transportation than American city dwellers.

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Figure 11.38 European cities often have a low profile in their central areas, as shown in this scene of Paris. Although taller buildings—20, 30, even 50 or more stories in height—have become more common in major European cities since World War II, they are not the universal mark of CBDs that they are in North America, South America, and Asia, nor are they necessarily welcomed symbols of city progress and pride.

©Stockbyte/Getty Images

office buildings have been erected—such as in the financial districts of London and Frankfurt, Germany.

Compactness, high densities, and apartment dwelling encouraged the development and continued importance of public transportation, including well-developed subway systems. The private automobile has become much more common of late, though most central city areas have not yet been significantly restructured with wider streets and parking facilities to accommodate it. The automobile is not the universal need in Europe that it has become in U.S. cities. Home and work are generally more closely spaced in Europe—often within walking or bicycling distance—while most sections of towns have first-floor retail and business establishments (below upper-story apartments), bringing both places of employment and retail shops within convenient distance of residences.

In many cities, the historic core is now increasingly gentrified and residential units for the middle class, the self-employed, and the older generation of skilled artisans share limited space with preserved historic buildings, monuments, and tourist attractions. At the same time, many are affected by the processes of decentralization; some of their residents now choose to live in suburban locations as car ownership and use becomes more commonplace.

The West European city is not characterized by inner-city deterioration and out-migration. Its core areas tend to be stable in population and attract, rather than repel, the successful middle class and upwardly mobile. Nor does it always feature the ethnic neighborhoods of U.S. cities although some, like London, do (see The Caribbean Map in London, Section 6.4). Non-European immigrant communities, where present in a city, tend to be clustered in older, working class districts or in peripheral public housing apartment blocks. Segregation of new immigrants into remote suburban apartments has been a particular problem in France as it leads to social isolation and a lack of opportunities for youth.

Eastern European Cities

Cities of Eastern Europe, including Russia and the former European republics of the Soviet Union, once part of the communist world, make up a separate urban class. These post-communist cities share many of the traditions and practices of West European cities, but differ from them in the centrally administered planning principles that were, in the communist period (1945–1990), designed to shape and control both new and older settlements. For reasons both ideological and practical, the particular concerns were as follows: first, to limit the size of cities to avoid supercity growth and metropolitan sprawl; second, to ensure an internal structure of neighborhood equality and self-sufficiency; and third, to segregate land uses. The planned Eastern European city fully achieved none of these objectives, but by attempting them, it emerged as a distinctive urban form.

The planned city of the communist era is compact, with relatively high building and population densities reflecting the nearly universal apartment dwelling, and with a sharp break between urban and rural land uses on its margins. It depends heavily on public transportation. During the communist period, governments dictated that the central area of cities should be reserved for public use, assemblies, parades, and celebrations. In the Russian prototype, neither a CBD nor major outlying business districts were required or provided.

Residential areas were expected to be largely self-contained in the provision of at least low-order goods and services, minimizing the need for a journey to centralized shopping locations. They were made up of *microdistricts,* assemblages of uniform apartment blocks housing perhaps 10,000 to 15,000 persons, surrounded by broad boulevards, and containing centrally sited nursery and grade schools, grocery and department stores, theaters, clinics, and similar neighborhood necessities and amenities placed often at the outskirts of the city (**Figure 11.39**).

Figure 11.39 This scene from Poprad, Slovakia, shows the typical housing estates built throughout Eastern Europe during the socialist era. Superblocks of identical, mass-produced apartment houses formed self-contained districts, complete with their own shopping, schools, and other facilities.

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These characteristic patterns are changing as market principles of land allocation are adopted. Historic apartments and townhouses that were badly neglected during the communist era have been restored and are the most fashionable places to live. Newfound prosperity has expressed itself in the construction of Western-style shopping malls, and spacious privately owned apartments and single-family houses for the newly rich and middle-class. Meanwhile, population decline due to low birth rates (see Appendix B) and out-migration in pursuit of better-paying jobs in Western Europe has led to shrinking cities in Eastern Europe and problems of high vacancy rates in the drab, mass-produced apartment tower blocks of the communist era.

Rapidly Growing Cities of the Developing World

The fastest-growing cities and the fastest-growing urban populations are found in the developing world (Figure 11.4). Industrialization has come to most of them only recently. Modern technologies in transportation and public facilities are sometimes lacking, and the structures of cities and the everyday life-world of their inhabitants are far different from the urban world familiar to North Americans. The developing world is vast in extent and diverse in its physical and cultural content; generalizations about it or its urban landscapes lack certainty and universality.

The backgrounds, histories, and current economies and administrations of developing world cities vary greatly. Some are ancient, having been established many centuries before the more developed cities of Europe. Some are still pre-industrial, with only a modest central commercial core; they lack industrial districts, public transportation, or any meaningful degree of land-use separation. Others, though increasingly Western in form, are only beginning to industrialize. And some have taken on industrial, commercial, and administrative functions on the Western model and, at least in their central areas, assumed as well the appearance of fully modern urban centers (**Figure 11.40**).

Despite the variety of urban forms found in such diverse regions as Latin America, Africa, the Middle East, and South and Southeast Asia, we can identify some features common to most of them. First, most of what are currently categorized as developing countries have a colonial legacy, and several major cities were established principally to serve the needs of the colonizing country. The second aspect is that of underdevelopment of urban facilities. The tremendous growth that these cities are experiencing as their societies industrialize has left many of them with inadequate physical infrastructure and public utilities and no way to keep up with population growth. Third, most cities in developing countries are now characterized by neighborhoods hastily built by new migrants, away from city services, and often occupying land illegally. Such squatter settlements are a large and growing component of these cities and reflect both the city's attractiveness as a destination and lack of opportunities for all. Finally, in many cases, governments have responded with drastic remedies, sometimes going so far as to move the national capital away from the overcrowded primate city to a new location or to create entirely new cities to house planned industrial or transportation functions.

Figure 11.40 Dubai, in the United Arab Emirates, grew rich on oil revenues, but it is now a diversified center for finance, tourism, and business. It has grown rapidly from 50,000 people in 1965 to 2.4 million in 2015. It features many modern high-rise commercial buildings, the world's tallest skyscraper, and the world's largest enclosed shopping mall.

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Influences of the Past

Cities in developing countries originated for varied reasons and continue to serve several functions based on their position as market, production, government, or religious centers. Their legacy and purpose influence their urban form.

Many are the product of colonialism, established as ports or outposts of administration and exploitation, built by Europeans on a Western model current at the time of their development. For example, the British built Kolkata (Calcutta), New Delhi, and Mumbai (Bombay) in India and Nairobi in Kenya and Harare (formerly Salisbury) in Zimbabwe. The French developed Hanoi and Ho Chi Minh City (Saigon) in Vietnam, Dakar in Senegal, and Bangui in the Central African Republic. The Dutch planned Jakarta (formerly Batavia) in Indonesia as their main outpost, Belgium placed Kinshasa (formerly Leopoldville) in what is now the Democratic Republic of the Congo, and the Portuguese founded a number of cities in Angola and Mozambique.

Urban structure is a product not just of the time when a city was founded, or who the founders were, but also of the role it plays in its own cultural setting. Land-use patterns in capital cities reflect the centralization of government functions and the concentration of wealth and power in a single city of a country (**Figure 11.41a**). The physical layout of a religious center is conditioned by the religion it serves, whether Hinduism, Buddhism, Islam, Christianity, or other faith. Typically, a monumental structure—a temple, mosque, or cathedral—and associated buildings rather than government or commercial offices occupy the city center. Multifunctional centers display a greater diversity of land uses and structures (Figure 11.41b). Traditional market centers for a wide area (Timbuktu in Mali and Lahore in Pakistan), or cultural capitals (Addis Ababa in Ethiopia and Cuzco in Peru), have land-use patterns that reflect their special

functions. Similarly, port cities such as Dubai (United Arab Emirates), Haifa (Israel), or Shanghai (China) have a land-use structure different from that of an industrial or mining center such as Johannesburg (South Africa). Adding to the complexity is the fact that cities with a long history reflect the changes wrought by successive rulers and/or colonial powers, and recent rapid growth.

Yet, by observation and consensus, some common features of developing-world cities are recognizable. For example, wherever automobiles or modern transport systems are an integral part of the modernizing city, the metropolis begins to take on Western characteristics. Also, all of the large cities have modern centers of commerce, not unlike their North American counterparts (see Figure 11.40).

All, too, wherever located, have experienced massive in-migrations from rural areas. Many, particularly in sub-Saharan Africa, have absorbed large numbers of foreign immigrants seeking asylum or economic opportunity. Most have had even faster rates of natural increase than of immigration. The predicted consequences, according to the United Nations, will be that nearly all of the global population increase in the coming decades will take place in the urban areas of the world's developing countries. Many of those populations are and will continue to be drawn into a globalizing world economy searching for locations able to offer the cheapest labor for the *footloose* operations of transnational corporations. UN-Habitat has termed the economic consequences a "race to the bottom," as different cities compete for low-skill, low-wage manufacturing jobs. Increased urban poverty and greater social and economic inequality and segregation are the foreseen consequences for much of the urbanizing developing countries. In all their cities, large numbers of people support themselves in the *informal* sector—as food vendors, peddlers of cigarettes or trinkets, streetside barbers or tailors, sex workers, errand runners or package carriers—outside the usual forms of wage labor (see Table 10.2 and Figure 10.6). Although informal sector work is vital to the survival of many or even most city residents in developing countries, it doesn't pay the taxes that governments need to provide the basic services that will help the country emerge from poverty.

(a)
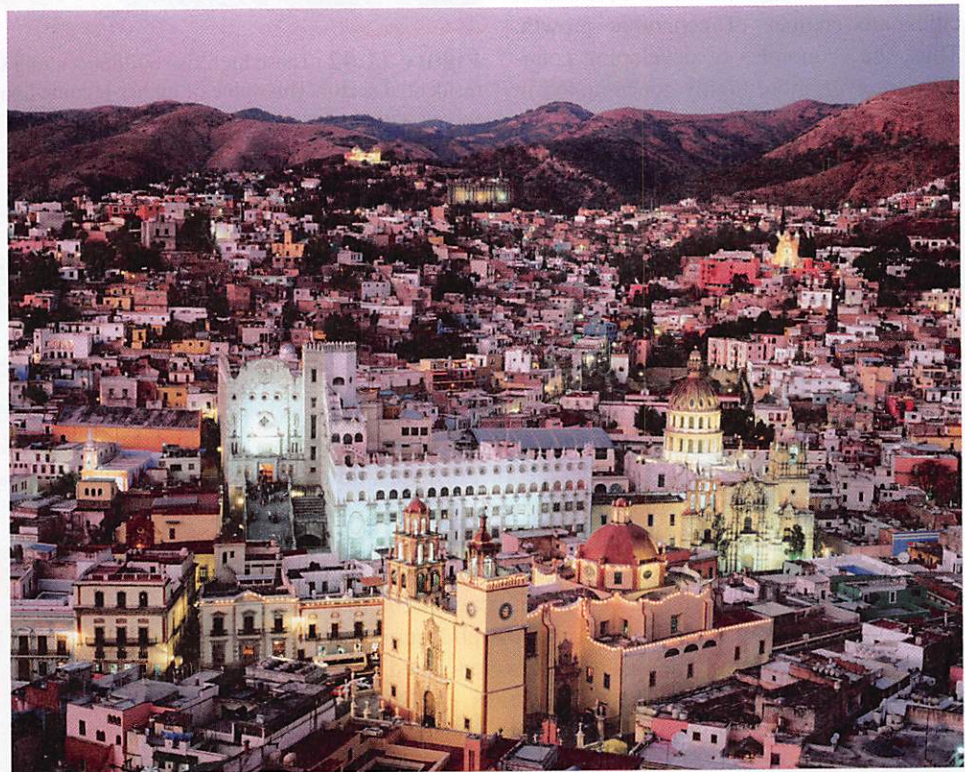
(b)

Figure 11.41 Developing-world cities vary greatly in structure and appearance, reflecting their differing culture regions, histories, and functions. (*a*) Monumental government buildings mark single-function Brasilia, the capital of Brazil. Brazil's capital was moved to Brasilia in the 1950s to promote the development of the country's remote interior. (*b*) The central area of multifunctional Guanajuato, Mexico, is dominated by religious structures, government buildings, a central plaza, and homes of the city's elite. The architecture in the central area displays the city's Spanish colonial heritage.

(a) ©Julia Waterlow/Getty Images; (b) ©Jose Fuste Raga/Getty Images

Urban Primacy and Rapid Growth

The population of many developing countries is disproportionately concentrated in their national and regional capitals. Few developing countries have mature, functionally complex systems of cities with multiple small and medium-size centers. Instead, one primate city dominates their urban systems (see Figure 11.17). One-fifth of all Nicaraguans live in metropolitan Managua, and Libreville contains a third of the populace of Gabon. Vast numbers of the rural poor are attracted to these developed seats of wealth and power. Poverty and rapid population growth in rural areas is the push factor and the bright lights and promise of opportunities in the big city provide the pull. All too often, though, the reality of life in the primate city doesn't live up to its promise.

With their agglomeration economies, cities are engines of economic growth. Thus, the economies of developing countries are even more highly concentrated in their largest cities. Buenos Aires, with a third of Argentina's population, generated almost two-thirds of the country's GDP. Examples of primate cities exerting a disproportionate economic influence are repeated over and over in the developing world.

Many large cities in developing countries with rapidly growing economies have a vibrant and modern city center and elite residential sector (**Figure 11.42**). Such districts contain amenities that could be found in major Western centers and are the places where the wealthiest members of society work and often live. This is also the part of the city that businesspeople, officials, tourists, and other visitors are most likely to see. Some, particularly Asian, cities have made great investments in these city centers, often as much for prestige as for practical purposes. In fact, the booming cities of Asia now are leaders in skyscraper construction. The world's tallest building is in Dubai, United Arab Emirates, and 9 of the world's 10 tallest buildings in 2015 were located in East or Southeast Asia, with just 1 in the United States.

Yet the presence of gleaming downtowns cannot disguise the fact that most of these cities simply cannot keep pace with the massive growth they are experiencing (**Figure 11.43**). The pace of urbanization promises unceasing pressure on governments to provide adequately for the housing, employment, and public service needs of that burgeoning population. In many individual cities, growth rates create daunting challenges; Lagos, Nigeria, for example, had 325,000 residents in 1950 but had grown to an estimated 13.1 million by 2015. It continues to add about 1,700 new residents each day and the United Nations estimates that it will reach 24 million by 2030. The challenge facing Lagos is equivalent to crowding in an additional Baltimore, Maryland, or Abilene, Texas, each year. The massive rural-to-urban movement contributing to such growth

Figure 11.42 These high rise buildings along Copacabana Beach are part of the city's elite residential sector. This spine of higher-income housing extends outward from the CBD and is well-served with sewers and other services. It stands in stark contrast with the favelas elsewhere in the city (Figure 11.44).

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rates and population increases is augmented by the additional births produced by the youthful immigrants.

Squatter Settlements

Most developing-world cities are ringed by vast, high-density squatter settlements (also known as informal settlements) lacking in public facilities and services. With regional variations (**Table 11.4**),

Table 11.4

Percentage of Urban Population Living in Slums

Region	2000	2014
Sub-Saharan Africa	65	55
South Asia	46	31
Southeast Asia	40	27
East Asia	37	25
Western Asia	21	25
Oceania	24	24
Latin America and Caribbean	29	20
North Africa	20	11

Source: United Nations, The Sustainable Development Goals Overview, *2016.*

Figure 11.43 The dualism of prosperity and poverty is apparent in Kuala Lumpur, Malaysia. In the background, the Petronas Towers—for a time the world's tallest—and the Radisson Hotel rise in sharp contrast to the downtown shanties in their shadow.

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slum dwellers accounted for about 30 percent of the urban population in developing regions in 2014, a substantial improvement over 1990 when 46 percent lived in slums. Although progress has been substantial, gains are partially offset by population growth. More than 880 million people were living in slum conditions in 2014. In sub-Saharan Africa, the rates are highest and the problem is most challenging. Thus, one of the United Nations' Sustainable Development Goals is to improve conditions in cities and reduce both the percentage and absolute number of people living in slums.
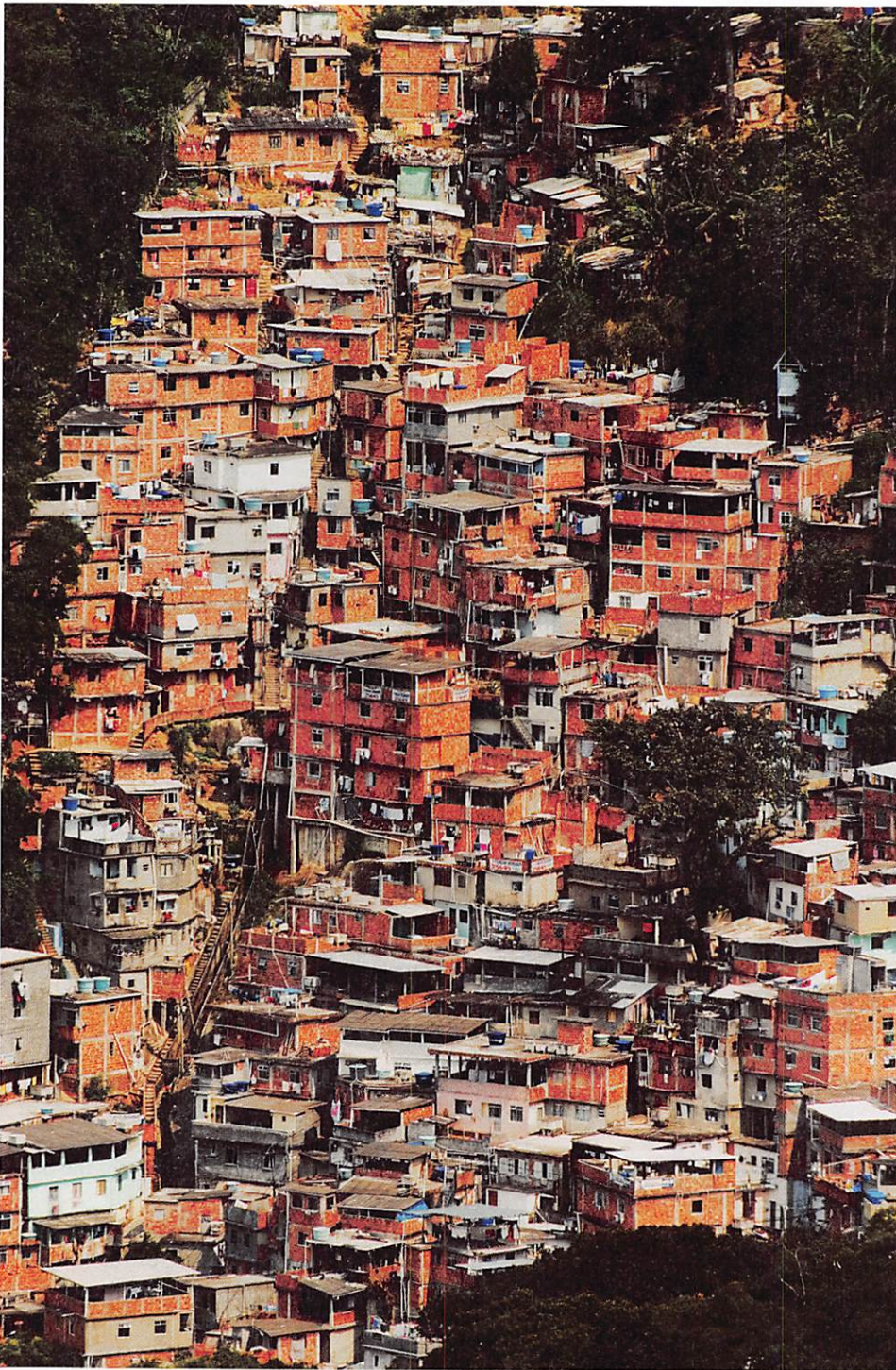
A substantial proportion of the population of most developing-world cities is crowded into informal settlements built by their inhabitants, often without legal title to the land. These informal communities—*favela* in Brazil, *barrio* in Mexico, *kampung* in Indonesia, *gecekondu* in Turkey, or *katchiabadi* in Pakistan—usually have little or no access to publicly provided services such as water supply, sewerage and drainage, paved roads, and garbage removal. In such megacities as Rio de Janeiro (**Figure 11.44**), São Paulo, Mexico City, Bangkok, Chennai (Madras), Cairo, or

Lagos, millions find refuge in the shacks and slums of the *informal housing sector*.

Only a fraction of the new housing in Third World cities is produced by the formal housing sector; the rest develops informally, ignoring building codes, zoning restrictions, property rights, and infrastructure standards. Squatter settlements often emerge on peripheral land that is undeveloped or on land that is too steep or flood-prone for conventional development. Overcrowding often transforms peripheral squatter settlements into vast zones of disease and squalor subject to constant danger from landslides, fire, and flooding. The informality (and often illegality) of the squatter housing solution means that those who improvise and build their own shelters lack registration and recognized ownership of their houses or the land on which they stand. Without such legal documentation, no capital accumulation based on housing assets is possible and no collateral for home improvement loans or other purposes is created.

As many as 3 million residents in Nairobi, Kenya, live in slums, most without electricity, running water, or sewers; in that

Figure 11.44 The *favelas* in Rio de Janeiro, Brazil house a substantial proportion of the population. These slums were originally built by new migrants to the city who could not afford existing housing. Urban slums such as these are often overcrowded and lacking in urban services. However, over time residents often form associations to help secure urban services and upgrade their community.
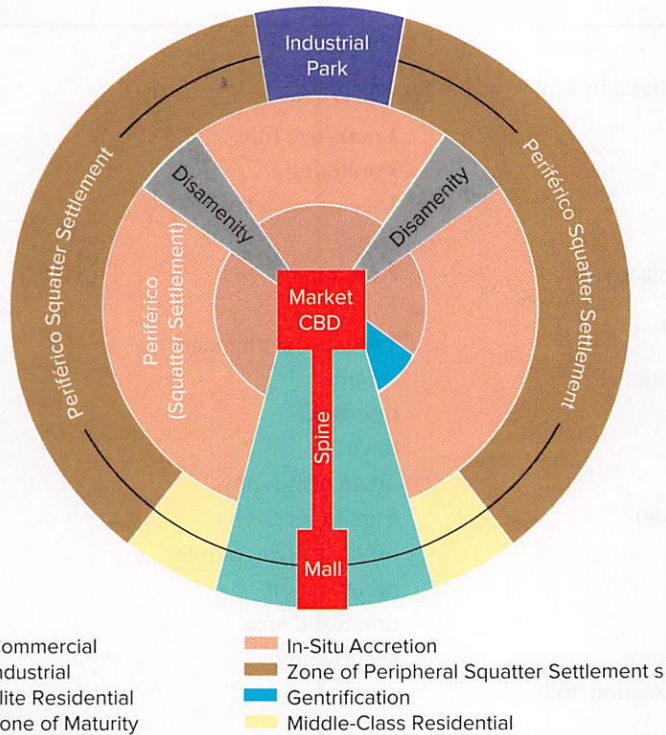
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With some of the fastest urban growth rates, sub-Saharan African cities have the highest percentage of their urban populations living in slums, despite the gleaming modern skyscrapers of their capital city cores. Almost two-thirds of city residents are slum dwellers; they are, in addition, afflicted with low life expectancies, high levels of infant and child mortality, HIV/AIDS prevalence, and illiteracy, particularly among women and girls. The prevalence of peripheral slum concentrations in all developing world regions reflects an *inverse concentric zone* pattern in which the elite and upper class reside in central areas and social status declines with increasing distance from the center.

In most world regions, there has been substantial recent improvement in the percentage of urban dwellers living in slums. Conflict-torn regions such as Syria in West Asia are areas where conditions have worsened. Sometimes residents of squatter settlements have successfully lobbied governments for water, sewers, roads, and other infrastructure, and over time, they have become more established neighborhoods. One of the major steps in upgrading slums is to give residents some form of secure right to the land on which their dwelling is located. As incomes stabilize over time, shacks can be upgraded to regular houses and slums can become stable neighborhoods. Unless the land is unsafe or unstable, slum upgrading is preferable to demolition and relocation, which displace people and break apart dense social networks.

Latin American City Model

While Latin American cities have their own unique characteristics, many of the traits common to cities in the developing world can be observed in the **Latin American city model** (**Figure 11.45**). At the center lie the traditional market area, key government and religious buildings, and a modern CBD. Extending outward from the center is a commercial spine that features high-status establishments and terminates at a suburban mall. The spine features amenities such as tree-lined boulevards, is well supplied with sewers and urban services, and is surrounded by an elite residential sector. Residential zones generally decrease in status with distance from

city's sprawling slum district of Mathare Valley, some 190,000 people are squeezed into 15 square kilometers (6 square miles), and the population is increasing by 10,000 inhabitants each year.

Figure 11.45 The Latin American city model shows the wealthy living in the inner city and along a commercial spine that extends outward in one sector. Income generally declines with distance from the CBD.

Source: Larry R. Ford, "A New and Improved Model of Latin American City Structure," Geographical Review 86 (1996): 438.

Legend:
- Commercial
- Industrial
- Elite Residential
- Zone of Maturity
- In-Situ Accretion
- Zone of Peripheral Squatter Settlements
- Gentrification
- Middle-Class Residential

the center because the inner city has a positive connotation. The zone of maturity has the better-quality residences, while the zone of in-situ accretion is mixed in status but undergoing improvement. Squatter settlements are found at the urban periphery and in disamenity zones, such as near dumps, in flood-prone areas, or on steep slopes. An industrial corridor terminates at a peripheral industrial park and a circumferential roadway (*perférico*) connects the industrial park and suburban mall.

Planned Cities

Some national capitals have been removed from their earlier primate city sites and relocated outside the core regions of their countries. The objective of these "forward capitals" has been to achieve a more central location or to encourage more uniform national development; examples include Islamabad (Pakistan), Brasilia (Brazil), Abuja (Nigeria), and Putrajay (Malaysia). Other relocations have been planned or announced, including a 2004 decision to relocate South Korea's primary government administrative agencies 150 kilometers (93 miles) to the southeast of Seoul.

A number of developing countries have also created or are currently building some new cities intended to draw population away from overgrown metropolises; others are designed to house transportation facilities or industrial agglomerations. For example, China's government is building dozens of new cities with the goal of relieving pressure on the capital city of Beijing. Thailand opened Suvarnabhumi, a major airport an hour outside of Bangkok, intended to become the air transport hub for Southeast Asia with a new city nearby planned as a major new industrial center for the nation. China, India, Malaysia, and other Asian industrializing states are also planning—or have constructed—high-tech manufacturing and service centers, catering to the outsourcing needs and market opportunities of a globalizing economy (**Figure 11.46**).

Figure 11.46 The Cyber Gateway Building in Hyderabad's Hitec City houses firms like the multinational software companies Microsoft, IBM, and Toshiba, as well as Indian companies like Wipro, which provides information technology services and product design. Hitec City also houses professional schools in business and information technology.

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Use the terms below with a ▌ to focus your study of AP Human Geography key words in this chapter.

basic sector
▌ bid-rent theory
▌ blockbusting
▌ boomburb
brownfields
▌ built landscape
central business district (CBD)
central city
central place
▌ central place theory
Christaller, Walter
city
▌ concentric zone model
conurbation
▌ disamenity zone
economic base
▌ edge city
▌ exurb
▌ galactic city model

gated community
▌ gentrification
▌ gravity model
▌ greenbelt
hierarchy of central places
hinterland
isotropic plain
Latin American city model
▌ megacity
▌ metacity
metropolitan area
▌ multiple-nuclei model
multiplier effect
network city
▌ New Urbanism
nonbasic (service) sector
peak land value intersection 362
peripheral model
▌ primate city

▌ rank-size rule
▌ redlining
▌ sector model
▌ site
▌ situation
▌ sprawl
▌ squatter settlement
suburb
threshold
town
urban geography
▌ urban hierarchy
urban influence zone
urbanization
urbanized area
▌ world city

AP TEST PRACTICE

Multiple Choice Questions

1. **All of the following tend to increase urbanization EXCEPT**
   (A) immigrants tend to settle in cities.
   (B) more jobs are available in cities as they industrialize.
   (C) people flee impoverished rural districts.
   (D) more services are available to people in cities.
   (E) there is more crime and pollution in cities.

2. **Global population, according to Figure 11.2 on page 350, has**
   (A) become more rural as people become tired of the problems of city life.
   (B) become steadily more urban throughout the 20th century.
   (C) slackened in urban areas but grown quickly in rural areas since the 1950s.
   (D) remained at about 50% urban and 50% rural through the second half of the 20th century.
   (E) mainly concentrated in cities of more than a million people.

3. **The world's largest urban areas, according to Table 11.1 on page 351**
   (A) were almost all in Europe in 1900, but today all are found in periphery or semi-periphery countries.
   (B) are found mainly in core countries today.
   (C) have moved from predominantly U.S. cities to South American and African ones.
   (D) have doubled in size since the 1950s.
   (E) are found today on every continent in the world.

4. **Christaller's central place theory is used to explain**
   (A) the spacing of interdependent urban settlements of different sizes in such a way that all the goods and services are provided to the people.
   (B) the way that houses cluster around a central business district in cities.
   (C) the importance of religious and political buildings within a city's central business district.
   (D) the merging of separate cities into a megalopolis like the Boston to Norfolk corridor.
   (E) the movement of people to a city, causing urbanization to occur.

5. **If a country follows rank-size rule,**
   (A) there is one major city and many much smaller cities, which provide services to all the people equally.
   (B) there is only one major city in the entire country, so many people go without services they need.
   (C) there are two cities half the size of the largest city, ten cities one tenth the size, and so on, allowing for services to be provided in all parts of the country.
   (D) there are no big cities within the country, putting it very low on the development scale.
   (E) the size of the government is much larger than necessary for the size of the country.

6. **In the central business district (CBD) of a city**
   (A) many people live in garden apartments and condos.
   (B) land costs are at their highest.
   (C) mass transit is often not available.
   (D) there are many big box stores, car showrooms, and multiplex movie houses.
   (E) urban slums and ghettoes are common.

7. **The peripheral model, also known as the galactic city model,**
   (A) considers that cities are surrounded by rural land that supports the city by providing food and labor.
   (B) is a proposed model for cities in outer space.
   (C) is found mainly in Southeast Asia and Sub-Saharan Africa.
   (D) is less accurate than the Hoyt Sector Model.
   (E) depicts the effects of beltway or ring road construction on a city and its inhabitants.

8. **All of the following are true about segregation within cities EXCEPT**
   (A) segregation was forced upon African Americans by discriminatory housing practices such as redlining.
   (B) social and economic barriers make it difficult for members of some ethnic groups to move to wealthier areas of town.
   (C) some segregation is self-maintained, as seen in the persistence of areas known as Chinatown and Little Italy.
   (D) gated communities in many countries segregate the wealthier people of a city from the lower classes.
   (E) as the distance from the city center increases the average age of the population also increases, but the family size decreases.

9. **The needs, problems, and patterns of women with respect to urban social space differ from men's in that**
   (A) there are more women than men, particularly as heads of households with children, and therefore the poverty rate is also higher.
   (B) women travel farther to work than men and rely less on public transportation.
   (C) jobs that are "women's work" such as clerical work are concentrated in specific areas of the city.
   (D) there are more opportunities for childcare in cities, which enables women to find better jobs.
   (E) suburban women have more opportunities due to the variety of services available to them there.

10. **A major problem of urban growth in developing countries is**
   (A) high rise apartments that have been built to house the poor in inner cities.
   (B) mixed-use areas of cities where rich and poor live near one another.
   (C) central plazas that are being converted into business parks.
   (D) informal squatter settlements that lack amenities.
   (E) lack of schools and medical care for poor children.

Free Response Questions

1. **Answer Parts A, B, and C below.**
   (A) Explain Christaller's central place theory.
   (B) Define the term *primate city*, give an example, and explain the advantages or disadvantages.
   (C) Define the term *rank-size rule*, give an example, and explain the advantages or disadvantages.

2. **Choose two of the urban models listed below. Describe each one and compare their advantages and disadvantages. Use a concrete example for at least one model.**
   (A) Burgess Concentric Zone Model
   (B) Hoyt Sector Model
   (C) Harris and Ullman Multiple Nuclei Model

3. **Answer Parts A, B, and C below.**
   (A) Identify and explain three problems associated with the inner city.
   (B) Identify and explain one way cities are dealing with one of the problems discussed in Part A.
   (C) Identify and explain another way cities are dealing with another of the problems discussed in Part A.