UNIT 6

Cities and Urban Land-Use Patterns and Processes

Unit Overview

Cities and the suburbs around them are constantly changing—in how they are laid out, how they work, and how large they are. One of the most basic questions geographers study is why people move into, within, or out of various parts of urban areas.

Models of Urban Areas

Geographers create models to show the distribution and size of cities. They identify patterns that help explain why cities grow to various sizes and how people in different cities are connected to each other. Other models help geographers analyze how cities are organized and develop. Cities generally have zones for commerce, housing, and other functions.

Urban Landscapes and Urban Challenges

People express their attitudes and values through the landscapes they build and how they organize social spaces. The choices people make, such as how closely they live to others and where to build an airport, reflect what they consider important.

Large concentrations of people can produce both great opportunities for progress and great challenges. Some challenges result from decline, such as the movement of industry out of cities. Others result from sustainability, such as how to keep air and water clean.

ENDURING UNDERSTANDINGS

(PSO-6) The presence and growth of cities vary across geographical locations because of physical geography and resources.

(IMP-6) The attitudes and values of a population, as well as the balance of power within that population, are reflected in the built landscape.

(SPS-6) Urban areas face unique economic, political, cultural, and environmental challenges.

Source: *AP® Human Geography Course and Exam Description.* Effective Fall 2020. (College Board).

CHAPTER 15

Origin, Distribution, and Systems of Cities

Topics 6.1–6.4

Topic 6.1 The Origin and Influences of Urbanization

Learning Objective: Explain the processes that initiate and drive urbanization and suburbanization. (PSO-6.A)

Topic 6.2 Cities Across the World

Learning Objective: Explain the processes that initiate and drive urbanization and suburbanization. (PSO-6.A)

Topic 6.3 Cities and Globalization

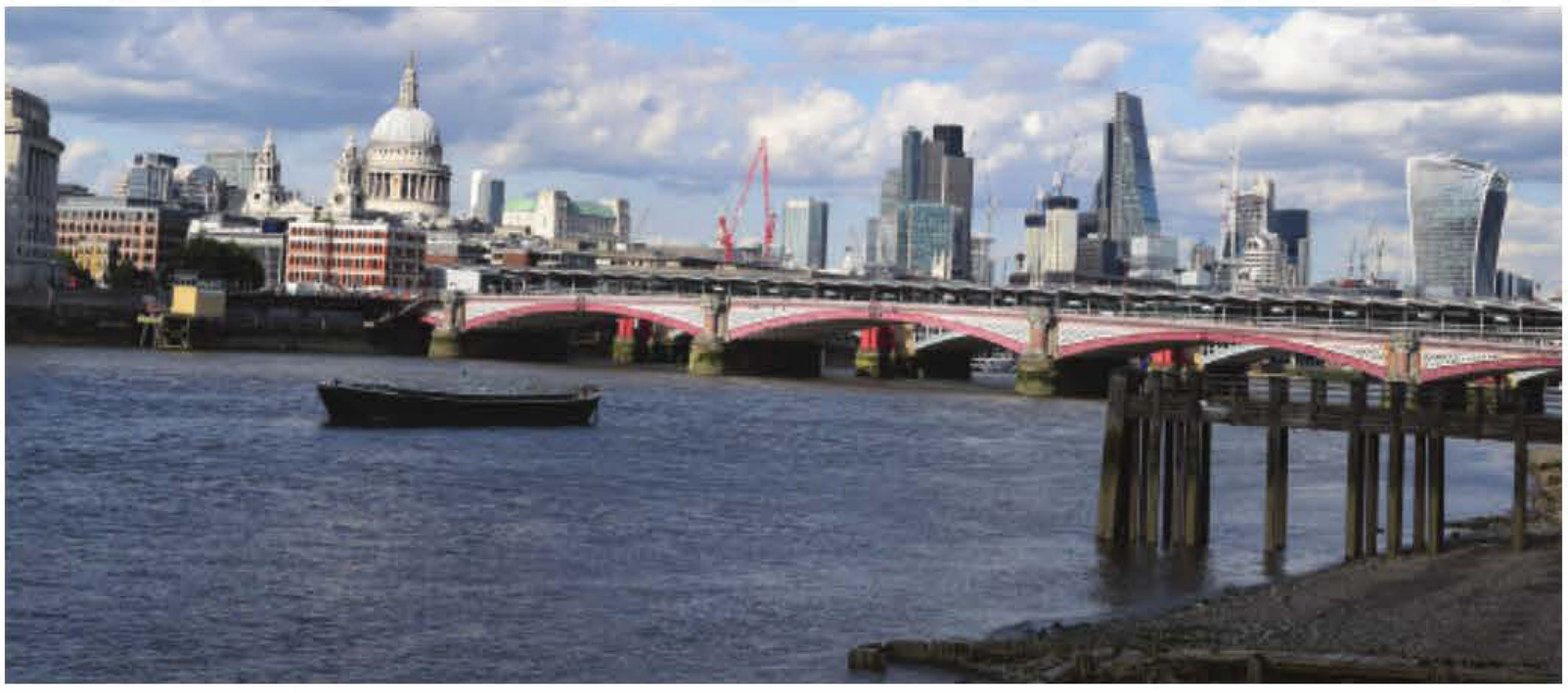
Learning Objective: Explain how cities embody processes of globalization. (PSO-6.B)

Topic 6.4 The Size and Distribution of Cities

Learning Objective: 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. (PSO-6.C)

Cities are extremely local and intimate places.... At the same time they are the product of complex interactions with other places near and far away.

—David Lanegran, *The Introductory Reader in Human Geography*



Source: David Palmer

Cities develop and change over time as illustrated by the contrast of the historic core and contemporary skyscrapers of London. (See topic 5.1 for factors that influence how cities develop.)

6.1

The Origin and Influence of Urbanization

Essential Question: What are the processes that initiate and drive urbanization?

The permanently inhabited portion of the earth's surface—what the classical Greeks called the **ecumene**—is a variety of community types with a range of population densities. As humans increasingly settled in permanent locations, classifications of settlements emerged:

- **Rural** areas (farms and villages) with low concentrations of people
- **Urban** areas (cities) with high concentrations of people
- **Suburbs** that are primarily residential areas near cities

Factors Driving Urbanization

A **settlement** is a place with a permanent human population. The first agricultural settlements appeared around 12,000 years ago. Before that, people survived by hunting and gathering, so they lived in temporary or movable shelters. The first permanent settlements were small enough that the inhabitants could all farm and subsist on the surrounding fields. Over time, in several places around the world, small agricultural settlements began to develop characteristics that made them the first true urban settlements, or cities:

- the presence of an agricultural surplus
- the rise of social stratification and a leadership class or urban elite
- the beginning of job specialization

A food surplus became available as irrigation, farming, and domestication of animals and plants developed. These changes enabled increasing numbers of people to live in the same location. A ruling class emerged to control the products that were accumulated and the people living in the community. Because not everyone was needed to produce food, some people specialized in making things, such as tools, weapons, and art. Others specialized as accountants or religious leaders—the first members of a service sector. As a result, cities developed as economic centers of services, manufacturing, and trade.

Urbanization

The process of developing towns and cities is known as **urbanization**, an ongoing process that does not end once a city is formed. Urbanization also

involves the causes and effects of existing cities' growth. Describing a region as urbanized indicates that cities are present there. A common statistic associated with regions, countries, and even continents is **percent urban**—an indicator of the proportion of the population that lives in cities and towns as compared to those that live in rural areas.

Urbanization is one of the most important phenomena of the 19th and 20th centuries, and geographers continue to study its development. Today, more than 50 percent of the world's population lives in cities. Demographers estimate that by the year 2030, 60 percent will live in cities, and nearly 70 percent by 2050. Most of those people will be in the less-developed countries (LDCs) of the world's periphery and semiperiphery. While urbanization can be positive for both individuals and societies, the challenges may be overwhelmingif a city is not prepared to grow or if urbanization occurs too rapidly.

Influence of Site and Situation on Cities

The location of where cities develop is a critical aspect of urban geography. The concepts of site and situation, introduced in Topic 1.4, play a key role in explaining this process. **Site** describes the characteristics at the immediate location—for example, physical features, climate, labor force, and human structures. In contrast, **situation** refers to the location of a place relative to its surroundings and its connectivity to other places. Examples would include near a gold mine, on the coast, or by the railroad. Important factors of site and situation today are different than past cities.

The site and situation of a city influences its function. Specialized functions of cities include defense, religion, trade, education, finance, transportation, government, manufacturing, retirement, entertainment, residential housing, or service centers. Larger cities often have multiple functions. Cities near natural ports, such as Boston or New York City, started as centers of trade but provide multiple functions today.

Early City-States

Historically, a **city-state** consisted of an urban center (the city) and its surrounding territory and agricultural villages. A city-state had its own political system and functioned independently from other city-states. The population in the surrounding villages and territory received services and protection from the urban center. These communities were often raided by other groups for their wealth. As a result, defense was a primary consideration, and military leaders evolved into political rulers, or kings.

Early city-states emerged in several locations around the globe in an **urban hearth**, or area generally associated with defensible sites and river valleys in which seasonal floods and fertile soils allowed for an agricultural surplus:

- the Tigris-Euphrates Valley (Mesopotamia) in modern Iraq
- the Nile River Valley and Nile Delta in modern Egypt
- the Indus River Valley in modern Pakistan
- the Huang-He floodplain in modern China

Other urban centers also emerged in Mesoamerica (in modern Mexico) and in the Andean region of South America.

Examples of city-states through history include those of Classical Greece (Athens, Sparta, Corinth), those of the Middle Ages in Europe, and Venice and Italian city-states during the Renaissance. Monaco, a city-state located entirely within the boundaries of Italy, has endured to modern times. Vatican City and Singapore are also modern city-states, though they did not evolve from previous agricultural settlements, but from religious influence. City-states eventually coalesced to form early states and empires. The ancient Babylonian Empire grew from the original city-state of Babylon.

Centers for Services

As cities grew, more people developed specialized skills other than producing food. This changed the relationship between cities and the areas around them. City residents depended on farmers for food. In return, people in cities focused on supplying services for their inhabitants and the inhabitants of surrounding regions.

Early cities often specialized in particular services. Some emerged as administrative centers from which the elite ruled. Others, often associated with important shrines, became religious centers. Defensive strongholds, university towns, and centers of specialized production—located at resource sites—also emerged.

Defining Cities

Most definitions of a city describe a place with a relatively high concentration of people. Cities are places where people come together to build a nucleated, or clustered, settlement. An **urban area** is usually defined as a central city plus land developed for commercial, industrial, or residential purposes, and includes the surrounding suburbs.

Legal Definition of a City

Definitions of what constitutes a city vary greatly, but the easiest way to define a **city** is a higher-density area with territory inside officially recognized political boundaries. This definition is useful for determining the precise population, taxing residents, providing services, and establishing and enforcing laws. Most large cities today, as defined legally, share boundaries with adjacent cities, yet those boundaries are visible only on a map. On the ground, people leaving one city might have no idea they were entering another legal city.

Metropolitan Areas

A collection of adjacent cities economically connected, across which population density is high and continuous is a **metropolitan area**, sometimes called a **metro area**. Most large cities in the world today are really metro areas of a series of legally defined cities, but they are referred to using only the name of the largest city. For example, the metro area of Denver, Colorado, consists of

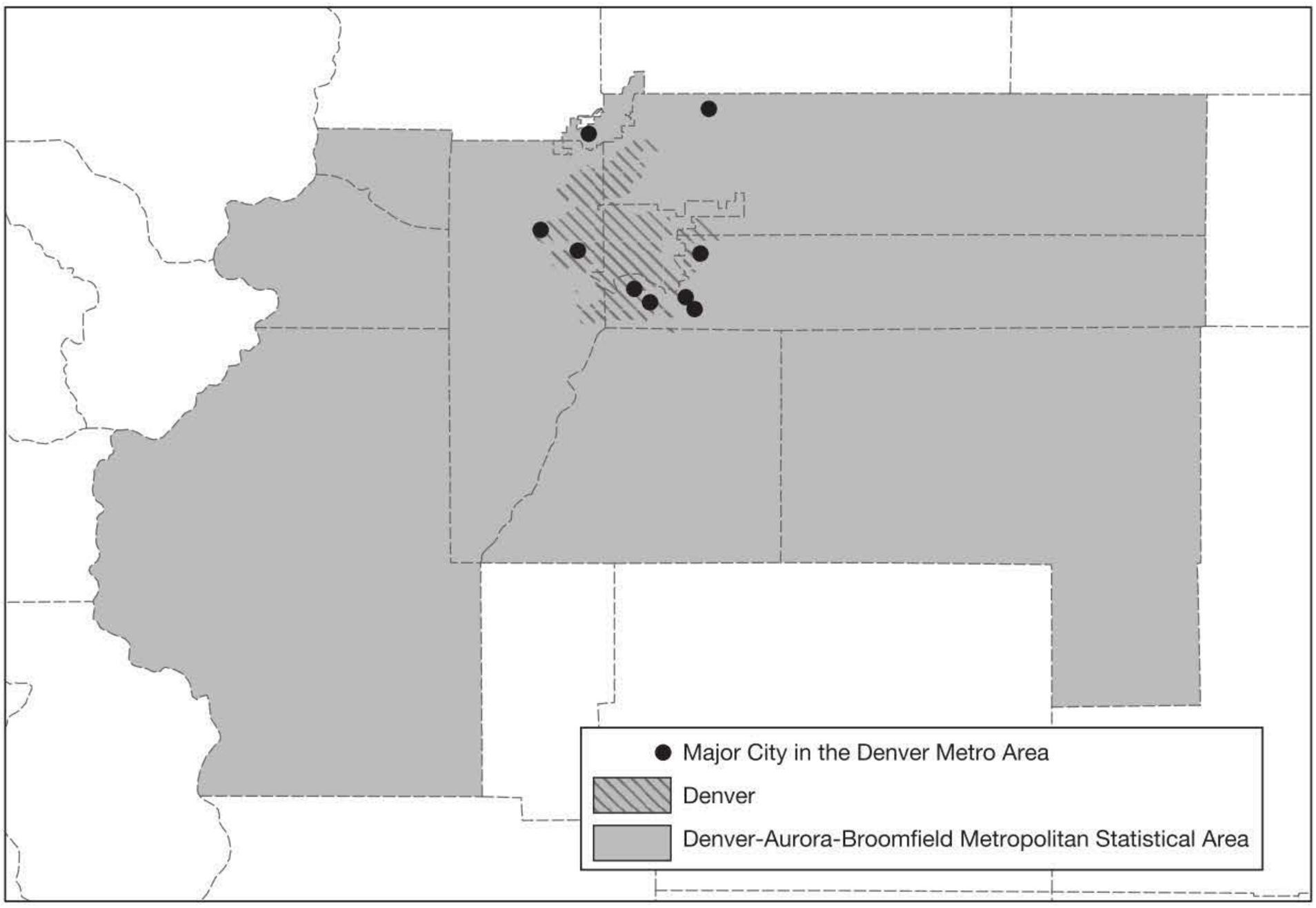
the cities of Denver, Aurora, Lakewood, Englewood, Greenwood Village, and other neighboring, legally defined cities.

In the United States, the term **metropolitan statistical area** (MSA) is another way to define a city. An MSA consists of a city of at least 50,000 people, the county in which it is located, and adjacent counties that have a high degree of social and economic integration, or connection, with the urban core. Similarly, **micropolitan statistical areas** are cities of more than 10,000 inhabitants (but less than 50,000), the county in which they are located, and surrounding counties with a high degree of integration. Note that this designation is really one in which a city is defined as a **nodal region**, or focal point in a matrix of connections.

Morphology, or physical characteristics, such as the buildings, streets, public places, and home, can also describe an urban area:

- The built-up area is where the landscape has a high concentration of people and structures.
- The places where built-up areas begin to give way to open spaces and underdeveloped areas are the outskirts of the city.
- This end of the continuously built-up area is often considered an urban border, whether or not it coincides with a legally defined city boundary.

THE DENVER METROPOLITAN AREA



The shaded-lined area shows the metro area of Denver and includes several cities. Investigate a map of your city (or a large city near you) and attempt to define its metro area and see how it differs from the MSA.

Population Characteristics

People are drawn to urban areas often from rural areas, other regions, or other countries, looking for jobs and opportunities. For these reasons, **social heterogeneity** is particularly high in cities, meaning that the population of cities, as compared to other areas, contains a greater variety of people. Diversity in cultural interests, sexual orientations, languages spoken, professional pursuits, and other characteristics are present in cities to a much larger degree than in small towns or rural areas.

Immigration One reason cities are diverse is because they are centers of immigration. For example, in several large cities around the world, 40 percent or more of the population is foreign born. Among these are Miami and San Jose in the United States, Toronto and Vancouver in Canada, and Sydney and Melbourne in Australia.

Diversity Because of the higher population density and the relative anonymity of cities, urban residents are generally more accustomed to diversity than are people in non-urban areas. Walking through the streets of cities such as New York, London, or Amsterdam, one can see signs in numerous languages, restaurants that serve food from around the world, and buildings representing many religious traditions. Such diversity is less common in more sparsely populated areas.

One result of this diversity in cities is that it leads to more diversity. Cities have always attracted individuals with less common cultures, interests, or ways of life. They are more likely to find people whom they share traits with in cities.

Transportation and Communication

Improvements in transportation and communication have aided the growth of cities in size and number. Urban areas have expanded as trains, buses, and cars have enabled people to move farther from the center of the city, but still visit or work in the city. That change illustrates how **time-space compression** (see Topic 1.4), in the form of transportation improvements, has led to urban growth. The development of the Internet—to transport ideas rather than people—has allowed more and more people to work from home, which has increased the distance people can live from the center of a city.

Borchert's Transportation Model

Geographer John Borchert developed **Borchert's transportation model** to describe urban growth based on transportation technology. Each new form of technology produced a new system that changed how people moved themselves and goods in and between urban areas. He divided urban history into four periods, which he called epochs. Each epoch had profound effects on the local scale related to a city's form (shape), size, density, and spatial arrangement. Additionally, transportation had profound impacts on the distribution and connectivity of cities on a regional, national, and global scale.The epochs are shown in the table on the following page.

BORCHERT'S MODEL OF URBAN GROWTH		
Epoch	**Time Period**	**Conditions and Effects**
Sail-Wagon	1790–1830	▪ Water ports became very important. ▪ Poor road conditions made long-distance travel between cities difficult.
Iron Horse	1830–1870	▪ Steam engines powered boats, which promoted the growth of river cities. ▪ Regional rail networks connected cities. ▪ Rail lines connected resources and industrial sites.
Steel Rail	1870–1920	▪ Transcontinental railways emerged. ▪ Cities emerged along rail lines in the interior of continents.
Auto-Air-Amenity	1920–1970	▪ Cars allowed cities to spread out. ▪ Airport hubs emerged. ▪ Cities became far more interconnected.

While Borchert's model ends in 1970, it could be expanded. Since 1970, some cities have encouraged mass transit (rail lines), biking (separate bike lanes on roads and new bike paths), and walking (car-free areas in cities). Additionally, the expansion and importance of jet air travel is not fully captured in the model.

Transportation's Impact on Cities

Changes in transportation infrastructure within cities has also had important effects on the urban structure. The earliest urban centers were **pedestrian cities**, or cities shaped by the distances people could walk. A horse-and-buggy era allowed for city size to increase as people could move farther from the center and its concentration of services and jobs. Streetcar systems encouraged the movement of the population even farther from the center of a city, and growth became concentrated along the lines of these small urban rail systems. **Streetcar suburbs**, communities that grew up along rail lines, emerged, often creating a pinwheel shaped city.

The advent of the automobile had profound effects on the growth of cities. Using cars and the highways built to facilitate movement, the population of cities spread out over ever-increasing distances from the urban core. The lower density suburbs that emerged around original cities developed as separate legal cities but functioned as part of the metropolitan area focused on the central, or original city. Additionally, with the U.S. interstate highway system, cities connected to highways have situational advantages of accessibility to road networks to transport goods or services more efficiently.

Today, major cities that hope to grow economically must have access to multiple modes of national and international transportation, as well as trade networks with air travel becoming increasingly important. Individual cities will

often focus economic development policies to increase connectivity from the local to the global scale. Therefore, transportation methods have profound effects on the growth and shape of cities.

Communication Networks

Changes in communication technology have dramatic impacts on the growth and development of cities. Historically, cities connected to trade routes received information first. However, as telecommunication technology developed—with the telegraph, telephone, cell phones, and the Internet—early adopting cities benefitted.

Cities are nodal regions that require connectivity in order to thrive. New communication technologies diffused hierarchically to large cities first. In the early 2000s, cities that lagged in building new communication infrastructure fell behind cities that were on the cutting edge of technology, like Tokyo, Chicago, London, and New York City. Today, advanced communication networks are essential to attract large corporations, factories, or high-tech companies to an urban area in order to encourage further economic growth. In 2020, according to *U.S. News & World Report*, the city with the best communication network (or *smart city*) was Singapore.

Population Growth and Migration

Rural-to-urban migration is an important concept to understand the growth of cities. Population growth pressure, cultural tension, environmental strain, and lack of economic opportunities create push factors in agricultural communities. Cities promise the hope of economic opportunities and cultural freedoms. Consequently, billions of people have migrated from agricultural regions to urban areas over the past 100 years. People are attracted to more densely populated cities to obtain higher paying jobs and more government services.

Today, the most rapid rural-to-urban migration occurs in periphery and semiperiphery countries of the world, including China, India, and Brazil. The vast majority of this migration pattern occurs domestically, or within the country. For example, millions of people continue to migrate from rural northern and western Brazil to the rapidly expanding cities of Sao Paulo and Rio de Janeiro in southeast Brazil. This rapid growth has stretched resources and created challenges for cities, such as substandard housing, overcrowding, and stressed infrastructure (transportation, sanitation and water systems).

In core countries, such as the United States, rural-to-urban migration has slowed but domestic and international migration to cities in the west and south has increased. The increase is due to the perception of economic opportunity, cost of living, and quality of life in those regions. Urban areas, such as Atlanta, Tampa, and Charlotte in the South; and Denver, Dallas, and Phoenix, in the West, have experienced rapid urban population growth that has created challenges for local communities, governments, and residents. (See Topics 6.10 and 6.11.)

Economic Development and Government Policies

Increasingly, cities are viewed as engines of growth for a country's economy. Consequently, economic and political leaders, at the national and local scale, develop policies to guide and encourage the growth of cities. Cities can have a variety of different functions and economic emphases. Cities in the Midwest of the United States, such as Cleveland, Pittsburgh, and Chicago, were often focused on attracting manufacturing jobs; while cities in Florida, such as Orlando and Tampa, promoted development based on retirement and tourism. Local policies that created economic incentives, such as low-cost loans, lower taxes, or cheap available land, were used to encourage economic development. However, the economic function of a city can change over time. Today, Pittsburgh has changed its economic development policies to attract high-tech industries, such as Google and Uber, to take advantage of the highly educated students graduating from Carnegie Mellon University and the University of Pittsburgh. Within the high-income countries of the world, cities often compete with each other to attract companies and jobs.

Policies at the national scale can also impact the growth and development of cities. In 2014, China implemented the New Urbanization Plan that developed specialized cities and designated the eastern coast of the country for urbanization. The plan used a variety of methods such as tax incentives, land grants, and the creation of a series of connected cities, each with an economic focus. An example would be Shenzhen, a city near Hong Kong where the Chinese government has invested heavily in higher education and the high-tech industry to create a global financial center and its own Silicon Valley.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the processes that initiate and drive urbanization?*

Identify the Processes That Initiate and Drive Urbanization	Explain the Processes That Initiate and Drive Urbanization

KEY TERMS

ecumene
rural
urban
suburbs
settlement
urbanization
percent urban
site
situation
city-state
urban hearth
urban area
city
metropolitan area (metro area)
metropolitan statistical area (MSA)
micropolitan statistical area
nodal region
social heterogeneity
time-space compression
Borchert's transportation model
pedestrian cities
streetcar suburbs

6.2

Cities Across the World

Essential Question: What are the processes that initiate and drive urbanization and suburbanization?

The process of urbanization and suburbanization appears differently on the cultural landscape in different regions of the world. In North America after World War II, changes in transportation, demographics, and the economy dramatically changed how cities developed. In the periphery and semi-periphery, rapid population growth of cities has affected how geographers classify and study the urban areas of the world.

Suburbanization

A suburb is a largely residential area adjacent to an urban area. **Suburbanization** involves the process of people moving, usually from cities, to residential areas on the outskirts of cities. There, they form communities that are connected to the city for jobs and services. However, suburbs are often less-densely populated and less-ethnically diverse than inner cities.

Causes of Suburbanization

Several causes contributed to the growing suburbanization in North America after World War II. Among these were economic expansion, greater purchasing power for many families, the growth of a car-centered lifestyle, and the government's construction of a vast system of new highways that allowed workers to commute from their city jobs to suburban homes. In the United States, the Federal Housing Administration provided mortgage loans for families to move to the suburbs, which were newly zoned for single-family housing.

Racial tensions provided another impetus for suburban growth. As African Americans came to the North in search of jobs and better education during and after World War II, many White Americans moved to the suburbs in what became known as "White flight." Continued government investment in suburban growth, along with a lack of investment in inner cities, hastened both urban decline and suburban growth. Industries and jobs left the cities, and residents followed. In addition, highways were sometimes built in locations that uprooted or divided existing urban communities.

Shifting Trends

The process of suburbanization is one effect of urban growth. In the developed world, especially North America, it has been the most prominent change in

urban areas since the middle of the 20th century. In 1960, the U.S. population was roughly equally divided with about 60 million people living in each of the three types of areas—urban, suburban, and rural. According to the Pew Institute, in 2016, 55 percent (175 million) of Americans lived in suburban counties, 31 percent (98 million) in urban, and 14 percent (46 million) in rural counties. Suburbs are now the dominant form of residential living in the United States.

As economic and residential activities continue to decentralize into the suburbs, cities spread out horizontally, creating a sprawling landscape. **Sprawl** is the rapid expansion of the spatial extent of a city and occurs for numerous reasons:

- growth of suburbs
- lower land costs in suburbs compared to inner cities
- lower density single family housing
- weak planning laws
- the continuing growth of car culture

In the United States, sprawl is most common in fast-growing areas in the Southeast and West. A specific process that encourages sprawl is **leap-frog development**, where developers purchase land and build communities beyond the periphery of the city's built area. As a result of sprawl, the urban footprint of American cities, such as Atlanta, grew larger than those of more populated cities in other regions of the world. Atlanta now covers over 8,300 square miles and contains 6 million people. In contrast, cities in other parts of the world are much smaller in physical size. For example, Mexico City is 580 square miles but contains over 21 million people, resulting in a much more compact and densely populated city.

New Forms of Land Use

As a result of the suburbanization process, new land-use forms have been created. **Boomburbs,** or boomburgs, are rapidly growing communities (over 10 percent per 10 years), have a total population of over 100,000 people, and are not the largest city in the metro area. This type of community develops differently than a traditional city and usually do not have a dense urban center. Examples include Mesa, Arizona; Plano, Texas; and Riverside, California.

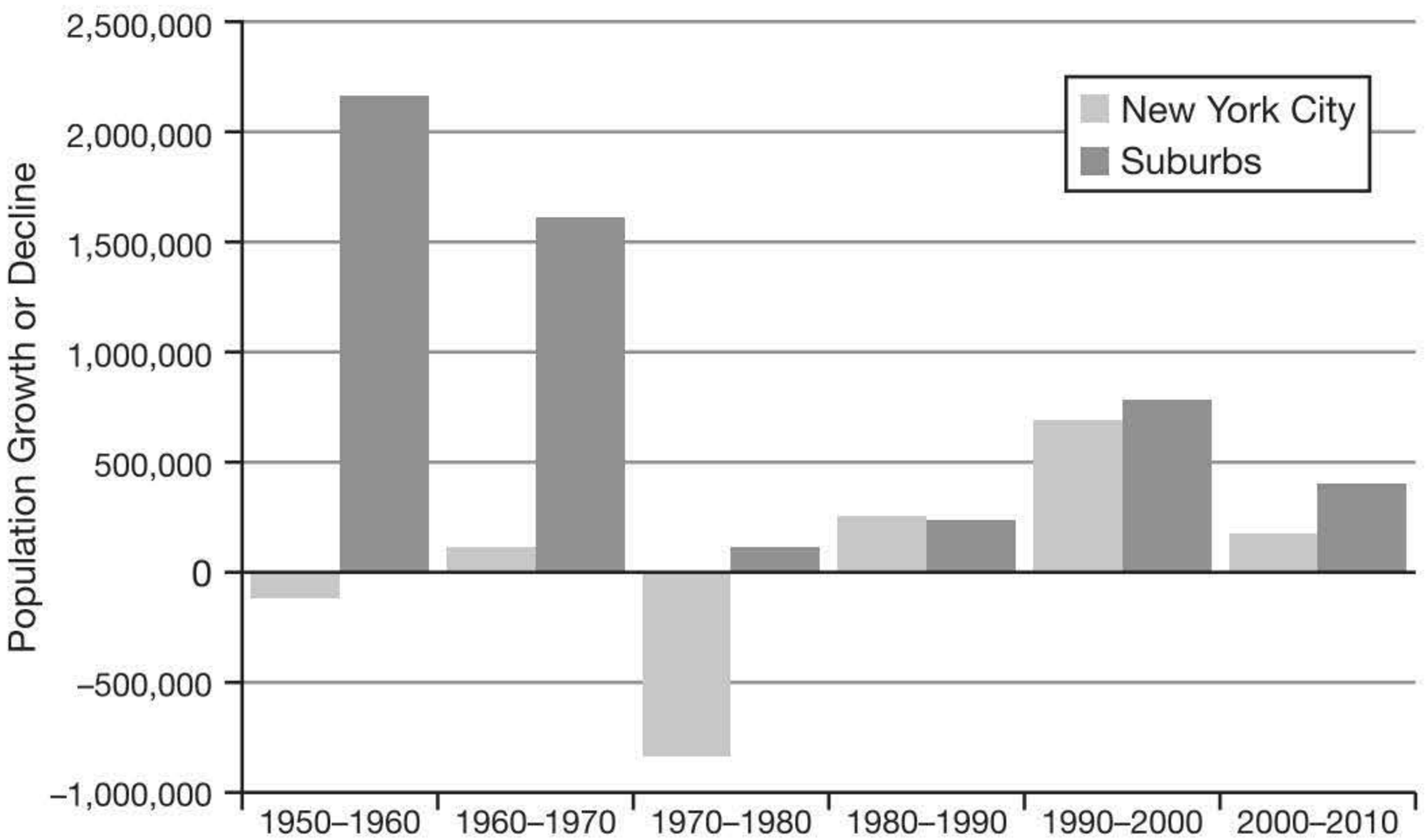
Another new land use is found near key locations along transportation routes that has mini downtowns of hotels, malls, restaurants, and office complexes. Modern geographers have dubbed these **edge cities,** which are nodes of economic activity that have developed in the periphery of large cities. They usually have tall office buildings, a concentration of retail shops, relatively few residences, and are located at the junction of major transportation routes.

While cities are the destination for many of the world's migrants, the counter-flow of urban residents leaving cities is known as **counter-urbanization** or **deurbanization**. Many of these migrants are relocating to **exurbs**, the prosperous residential districts beyond the suburbs. Contributing to exurbanism is the ability of people to work remotely via technology, which

removes the need to commute. Other factors include relative affordability of land in these areas and cultural preferences. These *exurbs* tend to have expansive lots and large single-family homes. People who live in these areas want tranquility and privacy while still having connections to an urban center.

Suburbanization has affected rural areas by increasing population density, building homes and businesses on former farmlands, and adding new residents from urban backgrounds to communities. However, suburbanization itself is currently changing in North America, as some suburbanites return to live in the city, in a process called **reurbanization**.

POPULATION CHANGE IN NEW YORK CITY AND ITS SUBURBS



Source: Adapted from Wendell Cox, "The Accelerating Suburbanization of New York." New Geography, 2011.

The graph of city and suburb growth in New York illustrates the massive growth of suburbs after World War II as well as the later process of reurbanization.

Megacities and Metacities

Megacities and metacities are the world's largest cities. **Megacities** have a population of more than 10 million people. Because of the rapid growth of cities in the 21st century a new type of city has emerged—the metacity. **Metacities**, sometimes called hypercities, are defined in two ways:

- continuous urban area with a population greater than 20 million people
- attributes of a network of urban areas that have grown together to form a larger interconnected urban system

These urban giants can spread across political borders and exert an influence that is felt regionally, and even worldwide. This influence is due to the size of their populations, but in other cases, their influence is derived from the city's political, economic, and cultural power. The world's first and largest metacity is Tokyo, Japan, with a current population of over 37 million. New York City is the tenth largest with just over 20 million people. An emerging metacity near Shenzhen, China, is predicted to exceed 120 million people by 2050.

Megalopolis

The term **megalopolis** goes back to the early 1900s and describes a chain of connected cities. It became more common after 1961, when French geographer Jean Gottman used it to describe the continuously developed string of cities from Boston—through New York City, Philadelphia, and Baltimore—to Washington, DC. The "Bos-Wash Corridor" now includes nearly 50 million residents.

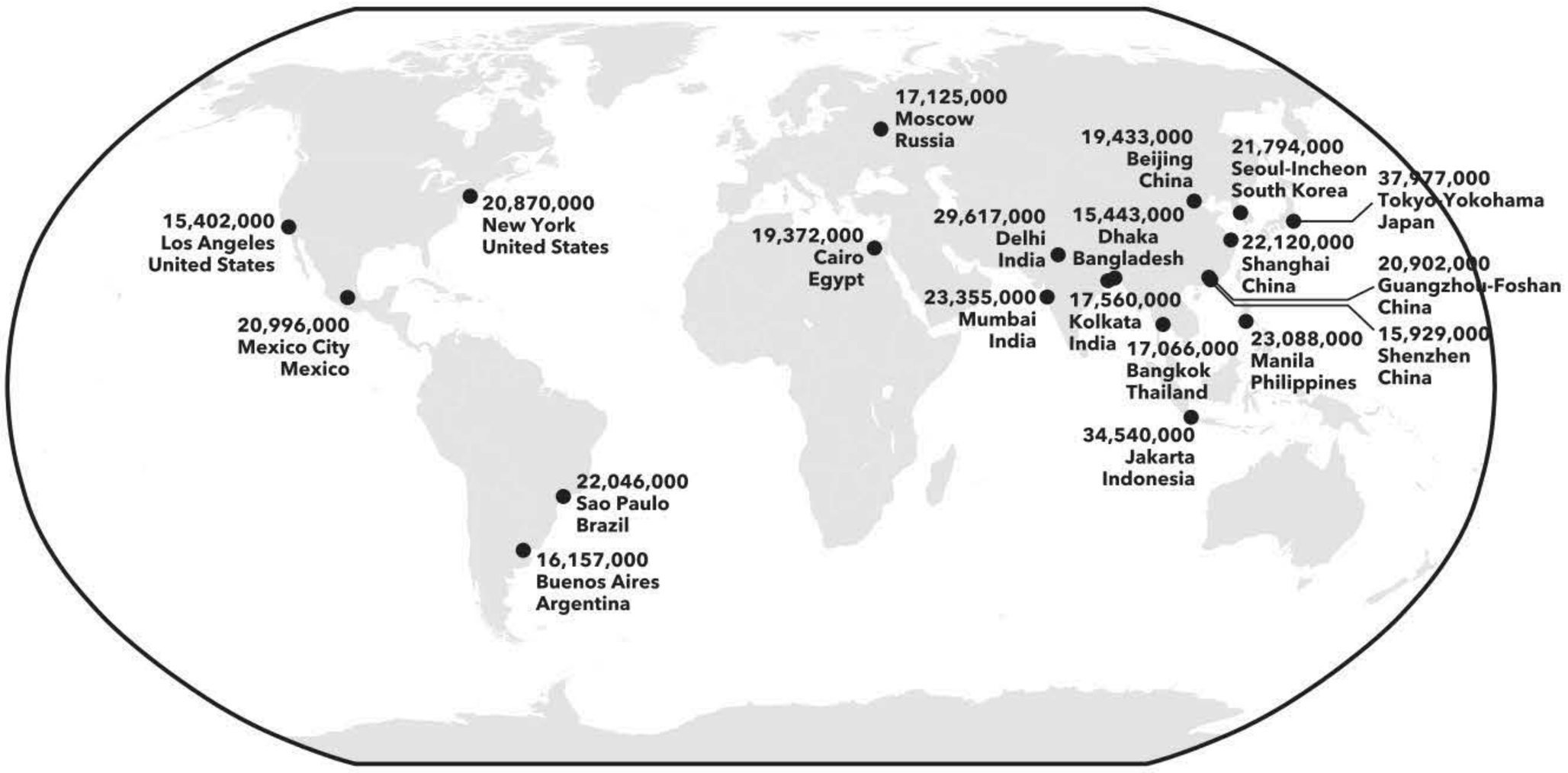
These cities had grown until they essentially merged into a single **conurbation**, an uninterrupted urban area made of towns, suburbs, and cities. The cities crossed state boundaries and exceeded the definition of a metropolitan area, which is focused on a single, urban center. Gottman noted that, although legally the major cities remained separate, they and their suburbs had become a single region that had taken on some characteristics of a single, massive city.

Since that time, with urban growth increasing across the planet, other cities have combined into megalopolises. The corridor in California from San Diego through Los Angeles to San Francisco is a single, growing metropolitan corridor on the West Coast of the United States. Tokyo through Yokohama is a megalopolis in Japan.

Urbanization in the Developing World

Megacities were once found at only the centers of large empires or the most powerful countries. However, that pattern has changed. In the past century, megacities have become more common in less-developed countries because of high birth rates and increased rural-to-urban migration. Of the 20 largest urban areas in the world in 2020, 15 were in semiperiphery or periphery countries.

WORLD'S LARGEST URBAN AREAS, 2020



Megacities in relatively poor countries face the same challenges as megacities in wealthy countries, but without as many resources to respond. Social problems between ethnic groups, joblessness, lack of infrastructure, inadequate housing, and environmental problems—such as Mexico City's severe air pollution—are common in all megacities.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the processes that initiate and drive urbanization and suburbanization?*

Processes That Influence Urbanization and Suburbanization	Effects of Those Processes

KEY TERMS

suburbanization
sprawl
leap-frog development
boomburbs
edge cities
counter-urbanization (deurbanization)
exurbs
reurbanization
megacities
metacities
megalopolis
conurbation

6.3

Cities and Globalization

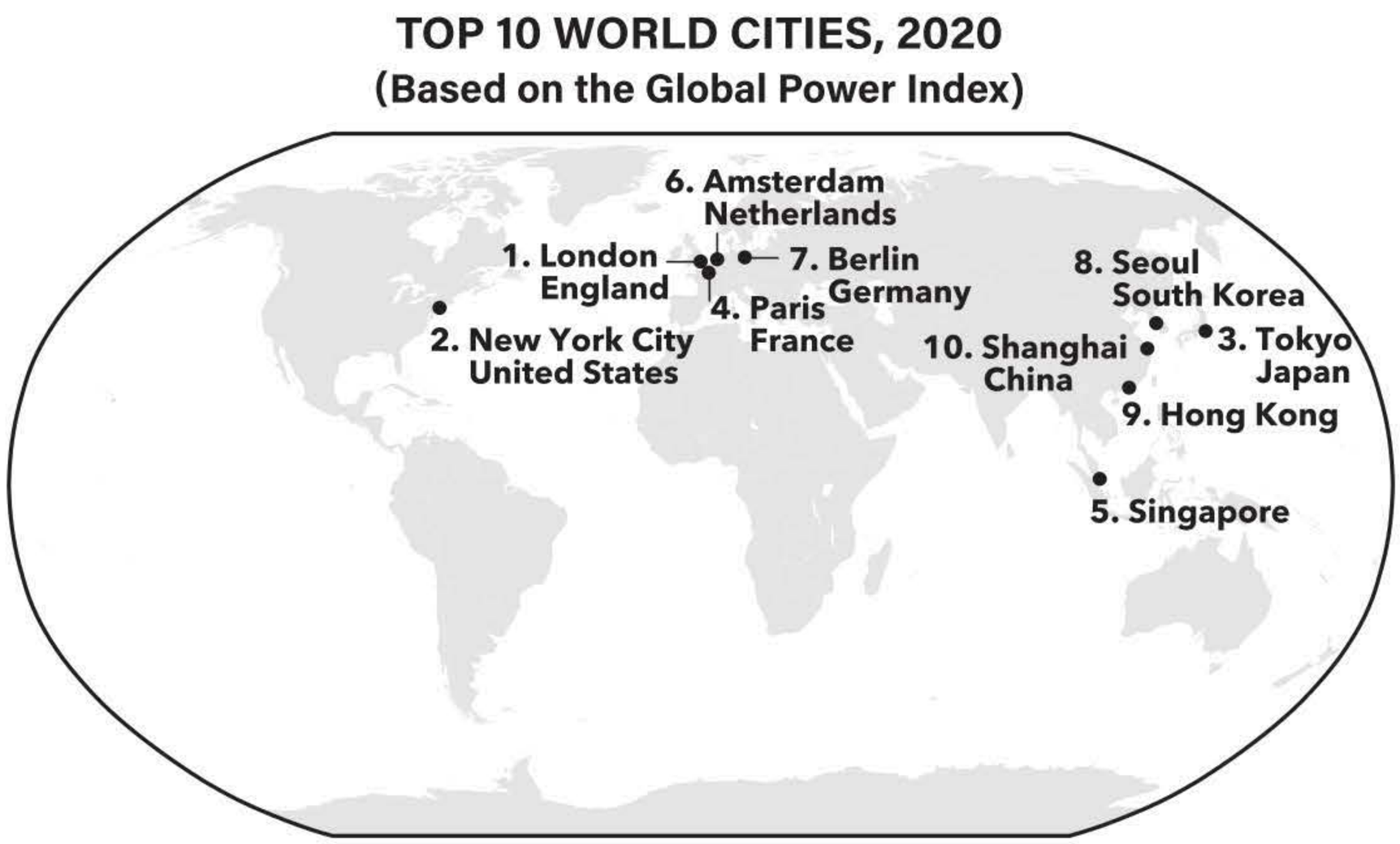
Essential Question: How do cities influence the processes of globalization?

Cities are becoming increasingly larger in population and physical size, as well as the economic engine of the global economy. The influence of cities is an important area of study for geographers. An analysis of the influence of urban systems is critical to understand the concepts of world cities and urban hierarchy.

World Cities

The world's largest cities are not always the most influential. Cities such as New York, London, Tokyo, and Paris are **world cities**, or **global cities**, that exert influence far beyond their national boundaries. All are currently media hubs and financial centers with influential stock exchanges, banks, and corporate headquarters. Many are the headquarters of international organizations. For example, New York is home to the United Nations. World cities are the control centers for the global economy where key decisions about products, manufacturing, banking, cultural trends, marketing and information originate.

Researchers rank a city's influence based on its financial power, innovation, academic resources, cultural influence, livability, connectivity, accessibility, and political influence. The top 10 world cities in 2020 according to the Global Power City Index are shown in the map below.



Source: Mori Memorial Foundation

The decisions made by leaders in world cities impact all people, even those in a rural areas or small towns. World cities are the most powerful of all urban centers and drive globalization. These influential cities are very interconnected via transportation and communication networks. Leaders of world cities typically wield political power on a national and international scale that rivals the power of leaders of entire countries.

Connectivity and Urban Hierarchy

Cities at all scales of geography do not function in isolation, rather they are a part of a larger urban system. Systems of cities have an **urban hierarchy,** or ranking, based on influence or population size. (See Topic 6.4.) For a city to be influential, it must have *connectivity*, or be connected to regional, national, and global networks. World cities operate on a global scale but also have connectivity to smaller cities within a country's urban system.

Nodal cities are command centers on a regional and occassionally national level. Cities like Denver, Phoenix, or Minneapolis are not as influential as world cities but possess significant power within a region of the country. These cities will have some corporate headquarters and numerous regional offices for transnational companies, while they also serve as major entertainment, cultural, and economic centers within their regions. In order to maintain global connectivity, these cities have developed road systems, large airports, and advanced communication networks that connect to smaller cities in their regions and to world cities, such as New York, Chicago, or Los Angeles.

Cities specializing in certain functions are another level of the urban hierarchy. Examples include Austin, Texas (government); Las Vegas, Nevada (entertainment); Elkhart, Indiana (manufacturing); and Norfolk, Virginia (military).

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How do cities influence the processes of globalization?*

Characteristics of Cities	Global Influence of Characteristic

KEY TERMS

world cities (global cities) urban hierarchy nodal cities

6.4

The Size and Distribution of Cities

Essential Question: What are the different urban concepts such as hierarchy, interdependence, relative size, and spacing that are useful for explaining the distribution, size, and interaction of cities?

Today, cities range in size from just a few thousand inhabitants to those that have populations of over 20 million, such as Karachi, Pakistan. Often a city exists in an **urban system**—an interdependent set of cities that interact on the regional, national, and global scale. Models have been developed to help explain the distribution, or location, and interaction of these urban systems.

Urban Hierarchy

Systems of cities have an *urban hierarchy* or ranking based on influence or population size. (See Topic 6.3.) On the global scale, world cities are at the top of the hierarchy regarding influence or power. Megacities and metacities are on the top of the urban hierarchy when considering population. On a national or regional scale, the concepts of rank-size rule and primate city are utilized to determine the hierarchy within a country's urban system.

Rank-Size Rule

The **rank-size rule** describes one way in which the sizes of cities within a region may develop. It states that the n^{th} largest city in any region will be 1/n the size of the largest city. That is, that the rank of a city within an urban system will predict the size of the city. For example, the third-largest city in a system that exhibits the rank-size distribution would be approximately one-third the size of the largest city.

Geographers consider rank-size distributions to be characteristic of well-developed regions or countries. Such distributions are also more common where federal governments typically share power with other levels of government. A rank-size distribution includes cities of all sizes in the system. This implies that there are cities with a wide variety of services available within the system, from very high-order services in the largest cities to lower-order services in the smaller cities. **Higher-order services** are usually expensive, need a large number of people to support, and are only occasionally utilized. Examples include major sports teams, large malls, luxury car dealerships, and large specialized research hospitals. **Lower-order services** are usually less expensive than higher-order services, require a small population to support, and are used on a daily or weekly basis. Examples include gas stations, local grocery stores, or small restaurants.

As a general rule, geographers consider rank-size distribution to be an indicator of an urban system that can efficiently provide needed services to its population. Countries that demonstrate the rank-size rule include the United States, Canada, Australia, and India. The model is not exact and applies better to some countries than others. Limitations of the model are that it does not explain the distribution of cities nor does it take into account the distance or interactions between cities. Problems can arise when comparing city systems in multiple countries because places define cities differently. In general, the model works better when using metropolitan area population.

Primate Cities

If the largest city in an urban system is more than twice as large as the next largest city, the largest city is said to have primacy, or be a **primate city**. A primate city is more developed than other cities in the system, and consequently, disproportionately more powerful. Primate cities are the social, political, and economic hub for the system and offer a wider range of services than do the many smaller cities. In primate city urban systems, medium sized cities are often not present. In addition, countries that follow a unitary form of government, or extremely strong central government, often follow a primate city model.

The United Kingdom exhibits urban primacy. London is by far the largest city in the country. However, the relatively small size of the country, its unitary government, and its well-developed transportation infrastructure, all reduce the need for a number of medium-sized cities. In the United Kingdom, people can get to London for higher-order services relatively easily. Northern Scotland is less than a two-hour flight from London.

Mexico illustrates a different model for a country with a primate city. Mexico City provides many services that are not as easily available to portions of the population. Across large portions of northern Mexico, people would have to travel great distances to receive even mid-level services due to the lack of medium-sized cities. Because of Mexico City's primacy, people often migrate to the city in search of economic opportunity and greater services.

TWO PRIMATE CITIES: LONDON AND MEXICO CITY

Trait	United Kingdom	Mexico
Largest urban area: Population	London: 14.0 million	Mexico City: 21.2 million
Second largest urban area: Population	Manchester: 2.6 million	Guadalajara: 4.3 million
Distance from primate city to farthest edge of country	675 miles	1,750 miles
Transportation network (buses, trains, planes)	Excellent	Poor
Population density	660 people/sq. mi.	148 people/sq. mi.

Both the UK and Mexico have primate cities. What evidence in the chart indicates the existence of a primate city? What influence does Mexico's transportation network have on people's ability to acquire services?

Gravity Model Interactions

The **gravity model** states that larger and closer places will have more interactions than places that are smaller and farther from each other. This model can be used to predict the flow of workers, shoppers, vacationers, migrants, information, mail, products, economic activity, and nearly any other flow between cities. The model holds that there are more numerous flows to bigger cities and between nearer cities. Assumptions of this model include locations with no barriers, which is also considered a limitation. Other limitations with the model include not accounting for how political (borders), physical (walls or rivers), or cultural (language) barriers influence the interactions between cities.

Interactions between cities are complicated by factors beyond size and distance. Cities such as Orlando, Florida, and Las Vegas, Nevada, are tourist destinations that attract far more visitors than their size and their distance from other cities alone could predict. Similarly, religious sites such as Jerusalem and Mecca, government centers such as Washington, DC, and various cultural destinations distort effects predicted by the gravity model. However, the basic theory applies to most places.

Central Place Theory

In 1933, Walter Christaller, a German geographer, proposed the **central place theory** to explain the distribution of cities of different sizes across a region. The model used consumer behavior related to purchasing goods and services to explain the distribution of settlements. Christaller defined a **central place** as a location where people go to receive goods and services. It might be a tiny community, such as a hamlet, with only lower-order services, such as a convenience store, post office, and religious center. Or it might be a slightly larger village, town, or small city with more stores and services. Or the central place might be a major city, where one can get lower- and higher-order services, such as direct air flights to other major cities or watch a touring Broadway musical. In Christaller's model, each size of settlement would be evenly distributed across space.

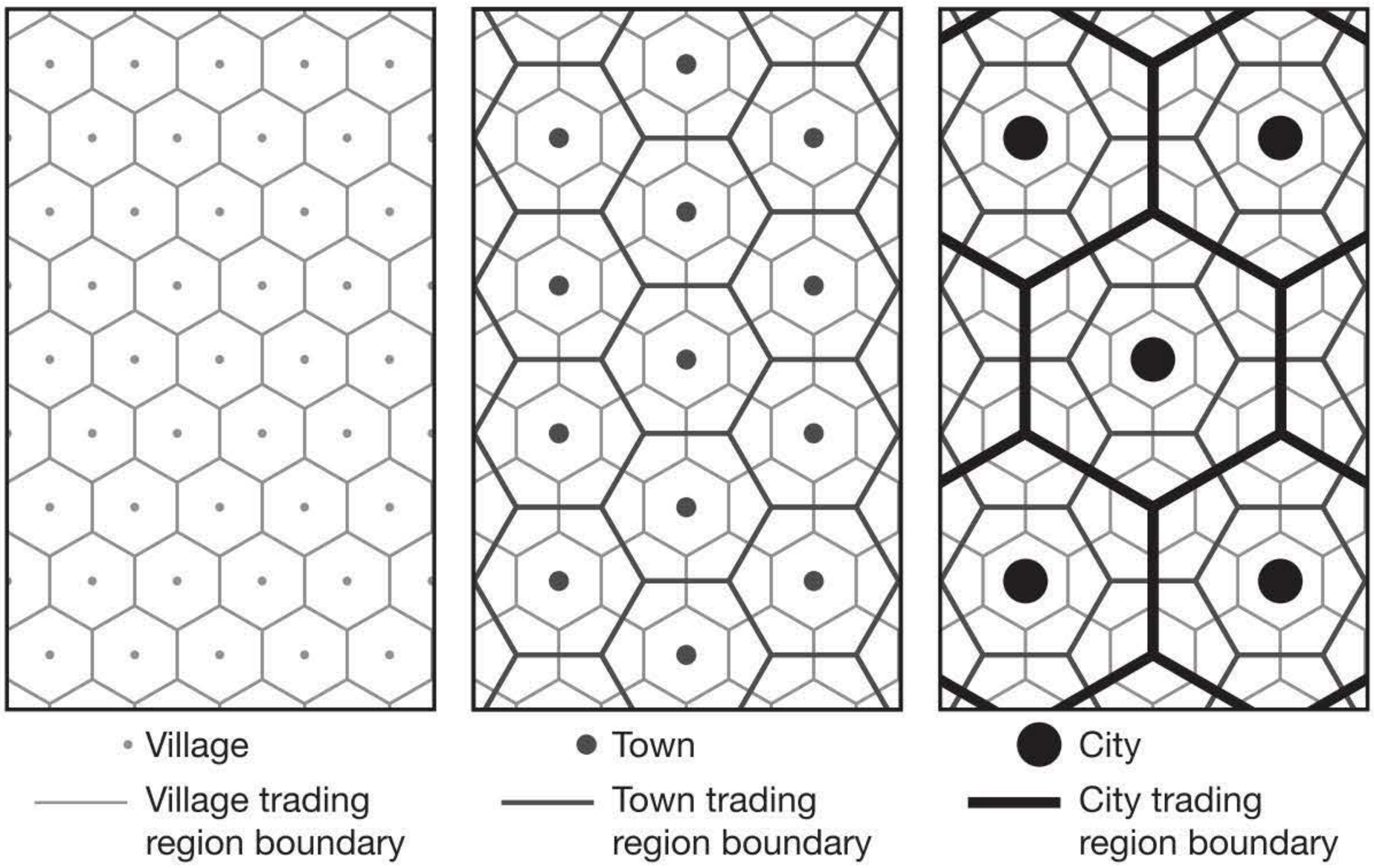
The model accurately concludes that larger cities will be farther spaced from each other than smaller town or villages. This conclusion is evident across multiple locations but particularly when viewing the distribution of cities in the eastern United States. (See North America at night map, page 5.) Large cities like Chicago and Atlanta have a series of medium cities between them that are roughly the same distance from each other.

The Shape of Market Areas

A **market area**, or zone that contains people who will purchase goods or services, surrounds each central place. Higher-order services have larger market areas than lower-order services. Christaller chose to depict these market areas as **hexagonal hinterlands** because this shape was a compromise between a square—in which people living in the corners would be farther from

the central place—and a circle—in which there would be overlapping areas of service. Nesting hexagons allowed for central places of different sizes to distribute themselves in a clean pattern across the region.

CHRISTALLER'S CENTRAL PLACE THEORY



Threshold and Range

What determines which services will be available in any central place? How far apart should central areas of the same population size be located? Central place theory uses the concepts of threshold and range to answer these questions.

The size of population necessary for any particular service to exist and remain profitable is the **threshold**. Services with a very low threshold, such as a convenience store or a gas station, are present even in very small central places. Restaurants, hospitals, high schools, and department stores have higher thresholds, so they require a larger population within the market area to survive economically. Only in the largest market areas can services appear that depend on the support of huge populations—stock market exchanges, major sports teams, symphony orchestras, and elite research centers. As cities grow in size, the number and variety of available services increase with the population.

The distance people will travel to obtain specific goods or services is **range**. People will travel very far for higher-order services such as wedding rings and heart transplants, but they are less likely to travel very far for basic services such as fast food or toothpaste. This helps explain why fast-food restaurants can be found in nearly any town but a shop dealing in diamond jewelry would be found only in larger cities.

Limitation of Central Place Theory

A limitation of the model is that it assumes a flat, featureless plain. It does not take into account the effects of natural landscapes of rivers, mountains, or other barriers on the distribution of cities. Nor does it consider the influence of transportation systems (rail, road, water, and air) and how the availability of those types of transportation can expand the market area.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the different urban concepts such as hierarchy, interdependence, relative size, and spacing that are useful for explaining the distribution, size, and interaction of cities?*

Urban Concepts	Application of Concepts for Cities

KEY TERMS

urban system
rank-size rule
higher-order services
lower-order services
primate city
gravity model
central place theory
central place
market area
hexagonal hinterlands
threshold
range

GEOGRAPHIC PERSPECTIVES: *URBAN LIFE IN 2040*

A century ago, approximately 10 percent of the world's population lived in cities. By 2008, the world passed a milestone: more than half the populace was urban. While urbanization and suburbanization continue to expand in more-developed countries (North America and Europe), the pace remains slow and steady.

American Cities

In the United States, as millennials have started families, they have relocated out of central cities into enclaves inspired by new urbanist designs. These "urban burbs" offer walkable streets, local markets, public transit, and less-expensive accommodations than central business districts (CBDs). In the future, self-driving cars and other new technology could reduce the friction of distance. If so, edge cities and exurbs will likely expand.

Experts predict that immigration will likely continue, making the population more diverse. Voluntary segregation will likely continue, and the number of ethnic neighborhoods will flourish.

Megacities in Asia and Africa

The megacities of the less-developed countries of Asia and Africa will likely get even larger. The economic, social, and educational opportunities these cities offer will continue to pull in migration from rural areas. However, if growth exceeds carrying capacity, the standard of living will deteriorate. In addition, the increasingly dense concentration of people will increase the impacts of deadly epidemics, natural disasters, environmental changes, immense pollution, criminal networks, terrorist activity, and civil unrest.

These megacities are already home to more than one-billion squatters, and many people breathe unhealthy air and lack access to safe drinking water. Without dramatic economic and political changes, these problems seem likely to worsen. However, efforts to address these problems have had some success, which suggests that megacities may become more livable in the future.

1. Describe TWO ways that you think U.S. cities will change over the next 20 years.
2. Describe TWO challenges that megacities in Asia and Africa could face in the future.

THINK AS A GEOGRAPHER: *COMPARING METROPOLITAN REGIONS*

Comparing similar places, regions, or trends is one way to highlight significant elements in phenomena. For example, comparing the size of the largest cities on Earth suggests patterns in urban developments. Over the past 12,000 years, the size of the largest cities in the world has generally increased. The first cities to reach a population of 100,000 were probably in Iraq around 2000 B.C.E. By the beginning of the Common Era, several cities were approaching or had passed 1 million residents. Sometime in the late 1800s, London probably exceeded 5 million residents. Today, more than 30 urban areas, which include several neighboring cities, have more than 10 million residents.

POPULATION OF WORLD'S LARGEST URBAN AREAS, 2020

City	Entire Urban Area	Main City Only
Tokyo, Japan	37 million	9 million
New Delhi, India	29 million	11 million
Shanghai, China	26 million	18 million
Mexico City, Mexico	22 million	9 million
Sao Paulo, Brazil	22 million	12 million
Mumbai, India	21 million	12 million
Osaka, Japan	20 million	9 million
Beijing, China	20 million	12 million
New York, United States	20 million	8 million
Cairo, Egypt	18 million	7 million

1. Based on the data for these ten urban areas, which region of the world has the most megacities?
2. Seven of the ten largest urban areas are in periphery and semiperiphery countries. Explain two factors that contributed to the growth of megacities in these countries.
3. Estimate the typical ratio between the relationship in size between the entire urban areas and the main cities alone. What factors of political or physical geography might explain the variations in ratios?

CHAPTER 15 REVIEW:
Origin, Distribution, and Systems of Cities

Topics 6.1–6.4

MULTIPLE-CHOICE QUESTIONS

Question 1 refers to the following chart.

BORCHERT'S MODEL OF URBAN GROWTH		
Epoch	**Time Period**	**Conditions and effects**
Sail-Wagon	1790–1830	▪ Water ports became very important. ▪ Poor road conditions made long-distance travel between cities difficult.
Iron Horse	1830–1870	▪ Steam engines powered boats, which promoted the growth of river cities. ▪ Regional rail networks connected cities. ▪ Rail lines connected resources and industrial sites.
Steel Rail	1870–1920	▪ Transcontinental rail emerged. ▪ Cities emerged along rail lines in the interior of continents.
Auto-Air-Amenity	1920–1970	▪ Automobiles allowed great expansion of city size. ▪ Airport hubs expanded. ▪ Cities became far more interconnected.

1. Which generalization does the chart above support?

(A) Each new form of transportation technology slowed urban growth by leading to suburbanization, reurbanization, and exurbanization.

(B) Some new forms of transportation technology slowed urban growth in peripheral countries and other factors slowed it down.

(C) Each new form of transportation technology spurred urban growth by allowing more people to live and work in the central city.

(D) Each new form of transportation technology spurred urban growth by producing a new system for moving people and goods.

(E) Some new forms of transportation technology spurred urban growth and other factors slowed it down.

2. The term "percent urban" means the

(A) population of people living in a city

(B) ratio of people living in cities compared to rural areas

(C) percent of people who work in cities

(D) amount of land devoted to buildings versus green areas

(E) number of cities in a given area

3. Singapore is an example of a modern city-state because it

(A) is a city and surrounding territory with its own independent government

(B) has survived for centuries in an important trading center

(C) has historical connections to the Italian city-states of the Renaissance

(D) is located entirely within the boundaries of the independent nation of Malaysia

(E) is a self-governing city that has never fully gained independence from the British

4. Which statement most accurately describes the urban hearths where the first city-states developed?

(A) Any urban center and its surrounding territory and fertile agricultural lands.

(B) A location that was a service center, producing tools, dwellings, and weapons.

(C) A river valley where floods and fertile soil aided production of an agricultural surplus.

(D) A location where a city-state has endured to the present, such as Monaco and Vatican City.

(E) A city-state in the Tigris-Euphrates Valley, Mesoamerica, or the Andes of South America.

5. Which term most accurately describes a city with a population of approximately 60,500 in 2016 that was strongly integrated with its adjacent counties, socially and economically?

(A) Metropolitan area

(B) Metropolitan statistical area

(C) Micropolitan statistical area

(D) Primate city

(E) Suburban area

Question 6 refers to the following chart.

LARGEST CITIES IN OHIO		
City	**Population**	**Population (rounded)**
Columbus	787,033	800,000
Cleveland	396,815	400,000
Cincinnati	296,943	300,000
Toledo	287,208	300,000
Akron	199,110	200,000
Dayton	141,527	150,000
Parma	81,601	100,000
Canton	73,007	100,000

6. Which concept is most clearly demonstrated by the population information shown in the chart?

(A) Primate city

(B) Rank-size rule

(C) Central place theory

(D) Forward thrust capital

(E) Unitary state

7. Which feature would most distort the predictions of the gravity model of flow and interaction among urban areas?

(A) St. Peter's Cathedral in New York City

(B) The Mississippi River shore in St. Louis, Missouri

(C) Lake Michigan in Chicago, Illinois

(D) Raleigh, the capital city of North Carolina

(E) Disney World in Orlando, Florida

FREE-RESPONSE QUESTION

1. The geography of urban areas around the world is rapidly changing. Megacities and world cities are a way of clarifying different types of cities today.

LARGEST METACITIES IN THE WORLD, 2018	
City	**Population**
Tokyo, Japan	37 million
New Delhi, India	29 million
Shanghai, China	26 million
Mexico City, Mexico	22 million
Sao Paulo, Brazil	22 million

TOP 5 WORLD CITIES, 2018
London, United Kingdom
New York City, United States
Tokyo, Japan
Paris, France
Singapore

(A) Define a metacity.

(B) Explain the concept of world city using either economic or political characteristics.

(C) Using the tables, compare the distribution of metacities to world cities.

(D) Choose ONE of the world cities from the table and explain an economic reason why the city has become such a powerful city.

(E) Choose ONE of the metacities from the table and explain either an environmental or social problem it faces.

(F) Explain ONE political or social reason why suburbanization has occurred so prevalently in United States cities since the 1950s.

(G) Describe the role that transportation has played in the suburbanization of United States cities since the 1950s.

CHAPTER 16

Urban Structure

Topics 6.5–6.7

Topic 6.5 The Internal Structure of Cities

Learning Objective: Explain the internal structure of cities using various models and theories. (PSO-6.D)

Topic 6.6 Density and Land Use

Learning Objective: Explain how low-, medium-, and high-density housing characteristics represent different patterns of residential land use. (IMP-6.A)

Topic 6.7 Infrastructure

Learning Objective: Explain how a city's infrastructure relates to local politics, society, and the environment. (IMP-6.B)

Like a piece of architecture, the city is a construction in space, but one of vast scale.

—Kevin Lynch, *The Image of the City,* 1960

Peripheral areas of cities in southeastern Brazil exhibit many of the visible landscape elements typical of favelas—steep slope, dense population, and poor construction. (See Topic 6.5 for more on the structure of cities around the world.)

6.5

The Internal Structure of Cities

Essential Question: How do various models and theories explain the internal structure of cities?

Cities are enormously complex and important centers for much of the world's population. Since cities first emerged in human civilization, they have been centers of economic, political, and cultural power. They have been places of innovation. Cities are growing faster today than ever before in history and that trend is projected to continue.

Urban Models

Like most other models used by geographers, urban models are based on observations of real places. Though models vary, all models share certain functions:

- classifying and categorizing land use in urban areas
- describing how various urban land uses are segregated spatially
- offering explanations for the location of different urban land uses

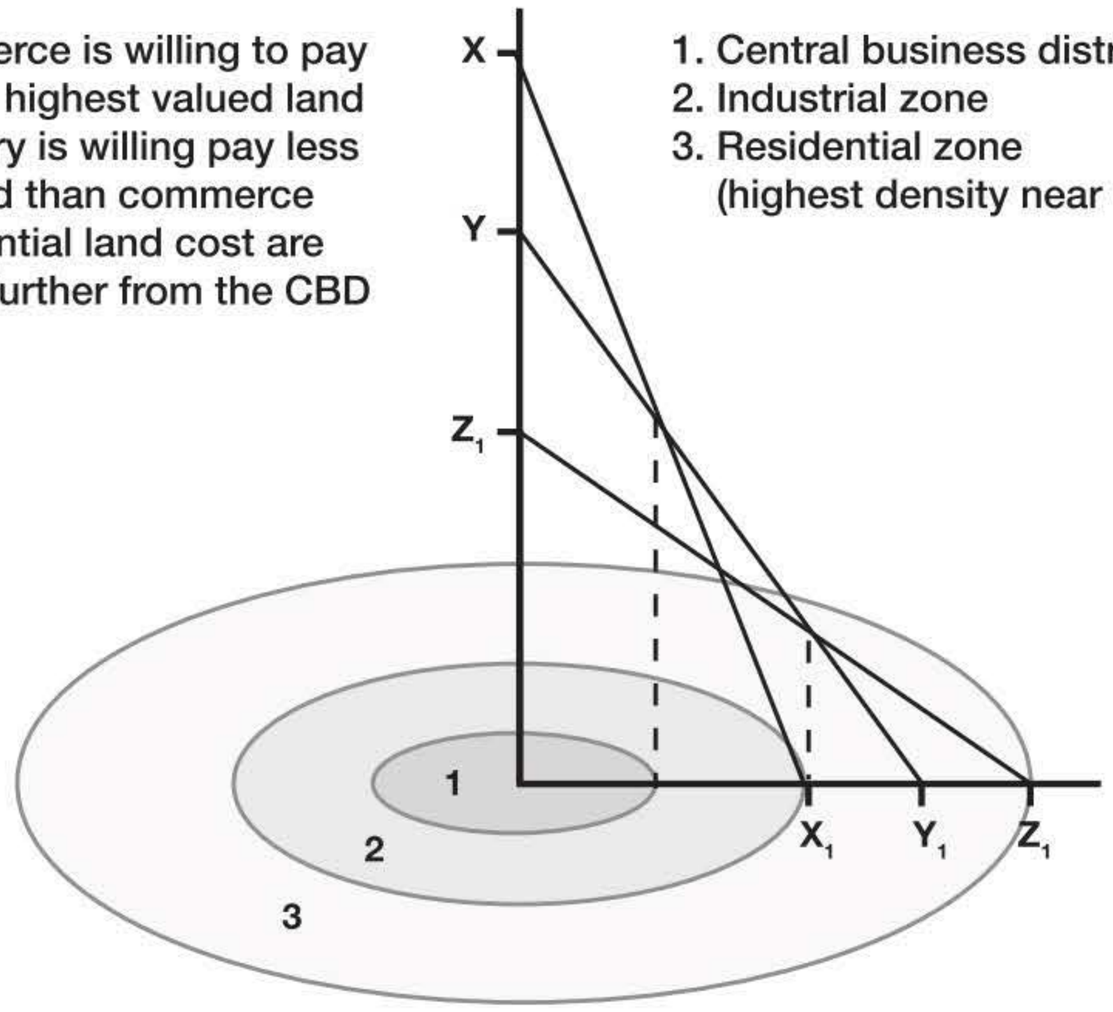
Urban Zones

One principle underlying all urban models is **functional zonation**, the idea that portions of an urban area—regions, or zones, within the city—have specific and distinct purposes. The various zones fit together like a puzzle to create the entirety of the city. However, unlike a puzzle, the pieces of a city are not clearly delineated, and geographers have tried to identify and classify them with models. The resulting urban models provide geographers with a framework to describe, understand, and analyze cities. Urban areas around the world share three basic zones: the central business district, industrial/commercial, and residential.

Central Business District A vital part of any urban model is the **central business district (CBD)**, which is the commercial heart of a city. Often located near the physical center of a city, or the crossroads where the city was founded, the CBD is the focus of transportation and services. The **bid-rent theory** explains agricultural land use, just as it helps explain land use in central business districts. This theory explains that land in the center of a city will have higher value than land farther away from the city's center. Therefore, land use will be more intense and costs will be higher closer to the CBD. This means high-order services often dominate the CBD.

BID-RENT THEORY FOR CENTRAL BUSINESS DISTRICTS

X-X_1: Commerce is willing to pay for the highest valued land
Y-Y_1: Industry is willing pay less for land than commerce
Z-Z_1: Residential land cost are lower further from the CBD



1. Central business district
2. Industrial zone
3. Residential zone (highest density near center)

Competition for valuable space in the CBD gives it certain characteristics:

- In some countries, including the United States and Canada, the CBD has skyscrapers and "underground cities" that might include facilities for parking, shopping, and rapid transit.
- In Europe, many CBDs are located in the historic heart of the city where buildings are shorter but services are still concentrated.
- Because the cost of land is high in CBDs, manufacturing activities are rarely located there.
- High costs and limited space often result in residential portions of CBDs having high-density housing, such as high-rise apartment buildings.

The cultural landscape Chicago's CBD is characterized by high rise office buildings, with few examples of residential life—single-family homes, parks, grocery stores, or schools.

Industrial/Commercial Zone The zone outside the central business district is dedicated to industry. These industrial zones may include manufacturing, warehousing, and transportation. Industrial zones are generally separated from residential areas because they are associated with air and noise pollution.

Commercial areas with lower-order services and less-intensive land use are also found outside the CBD. Law firms might locate in the CBD, but department stores usually prefer commercial shopping zone with land values.

Several factors influence the choice of locations for businesses within the commercial zone. First, the land is zoned for commercial use so they are legally allowed there. Second, some industries have a **commensal relationship**, which is when commercial interests benefit each other. For example, restaurants and theaters benefit by being in the same zone, as do clothing stores and shoe stores.

Residential Zone All cities have **residential zones,** areas where people live. These are generally separate from the CBD and industrial zones either legally—through government zoning—or simply by the choices of inhabitants.

The different residential zones are distinct from one another. They may be segregated by density, income level, ethnic group, religion and culture, social status, or other characteristics. Which characteristic distinguishes the residential zones depends on the world region where the city is located.

Models of North American Cities

Three models describe typical urban areas in North America—the concentric zone model, sector model, and multiple-nuclei model. These "classic models" were based on the city of Chicago. It was a good place to examine urban structure without the complications caused by irregular topography.

Concentric Zones

The **concentric zone model** describes a city as a series of rings that surrounds a central business district. It is known as the Burgess model because sociologist E. W. Burgess proposed it in the 1920s. The first ring surrounding the CBD is a transition zone that mixes industrial uses with low-cost housing. Manufacturing benefits from proximity to the city-center workers and affordable land. Housing in this zone is often high-density, consisting of older, subdivided homes.

The next three rings are residential. Moving outward, one is for working-class housing, then one of more expensive housing, and finally, one of larger homes on the edge of the city and in the suburbs. With greater distance from the CBD, land is more plentiful and affordable, so residences are larger and of higher quality, and population densities decrease.

Sectors

In the 1930s, economist Homer Hoyt developed the **sector model,** also called **Hoyt's model**. While Burgess used land-use rings that grew outward from the CBD, Hoyt described how different types of land use and housing were all located near the CBD early in a city's history. Each grew outward as the city expanded, creating wedges, or sectors of land use, rather than rings.

Hoyt's model describes sectors of land use for low-, medium-, and high-income housing. The model locates the sectors for the low-income, lower-quality housing next to these industrial and transportation zones, and it places high-income residences extending in a wedge away from these zones

along wide tree-lined boulevards or on higher ground. The model also notes a sector for transportation extending from the city's center to the edge. This sector would contain rail, canal, and other transport networks within it. The transportation sector would also favor an adjacent zone of manufacturing.

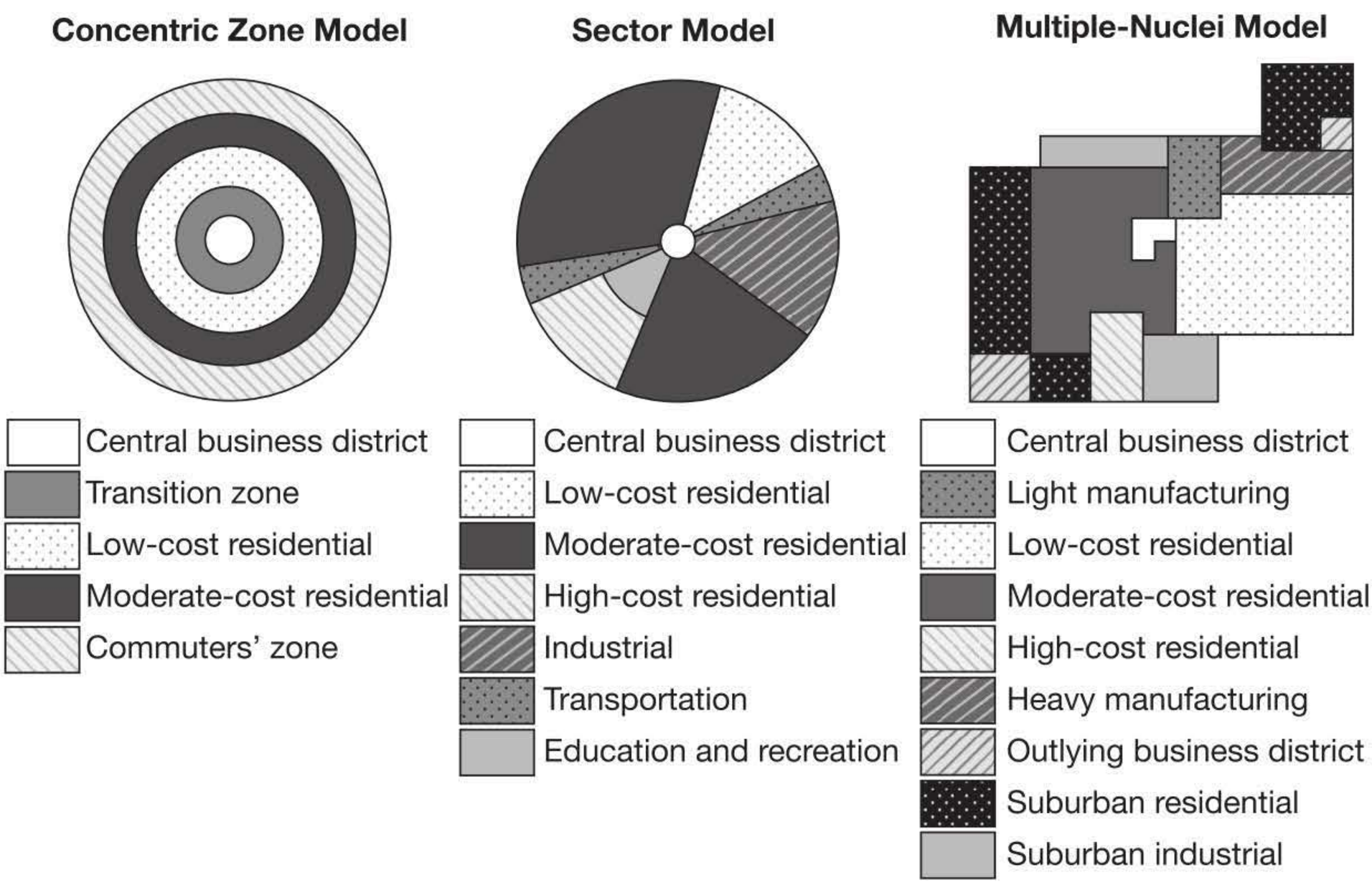
Multiple Nuclei

Geographers Chauncy Harris and Edward Ullman developed the **Harris and Ullman multiple-nuclei model** by studying changes in cities in the 1940s. This model suggested that functional zonation occurred around multiple centers, or nodes. The characteristics of each node either attracted or repelled certain types of activities. The result was a city that consisted of a patchwork of land uses, each with its own center, or nucleus.

In the multiple-nuclei model, the CBD and related functions continued to exist but were joined by smaller business districts that emerged in the suburbs. A zone of industry could be in a variety of locations, including the traditional CBD or port, or it could move to new outlying locations near an airport or other transportation junction. This industrial zone would attract related industries and an area of higher density housing. A university or a business park might attract nearby restaurants, theaters, and other amenities. As a result, people might create a district of student housing or high-quality homes nearby.

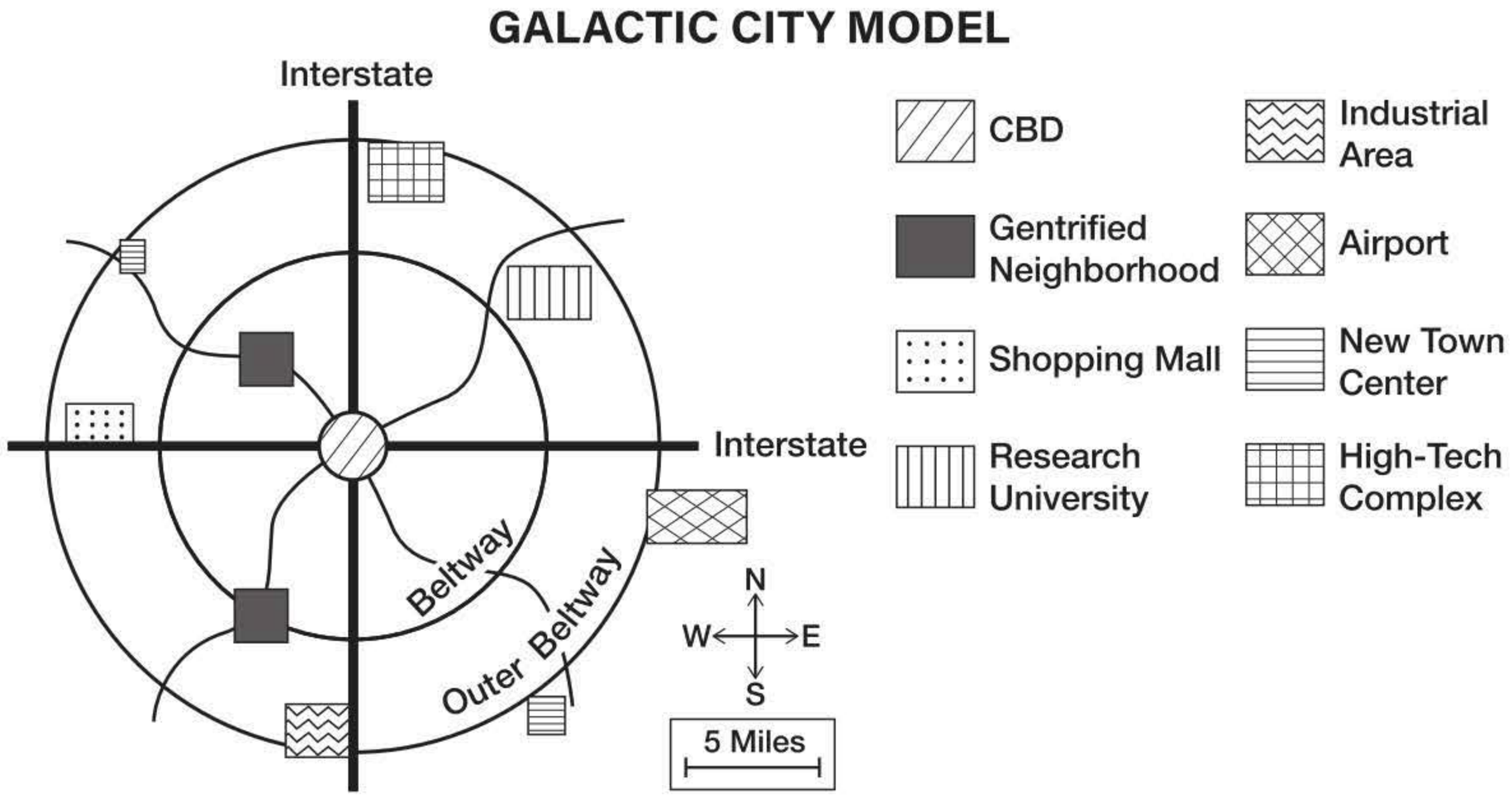
The **peripheral model**, a variant of the multiple-nuclei model, describes suburban neighborhoods surrounding an inner city and served by nodes of commercial activity along a ring road or beltway. This model's name derives from the role of the service nodes with the related suburbs that develop on the periphery of the original city.

URBAN LAND-USE MODELS



Galactic Cities

Beginning in the 1950s, suburban growth in the United States skyrocketed as governments built highways that improved transportation in and out of cities and subsidized home purchase. Based on this process in Detroit, Chauncy Harris developed the **galactic city model.** In it, an original CBD became surrounded by a system of smaller nodes that mimicked its function. As suburbs grew, they took on some CBD functions. At key locations along transportation routes, people created mini-downtowns of hotels, malls, restaurants, and office complexes. Some of these nodes grew large enough to become **edge cities** (see Topic 6.2.), but they left behind a declining inner city.



The image above illustratates the geographic distribution of zones in a galactic city.

World-Regional Models

Geographers have also developed models to describe cities outside of North America. Rings, sectors, and multiple-nuclei are found in these models, along with some additional elements. But the models share the same basic characteristic of North American models, that of functional zonation.

European Cities

Many of today's cities in Europe grew out of medieval and pre-industrial cities. City walls, which were built for protection before the wide use of gunpowder weapons, restrained growth. These cities grew slowly and with little planning for centuries. The result is now a dense mix of commercial and residential land use with narrow, winding streets. Distinct land-use zones are difficult to find in the core areas of these cities. Later urban renovations cut through areas to produce elegant, wide boulevards with high-quality housing and shops.

CBDs in Europe differ in important ways from those in North America. Attempting to preserve their historic urban cores, city leaders have limited new construction and restricted the height of buildings. Often, former palace grounds have become large urban parks. European CBDs also have many more

Source: Getty Images

Aerial view of Paris with Eiffel Tower and skyscrapers of La Defense. Paris is a planned city with the historical districts in the center of the city. The newer skyscraper business district is outside the city center.

residents living in relatively low-rise apartment buildings. As a result of the larger population living downtown, commercial uses go beyond those in North America and include many more small businesses such as vegetable markets, bakeries, and butcher shops. The result supports a very walkable lifestyle.

Also in contrast to North America, European suburbs are likely to have a higher percentage of tall buildings. Most are apartment buildings, so population densities are higher in the suburbs of Europe compared to North America. International immigration creates ethnic diversity in the suburbs, and this diversity often reflects the colonial heritage of the country. For example, suburban London includes a large number of South Asians and their descendants, and suburban Paris includes people of North African heritage.

Middle Eastern and Islamic Cities

The spread of Islam shaped many cities in the Middle East, North Africa, and parts of Spain, East Africa, and Southeast Asia. Dominating these cities is a central mosque that includes one or more tall and highly visible minarets, or tall slender towers. The principal **mosque** in the center of an Islamic city is usually surrounded by a complex of structures to serve the public, such as schools and soup kitchens. As cities grew, additional mosques were added in outlying neighborhoods.

Many Islamic cities were built with a defensive **citadel**, a fort designed to protect the city, with its related palace and barracks for soldiers. Walls with gates and towers were typical in earlier times and they, or their remnants, still survive in many modern Islamic cities. Major roads connect the gates of the citadel to the city center. Along these roads are traditional outdoor markets or covered bazaars, called **suqs**. These markets often exhibit spatial differentiation with shops selling luxury items near the center of the city, with bulkier, less-valuable materials for sale near the wall and gates.

Explain the similarities and differences between the market in the photo and a local grocery store or convenience store.

Residential neighborhoods often reflect differences in ethnicity or branch of Islam in their organization and architecture:

- Streets and alleys are usually twisting and often dead-end.
- Homes have central courtyards rather than yards in front or back.
- Windows are small and located above eye level.

The above features create shady areas, which suggests they might be cultural adaptations to the sun and heat of the Middle East. These features also imply that privacy is an important value within Islam.

Latin American Cities

The **Griffin-Ford model** is often used to describe Latin American cities. It places a two-part CBD at the center of the city—a traditional market center adjacent to a modern high-rise center. The most desirable housing in the city is located there, next to the developed center of the city. This high-quality housing extends outward from the urban core, accompanied by a **commercial spine** of development. Theaters, restaurants, parks, and other amenities are also located along this spine, or corridor. The spine ends in a growing secondary center, also called a **mall**.

In contrast to the concentric zone model in North America, as distance increases from the center of Latin American cities, the quality of housing decreases. Public transportation, the urban water supply, and access to electricity all decrease farther away from the center, sometimes disappearing altogether. Often, Latin American cities have a zone of *in situ accretion* that acts as a transitional area between the older areas of the central city and the peripheral outer ring. The outer ring of the city, the **periférico,** shows poverty, lack of infrastructure, and areas of poorly built housing known as **shantytowns**. Often, the residents of shantytowns are recent migrants to the city. The model notes the possible presence of an industrial node closer to the commercial spine.

Many Latin American cities include **favelas**, or **barrios**, which are neighborhoods marked by extreme poverty, homelessness, and lawlessness. Most favelas are in **disamenity zones**, areas not connected to city services and under the control of criminals. They are often in physically unsafe locations, such as on steep, unstable mountain slopes. Structures are poorly constructed, often by the residents themselves, and densely packed together.

African Cities

Large cities were rare in most of Africa until the 19th century, when Europeans colonized the continent. But in recent decades, urban areas in Africa have grown rapidly. New cities have been built next to or on top of existing ones. These new cities can include several identifiable regions:

- The **traditional CBD**, which existed before European colonization, has small shops clustered along narrow, twisting streets. It includes the formal economy—permanent stores with full-time jobs that comply with local regulations and have set wages.

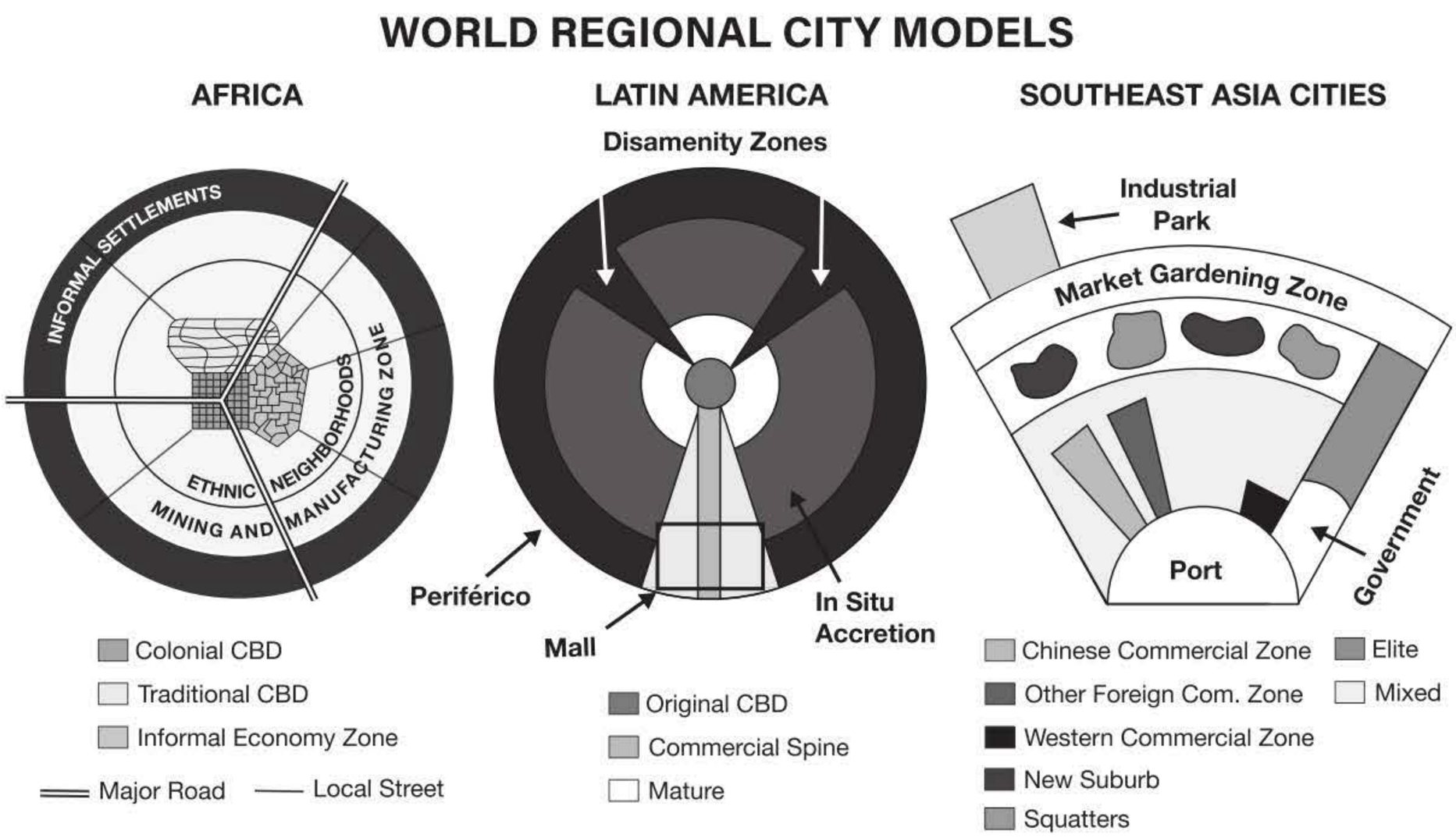
- The **colonial CBD** has broad, straight avenues and large homes, parks, and administrative centers.
- The **informal economy zone** thrives with curbside, car-side, and stall-based businesses that often hire people temporarily and do not follow all regulations. This zone also includes **periodic markets**, where small-scale merchants congregate weekly or yearly to sell their goods.
- A zone of mining and manufacturing is often found in cities.
- Residential zones are often based on ethnicity. These mirror the multi-ethnic makeup of African countries.

The periphery of cities often consists of densely populated **informal settlements**, called **squatter settlements.** They often lack sufficient public services for electricity, water, and sewage. Similar to Latin American favelas, they face problems with drugs, crime, and disease. One of the largest squatter settlements in the world is Kibera, on the western edge of Nairobi, Kenya.

Southeast Asian Cities

The **McGee model** describes the land use of many large cities in Southeast Asia, where the focus of the modern city is often a former colonial port zone. This export-oriented zone shares commercial uses similar to the CBD in North American cities. Additionally, these cities might include a government zone. If the city is a national or regional capital, it might have a commercial zone dominated by foreign merchants and ambassadors. A belt of market gardening often surrounds and supplies these cities.

Cities in Southeast Asia have a history of Chinese immigration and commercial interest that dates back a few centuries. As a result of this immigration, many cities include a secondary commercial zone dominated by Chinese businesses. As the importance of industry in Southeast Asia has risen in the last few decades, industrial parks and regions of manufacturing have emerged on the peripheries of some cities.



REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How do various models and theories explain the internal structure of cities?*

Model or Theory	City Structure Within Model

KEY TERMS

functional zones
central business district (CBD)
bid-rent theory
commensal relationshhip
residential zones
concentric zone model
sector model (Hoyt's model)
Harris and Ullman multiple-nuclei model
peripheral model
galactic city model
edge cities
mosque
citadel
suqs
Griffin-Ford model
commercial spine
mall
periférico
shantytowns
favelas (barrios)
disamenity zones
traditional CBD
colonial CBD
informal economy zone
periodic markets
informal settlements
squatter settlements
McGee model

6.6

Density and Land Use

Essential Question: How do low-, medium-, and high-density housing characteristics represent different patterns of residential land use?

Residential zones have different population and building densities. These differences can reflect the city's culture, landscape and lifestyle preferences, and social divisions.

Local Regulations on Land Use

Sometimes individuals or groups have conflicts over how to use land in a city. For example, most homeowners want a place that is quiet at night so they can sleep. However, a factory owner might want to continue production, which can be noisy, around the clock. To balance competing desires, cities and counties use **zoning ordinances**, regulations that define how property in specific geographic regions may be used. Local governments use three general zoning categories:

- residential, where people live
- commercial, where people and businesses sell goods and services
- industrial, where businesses make things

Governments use zoning ordinances as a tool of **urban planning**, a process of promoting growth and controlling change in land use. Zoning laws can result in very clear land-use segregation. However, not all cities have zoning ordinances, and most include undeveloped areas yet to be zoned.

Residential Zones

Those areas of a city devoted to where people live rather than to commercial or industrial functions are **residential zones**. Ordinances set limits on the density and size of houses within specific zones. For this reason, some residential neighborhoods contain only large homes and lots, while others are composed of small homes and lots, and still others contain apartment buildings.

Zoning can create various types of neighborhoods that appeal to people with various housing needs and lifestyles. However, it can also be used to prevent socioeconomic diversity or ethnic diversity in a neighborhood.

In North America, residential areas surrounding the CBD are known as the **inner city**. Apartment buildings and townhomes dominate the residential zone, which has the highest population density of the zones. As one moves farther from the inner city, population and housing-unit density declines, and types of housing change. This variation is known as the **residential density gradient**.

Suburbs are often characterized by single-family detached houses. More than half of all Americans now live in suburbs. Many suburbs are noticeably homogenous in terms of housing size and style. However, in recent years, homeowners have been tearing down existing homes and building new ones that are much larger. These new homes, known as McMansions, do not always conform to the style of other homes in the neighborhood.

Source: David Palmer

When homes age or people of higher income move into a neighborhood, older homes may be torn down and replaced. What are the advantages and disadvantages of this process?

Cycles of Residential Zones

Neighborhoods undergo transformations over time as existing residents move out and new ones move in. Through a process known as **filtering**, houses pass from one social group to another. This usually occurs when people with less wealth move into the houses after wealthier residents move. This creates a ripple effect down the social scale. The filtering process might include changing the use of a house. For example, a home built for a single family might be subdivided for use by two or more families or replaced with apartments.

Filtering is most noticeable when an ethnic enclave neighborhood changes to another group. The term **invasion and succession** refers to the process by which one social or ethnic group gradually replaces another through filtering. An important result of filtering is a changing landscape through the process of sequent occupancy. (See Topic 3.2.)

The rise of *gated communities* (see Topic 6.10) is another example of change in suburbs and occasionally in cities. These neighborhoods are planned to control access and promote aesthetics within the community. They are fenced, or walled, with a limited number of streets going in and out. Security guards and cameras are sometimes found at the entrances. The landscaping, housing styles, and other visual elements of the community are strictly regulated.

Many communities today use **urban infill** in suburbs as one way to reduce urban sprawl on the outer edges of the city. Urban infill is the process of increasing the residential density of an area by replacing open space and vacant housing with residences. As land becomes more valuable in a suburb, bid-rent may make it profitable to replace lower-density houses with the large yards of

higher density housing, multi-family housing, or even apartments.

Another change involves the availability of businesses. Suburban residents have always been able to find shops for food and necessities in their neighborhoods. In recent decades, there has been an increase in the number and size of businesses in suburbs:

- Strip malls and shopping malls have become common.
- Big-box retail stores have been successful.
- Offices and business services have moved to the suburbs.

All of these changes are part of the **suburbanization of business**, the movement of commerce out of cities to suburbs where rents are cheaper and commutes for employees are shorter. As a result, many cities have faced declines in job opportunities, consumer choices, and services.

Residential Land Use Outside North America

Outside of the United States and Canada, the residential density gradient does not usually run from higher to lower the farther one goes from the CBD. Instead, population density tends to increase in the suburbs even though land is more plentiful. In Europe, as explained earlier, the centers of cities contain many historic structures, and population densities are fairly low. The suburbs on the edges of the central cities contain multistory apartment complexes and have very high population densities.

In Latin America, the peripheral areas of cities may contain suburbs typical of the United States, with single-family houses and lower densities, and also suburbs similar to Europe with high-rise apartments. In addition, very densely settled squatter settlements, or favelas, are where the poorest residents live. Gated communities are increasingly common in Latin America as the region develops. Because of their popularity with wealthy urban elites, these security-minded neighborhoods are emerging in residential areas in all regions of the world today.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How do low-, medium-, and high-density housing characteristics represent different patterns of residential land use?*

Type of Residential Land Use	Characteristics

KEY TERMS

zoning ordinances
urban planning
residential zones
inner city
residential density gradient
filtering
invasion and succession
urban infill
suburbanization of business

6.7

Infrastructure

Essential Question: How does a city's infrastructure relate to local politics, society, and the environment?

Critical to the functioning of any city is its **infrastructure**, the facilities and systems that serve the population. The infrastructure of any city has many elements:

- transportation features, such as roads, bridges, parking lots, and signs
- communications features such as cell phone towers, television cables, and Internet service
- distribution systems for water, gas, and electricity
- buildings, such as police stations, courthouses, and fire stations
- collection systems for sewage and garbage
- entertainment venues, such as museums, theaters, and sports facilities
- open spaces, such as public parks and town squares

Building, repairing, and replacing infrastructure is costly and, in a busy urban setting, disruptive to people who live and work there. The infrastructure of older cities around the world is often in poor condition.

Deciding who pays for elements of infrastructure, where they should be built, and what economic and social benefits they offer are usually hotly debated issues. For example, using public resources to build sports stadiums is particularly controversial, and the results are difficult to predict. In Denver, building a baseball stadium for the Colorado Rockies served as an anchor for economic development that helped revitalize a dilapidated area. In Atlanta, building a stadium displaced African American neighborhoods and provided limited economic benefits to the community.

Political Organization and Infrastructure

A city is a political entity. The term **municipal** refers to the local government of a city or town and the services it provides. For example, a mayor and city council make up the core of the municipal government, and the local water supply is the municipal water supply. **Municipality** refers to a local entity that is all under the same jurisdiction. The municipal government is responsible for managing infrastructure at the local scale, although the federal government often subsidizes large expenses.

As cities have grown in the past two centuries, they have expanded in physical size, pushing their boundaries farther from the original core. When

these settled areas move beyond the legal boundaries of the city, the inhabitants may be left without political representation or services from the city. The process of adding land to a city's legally defined territory is known as **annexation**. Annexation generally requires a vote by residents in the affected areas.

Sometimes, residents who live beyond the legal boundaries of the city do not desire to become part of the central city. In such cases, residents may choose the option of **incorporation**, the act of legally joining together to form a new city. One reason is that the newly-created municipality is smaller and political representation is more "local" than if the residents had opted for annexation. Often many of these peripheral municipalities are cities only in terms of legal and political considerations. They usually lack a true CBD and continue to function as **bedroom communities**, or commuter suburbs, within the larger metro area.

Some populated regions do not fall within the legal boundary of any city or municipality. These are known as **unincorporated areas**. On a political map, these are the areas between the legal boundaries of cities. Usually a nearby municipality provides their services and administration, through some higher division of civil government such as a county, borough, parish, or province. Over time, people of these areas may consider annexation by an existing city or incorporation as their own city.

Infrastructure and Economic Development

Economic wealth is not evenly distributed across the globe. Some cities are located in wealthier countries and, therefore, can spend more money on developing, maintaining, and improving infrastructure.

Frankfort For example, Frankfurt, Germany, is centrally located in Europe and is within a two-hour flight to most European capitals. The Frankfurt airport provides service to more than 100 countries. Its rail transportation is highly developed with nearly 1,800 trains that move people about the city each day. In addition, telecommunications are an integral part of the city's infrastructure. At the national scale, Frankfurt is considered the most important Internet exchange center in Germany. At the global scale, the city is one of the world's largest and most reliable data transfer sites.

Lagos By comparison, Lagos, Nigeria, with almost 20 million people, is one of the world's most populous megacities. Lagos is a vibrant city with a significant amount of commerce, accompanied by dynamic music, fashion, and film industries.

However, due to extensive unplanned population growth, Lagos faces significant obstacles in the areas of public transportation, utilities, and sanitation. Roads are in severe disrepair, and often become nothing more than pathways of mud when heavy rains occur. The lack of sufficient roads limits the movement of residents and commerce in many parts of the city. While the city of Lagos has planned to improve communication infrastructure, it still lacks much of the technology of more-developed regions.

Infrastructure and Social Development

Urban planning and smart-growth policies are often implemented as urban and suburban populations continue to grow. *Smart-growth policies* (see Topic 6.8) encourage sustainable development economically and socially to increase efficiencies and protect the environment. Many aspects of smart-growth are illustrated in the infrastructure and social development of a city. Creating more walkable areas (both paved and nature trails), bike lanes, and common public spaces encourages a sense of place and community belonging.

Improvements in infrastructure dramatically improve the living conditions in the poorest areas of the world. More indoor plumbing can help improve the sanitation conditions of people in some of the more densely populated cities like Kolkata, India; Port-au-Prince, Haiti; and Nairobi, Kenya. Expanding access to educational opportunities and healthcare, especially for females, helps to strengthen society. People with more educational opportunities tend to have higher earning potential over the course of their lifetimes, which means they are more likely to have the financial resources to meet basic needs such as housing and healthcare.

Transportation and Urban Infrastructure

Running a city is complex and a challenge to all levels of government, especially smaller less-funded municipal governments. Local governments have to provide services that meet the needs of sometimes rapidly growing populations. Governments must build and care for infrastructure, maintain order, and mediate competing interests for the benefit of the entire population.

Public Transportation

The dense population of cities, combined with the high number of suburban residents who commute to central cities for jobs each day, places great demands on the transportation system. The use of large numbers of individual automobiles creates a multifaceted problem:

- environmental—air pollution and excessive use of nonrenewable energy sources
- social—congested roads and long commute times
- economic—valuable real estate used for parking areas and costs associated with car ownership

One solution to moving people around an urban area is **public transportation**—buses, subways, light rail, and trains that are operated by a government agency. Some cities in the United States—such as New York City, Washington, DC, and San Francisco—are known for the success of their mass transit systems. However, few cities have extensive systems and ridership is often low in these cities so fares rarely cover operating costs.When fares increase, passenger numbers decline and the poor, who need public transportation the most, are often not able to use the system.

In contrast, governments in other countries have placed a higher priority on building, maintaining, and promoting the use of public transportation. A much higher percentage of the population of cities in Europe, Latin America, and parts of Asia rely on public transportation. Of the ten most-used urban train systems in the world, only New York City is in the United States. Of the top 50, only New York City and Washington, DC, are in the United States.

Automobiles in Urban Areas

Along with the importance of public transportation, automobile ownership has continued to grow in the 21st century. Collecting data about automobile use and applying it to improve traffic flow is critical to transportation in large cities. The use of this data by cities is an example of applied geography.

Traffic patterns change throughout the day as commuters come into the city in the morning and leave again in the afternoon. Lunch rush hours, weekends, and holiday data is also collected.

Once a city knows when and where the traffic issues are, the primary tool used to encourage efficient flow is the traffic signal. Cameras mounted at intersections and along major transportation arteries allow cities to adjust traffic flows in response to vehicle accidents and weather in real time. Emergency vehicles benefit from the data collected in both setting up signal patterns ahead of time and adjusting them from real-time data collection. A great deal of planning goes into decisions about signal lengths and coordination to keep cars moving efficiently.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How does a city's infrastructure relate to local politics, society, and the environment?*

Element of Infrastructure	Importance to Society

KEY TERMS

infrastructure	incorporation
municipal	bedroom communities
municipality	unincorporated areas
annexation	public transportation

GEOGRAPHIC PERSPECTIVES: *WHERE THE WEALTHY CHOOSE TO LIVE*

One basic geographic decision that nearly every person makes is where to live. Since they have more money than others, wealthy people have more options. The choices they make reflect what people value in a particular culture. In turn, these choices shape the spatial distribution of public services.

Different Places, Different Choices

In Europe and Canada, wealthy people have traditionally chosen to concentrate in densely-populated central cities. They have always valued having a short commute to their place of work, as well as easy access to concerts, plays, museums, and other forms of entertainment.

In contrast, in the United States, wealthy citizens have been more likely to choose to live in suburbs where population densities are lower. The attractions of spacious homes, large yards, and clean air have outweighed the longer commute to work. Smart-growth approaches have transformed large swaths of sprawled suburbia into lively, walkable, and wealthy neighborhoods.

The Impact of Choices

The distribution of wealth, by area, affects the distribution of political power. The strong core of wealthy residents in central cities in Europe and Canada has created political pressure on governments to provide excellent public transit and other public services to these areas. In U.S. cities, without as many wealthy people, the pressure for those services has been less—but pressure to provide suburban rail lines and freeways has been greater.

Geographers study how changes in work and public policy affect choices about where people live. As more people work at home, they worry less about a long commute to an office. And as more people fly for work, living near an airport becomes a bigger benefit. For these reasons, more wealthy people in Europe and Canada are moving to the suburbs.

At the same time, increasingly strict pollution regulations have cleaned up the air and water in central cities, making them more desirable places to live. Since families are smaller today, the desire for a large house and yard is less important than it once was. For these reasons, in recent decades more wealthy people in the United States are moving downtown, and these areas are increasing their political power.

1. If you just graduated from college and have accepted your first professional job offer in a major metropolitan area, describe where you think the most desirable place to live would be.
2. How do level of education, cultural perceptions, and income level affect a person's choice about where they live?
3. Explain the types of public services each of the following groups of people living in the United States often want in urban areas in which they live:
   - married couple, both recent college graduates, no kids
   - single parent with a teenager, an elementary-age child, and a baby
   - retired couple in good health

THINK AS A GEOGRAPHER: *DATA AND INFRASTRUCTURE PLANNING*

	COOK COUNTY, ILLINOIS	MARION COUNTY, INDIANA
Area, in Square Miles	1,635	403
Number of Municipalities	135	1
Major City	Chicago	Indianapolis
Population	5,238,000	939,000
North-South Distance	c. 48 miles	c. 20 miles
East-West Distance	c. 32 miles	c. 20 miles

1. Explain how the different physical shapes of the counties might affect how each county is governed.
2. Describe the borders within each county and what that suggests about the role of county government.
3. How might the difference in population explain the differences in the number of municipalities?
4. How does the number of communities in each county affect how the government operates?

CHAPTER 16 REVIEW:
Urban Structure

Topics 6.5–6.7

MULTIPLE-CHOICE QUESTIONS

Question 1 refers to the photograph below.

1. Which phrase best describes the urban central business district (CBD) shown in the photograph?

(A) European CBD that mixes low-rise historic buildings with new skyscrapers

(B) Latin American CBD that mixes traditional markets with modern high-rises

(C) European suburban CBD with high-rise residential buildings and high population

(D) African colonial CBD with broad avenues, large homes, and administrative centers

(E) North American CBD near the city's center, offering commercial space, parking, and transportation

2. Which best provides a general explanation of functional zonation?

(A) Urban areas pass laws to define how property in specific areas can be used in order to separate commercial and residential spaces.

(B) A city is made up of a series of rings that surrounds the central business district, each having a different function.

(C) Different portions of an urban area have specific and separate purposes, which fit together to create the entirety of the city.

(D) In cities around the world, residential areas are based on ethnicity, and cities are thus divided into ethnic enclaves.

(E) An urban area's inner city has its highest population density, and population density declines in areas farther from the city.

3. Which urban model would best describe a city that includes edge cities along its beltways?

(A) Galactic city

(B) Concentric zone

(C) Multiple-nuclei

(D) Sector

(E) Griffin-Ford

4. Why do many African cities contain multiple commercial districts?

(A) Colonial central business districts emerged separately from the traditional commercial centers.

(B) Africans were traditionally not allowed to use the central business districts used by Europeans.

(C) African governments promoted multiple central business districts through urban planning.

(D) One central business district is not enough to serve Africa's fast-growing urban population.

(E) Locations of Africa's business districts were poorly chosen, requiring multiple downtowns.

5. Which of the following represents a key difference between European cities and North American cities?

(A) European cities do not contain suburbs.

(B) North American suburbs have a higher population density.

(C) European CBDs are less walkable than North American CBDs.

(D) Public transportation is better developed to serve North American cities.

(E) European suburbs are more ethnically diverse.

Question 6 refers to the photograph below.

6. T wide, tree-lined avenues, tall office buildings, and mansions of Mexico City's Paseo de la Reforma, illustrate what feature of many large Latin American cities?

(A) Disamenity zone

(B) Periférico

(C) Favelas

(D) Commercial spine

(E) Zone in transition

7. Which best explains why European central business districts have largely resisted the construction of skyscrapers and the resulting impressive skylines that typify American cities?

(A) Competition for valuable commercial space is not as keen in European cities as it is in the United States.

(B) European culture prefers lower buildings and has negative attitudes toward commercialism and skyscrapers.

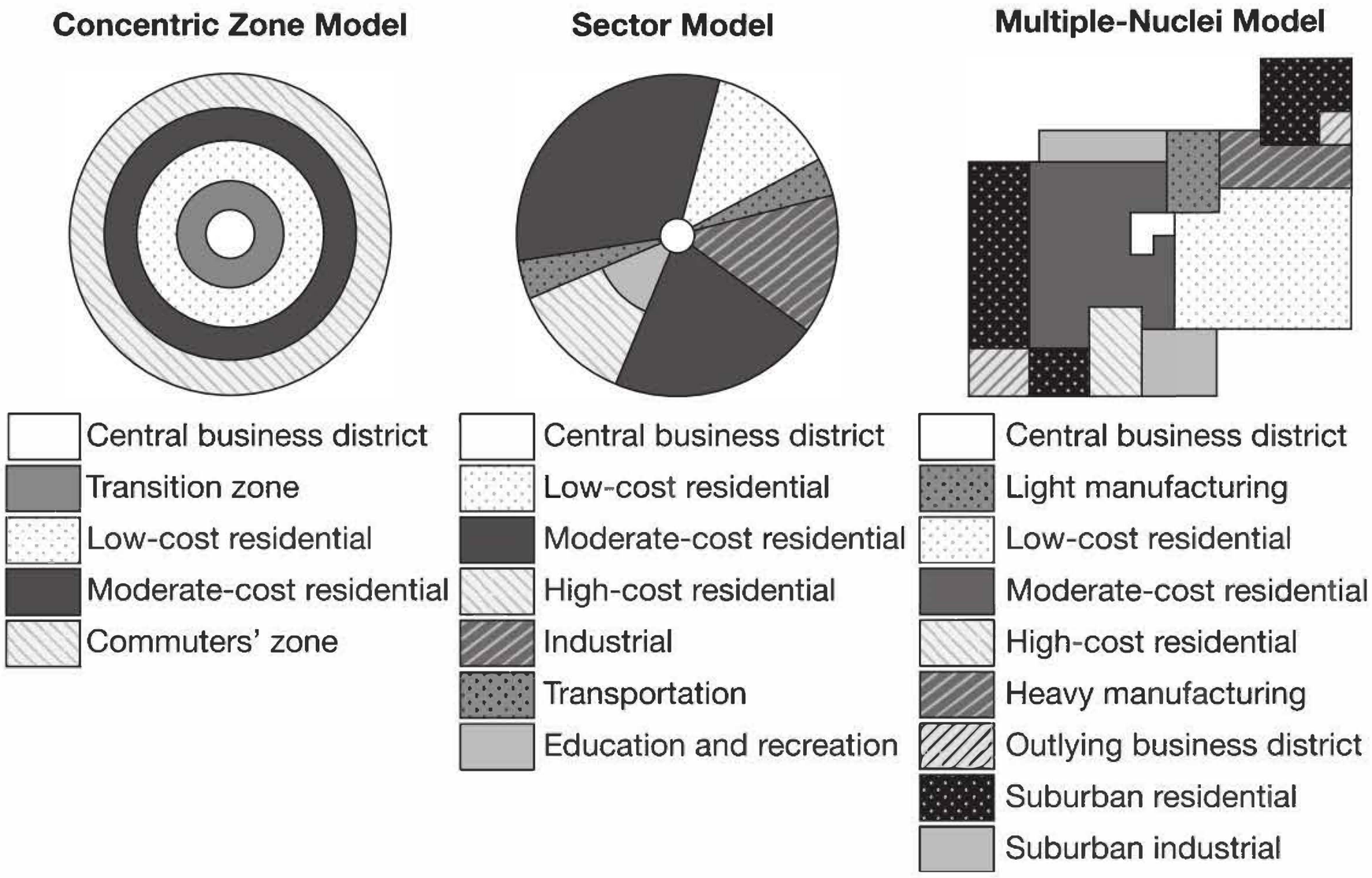
(C) The centers of European cities contain many historically significant buildings that leaders choose to preserve.

(D) The European Union regulates the height of buildings and has forbidden tall buildings because of safety concerns.

(E) European cities tend to have stronger mass transit systems, so people do not need to be as concentrated in CBDs.

FREE-RESPONSE QUESTION

1. The diagrams show three early models of urban development and land use in North America.



(A) Using the sector model, explain the rationale for the location of the industrial sector.

(B) Choose one of the models and explain in detail the rationale for a different specific land use location.

(C) Describe TWO similarities that North American models share in how they describe land use.

(D) Using the multiple-nuclei model, explain why some businesses relocate near the suburbs.

(E) Compare these models with one pattern of urban development and land use on a continent other than North America and account for the differences.

(F) Describe ONE positive of zoning regulations related to urban planning.

(G) Describe ONE negative of zoning regulations related to urban planning.

CHAPTER 17

Urban Challenges and Sustainability

Topics 6.8–6.11

Topic 6.8 Urban Sustainability

Learning Objectives: Identify the different urban design initiatives and practices. (IMP-6.C)

Explain the effects of different urban design initiatives and practices. (IMP-6.D)

Topic 6.9 Urban Data

Learning Objective: Explain how qualitative and quantitative data are used to show the causes and effects of geographic change within urban areas. (IMP-6.E)

Topic 6.10 Challenges of Urban Changes

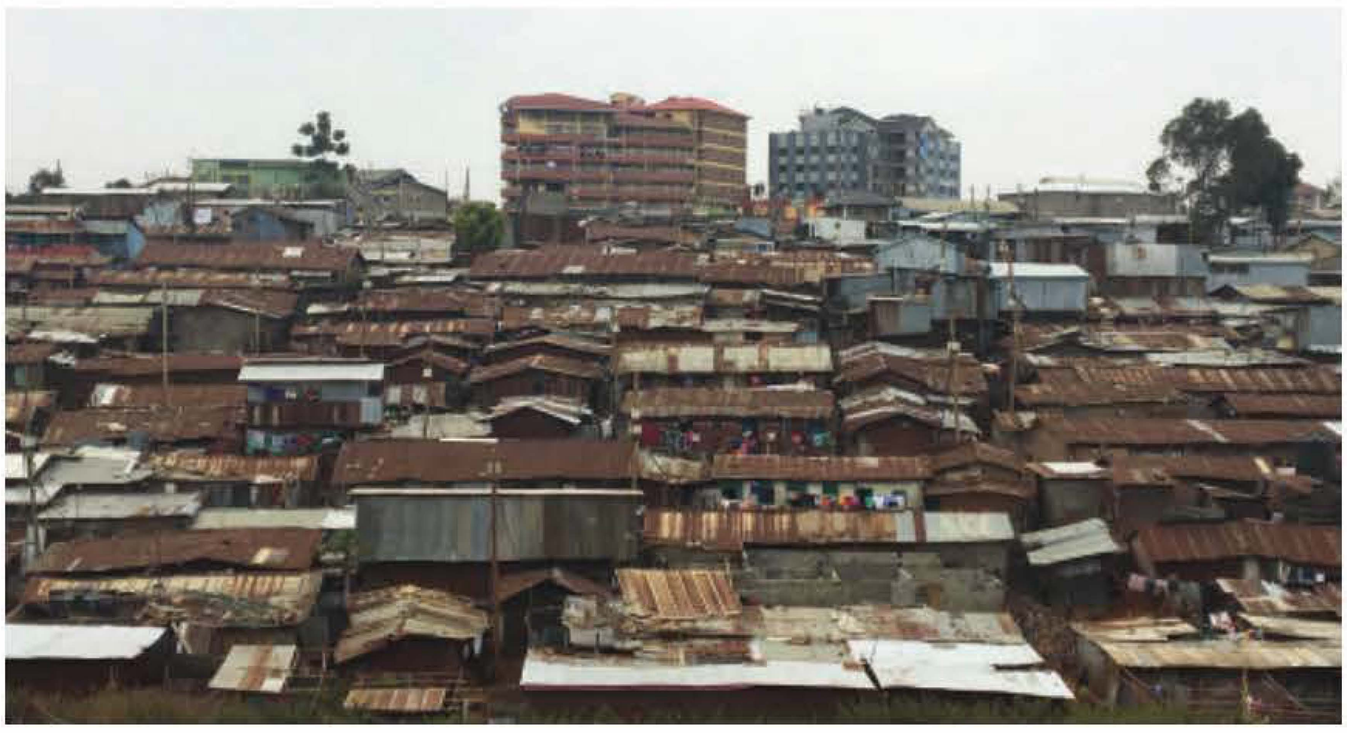
Learning Objective: Explain causes and effects of geographic change within urban areas. (SPS-6.A)

Topic 6.11 Challenges of Urban Sustainability

Learning Objective: Describe the effectiveness of different attempts to address urban sustainability challenges. (SPS-6.B)

Whenever. . . societies. . . prospered rather than stagnated and decayed, creative and workable cities have been at the core of the phenomenon. Decaying cities, declining economies, and mounting social troubles travel together. The combination is not coincidental.

—Jane Jacobs, *The Death and Life of Great American Cities,* 1961



Source: Getty Images

The image shows the Kibera slum in Nairobi, Kenya. In the background are numerous gated residential communities. (See Topic 6.10 for more on housing in periphery countries.)

6.8

Urban Sustainability

Essential Question: What are urban design initiatives and practices and what are the effects of those initiatives and practices?

Using the earth's resources while not causing permanent damage to the environment is referred to as **sustainability.** Maintaining the sustainability and long-term viability of cities has become an increasingly important discussion for city planners, developers, and citizens.

Sustainability and the Future

Modern cities face numerous challenges from urban sprawl to access to services to environmental injustice. (See Topics 6.10 and 6.11.) New development concepts are shaping the debate about sustainability and city landscapes in both the United States and around the world.

Smart-Growth Policies and Greenbelts

Urban planners and policymakers have developed **smart-growth policies** to combat urban sprawl and create a new vision for cities that are more sustainable and equitable. Smart growth focuses on city planning and transportation systems of an urban region.

One major goal of smart-growth policies is to slow sprawl by creating concentrated growth in compact centers. These policies suggest spatial arrangements that focus on encouraging a mix of building types and uses with a variety of housing and transportation options available within communities. Smart growth also includes several other goals:

- to create attractive residential neighborhoods that are walkable, meaning they provide amenities that people can walk to easily
- to develop a strong sense of place among residents
- to increase livability by making the community easy and safe to navigate
- to involve residents and stakeholders in decisions that impact the community

In London and other European cities, smart growth policies that preserve farmland and other open, undeveloped spaces near the city have existed for over one hundred years. These **greenbelts,** areas of undeveloped land around an urban area, have been created to limit a city's growth and preserve farmland. At the same time, they provide an area for people to enjoy recreation and the environment.

This photo of Feltham, England, located in West London, shows the edge of the greenbelt that surrounds much of the city of London. What purposes does the greenbelt serve?

Many communities in the United States have adopted greenbelt policies to limit growth similar to those in Europe. Under the principles of smart growth, cities are allowed to annex (legally add) land only in areas specifically designated by laws. New Jersey, Rhode Island, Washington, Tennessee, and Oregon have all enacted smart-growth policies.

Some cities desire to slow the population growth and development that could consume and alter their communities. **Slow-growth cities** adopt policies to slow the outward spread of urban areas and place limits on building permits in order to encourage a denser, more compact city. Protecting local sense of place and natural landscapes has also motivated governments to embrace slow-growth policies. The cities of Boulder, Colorado, and Portland, Oregon, are considered slow-growth cities that have aggressively applied these policies.

New Urbanism

A group of developers in the 1990s created a set of strategies called **new urban design** to put smart growth into action within communities. Some strategies of new urbanism include creating human-scale neighborhoods (designed for optimum human use), reclaiming neglected spaces, giving access to multiple modes of transportation, increasing affordable housing, and creating **mixed-use neighborhoods.** Unlike the clear separation between residential and commercial uses created by zoning in most cities, these neighborhoods would have a mix of homes and businesses. A mixed-use neighborhood is vibrant, livable, and walkable. Homes would include a variety of sizes and price ranges to create a socially diverse community. Shared open spaces and community gathering spaces are also common.

New urbanism has succeeded in many communities that have tried the strategies in spite of two large obstacles:

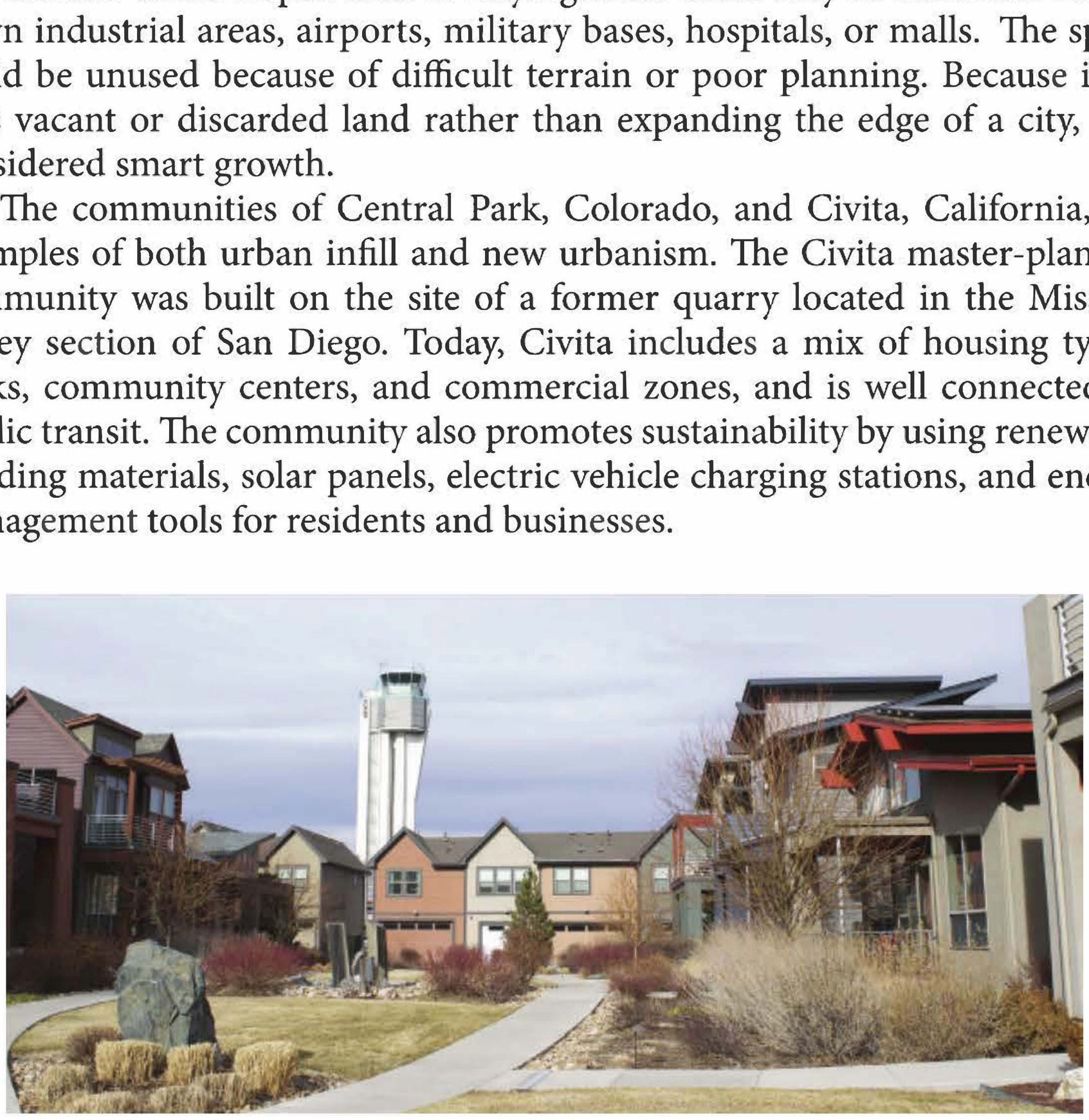
- The existing system of zoning (see Topic 6.6) created segregated areas by land use, and thus contributed to sprawl.
- People accustomed to traditional land-use patterns in cities were not easily convinced that the new urbanism was an improvement.

Stakeholder involvement is an important aspect of new urbanism. For example, in Denver, a new urban neighborhood that was built on the site of a closed major airport was recently renamed. The airport was originally named after a former politician who had supported racist and discriminatory policies, but the neighborhood decided to change its name Central Park in 2021. New urban design can occur in the suburbs as a new development or within the city practicing the concept of urban infill.

Urban Infill

The opposite of leapfrog development (see Topic 6.2) and sprawl is **urban infill**, the process of building up underused lands within a city. Most cities have areas of vacant or undeveloped land of varying sizes. These may be remnants of shut down industrial areas, airports, military bases, hospitals, or malls. The space could be unused because of difficult terrain or poor planning. Because infill uses vacant or discarded land rather than expanding the edge of a city, it is considered smart growth.

The communities of Central Park, Colorado, and Civita, California, are examples of both urban infill and new urbanism. The Civita master-planned community was built on the site of a former quarry located in the Mission Valley section of San Diego. Today, Civita includes a mix of housing types, parks, community centers, and commercial zones, and is well connected by public transit. The community also promotes sustainability by using renewable building materials, solar panels, electric vehicle charging stations, and energy management tools for residents and businesses.



Source: David Palmer

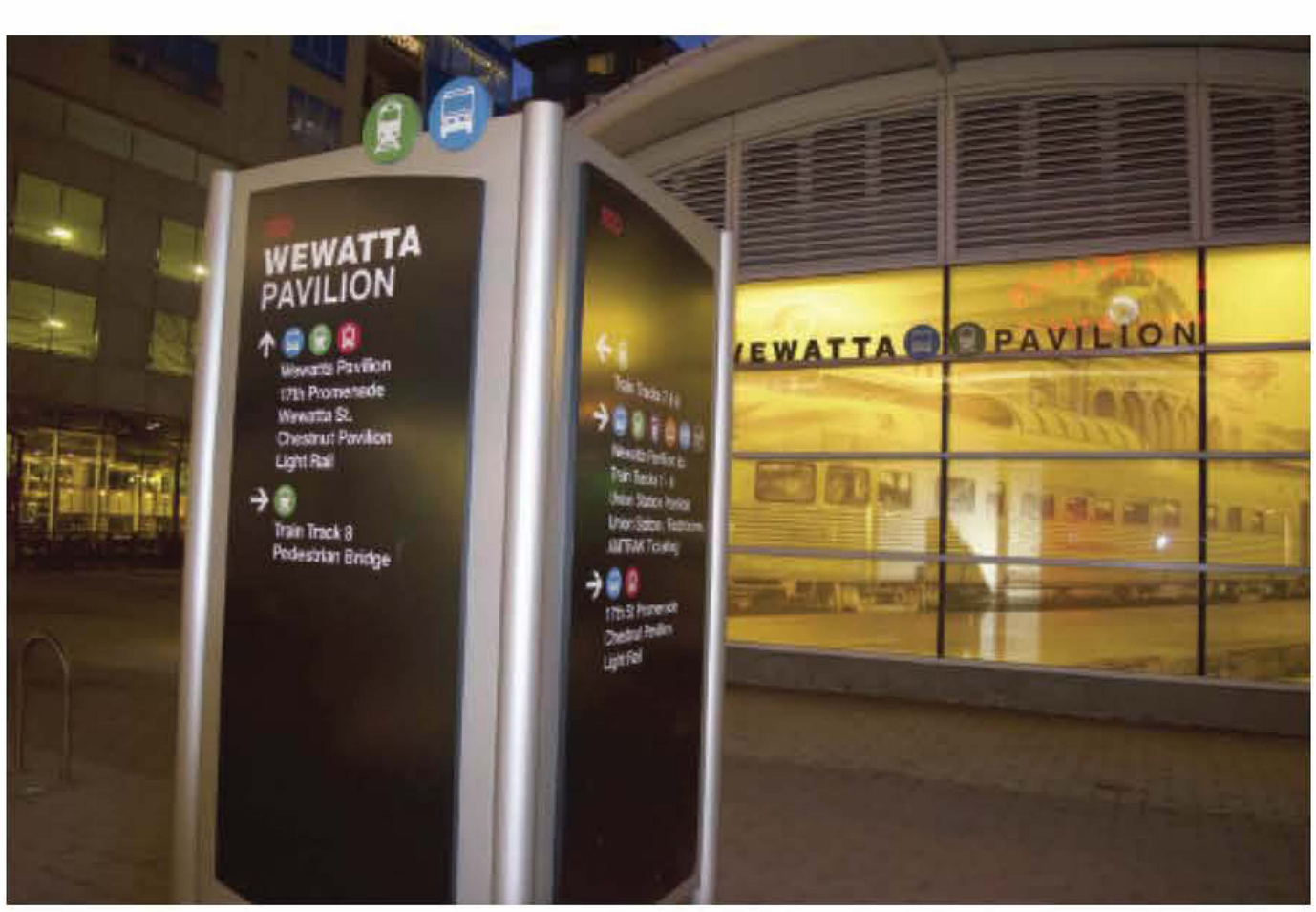
Denver's Central Park Neighborhood is an example of both new urban design and infill. The former airport control tower is in the background and the neighbors share a common open space. Notice the single-family homes and higher density townhomes in the background. Shops are two blocks away.

Transit-Oriented Development

New urban and other smart growth developers have embraced the concept of **transit-oriented development (TOD),** which locates mixed-use residential and business communities near mass transit stops, resulting in a series of more

compact communities which decreases the need for automobiles. Increasingly TOD includes multiple forms of transportation including train, bus, and light rail.

Getting public transit riders the last mile from a transit stop to home or work is challenging for city planners. Micro-transport options such as taxis, electric street scooters, bicycles, and shared rider apps (such as Uber or Lyft) help solve the last mile problem. These types of transportation exist in most major world cities and have varying levels of success.The cities of Singapore, London, Paris, and New York City are rated as some of the most successful cities in transit-oriented development.



Source: David Palmer

Transit-oriented development (TOD) often includes multiple forms of transportation. Union Station in Denver includes train, bus, light rail, and many micro-transport options.

Livability

A concept that has recently gained traction with sustainable urban development is livability. **Livability** refers to a set of principles that supports sustainable urban designs. Livable communities have affordable and equitable housing, access to employment and community services, multiple and accessible transportation modes, and social and civic engagement.

Other Changes

Cities adapt to their growing and evolving populations. For example, the creation of pedestrian zones where street fairs, festivals, and public events are held help make inner cities both safer and more desirable destinations. The addition of bike lanes and an increase in bike usage reduces traffic congestion and parking needs while encouraging a healthful lifestyle. In addition, increasing the number of running paths, community gardens, and dog parks further promotes the health and well-being of residents. Many cities are actively developing relationships with local farmers, which benefits both urban and rural citizens through the spread of farmers' markets and the promotion of a more sustainable local economy.

Criticisms of Smart Growth

While smart growth has proven successful in many cities, it is not without critics. Opponents make economic and social arguments against smart growth:

- It is not affordable to families because of increases in the cost of land and housing. It also contributes to congestion and noise within cities
- Smarth growth limits peoples' choices for single-family housing, a suburban lifestyle, quality schools, and the autonomy of car ownership.
- It creates high-population density areas that often have higher crime rates and provides less privacy for residents.
- Smart growth can result in unintended segregation both ethnically and economically.
- It promotes the displacement of low-income and ethnic communities, and the destruction of historical buildings and unique places.

Specific criticisms of mass transit are that it has large upfront costs and is slow to adjust. Rapid growth and change often make it difficult for city planners to predict where mass tranist will be most useful. Also, mass transit often does not connect all parts of a city so people still need cars to get to work, services, or school.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are urban design initiatives and practices and what are the effects of those initiatives and practices?*

Urban Design Initiatives and Practices	Effects of Initiatives and Practices

KEY TERMS

sustainability
smart growth policies
greenbelts
slow-growth cities
new urban design
mixed-use neighborhoods
urban infill
transit-oriented development (TOD)
livability

6.9

Urban Data

Essential Question: How are qualitative and quantitative data used to show the causes and effects of geographic change within urban areas?

Cities are large, diverse, and dynamic. People live in cities for two primary reasons: access to jobs and public services. In the late 20th century, total urban population worldwide grew larger than rural population. The most significant reasons for urban growth were ample job opportunities and a changing economy. This rapid growth led to dynamic and increasingly diverse cities. The ability to analyze the changes and needs within cities requires accurate and local scale quantitative and qualitative data.

Quantitative Data

Quantitative data is information that can be counted, measured, or sequenced by numeric value. For example, geographers count the total population of a country and sequence it with the total populations of other countries. This allows for comparison based on that particular data.

In the United States, a census is required by law every ten years. Census data, as well as other data, provides **population composition**. In addition to showing where people live, population composition gives a description of people's income, age, gender, ethnicity, race, family size, and other details. That information is valuable to governments to determine what services are needed, such as public libraries, schools, and neighborhood parks, and where they should be located.

Quantitative data helps identify the need for and location of other public services such as local emergency medical help providers (EMS), police, fire, and public utilities (trash and sewer services). Each have specific site and situation factors (see Topic 6.1) that influence its ideal location.

GEOGRAPHIC CATEGORIES IN THE CENSUS

Category	2010 Census	Increase over the 2000 Census	Average Number of People in the 2010 Census
Population	308,745,538	9.7%	-----
Census Tracts	73,057	11.8%	4,226 people/tract
Block Groups	217,740	4.3%	1,418 people/group
Blocks	11,078,297	35.0%	28 people/block

Source: Bureau of the Census

Notice that each subdivision gets smaller in total number of people. What are the advantages and disadvantages of data at each scale of analysis? Assuming you had income data for each category, describe how the data could be used at each scale.

Population Data in Urban Areas

U.S. census data is available at many scales. Urban areas in many countries are divided into **census tracts**, contiguous geographic regions that function as the foundation of a census. In the United States, a census tract typically consists of between 4,000 and 12,000 people. Each tract is subdivided into block groups,which are further subdivided into blocks. A **census block** in a densely populated urban area is often very small, consisting of a single block bounded by four streets. In suburban and rural areas, because of their lower population densities, a census block typically covers a larger area.

Using the proper scale of data is critical. Deciding where to build a new playground in a neighborhood requires data such as number of children per household at the block level. Country-level data would be useless in this case. Block-level information might be of some value in deciding where to build an airport but data of the metro area or a national-scale map would be critical.

Researchers and businesses use data to identify potential goods and services that people desire. Merchants and business owners, such as those who own grocery stores and car dealerships, could also use this information to determine the best locations to serve the needs of the population. Census data is usually gathered per household but can be aggregated at multiple scales.

The chart below shows a sample of some of the types of data that are gathered in the U.S. census. National and local scale data are both shown. Many statistics such as household size and income also have corresponding data (not shown) down to the block or census tract scale. Geographers compare local data with that at the national scale to analyze patterns, trends, and processes within communities.

SELECTED QUANTITATIVE DATA OF THE UNITED STATES AND THE DETROIT MSA, 2019

	United States		Detroit MSA	
Average household size	2.61		2.51	
Household income ranges	Over $200,000	8.5%	Over $200,000	6.6%
	$150,000-199,999	7.2%	$150,000-199,999	6.8%
	$100,000-149,999	15.7%	$100,000-149,999	15.2%
	$75,000-99,999	12.8%	$75,000-99,999	12.5%
	$50,000-74,999	17.4%	$50,000-74,999	17.0%
	$25,000-49,999	20.3%	$25,000-49,999	21.6%
	Under $25,000	18.1%	Under $25,000	20.3%

Source: US Census Bureau, 2019.

Identify the scale of the data presented. Would this data be useful for determining the local population composition or income of a neighborhood? Explain your response.

Qualitative Data

Qualitative data is based primarily on surveys, field studies, photos, video, and interviews from people who provide personal perceptions and meaningful descriptions. Questions and study topics help those who gather information

learn how individuals and communities feel about urban growth, zoning changes, local government, crime rates, and other topics that affect people living in the city. Questions have to be carefully worded to be objective so responses are accurately reflected. They can also be worded in such a way to elicit value judgements:

- Would you support the city spending money to make more sidewalks?
- Would you like to have new playground equipment in your neighborhood park? Why or why not?
- Would you rather see the city pay for more street lights or a community recreation center? Why or why not?
- Would you support a 2-cent tax increase to pay for a police substation in your neighborhood? Why or why not?

Qualitative data is important to geographers and is often used to verify quantitative data. Cities are diverse and there are often many perspectives related to urban issues. For example, when a new housing development is being built in a neighborhood, researchers seek out multiple viewpoints about the project. Business and property owners may view this as positive as it will increase economic activity, while longtime apartment residents may view it as a negative because it will cause higher rent.

Geographers use qualitative and quantitative data to analyze changes in the spatial relationships of an urban setting. Recognizing patterns and locations of urban growth can help city planners meet the social, economic, and infrastructural needs of its citizens. However, researchers must always be aware that data can be flawed or inaccurate. Factors such as who gathered the information, the type of questions asked, the scale of the data, how often or when the data was gathered, and if the people who responded answered accurately, influence the quality of the data.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How are qualitative and quantitative data used to show the causes and effects of geographic change within urban areas?*

Uses of Urban Quantitative Data	Uses of Urban Qualitative Data

KEY TERMS

quantitative data
population composition
census tracts
census block
qualitative data

6.10

Challenges of Urban Changes

Essential Question: What are the causes and effects of geographic change within urban areas?

Cities are nodes, complex places characterized by interconnections, and are often centers for innovation, cultural diversity, and art. They are often engines of economic growth and centers of political power. But the dense concentration of people combined with many complicated systems of cities can make solving problems difficult. Cities can be places of poverty, violence, and environmental decay.

The world is more urbanized than ever, and experts expect the percentage of people living in cities to continue growing. Consequently, understanding and solving urban challenges will continue to be important work for geographers.

Urban Challenges

While people with great wealth concentrate in cities, so do people with little wealth. Urban poverty exists throughout the world. It is found from inner cities of core countries to squatter settlements and favelas of less-developed countries. According to a United Nations report, about one-sixth of the world's population lives in urban poverty, and mostly in developing countries.

The role of cities in more-developed countries has changed rapidly, shifting from centers of industry to centers of services. Conversely, in less-developed countries, cities have experienced problems brought on by rapid industrialization and growing numbers of new migrants.

Urban Housing Issues in Core Countries

In the developed world, housing for inner-city poor residents is characterized by at least three problems—poor quality, insufficient availability, and significant unaffordability. Often the physical conditions of the buildings need updated to be safe. Proper maintenance and repairs of plumbing, electrical systems, roofing, stairwells, and heating systems are often unaffordable to inner city residents. Landlords often delay making expensive repairs, so over time, the overall quality of the housing suffers.

This process is often visible in the transitional areas of cities, as well as in ethnic enclaves, since both have a high percentage of renters. In European cities, these issues often occur near the edge of cities where mass transit lines end and rent is less expensive. Some geographers contend that in many European and North American cities, poorer residential areas are concentrated near industrial regions built on the eastern side of cities. Rents are lower in

these areas in part because the wind usually blows east, sending air pollution and industrial smells through these neighborhoods.

Women are more numerous than men in large, central cities in North America. One reason for this disparity is the high number of female-headed households. These women and their children are more likely to be poor than men. According to the U.S. Census Bureau in 2018, 56 percent of the U.S. population living in poverty were women. Hence, women concentrate in areas where housing is the least expensive, even if these areas often have higher crime rates. The lack of good schools, parks and playgrounds, and available of day care options, compound the problems faced by women and their children.

Housing Discrimination and Segregation in the United States

For the poor in the United States, housing opportunities have suffered because of decay in central cities. Neighborhoods go through cycles of change (see Topic 6.6), culturally and in land use. During much of the 20th century in the United States, housing discrimination was legal.

At the neighborhood scale, **redlining**, the process by which banks refuse loans to those who want to purchase and improve properties in certain urban areas, was common. Historically, minorities and the poor were the predominant inhabitants of neighborhoods where loans were commonly denied. Banks and federal government loan agencies considered investments in these areas too risky. The term originated as these lending institutions identified these no-loan areas by red lines on maps. Redlining reinforced the downward spiral of struggling and predominately minority neighborhoods. Minorities' inability to get loans significantly limited homeownership and often resulted in higher poverty rates. Laws now restrict redlining so that denial of a loan cannot happen for racial or cultural reasons.

Other discriminatory laws and practices existed. It was legal for landowners or real estate agents to deny selling or renting property to people based on race, ethnicity, gender, marital status, or religion. Most of the suburban neighborhoods in the United States denied minorities the right to buy homes. This practice prevented minorities from buying less-expensive homes in the suburbs, thereby forcing them to rent because they could not afford the more expensive land and houses closer to the city center.

These practices are now illegal in the United States because of the Fair Housing Act of 1968, but discriminatory policies have impacted the spatial arrangements of U.S. cities dramatically. Most economists argue that home ownership is a key factor for individual wealth. While minority homeownership has improved, the legacy of discriminatory policies still exists according to U.S. census data:

- In 1900, fewer than 20 percent of African Americans owned a home compared to over 46 percent of White people.
- In 2019, over 73 percent of White Americans owned the home they lived in compared to 42 percent of African Americans and 47 percent of Hispanics and Latino Americans.

Racial segregation in housing occurs when people live in separate neighborhoods based on their ethnicity or race. Segregation can occur voluntarily (see Topic 3.2) but often occurs involuntarily. In particular, throughout U.S. history, many communities had neighborhoods where African Americans could live and neighborhoods where they could not. Such segregation was enforced through real estate practices, traditions, and violence.

One of these practices was **blockbusting**. This is when people of an ethnic group sold their homes upon learning that members of another ethnic group were moving into the neighborhood. In U.S. history, often middle-class White families left when African American or Hispanic families moved into neighborhood. Investors would buy houses at low prices and either resell or rent them to minorities for a large profit.

Segregated neighborhoods can sometimes become **ghettos**, areas of poverty occupied by a minority group as a result of discrimination. Residents who live in ghettos often feel trapped because of social or political factors or a lack of economic opportunities. These neighborhoods have a high percentage of residents who rent, poorly maintained buildings, fewer businesses, and underfunded education and other government services.

Government Support for Affordable Housing

Governments have responded to the shortage of low-income housing in various ways. The federal government provides financial subsidies to help low-income residents with the cost of housing. London, New York City, Denver, and other cities have rent control policies that keep some affordable units available when a neighborhood improves. **Inclusionary zoning** practices offer incentives for developers to set aside a percentage of housing for low-income renters or buyers. However, critics point out that these policies reduce incentives for investments in new housing.

One reason for the shortage of affordable housing in urban neighborhoods is the cost of constructing and managing a new building can be greater than the profits a business can make. Governments and charitable groups, in both the United States and other countries, often step in to provide assistance, either by building and operating housing or by providing subsidies for others to do so.

These public housing developments—sometimes called "projects"—were first built in areas of the inner city where other structures had been torn down. Many provided decent housing and a solid sense of community. However, these buildings were often high-rise apartments, which concentrated poverty in a small area within the city. These areas experienced problems common in other urban neighborhoods where the poor were clustered, such as drug use, high crime rates, and poor maintenance.

In some cities, community leaders used a **scattered site** approach to alleviate the problems of public housing. In this approach, of the city or government provided rental assistance for individuals to dispurse public housing throughout the area. This allowed children access to better local schools and older residents access to amenities in wealthier neighborhoods.

The scattered-site approach has faced opposition from the "not-in-my-backyard" response. People fear that adding public housing near them will reduce property values and create problems for local communities and schools.

Urban Renewal

As residents in the United States moved to the suburbs after World War II, inner cities suffered from urban decay, high crime rates, and increased poverty. During the 1960s and 1970s, many city governments in the United States adopted the policy of **urban renewal**. The policy allowed governments to clear out the blighted inner-city slums, which usually displaced the residents to low-income government housing complexes, and built new development projects.

Governments often use the legal concept of **eminent domain** which allows the government to claim private property from individuals, pay them for the property, and then use the land for the public good. The practices of urban renewal and eminent domain happen in all countries but they most disproportionately affect minorities and the poor in periphery and semiperiphery countries.

Gentrification

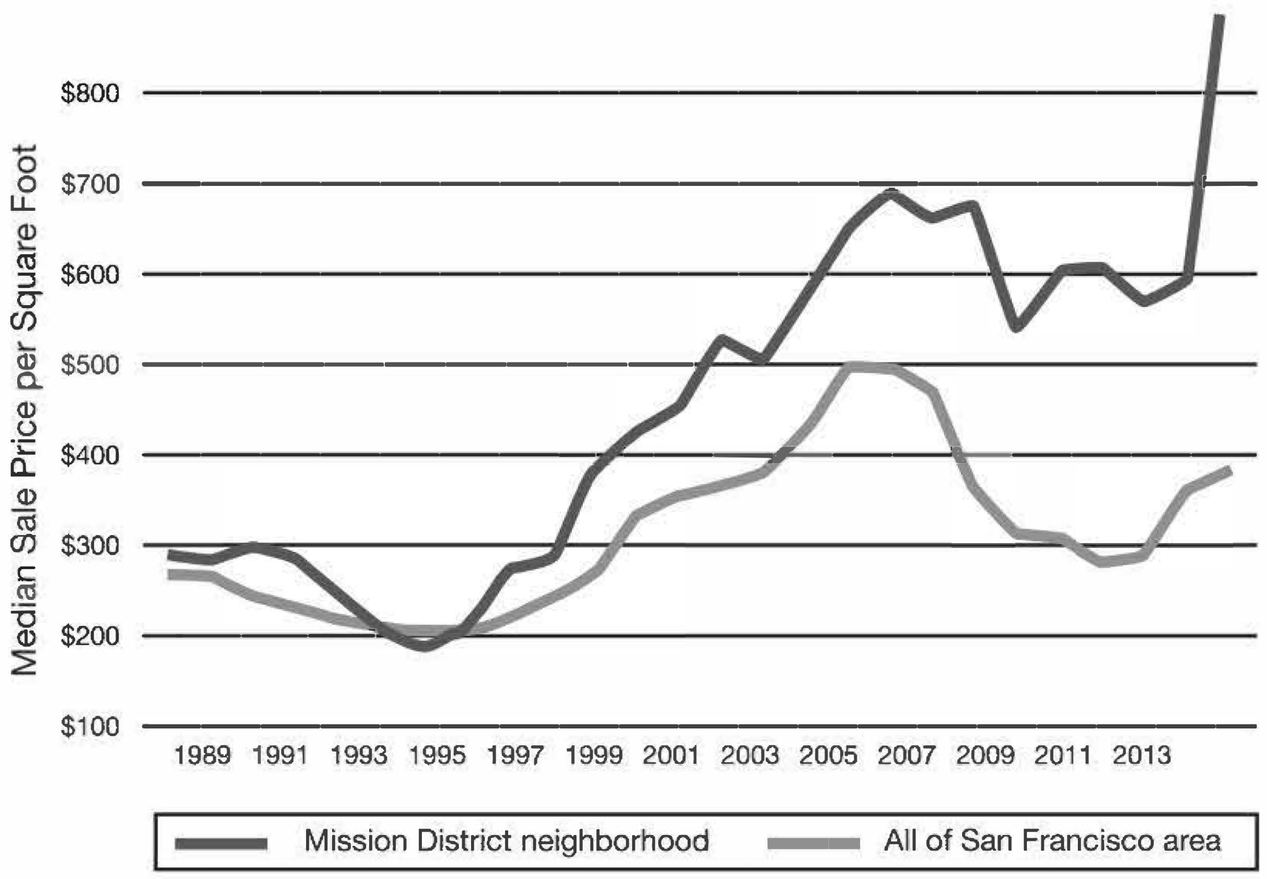
During the 21st century, large numbers of people desired to leave the suburbs and move closer to the urban core. **Gentrification** is the process of converting an urban inner-city neighborhood from a mostly low-income, renter-occupied area to a predominately wealthier, owner-occupied area of a city. Often gentrifying areas are of mixed-use development and include art districts, coffee shops, commissioned street art, dog parks, and trendy bars and restaurants. Also, these neighborhoods are near the central business district and its many amenities are available by public transportation.

Gentrification occurs mostly in the cities of core countries but is increasingly happening in cities in the periphery. Often the households in gentrified areas are dual-income, no-kids regardless of the level of development of the city in which they are located. The newcomers to gentrified areas are often a combination of three groups:

- young urban professionals with high-paying jobs
- LGBTQ+ looking for neighborhoods that are more inclusive, accepting, and safe
- older couples whose children have moved out

While gentrification includes positive aspects, there are also negative ones. These neighborhoods experience changes in racial and cultural diversity. Gentrification can displace residents, create space that excludes minorities or the poor, and eliminate the historical cultural landscape of previous residents.

As land values rise in inner cities along the growing edge of the central business district, low-income and often minority urban residents are pushed out by rising rents or rising taxes. Older residents who own their home, but live on fixed incomes, can no longer afford to pay taxes and often have to sell their homes and move.



Source: Dataquick

The graph shows how property values increased in the Mission District neighborhood in San Francisco. Describe a positive and a negative of rising property values.

Housing in Periphery Countries

Urbanization has rapidly expanded the population of cities in periphery countries, which has highlighted a lack of quality housing, especially for poorer residents. The periphery of cities often consists of **informal settlements**, densely populated areas built without coordinated planning and without sufficient public services for electricity, water, and sewage. Residents often lack **land tenure,** or the legal protection of contracts to show ownership of the land or structures. These areas are also known as urban slums, favelas or squatter settlements in different parts of the world. (See Topic 6.5.) Residents construct housing from whatever materials are available. Bricks and concrete blocks are more durable, but sheets of tin and plastic are also used. Living in these buildings can be dangerous because of questionable building materials and rarely enforced housing codes. In 2013 in Mumbra, India, 74 people died when an apartment building collapsed.

Most *informal settlements* are in *disamenity zones* (see Topic 6.5), abandoned land, or undeveloped open spaces such as parks. **Zones of abandonment** are areas of a city that have been deserted by their owners for either economic or environmental reasons. In some extreme cases, entire cities have been abandoned usually because of disasters such as the nuclear reactor meltdowns in Chernobyl, Ukraine (1986), and Fukushima, Japan (2011).

In most cases, abandonment is the result of economics and impacts different aspects of an urban region. The area will often have empty decaying buildings, poor sanitation, high crime rates, and vandalism. Examples occur in all regions of the world including Detroit, Michigan, or Kowloon, near Hong Kong. Another specific type of abandonment is a *brownfield,* created when factories leave an area. (See Topic 6.11.)

Source: Wikimedia Commons

Kowloon Walled City near Hong Kong was a zone of abandonment, then a slum, and was torn down in 1993 to make room for urban renewal and a park.

A problem facing many poor communities worldwide is **environmental injustice**, sometimes referred to as **environmental racism,** the disproportionate exposure of minorities and the poor to pollution and its impacts, plus the unequal protection of their rights under the law. This process is more common in urban settings where poor communities are often located near high-polluting activities. Some governments will limit new high-polluting industries and activities to poor existing neighborhoods. Residents of these neighborhoods often lack the economic and political resources to block new high-polluting development in their neighborhoods, or to even minimize the impacts.

Geographers use GIS technology to map and study the vulnerable impacted populations and some work together with communities to create solutions. Environmental injustice often results in increased health problems, such as birth defects and cancer, as well as shorter average life expectancy.

Gated or Walled Communities

The compact nature of many cities around the world has pushed informal settlements and poorer communities to live in close proximity to the wealthy. One response to this new geographic pattern is the building of walled or fenced neighborhoods with limited access and entry points, called **gated communities**. They represent a redesign of urban living with an attempt to recapture features more commonly found outside urban areas—safety, quiet, and homogeneity.

Gated communities are growing in cities all around the world. Some have referred to them as *citadels,* after historic castles and forts built to ensure safety inside the walls amid lawlessness and crime outside. The growth of gated communities can reinforce separation in economics, social status, ethnicity, and even political views. Slums and wealthy gated communities are often close to each other because residents in both groups desire access to the economic center of the city.

Homelessness

All countries of the world face the challenge of homelessness, the condition of not having a permanent place to live. While some unhoused people find temporary shelter with friends or relatives, others live on the streets. In the United States, the unhoused population was once primarily single men, but the problem expanded in the late 20th century to include more women and children. Government, religious groups, and nonprofit organizations responded by building shelters, advocating for public funding to support housing, and helping the unhoused learn new skills and gain access to health care and social services. In cities without strong public transit systems, people who are unhoused have difficulty traveling to available jobs and services.

Services

Shops and services often struggle to survive in urban neighborhoods. If the patrons are poor, prices for services must be low to maintain a customer base in the area. The result is very tight margins with little money available for shop owners to spend on maintenance or improvement of their facilities. The housing decay spreads to the service sector. Public services such as parks and swimming pools might be rare in urban neighborhoods with low tax bases. Private businesses and service providers, such as doctors and dentists, are often scarce in poor neighborhoods. They are particularly scarce in poor, heavily urbanized countries. For example, in Bangladesh, the number of doctors per capita is about one-fifth the number in the United States.

Food Deserts

Access to food stores in urban neighborhoods is often a problem. Grocery stores and supermarkets tend to favor suburban locations, where residents are wealthier and land costs less. Fresh, healthful food may be far less available than lower priced fast food. This results in few choices for poor families beyond fast food. These urban zones that lack food stores are known as *food deserts* (see Topic 5.11), and they contribute to health problems, such as obesity and diabetes, for poorer urban residents.

Many cities are developing programs and systems to bring food into urban food deserts, such as mobile grocery stores and community gardens, and incentives for grocery stores that locate in low-income areas. Some local food groups provide fresh fruits and vegetables at local pop-up markets.

Political Challenges of Urban Regions

Governing urban regions can be challenging because *metropolitan areas* (see Topic 6.1) are often a collection of adjacent cities and counties each, with its own government but environmentally, economically, and socially connected. Many urban challenges require a regional approach to governance—examples include urban growth, mass transit, road construction, pollution, and homelessness. Regional governance typically requires voluntary coalitions of city governments to address the needs and create plans for the larger region.

Occasionally, special districts (see Topic 4.7) are established to handle long-term regional needs such as transportation, fire, and police districts.

The system of federalism has many strengths but its fragmented nature of governance between states, counties, cities, and neighborhoods often makes collaboration difficult. It is challenging to get multiple levels of government to agree on and implement plans for any major project. The benefits of such cooperation are comprehensive plans and shared costs by the various levels of governance. Additionally, with collaboration, economies of scale (reduced per unit cost) are more likely to be achieved in large-scale projects.

Cities with successful regional planning include Portland, Oregon; Minneapolis, Minnesota; and Amsterdam, Netherlands. Amsterdam has developed a regional multi-model transportation system and a large-scale smart-city initiative that limits outward growth while improving the infrastructure and livability of the existing urban regions. Urban planners argue that as networked *meta-cities* (see Topic 6.2) of over 20 million people continue to increase around the world, regional planning will be required to improve the connectivity, infrastructure, and livability of these urban giants.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the causes and effects of geographic change within urban areas?*

Causes of Geographic Change in Urban Areas	Effects of Geographic Changes in Urban Areas

KEY TERMS

redlining
racial segregation
blockbusting
ghettos
inclusionary zoning
scattered site
urban renewal
eminent domain
gentrification
informal settlements
land tenure
zones of abandonment
environmental injustice (environmental racism)
gated communities

Challenges of Urban Sustainability

Essential Question: How effective are attempts to address urban sustainability challenges?

Cities are becoming the dominant landscape in the world with more than half of the world's population living in cities. The United Nations predicts that will rise to over two-thirds by 2050. Consequently, the actions of cities are key to living in a more sustainable world. Multiple levels of government will have to work together to deal with the challenges faced by urban areas.

Environmental Problems in Cities

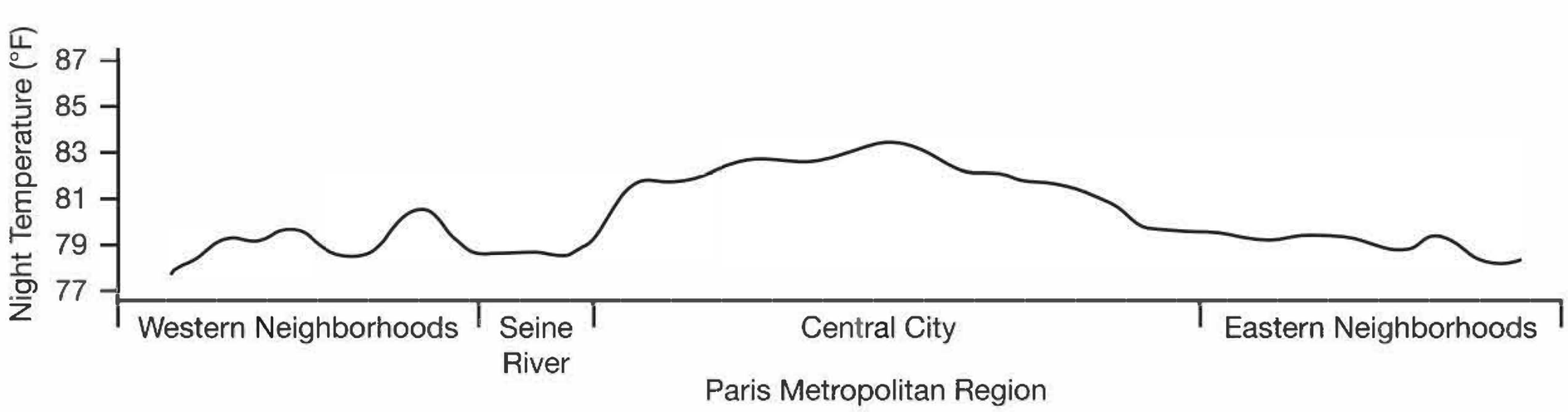
A city and its population affect the environment in many ways. Stresses are placed on nature when people modify the environment and in the way they respond to those changes.

Environmental Effects of Cities

The physical landscape of an urban area affects the natural environment in many ways and often poses challenges to urban sustainability:

- **Urban canyons**, streets lined with tall buildings, can channel and intensify wind and prevent natural sunlight from reaching the ground.
- Soils are compacted and replaced with structures that are impermeable to water, such as buildings, streets, and parking lots. As a result, rainwater runs off instead of soaking into the ground, causing urban flooding.
- Water demand increases as people move to cities, which can strain existing water resources. Water is often diverted from agricultural use to urban use.
- The concentration of buildings and concrete in the center of a city creates an **urban heat island**, an area of a city warmer than surrounding areas.

PARIS AS A HEAT ISLAND



Source: Data is from the Summer of 2003, nasa.gov.

The diagram of Paris shows that the central city is relatively warm. In contrast, the Seine River, which has no buildings, is cooler. In the summer what are the negatives of the urban center being hotter than the surrounding areas?

Cities and Wildlife

Wildlife is also affected by urban areas. Cities destroy animal and plant habitats, redirect or replace natural hydrologic (water) systems such as rivers and lakes, and break up ecosystems. The interruption of continuous ecosystems makes it difficult, if not impossible, for animal species to survive. The animals that survive are often in conflict with humans:

- Native animals such as deer, coyotes, skunks, alligators, bears, cougars, monkeys, and leopards cause problems where cities have invaded or abutted their natural territories.
- **Urban wildlife** such as rats, raccoons, and pigeons can thrive in cities, but they can spread diseases and be a nuisance to people.
- Feral (wild) populations of cats, dogs, snakes, and other former pets that have escaped their human owners or have been abandoned can be dangerous or upset the ecological balance.

Pollution

Rising urbanism also degrades the environment, particularly in less-developed countries that have fewer resources to combat pollution. Industrial and human waste, concentrated in cities will, if untreated, pollute rivers, aquifers, and coastal areas. As countries develop, air pollution increases because of more industrial activity and more emissions from a growing number of cars. Poorer inhabitants in these cities burn charcoal, wood, and kerosene as fuel sources, all of which pollute the air.

In large, urban regions, automobile pollution causes serious concerns. The huge number of commuters to central business districts and surrounding edge cities creates problems beyond congestion. During **rush hour**, the commuting periods in early morning and in late afternoon or early evening when many people travel to and from work, idling cars on roads increase and concentrate air pollutants in the city. The result is smog, a severe issue in large cities such as Los Angeles, Beijing, Delhi, and Mexico City.

Climatic conditions and the physical geography of cities and surrounding areas, such as mountains, can intensify pollution. For example, mountains surround Mexico City, and during temperature inversions (when a layer of hot air sits above cool air), smog is trapped and concentrated close to the ground for days with negative effects on the health of the inhabitants. According to the World Health Organization, air pollution results in three million deaths a year. One-third of those are in China, where coal is widely used in industry and to heat homes.

Urban Sprawl

Before automobiles became popular, cities tended to grow vertically through taller buildings as population expanded. Since the mid-20th century, cities and their related environment—such as roads and commercial developments—have expanded horizontally across the landscape. This rapid spread of development outward from the inner city is called **suburban sprawl**.

In the United States, sprawl is most common in fast-growing areas in the Southeast and West. Urban areas experience sprawl for several reasons:

- the availability of automobiles
- the creation of interstate and other high-speed highways
- the presence of inexpensive land outside the urban area

As a city spreads out it has a greater impact on the environment. More land and energy per capita are needed to maintain a sprawling city as compared to a more compact city design. The physical size of of a city has a direct correlation with an **ecological footprint**, or the impact of human activity on the environment. (See Topic 7.8.)

Responses to Urban Sustainability

Urban systems continue to expand and maintain their position as the dominant location where humans live, work, and play. Therefore, geographers continue to study and propose ideas to respond to the challenges that growing cities create.

Regional Planning and Brownfields

Responses to urban challenges often require a regional planning approach (see Topic 6.10) because urban areas spread across large spaces, include multiple cities, and have wide ranging impacts. Protecting farmland from expanding cities, developing large-scale water and sewage systems, or creating responses to air pollution require collaborative efforts from multiple stakeholders.

On a local scale remediating and redeveloping land is a critical issue for cities. Industry once thrived in central cities of developed countries. Yet new technologies have decreased the need for workers, which weakened the economic strength of many cities. Also, manufacturing moved to the suburbs, where land was cheaper, and to other countries, where labor was less expensive.

Source: Wikimedia Commons

This abandoned automobile factory in Detroit, Michigan, is both a zone of abandonment (see Topic 6.10) and a brownfield. Describe two challenges of using brownfields as sites for redevelopment.

As manufacturing moved away, cities were left with unemployed residents and abandoned factories. Brownfields are visual reminders on the landscape of how the centers of cities have changed over time. A typical **brownfield** consists of dilapidated buildings and polluted or contaminated soils. These are expensive to remove or repair and often remain in cities, devaluing neighboring properties. Brownfields exist in most core countries and in some semiperiphery countries such as China.

If remediated, their locations are increasingly used as redevelopment sites. If the building remains structurally solid, an entrepreneur might renovate it for a new use and keep enough of its exterior so that people know the building's history. People have converted old factories into apartments, restaurants, recreational facilities, and artisan boutiques.

Redevelopment

The process of **urban redevelopment** involves renovating a site within a city by removing the existing landscape and rebuilding from the ground up. The process of urban redevelopment usually begins when a local government declares that an area it wishes to develop is blighted, in a deteriorated condition. Eminent domain laws (see Topic 6.10) allow the government to seize land for public use after paying owners the market value for their property. Cities often use these laws to enable the building of new roads or schools, but they can also sell the land to private groups to build hotels, hospitals, or other developments.

While redevelopment initiatives sometimes replace brownfields or low-quality housing with successful enterprises, critics point out that these efforts can cause problems. They can force poor people to leave their homes and communities. Redevelopment can break up and eliminate historic neighborhoods. Private developers are also sometimes given tax-break incentives to purchase and build. By reducing tax revenues on these projects, the city shifts the tax burden to other taxpayers.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How effective are attempts to address urban sustainability challenges?*

Urban Challenges	Impacts

KEY TERMS

urban canyons
urban heat island
urban wildlife
rush hour
suburban sprawl
ecological footprint
brownfields
urban redevelopment

GEOGRAPHIC PERSPECTIVES: *IS URBAN OR RURAL LIVING MORE SUSTAINABLE?*

Humans who live in cities have an impact on the environment. Geographers have studied whether it is more sustainable to live in a city, suburb, or rural area. Many factors can influence this comparison ranging from level of development, income, consumption, or geographic location.

All three living scenarios modify the natural environment, but agricultural activities use over 50 percent of the habitable land in the world compared to less than 2 percent of the suburban and urban built-up land. In terms of resource consumption, urban areas consume the most resources in absolute value. However, if measured in per capita values, compact cities consume the least per person.

In periphery countries, air pollution is a major problem in both urban and rural areas. In urban areas, air pollution is generated by car emissions, coal, and other fossil fuels. In rural areas, the greatest threat of air pollution comes from using biomass (organic materials) as a fuel source for cooking and heating. In core countries, urban areas do have higher air-pollution rates than rural areas. However, core countries are making efforts to regulate limits on air pollution and use less-polluting sources of energy.

Water quality is usually better in urban and suburban areas of core countries because of better water treatment and purification systems than well water typically used in rural areas. However, rapidly growing urban areas have a difficult time keeping up with water demands and safe drinking water.

The question is complex and difficult to answer, but in general, compact cities in core countries are the most sustainable per capita and sprawling cities are the least sustainable. Rural areas do have a higher per capita ecological footprint, but the food production and energy resource demands placed on rural locations by cities is largely the cause. Most geographers agree that the choices made by rapidly growing cities in the periphery countries will shift the focus of sustainability and the environment in the future.

1. Explain TWO reasons why compact urban areas are more sustainable than suburbs.
2. Explain why farming is essential to maintaining cities.
3. Explain why it is difficult to answer the question: Which is more sustainable, urban or rural living?

THINK AS A GEOGRAPHER: *COMPARING CITIES*

Geographers compare data describing different regions or communities as a way to highlight what makes each place distinctive. Large cities feature diverse populations, including a variety of ethnicities, religions, income levels, forms of entertainment, and health services.

Use the information in this chart to compare life in Philadelphia, Minneapolis, and Orlando and to help you answer the questions below.

COMPARING LIFE IN THREE CITIES

Statistic	Philadelphia	Minneapolis	Orlando
Population: City	1,517,550	382,618	185,951
Population: Metropolitan Statistical Area (MSA)	6,188,463	3,615,902	1,644,561
Median Household Income (Entire MSA)	$47,528	$54,304	$41,871
Murder Rate per 100,000 Population (City Only)	15.9	7.7	5.8
Median Age (City Only)	34.2	31.2	32.9

1. What are the advantages and disadvantages of living in a large metropolitan area?
2. Explain why the MSA population is larger than the population of each city.
3. Describe the scale of the data for Median Age.
4. In which of the major urban areas listed above would you prefer to live? Use the data from the chart to support your answer.

CHAPTER 17 REVIEW:
Urban Challenges and Sustainability

Topics 6.8–6.11

MULTIPLE-CHOICE QUESTIONS

Question 1 refers to the table below.

USE OF PUBLIC TRANSPORTATION			
City	**Metropolitan Area Population**	**Daily Bus Commuters**	**Daily Subway Commuters**
Seoul	25,000,000	4,500,000	5,600,000
New York	20,000,000	2,500,000	3,800,000
Chicago	9,500,000	1,000,000	750,000
Berlin	5,000,000	1,000,000	1,000,000

1. Which generalization comparing the use of urban transportation systems in four cities does the table support?

(A) People in no country have placed much importance on urban public transportation.

(B) Europeans and Asians have placed about the same importance on urban public transportation as have people in the United States.

(C) People in the United States have placed more importance on urban public transportation than have Europeans and Asians.

(D) European and Asian urban transportation systems serve a higher proportion of residents than do systems in the United States.

(E) European and Asian urban transportation systems meet the needs of residents, but systems in the United States fail to do so.

2. Based on current and historical conditions, which would be most likely to help alleviate the problem of food deserts?

(A) Encouraging food trucks that are part of the informal economy to serve food deserts

(B) Encouraging gentrification and building upscale housing in poor neighborhoods

(C) Establishing new farmers markets in the suburban and exurban communities

(D) Opening upscale food stores in neighborhoods that have already gentrified

(E) Opening supermarkets in inner city neighborhoods that have poor public transportation

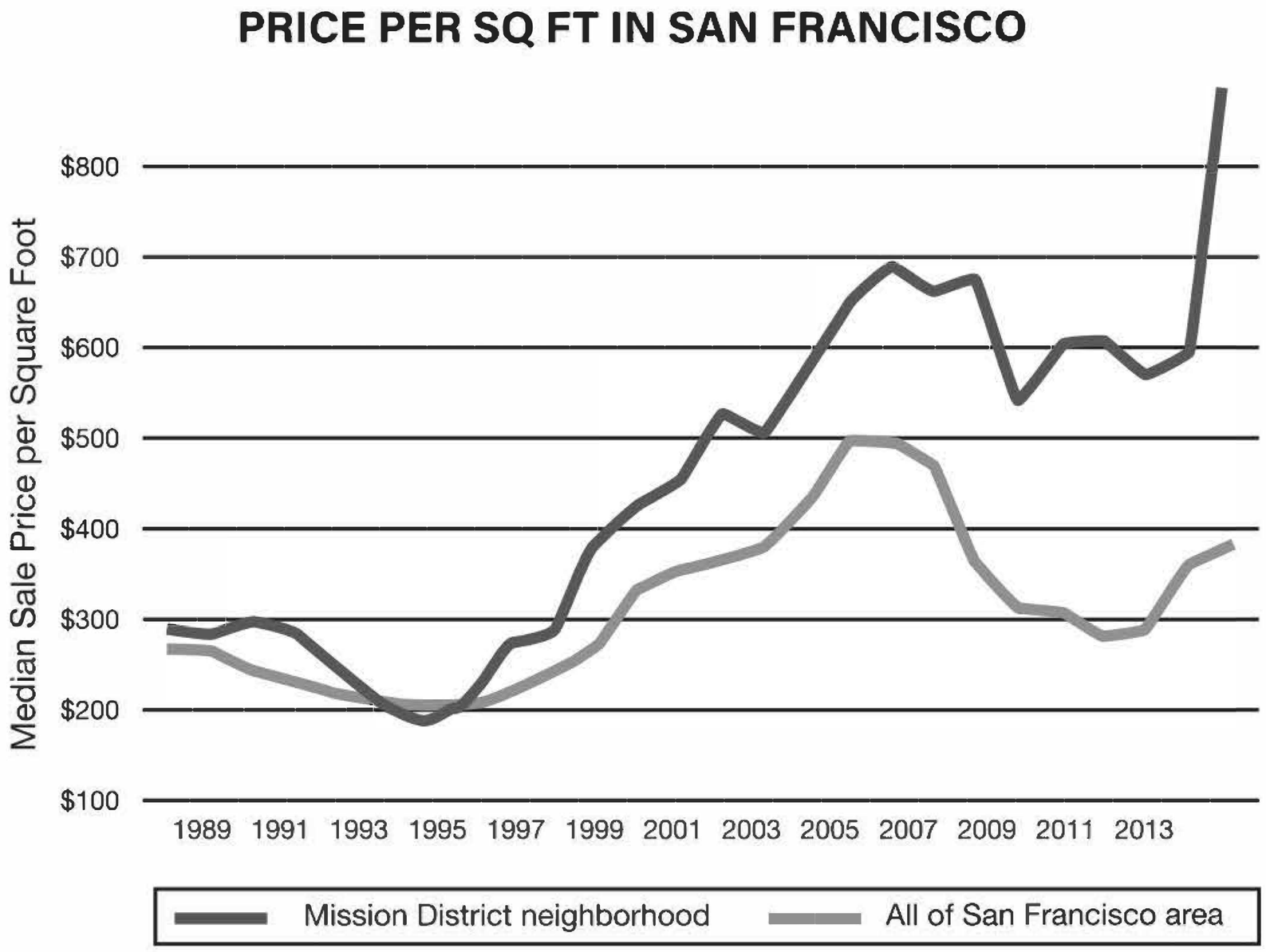
3. Which has been a partially effective response to the problems of public housing?
   (A) Gentrification, because it creates a safer and more diverse community
   (B) Scattered-site housing, because it places families in safer areas with better schools
   (C) Redlining, because it limits bad housing investments in the inner city
   (D) Eminent domain, because it allows government to gain vast urban lands to develop
   (E) Blockbusting, because it makes affordable housing more available

4. Which of the following scenarios is best solved using a regional planning model?
   (A) Redeveloping the buildings of a brownfield
   (B) Deciding to build a new entrance into a mall
   (C) Choosing a location to build a new playground
   (D) Building a new mass transit line
   (E) Choosing where in a CBD to erect a new ten-story office building

5. The revival of downtown nightlife and an increase in street lighting are methods used by city governments primarily to
   (A) deter criminal activity
   (B) generate tax revenue during evening hours
   (C) decrease traffic congestion during the day
   (D) promote new urbanism
   (E) reduce the effects of exurbanization

6. Which activity most directly uses racial prejudice to perpetuate segregation in housing?
   (A) Gentrification by young professionals and suburbanites moving into the inner city
   (B) Leapfrogging over suburbs by developers to expand communities far from the inner city
   (C) Blockbusting by realtors who want to promote movement to the suburbs
   (D) Scattered-site housing by city governments to keep the poor in the city
   (E) Ideas of new urbanism applied by developers who are creating mixed-use neighborhoods

Question 7 refers to the graph below.



7. Which of the following is the most likely impact of the changes in price of the Mission District neighborhood?

(A) Increased poor populations seeking jobs
(B) Increased minority-owned businesses
(C) Decreased young urban professional residents
(D) Increased likelihood of a food desert
(E) Increased number of dog parks and specialty coffee shops

FREE-RESPONSE QUESTION

1. The Brookings Institution, a research organization based in Washington, D.C., issued a report that stated, "Urban areas face daunting economic challenges that have increased in scope in recent years. At the same time, cities provide exciting opportunities for growth and revitalization. The interplay of these challenges and opportunities creates important tasks for policymakers and researchers."

(A) Describe ONE economic problem of urban areas today to which this quotation could refer.

(B) Explain the potential economic benefits when an older, run-down part of a city is redeveloped.

(C) Explain ONE social problem that can occur when an older, run-down part of a city is redeveloped.

(D) Describe the challenges for people who live in an urban food desert.

(E) Explain ONE potential solution to address the challenges of living in an urban food desert that does not involve relocating residents.

(F) Metropolitan areas such as Los Angeles and Chicago are often made up of multiple smaller cities, each with its own local government. Explain the problems this can create related to solving transportation issues within a metro area.

(G) Describe how cities can negatively impact the environment.

UNIT 6 REVIEW:
Connecting Course Skills and Content

APPLYING GEOGRAPHIC SKILLS

Applying geographic skills is critical for success on the AP Exam. For each skill listed write a one-paragraph response that illustrates your understanding of the question. Support your response with specific examples and evidence. Refer to the Unit 1 introduction (pages 3–7) for tips on how to apply geographic skills.

1C Compare the concepts of metacity and world city.

2D Explain a geographic land use similarity and difference between cities in core and periphery countries.

3F Explain the possible limitations of the quantitative demographic data shown in the table in Topic 6.9 (page 423) for solving an issue about locating a playground in a neighborhood.

4E Compare the images of Chicago and favelas in Brazil in Topic 6.5. Describe a pattern that is similar and one that is different between the images.

5B Using Borchert's transportation model in Topic 6.1 and urban models in Topic 6.5, explain how rail transportation influences land use of a city on the local scale and the distribution of cities across a wider regional scale.

WRITE AS A GEOGRAPHER: *GIVE FULL EXPLANATIONS*

Well-written paragraphs usually begin with a topic sentence stating the paragraph's primary claim. The other sentences then provide support for this idea, such as examples, explanations, or applications of a concept.

Below are sets of points that could be used in a paragraph in response to a question about *urban sustainability*. For each set, write a topic sentence for a paragraph that includes a claim and ties the ideas together and relates to *urban sustainability*.

1. Set A
   - a city begins a public service to help residents compost
   - a state provides incentives for consumers to use less electricity
   - a national organization runs public service ads about reducing pollution
   - countries of the world sign an agreement to combat climate change
2. Set B
   - Transit-oriented development (TOD) encourages businesses and residents to locate near mass transit stations.
   - New urbanism encourages compact and walkable mixed-use neighborhoods.
   - Walkable neighborhoods improve the health of residents.
   - Car-dependent cities create a larger ecological footprint.
3. Set C
   - United States: commuting by bike increased by 62 percent between 2000 and 2013
   - Brazil: rainforest loss in 2014 was one-sixth the rate in 2004
   - Germany: production of solar energy increased from 1 percent of all energy production in 2009 to nearly 7 percent in 2015
   - China: efforts to reduce air pollution have begun to show success