



◀ **FIGURE 13-8 UNDERGROUND CBD** Montreal's CBD has an extensive network of underground walkways lined with retail services.

THE UNDERGROUND CBD. A vast underground network exists beneath most CBDs. The typical “underground city” includes garages, loading docks for deliveries to offices and shops, and pipes for water and sewer service. Telephone, electric, TV, and broadband cables run beneath the surface as well because not enough space is available in the CBD for the large number of overhead poles that would be needed for such a dense network, and the wires would be unsightly and hazardous. Subway trains run beneath the streets of large CBDs. And cities in cold-weather climates, such as Minneapolis, Montreal, and Toronto, have built extensive underground pedestrian passages and shops. These underground areas segregate pedestrians from motor vehicles and shield them from harsh winter weather (Figure 13-8).

SKYSCRAPERS. Demand for space in CBDs has also made high-rise structures economically feasible. Downtown skyscrapers give a city one of its most distinctive images and unifying symbols. Suburban houses, shopping malls, and factories look much the same from one city to another, but each city has a unique downtown skyline, resulting from the particular arrangement and architectural styles of its high-rise buildings.

The first skyscrapers were built in Chicago in the 1880s, made possible by several inventions, including the elevator, steel girders, and glass structures because they blocked light and air movement. Artificial lighting, ventilation, central heating, and air-conditioning have helped solve these problems. Most North American and European cities enacted **zoning ordinances** early in the twentieth century in part to control the location and height of skyscrapers.

Skyscrapers are an interesting example of “vertical geography.” The nature of an activity influences which floor it occupies in a typical high-rise:

- Retail services pay high rents for street-level space to entice customers.

- Business services, less dependent on walk-in trade, occupy offices on the middle levels at lower rents.
- Apartments on the upper floors take advantage of lower noise levels and panoramic views.

The one large U.S. CBD without skyscrapers is Washington, D.C., where no building is allowed to be higher than the U.S. Capitol dome. Consequently, offices in downtown Washington rise no more than 13 stories. As a result, the typical Washington office building uses more horizontal space—land area—than in other cities. Thus the city's CBD spreads over a much wider area than those in comparable cities.

Pause and Reflect 13.1.2

The Capitol is the tallest building in the CBD of Washington, D.C. Is Washington's CBD typical of American cities? Why or why not?

CHECK-IN: KEY ISSUE 1

Why Do Services Cluster Downtown?

- ✓ **Business, public, and some consumer services cluster in the CBD.**
- ✓ **The CBD has relatively few manufacturers and residents.**
- ✓ **North American CBDs are characterized by high-rise office buildings, as well as extensive underground services.**
- ✓ **Historic European CBDs have fewer high-rises and more residents and consumer services.**

KEY ISSUE 2

Where Are People Distributed within Urban Areas?

- Models of Urban Structure
- Geographic Application of the Models
- Applying the Models Outside North America

Learning Outcome 13.2.1

Describe the concentric zone, sector, and multiple nuclei models.

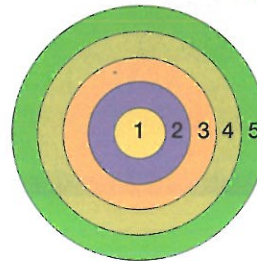
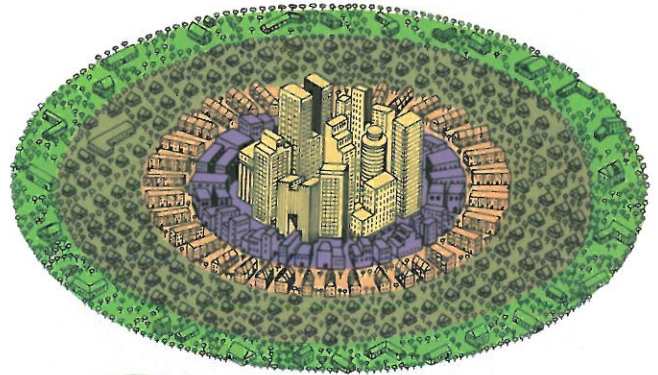
People are not distributed randomly within an urban area. They concentrate in particular neighborhoods, depending on their social characteristics. Geographers describe where people with particular characteristics are likely to live within an urban area, and they offer explanations for why these patterns occur.

Models of Urban Structure

Sociologists, economists, and geographers have developed three models to help explain where different types of people tend to live in an urban area—the concentric zone, sector, and multiple nuclei models. The three models describing the internal social structure of cities were developed in Chicago, a city on a prairie. The three models were later applied to cities elsewhere in the United States and in other countries. Chicago includes a CBD known as the Loop because transportation lines (originally cable cars, now El trains) loop around it. Surrounding the Loop are residential suburbs to the south, west, and north. Except for Lake Michigan to the east, few physical features have interrupted Chicago's growth.

CONCENTRIC ZONE MODEL

The **concentric zone model** was the first model to explain the distribution of different social groups within urban areas (Figure 13-9). It was created in 1923 by sociologist E. W. Burgess. According to the concentric zone model, a city grows outward from a central area in a series of



- | | |
|---|------------------------------------|
| 1 | Central business district |
| 2 | Zone of transition |
| 3 | Zone of independent workers' homes |
| 4 | Zone of better residences |
| 5 | Commuter's zone |

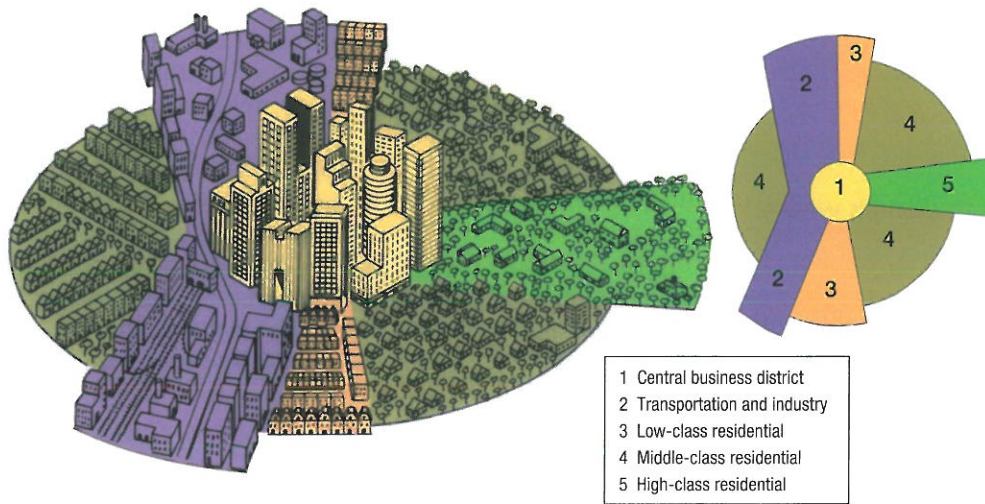
▲ **FIGURE 13-9 CONCENTRIC ZONE MODEL** According to this model, a city grows in a series of rings that surround the central business district.

concentric rings, like the growth rings of a tree. The precise size and width of the rings vary from one city to another, but the same basic types of rings appear in all cities in the same order. Back in the 1920s, Burgess identified five rings:

1. **CBD**, the innermost ring, where nonresidential activities are concentrated.
2. **A zone in transition**, which contains industry and poorer-quality housing. Immigrants to the city first live in this zone in small dwelling units, frequently created by subdividing larger houses into apartments. The zone also contains rooming houses for single individuals.
3. **A zone of working-class homes**, which contains modest older houses occupied by stable, working-class families.
4. **A zone of better residences**, which contains newer and more spacious houses for middle-class families.
5. **A commuters' zone**, beyond the continuous built-up area of the city. Some people who work in the CBD nonetheless choose to live in small villages that have become dormitory towns for commuters.

Pause and Reflect 13.2.1

If you cut down a large tree, the cross-section will appear to be a circle with concentric rings. Which rings of the tree are the newest? Are tree rings a good analogy to the concentric zone model? Why or why not?



▲ **FIGURE 13-10 SECTOR MODEL** According to this model, a city grows in a series of wedges or corridors, which extend out from the central business district.

SECTOR MODEL

A second theory of urban structure, the **sector model**, was developed in 1939 by land economist Homer Hoyt (Figure 13-10). According to Hoyt, a city develops in a series of sectors, not rings. Certain areas of the city are more attractive for various activities, originally because of an environmental factor or even by mere chance. As a city grows, activities expand outward in a wedge, or sector, from the center.

Once a district with high-class housing is established, the most expensive new housing is built on the outer edge of that district, farther out from the center. The best housing is therefore found in a corridor extending from downtown to the outer edge of the city. Industrial and retailing activities develop in other sectors, usually along good transportation lines.

To some extent the sector model is a refinement of the concentric zone model rather than a radical restatement. Hoyt mapped the highest-rent areas for a number of U.S.

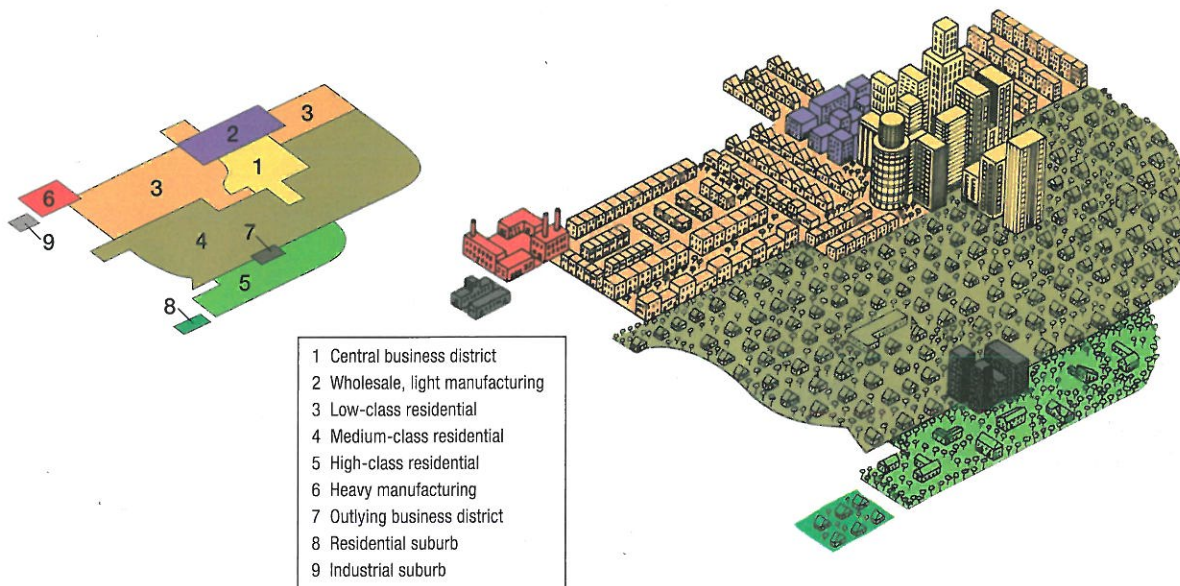
cities at different times and showed that the highest social-class district usually remained in the same sector, although it moved farther out along that sector over time.

Hoyt and Burgess both claimed that social patterns in Chicago supported their model. According to Burgess, Chicago's CBD was surrounded by a series of rings, broken only by Lake Michigan on the east. Hoyt argued that the best housing in Chicago developed north from the CBD along Lake Michigan, whereas industry located along major rail lines and roads to the south, southwest, and northwest.

MULTIPLE NUCLEI MODEL

Geographers C. D. Harris and E. L. Ullman developed the **multiple nuclei model** in 1945. According to the multiple nuclei model, a city is a complex structure that includes more than one center around which activities revolve (Figure 13-11). Examples of these nodes include a port, a neighborhood business center, a university, an airport, and a park.

The multiple nuclei theory states that some activities are attracted to particular nodes, whereas others try to avoid them. For example, a university node may attract well-educated residents, pizzerias, and bookstores, whereas an airport may attract hotels and warehouses. On the other hand, incompatible land-use activities avoid clustering in the same locations. Heavy industry and high-class housing, for example, rarely exist in the same neighborhood.



◀ **FIGURE 13-11 MULTIPLE NUCLEI MODEL** According to this model, a city consists of a collection of individual nodes, or centers, around which different types of people and activities cluster.

Geographic Applications of the Models

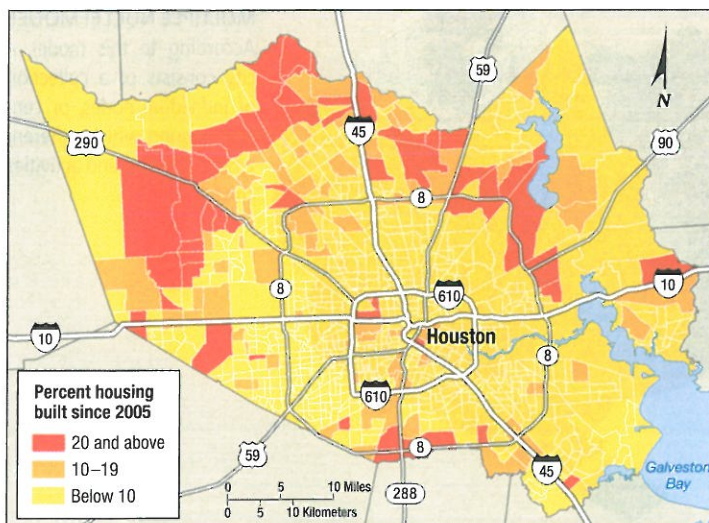
Learning Outcome 13.2.2:

Analyze how the three models help to explain where people live in an urban area.

The three models help us understand where people with different social characteristics tend to live within an urban area. They can also help explain why certain types of people tend to live in particular places. Effective use of the models depends on the availability of data at the scale of individual neighborhoods. In the United States and many other countries, that information comes from the census.

Urban areas in the United States are divided into **census tracts** that each contain approximately 5,000 residents and correspond, where possible, to neighborhood boundaries. Every decade the U.S. Bureau of the Census publishes data summarizing the characteristics of the residents and the housing in each tract. Estimates are also issued annually through the American Fact Finder service of the census's American Community Survey program. Examples of information the census provides include the number of nonwhites, the median income of all families, and the percentage of adults who finished high school. The spatial distribution of any of these social characteristics can be plotted on a map of the community's census tracts. Computers have become invaluable in this task because they permit rapid creation of maps and storage of voluminous data about each census tract. Social scientists can compare the distributions of characteristics and create an overall picture of where various types of people tend to live. This kind of study is known as **social area analysis**.

None of the three models taken individually completely explains why different types of people live in distinctive parts of a city. Critics point out that the models are too simple and fail to consider the variety of reasons

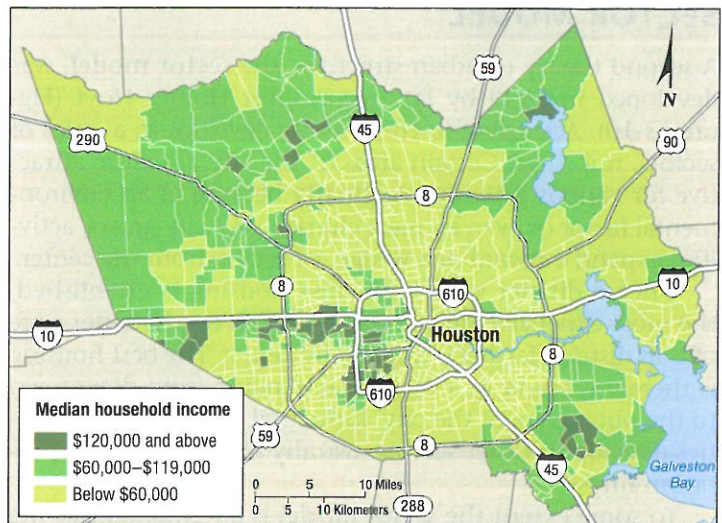


▲ **FIGURE 13-12 CONCENTRIC ZONES IN HOUSTON** Age of housing. Housing is newer in the outer rings of the city than in the inner rings.

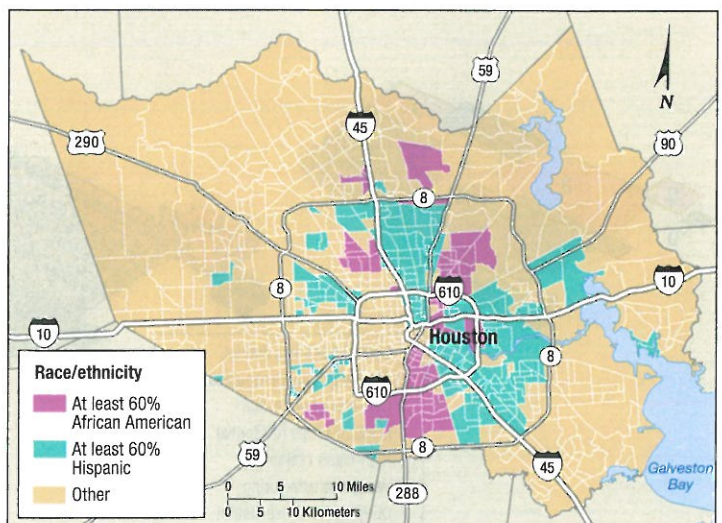
that lead people to select particular residential locations. Because the three models are all based on conditions that existed in U.S. cities between the two world wars, critics also question their relevance to contemporary urban patterns in the United States or in other countries.

But if the models are combined rather than considered independently, they help geographers explain where different types of people live in a city. People tend to reside in certain locations, depending on their particular personal characteristics. This does not mean that everyone with the same characteristics must live in the same neighborhood, but the models say that most people live near others who have similar characteristics:

- **Applying the concentric zone model.** Consider two families with the same income and ethnic background. One family lives in a newly constructed home, whereas the other lives in an older one. The family in the newer house is much more likely to live in an outer ring and the family in the older house in an inner ring (Figure 13-12).



▲ **FIGURE 13-13 SECTOR MODEL IN HOUSTON** Distribution of high-income households. The median household income is the highest in a sector to the west.



▲ **FIGURE 13-14 MULTIPLE NUCLEI MODEL IN HOUSTON** Distribution of minorities. Hispanics occupy nodes to the north and southeast of downtown, and African Americans occupy nodes to the south and northeast.

- **Applying the sector model.** Given two families who own their homes, the family with the higher income will not live in the same sector of the city as the family with the lower income (Figure 13-13).
- **Applying the multiple nuclei model.** People with the same ethnic or racial background are likely to live near each other (Figure 13-14).

Putting the three models together, we can identify, for example, the neighborhood in which a high-income,

Asian American owner-occupant is most likely to live (see the Contemporary Geographic Tools feature).

Pause and Reflect 13.2.2

What are the five most important PRIZM clusters for your zip code? Google Nielsen Claritas PRIZM or go to www.claritas.com/MyBestSegments/Default.jsp?ID=20.

CONTEMPORARY GEOGRAPHIC TOOLS

Market Segmentation: You Are Where You Live

Marketing geographers identify sectors, rings, and nodes that come closest to matching customers preferred by a retailer. Companies use this information to understand, locate, and reach their customers better and to determine where to put new stores and where advertising should appear.

Segmentation is the process of partitioning markets into groups of potential customers with similar needs and characteristics who are likely to exhibit similar purchasing behavior. A prominent example of geographic segmentation is the Potential Rating Index by Zip Market (PRIZM) clusters created by Nielsen Claritas. As Nielsen Claritas states, “birds of a feather flock together”—in other words, a person is likely to live near people who are similar.

Nielsen Claritas combines two types of geographic information: distribution of the social and economic characteristics of people obtained from the census and the addresses of purchasers of various products obtained from service providers. The variables are organized into 66 clusters that are given picturesque names. For each zip code in the United States, Nielsen Claritas determines the five clusters that are most prevalent. Nielsen Claritas calls this analysis “you are where you live.”

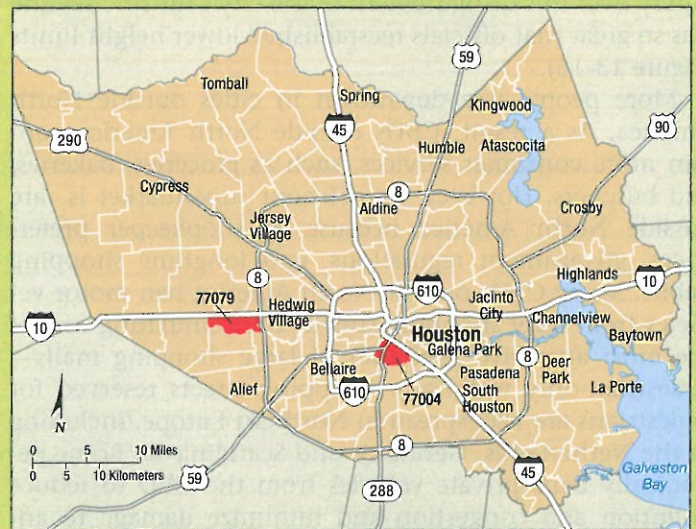
We can compare PRIZM clusters for two zip codes in the Houston area (Figure 13-15). Refer to Figures 13-12, 13-13, and 13-14 to see the close relationship between the Nielsen Claritas PRIZM clusters and the models of urban structure. Zip code 77004 is south of downtown Houston. The five most common clusters (in alphabetical order) are as follows:

- **City Roots:** older low-income ethnic minorities, living in older homes and apartments.
- **Low-Rise Living:** The lowest income of any PRIZM cluster; many are single parents who rent their homes and travel by bus rather than personal car.
- **Multi-Culti Ethnic:** Hispanics with modest incomes.
- **Urban Achievers:** young Hispanics.

- **Urban Elders:** elderly Hispanics.

Compare the above to the five most common PRIZM clusters in zip code 77079 in the western suburbs of Houston:

- **Beltway Boomers:** college-education, affluent, home-owning baby boomers.
- **Executive Suites:** upper-middle class couples with professional jobs.
- **Gray Power:** older couples living in quiet comfort.
- **Pools & Patios:** high-income older couples, with backyard pools.
- **Upper Crust:** very high income couples, especially those with grown children, living an opulent lifestyle.



▲ **FIGURE 13-15 NIELSEN CLARITAS PRIZM CLUSTERS** Zip code 77004, immediately southeast of downtown Houston, is home to a large percentage of older homes occupied by Hispanics with modest incomes. Zip code 77079, in Houston’s western suburbs, contains a large number of high-income, older college-educated couples.

Applying the Models Outside North America

Learning Outcome 13.2.3

Describe how the three models explain patterns in European cities.

The three models may describe the spatial distribution of social classes in the United States, but American urban areas differ from those elsewhere in the world. These differences do not invalidate the models, but they do point out that social groups in other countries may not have the same reasons for selecting particular neighborhoods within their cities.

CBDs IN EUROPE

Compared to CBDs in the United States, those outside North America are less dominated by skyscrapers for business services. The most prominent structures may be public and semipublic services, such as churches and former royal palaces, situated on the most important public squares, at road junctions, or on hilltops. Parks in the center of European cities often were first laid out as private gardens for aristocratic families and later were opened to the public.

European cities display a legacy of low-rise structures and narrow streets, built as long ago as medieval times. Some European cities try to preserve their historic CBDs by limiting high-rise buildings and the number of cars. Several high-rise offices were built for business services in Paris during the 1970s, including Europe's tallest office building (the 210-meter [688-foot] Tour Montparnasse). The public outcry over this disfigurement of the city's historic skyline was so great that officials reestablished lower height limits (Figure 13-16).

More people live downtown in cities outside North America. As a result, CBDs outside North America contain more consumer services, such as groceries, bakeries, and butchers. However, the 24-hour supermarket is rare outside North America because of shopkeeper preferences, government regulations, and longtime shopping habits. Many CBDs outside North America ban motor vehicles from busy shopping streets, thus emulating one of the most attractive attributes of large shopping malls—pedestrian-only walkways. Shopping streets reserved for pedestrians are widespread in Northern Europe, including in the Netherlands, Germany, and Scandinavia. Rome periodically bans private vehicles from the CBD to reduce pollution and congestion and minimize damage to ancient monuments.

Although constructing large new buildings is difficult, many shops and offices still wish to be in the center of European cities. The alternative to new construction is renovation of older buildings. However, renovation is more expensive and does not always produce enough space to meet



▲ **FIGURE 13-16 SKYSCRAPER IN PARIS** The Tour Montparnasse, Europe's tallest building, dominates the skyline of Paris. The image illustrates the allocation of much of the land in a European CBD to public services, including the Ecole Militaire (Military Academy), which takes up the entire foreground, and behind it France's Finance Ministry (left) and the United Nations offices (right).

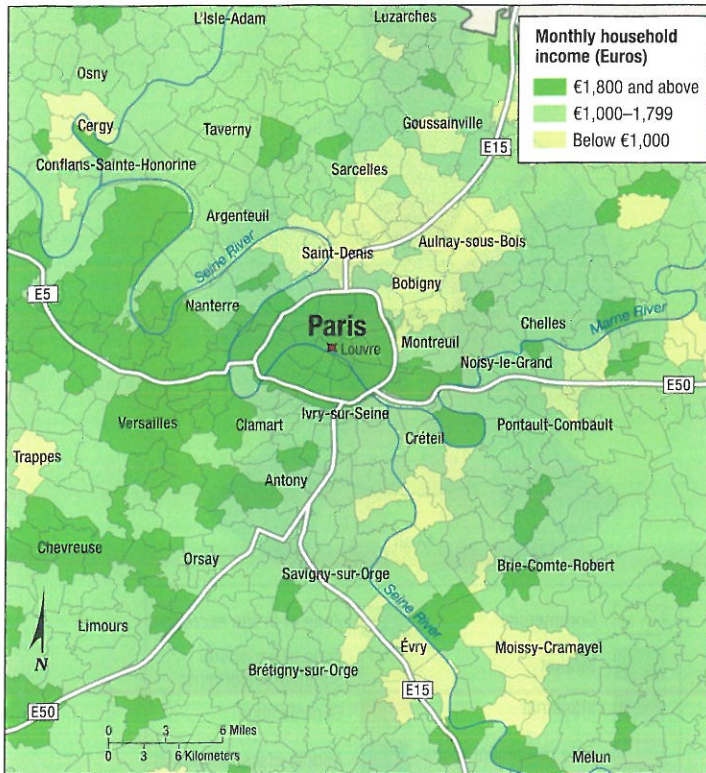
the demand. As a result, rents are much higher in the center of European cities than in U.S. cities of comparable size.

APPLYING THE MODELS IN EUROPE

To some extent, the models look similar in Europe to the way they look in the United States. In Paris, as in U.S. cities, newer housing is in the outer ring, and higher-income people cluster in a sector. These similarities mask important differences.

SECTORS IN EUROPEAN CITIES. In contrast to most U.S. cities, in Europe, wealthy people still live in the inner portions of the upper-class sector, not just in the suburbs. A central location provides proximity to the region's best shops, restaurants, cafés, and cultural facilities. Wealthy people are also attracted by the opportunity to occupy elegant residences in carefully restored, beautiful old buildings (Figure 13-17).

In Paris, for example, the wealthy lived near the royal palace (the Louvre) beginning in the twelfth century and the Palace of Versailles from the sixteenth century until the French Revolution in 1789. The preference of Paris's wealthy to cluster in a southwest sector was reinforced in the nineteenth century during the Industrial Revolution. Factories were built to the south, east, and north, along the Seine and Marne River valleys, and relatively few were built on the southwestern hills. Similar upper-class sectors emerged in the inner areas other European cities, typically on higher elevations and near royal palaces.



▲ **FIGURE 13-17 SECTORS IN PARIS, FRANCE** Wealthier people live in the center and to the southwest sector, often above sidewalk cafés and other consumer services.



CONCENTRIC ZONES IN EUROPEAN CITIES. Unlike in U.S. cities, in European cities such as Paris, most of the newer housing built in the suburbs is high-rise apartment buildings for low-income people and persons of color who have immigrated from Africa or Asia. (see ahead to Figure 13-21)

European officials encouraged the construction of high-density suburbs to help preserve the countryside from development and to avoid the inefficient sprawl that characterizes American suburbs, as discussed in the last section of this chapter. And tourists are attracted to the historic, lively centers of European cities. But these policies have resulted in the clustering of people with social and economic problems in remote suburbs rarely seen by wealthier individuals.

European suburban residents face the prospect of long commutes by public transportation to reach jobs and other downtown amenities. Shops, schools, and other services are worse in the suburbs than in inner neighborhoods; the suburbs are centers for crime, violence, and drug dealing; and people lack the American suburban amenity of large private yards. Many residents of these dreary suburbs are persons of color or recent immigrants from Africa or Asia who face discrimination and prejudice from “native” Europeans.

In the past, low-income people also lived in the center of European cities. Before the invention of electricity

in the nineteenth century, social segregation was vertical: Wealthier people lived on the first or second floors, whereas poorer people occupied the dark, dank basements or climbed many flights of stairs to reach the attics. As the city expanded during the Industrial Revolution, housing for low-income people was constructed in sectors near the factories and away from the wealthy. Today, low-income people are less likely to live in European inner-city neighborhoods. Poor-quality housing has been renovated for wealthy people or demolished and replaced by offices or luxury apartment buildings. Building and zoning codes prohibit anyone from living in basements, and upper floors are attractive to wealthy individuals once elevators are installed.

Pause and Reflect 13.2.3

European cities contain many famous tourist sites, such as the Parthenon in Athens (Figure 12-34) and the Church of the Holy Sepulchre in Jerusalem (Figures 6-14 and 9-48). Are these tourist sites in an inner ring or an outer ring? What do you think explains their location?

APPLYING THE MODELS IN DEVELOPING COUNTRIES

Learning Outcome 13.2.4

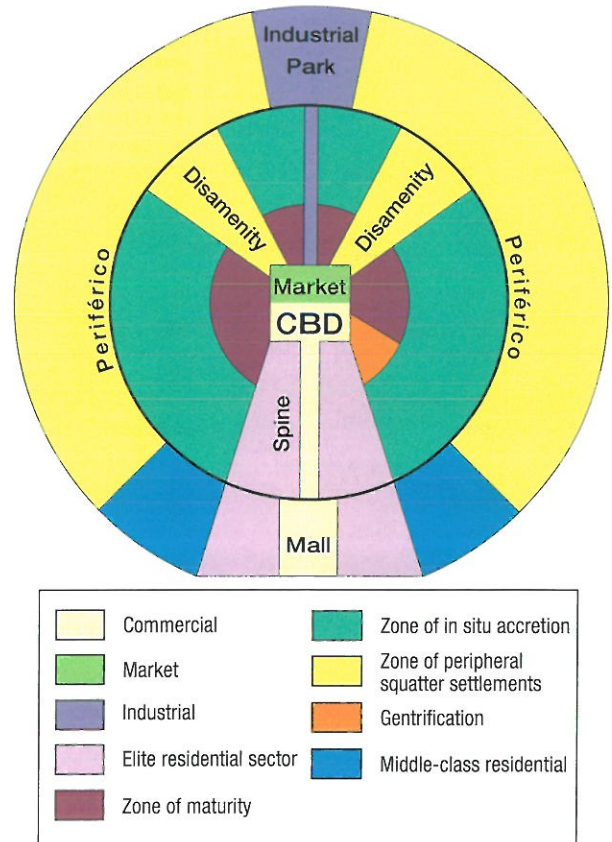
Describe how the three models explain patterns in cities in developing countries.

In developing countries, as in Europe, the poor are accommodated in the suburbs, whereas the wealthy live near the center of a city, as well as in a sector extending from the center.

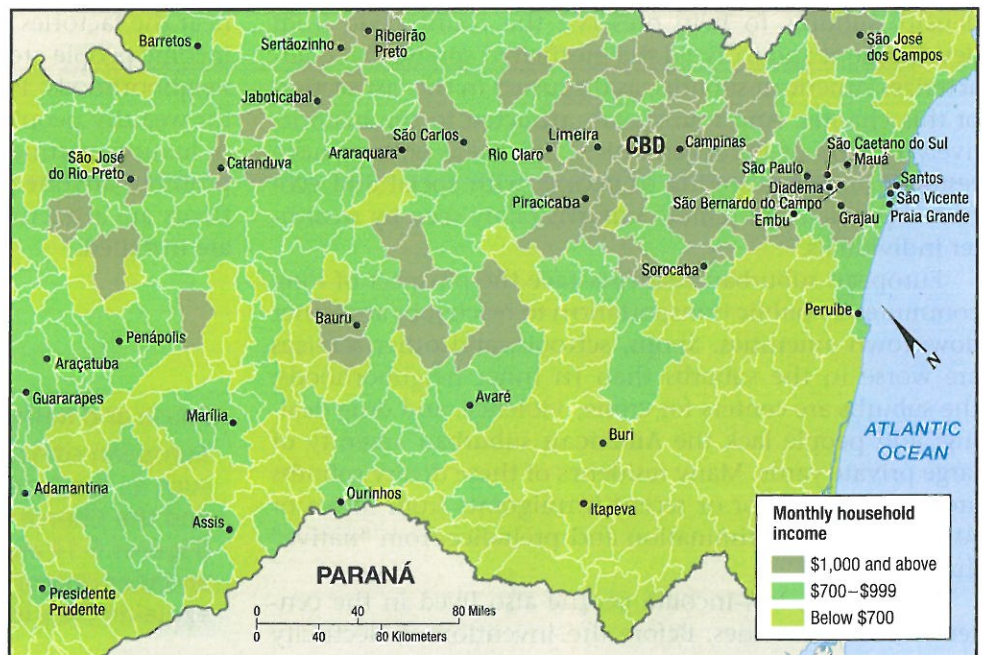
SECTORS IN CITIES OF DEVELOPING COUNTRIES. Geographers Ernest Griffin and Larry Ford show that in Latin American cities, wealthy people push out from the center in a well-defined elite residential sector. The elite sector forms on either side of a narrow spine that contains offices, shops, and amenities attractive to wealthy people, such as restaurants, theaters, parks, and zoos (Figure 13-18). The wealthy are also attracted to the center and spine because services such as water and electricity are more readily available and reliable there than elsewhere (Figure 13-19). Wealthy and middle-class residents avoid living near sectors of “disamenity,” which are land uses that may be noisy or polluting or that cater to low-income residents.

CONCENTRIC ZONES IN CITIES OF DEVELOPING COUNTRIES. Cities in developing countries have zones of the most intensive land uses and highest land values toward the center or along the commercial spine. Surrounding these zones is a ring of less-developed, lower-value land. Within this framework, cities in developing countries are unable to house the rapidly growing number of poor people. Their cities are growing because of overall population increase and migration from rural areas for job opportunities. Because of the housing shortage, a large percentage of poor immigrants to urban areas in developing countries live in squatter settlements.

Squatter settlements are known by a variety of names, including *barriadas* and *favelas* in Latin America, *bidonvilles* in North Africa, *bastees* in India, *gecekonu* in Turkey, *kampongs* in Malaysia, and *barong-barong* in the Philippines. Estimates of the number of people living in squatter settlements vary widely, between 175 million and 1 billion. Squatter settlements have few services because neither the city nor the residents can afford them. The settlements generally lack schools, paved roads, telephones, and sewers. Latrines are usually designated by the settlement’s leaders, and



▲ **FIGURE 13-18 MODEL OF A LATIN AMERICAN CITY** Wealthy people live in the inner city and a sector extending along a commercial spine. (Adapted from Larry R. Ford, “A New and Improved Model of Latin American City Structure,” *Geographical Review* 86 (1996): 438. Used by permission of the publisher.)



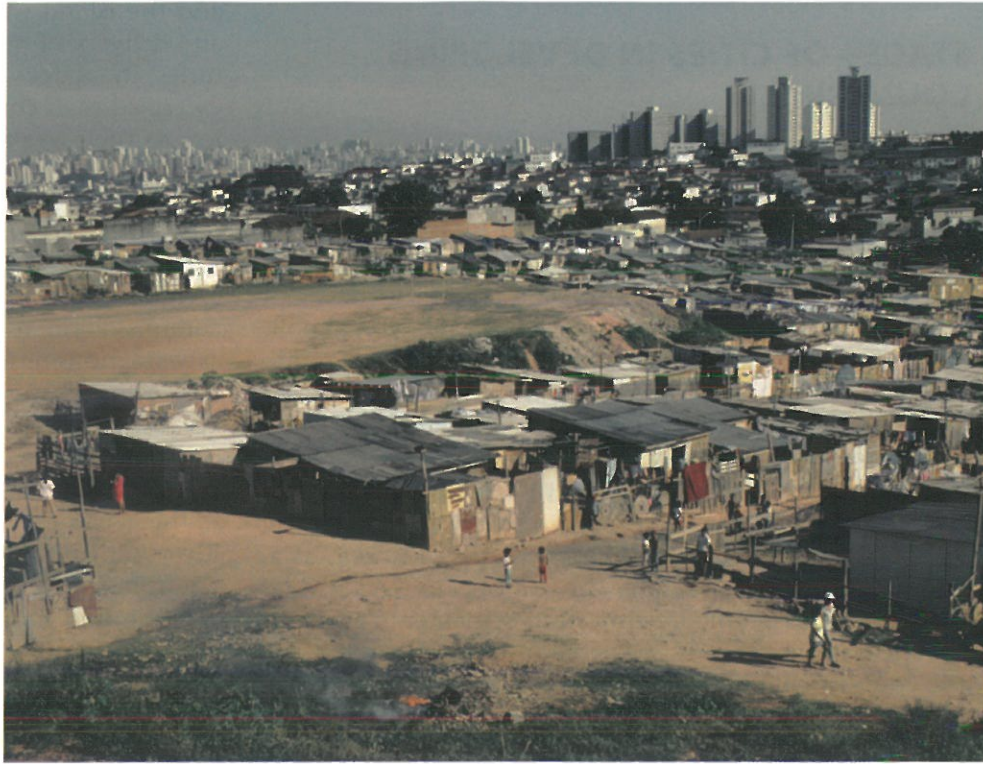
▲ **FIGURE 13-19 SECTORS IN SÃO PAULO** The high-income sector extends south from the CBD to the Atlantic Ocean.

water is carried from a central well or dispensed from a truck. Electricity service may be stolen by running a wire from the nearest power line. In the absence of bus service or available private cars, a resident may have to walk two hours to reach a place of employment (Figure 13-20).

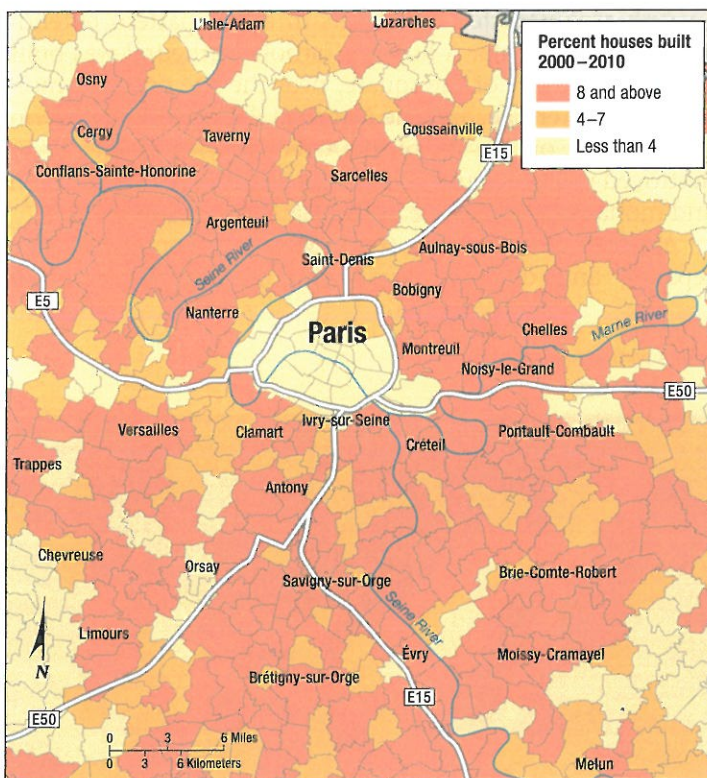
Pause and Reflect 13.2.4

In Google Earth, go to Rua Oscar Freire, São Paulo, Brazil. How does this street in São Paulo's high-income sector compare to the suburban neighborhood in Figure 13-20?

At first, squatters do little more than camp on the land or sleep in the street. In severe weather, they may take shelter in markets and warehouses. Families then erect primitive shelters with scavenged cardboard, wood boxes, sackcloth, and crushed beverage cans. As they find new bits of material, they add them to their shacks. After a few years they may build a tin roof and partition the space into rooms, and the structure acquires a more permanent appearance.



▲ FIGURE 13-20 SQUATTER SETTLEMENT IN SÃO PAULO The *favela* in the foreground is in a suburb, and the high-rises in the background are close to downtown.



▲ FIGURE 13-21 CONCENTRIC ZONES IN PARIS, FRANCE Newer housing is in the outer rings, but much of it is high-rise apartments for poorer people and immigrants.



STAGES OF CITIES IN DEVELOPING COUNTRIES

Learning Outcome 13.2.5

Describe the history of development of cities in developing countries.

The similarity between cities in Europe and in developing countries is not a coincidence: European colonial policies left a heavy mark on cities in developing countries, many of which have passed through three stages of development—pre-European colonization, the European colonial period, and postcolonial independence. Mexico City provides a good example of these three stages.

PRECOLONIAL CITIES. Few cities existed in Africa, Asia, and Latin America before the Europeans established colonies. Most people lived in rural settlements. In Latin America, some cities were located in interior Mexico and the Andean highlands of northwestern South America. In Africa, cities could be found along the western coast, in Egypt's Nile River valley, and in Islamic empires in the north and east (as well as in Southwest Asia). Cities were also built in South and East Asia, especially in India, China, and Japan.

In Mexico, the Aztecs founded Mexico City—which they called Tenochtitlan—on a hill known as Chapultepec (“the hill of the grasshopper”). When forced by other people to leave the hill, they migrated a few kilometers south, near the present-day site of the University of Mexico, and then in 1325 to a marshy 10-square-kilometer (4-square-mile) island in Lake Texcoco (Figure 13-22).

The node of religious life was the Great Temple. Three causeways with drawbridges linked Tenochtitlan to the mainland and also helped control flooding. An aqueduct brought fresh water from Chapultepec. Most food, merchandise, and building materials crossed from the mainland to the island by canoe, barge, or other type of boat,

and the island was laced with canals to facilitate pickup and delivery of people and goods. Over the next two centuries, the Aztecs conquered the neighboring peoples and extended their control through much of present-day Mexico. As their wealth and power grew, Tenochtitlan grew to a population of a half-million.

COLONIAL CITIES. When Europeans gained control of Africa, Asia, and Latin America, they sometimes expanded existing cities to provide colonial services, such as administration, military command, and international trade, as well as housing for European colonists. Sometimes, existing native towns were either left to one side or demolished because they were totally at variance with European ideas.

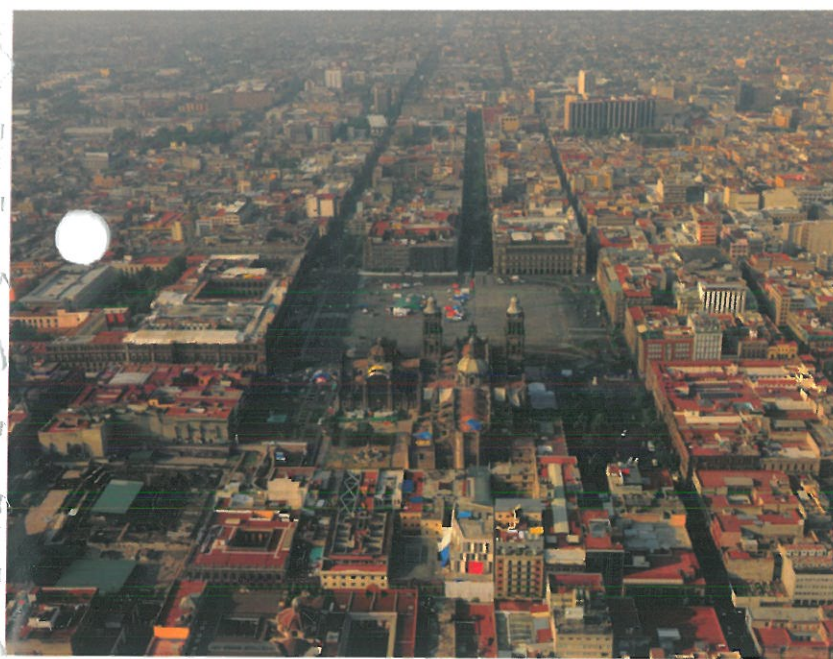
Colonial cities followed standardized plans. All Spanish cities in Latin America, for example, were built according to the Laws of the Indies, drafted in 1573. The laws explicitly outlined how colonial cities were to be constructed—a gridiron street plan centered on a church and central plaza, walls around individual houses, and neighborhoods built around central, smaller plazas with parish churches or monasteries. Compared to the existing cities, these European districts typically contain wider streets and public squares, larger houses surrounded by gardens, and much lower density. In contrast, the old quarters have narrow, winding streets, little open space, and cramped residences.

After the Spanish conquered Tenochtitlan in 1521, after a two-year siege, they destroyed the city and dispersed or killed most of the inhabitants. The city, renamed Mexico City, was rebuilt around a main square, called the Zócalo, in the center of the island, on the site of the Aztecs' sacred precinct. The Spanish reconstructed the streets in a grid pattern extending from the Zócalo. A Roman Catholic cathedral was built on the north side of the square, near the site of the demolished Great Temple, and the National Palace was erected on the east side, on the site of the Aztec emperor Moctezuma's destroyed palace (Figure 13-23). The Spanish placed a church and monastery on the site of the Tlatelolco market.

Another example, Fes (Fez), Morocco, consists of two separate and distinct towns—the precolonial city that

▼ **FIGURE 13-22 PRECOLONIAL MEXICO CITY** (left) The Aztec city of Tenochtitlan was built on an island in Lake Texcoco. (right) The center of the city was dominated by the Templo Mayor. The twin shrines on the top of the temple were dedicated to the Aztec god of rain and agriculture (in blue) and to the Aztec god of war (in red).





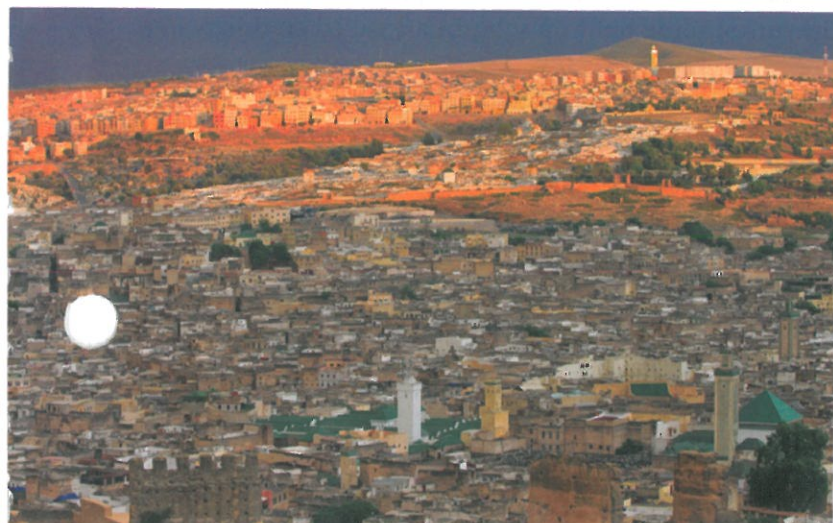
▲ **FIGURE 13-23 COLONIAL MEXICO CITY** The main square in downtown Mexico City, the Zócalo, was laid out by the Spanish. The Metropolitan Cathedral is at the near end of the square. The National Palace is to the left, and City Hall is facing the square. Excavations at the site of the Templo Mayor are in the lower left.

existed before the French gained control and one built by the French colonialists (Figure 13-24). The precolonial Muslim city was laid out surrounding a mosque. The center also had a bazaar, or marketplace, which served as the commercial core. Government buildings and the homes of wealthy families surrounded the mosque and bazaar. Narrow, winding streets led from the core to other quarters. Families with less wealth and lower status located farther from the core, and recent migrants to the city lived on the edge.

Pause and Reflect 13.2.5

In Google Earth, go to Fes, Morocco, and zoom in on the buildings to see the colonial city. Then go to Fes el Bali, Morocco, and zoom in on the buildings to see the precolonial city. How do the buildings differ? Which has the higher density? Which has more trees and green space?

▼ **FIGURE 13-24 FES, MOROCCO** The precolonial part of Fes, in the foreground, is characterized by narrow, winding streets and high density. The tower in the foreground is the Karaouine Mosque. The colonial city laid out by the French is in the background, separate and distinct from the precolonial city.



CITIES SINCE INDEPENDENCE. Following independence, cities have become the focal points of change in developing countries. Millions of people have migrated to the cities in search of work.

In Mexico City, Emperor Maximilian (1864–1867) designed a 14-lane, tree-lined boulevard patterned after the Champs-Élysées in Paris. The boulevard (now known as the Paseo de la Reforma) extended 3 kilometers southwest from the center to Chapultepec (Figure 13-25). The Reforma between downtown and Chapultepec became the spine of an elite sector. During the late nineteenth century, the wealthy built pretentious palacios (palaces) along it. Physical factors also influenced the movement of wealthy people toward the west, along the Reforma. Because elevation was higher than elsewhere in the city, sewage flowed eastward and northward, away from Chapultepec. In 1903, most of Lake Texcoco was drained by a gigantic canal and tunnel project, allowing the city to expand to the north and east. The dried-up lakebed was a less desirable residential location than the west side because prevailing winds from the northeast stirred up dust storms. As Mexico City's population grew rapidly during the twentieth century, the social patterns inherited from the nineteenth century were reinforced.

CHECK-IN: KEY ISSUE 2

Where Are People Distributed Within Urban Areas?

- ✓ According to the concentric zone model, a city grows by adding rings. The outer rings contain the newer housing.
- ✓ According to the sector model, a city grows along corridors. Some sectors contain higher-income households than others.
- ✓ According to the multiple nuclei model, a city grows through a series of nodes. Different ethnicities cluster around individual nodes.
- ✓ The three models show some similarities and some differences in the patterns within cities of North America and other regions.
- ✓ Cities in developing countries are further influenced by colonial history.

▼ **FIGURE 13-25 INDEPENDENT MEXICO CITY** The Paseo de la Reforma, in the heart of the high-income sector, is traffic-free on Sunday mornings.



KEY ISSUE 3

Why Are Urban Areas Expanding?

- Suburban Expansion
- Suburban Segregation
- Urban Transportation

Learning Outcome 13.3.1

State three definitions of urban settlements.

In 1950, only 20 percent of Americans lived in suburbs compared to 40 percent in cities and 40 percent in small towns and rural areas. In 2000, after a half-century of rapid suburban growth, 50 percent of Americans lived in suburbs compared to only 30 percent in cities and 20 percent in small towns and rural areas.

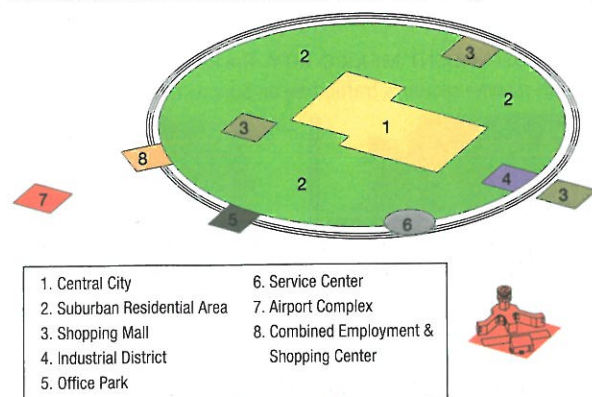
Suburban Expansion

Until recently in the United States, as cities grew, they expanded by adding peripheral land. Now cities are surrounded by a collection of suburban jurisdictions whose residents prefer to remain legally independent of the large city.

THE PERIPHERAL MODEL

North American urban areas follow what Chauncey Harris (one of the creators of the multiple nuclei model) called the **peripheral model**. According to the peripheral model, an urban area consists of an inner city surrounded by large

▼ **FIGURE 13-26 PERIPHERAL MODEL OF URBAN AREAS** The central city is surrounded by a beltway or ring road. Around the beltway are suburban residential areas and nodes, or edge cities, where consumer and business services and manufacturing cluster. (Adapted from Chauncey D. Harris, "The Nature of Cities and Urban Geography in the Last Half Century." Reprinted with permission from *Urban Geography*, vol. 18, no. 1 (1997), p. 17. © V. H. Winston & Son, Inc., 360 South Ocean Blvd., Palm Beach, FL 33480. All rights reserved.)



suburban residential and business areas tied together by a beltway or ring road (Figure 13-26). Peripheral areas lack the severe physical, social, and economic problems of inner-city neighborhoods. But the peripheral model points to problems of sprawl and segregation that characterize many suburbs.

Around the beltway are nodes of consumer and business services called *edge cities*. Edge cities originated as suburban residences for people who worked in the central city, and then shopping malls were built to be near the residents. Now edge cities contain manufacturing centers spread out over a single story for more efficient operations and office parks where producer services cluster. Specialized nodes emerge in the edge cities—for example, a collection of hotels and warehouses around an airport, a large theme park, a distribution center near the junction of the beltway, and a major long-distance interstate highway.

DEFINING URBAN SETTLEMENTS

Several definitions have been created to characterize cities and their suburbs:

- A city is a legal entity.
- An urban area is a continuously built-up area.
- A metropolitan area is a functional area.

LEGAL DEFINITION OF CITY. The term *city* defines an urban settlement that has been legally incorporated into an independent, self-governing unit (Figure 13-27). In the United States, a city surrounded by suburbs is sometimes called a central city.

Virtually all countries have a local government system that recognizes cities as legal entities with fixed boundaries. A city has locally elected officials, the ability to raise taxes, and responsibility for providing essential services. The boundaries of the city define the geographic area within which the local government has legal authority.

Population has declined since 1950 by more than one-half in the central cities of Buffalo, Cleveland, Detroit, Pittsburgh, and St. Louis, and by at least one-third in more than a dozen other cities. The number of tax-paying middle-class families and industries has invariably declined by much higher percentages in these cities.

URBAN AREA. In the United States, the central city and the surrounding built-up suburbs are called an urban area.

