

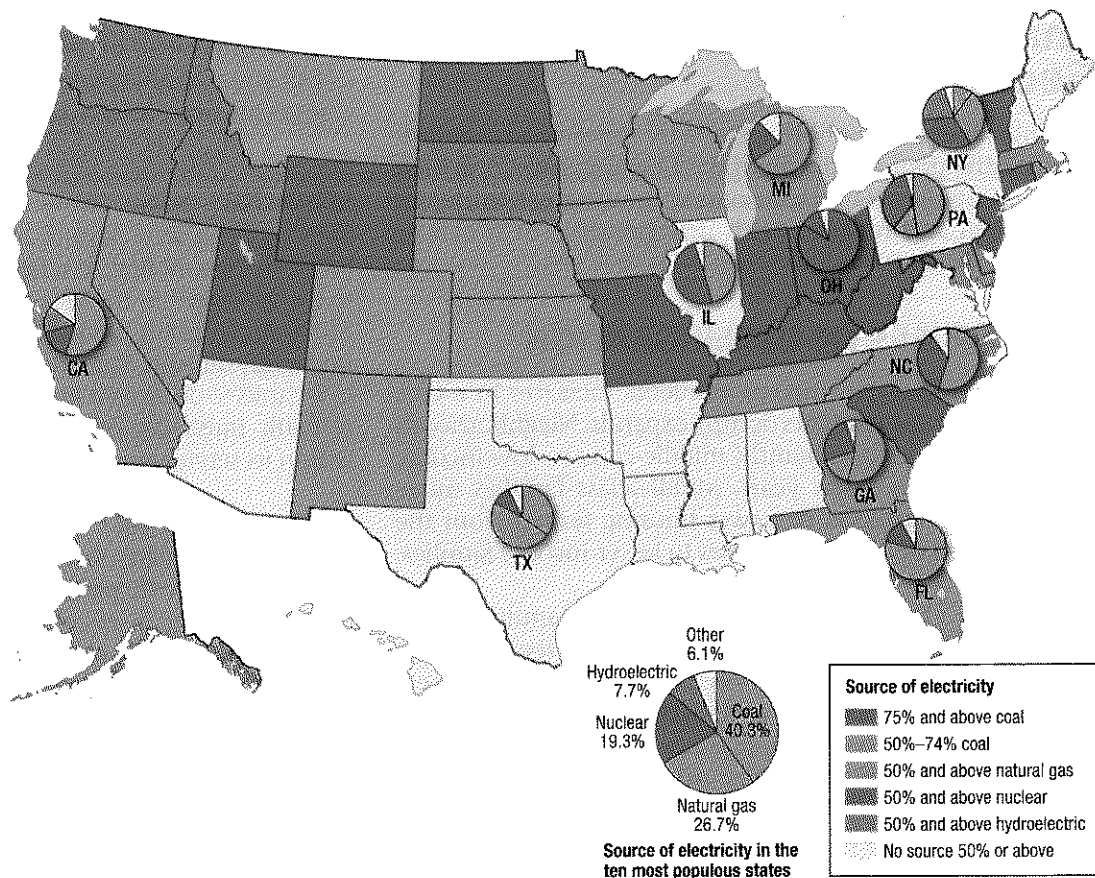
**HYDROGEN FUEL CELL.** Hydrogen forced through a PEM (polymer electrolyte membrane or proton exchange membrane) combines with oxygen from the air, producing an electric charge. The electricity can then be used to power an electric motor. Fuel cells are now widely used in small vehicles such as forklifts. Fuel cell vehicles are being used in a handful of large East Coast and West Coast cities, where hydrogen fueling stations have been constructed.

### Pause and Reflect 13.3.7

Which alternative-fuel vehicles appear most likely to be successful at reducing dependency on fossil fuels? Which appear most successful at improving air pollution?

**REGIONAL VARIATIONS IN ELECTRICITY.** Electric-powered vehicles require recharging by being plugged into a source of electricity such as an outlet in the garage that ultimately comes from a power plant. Though fossil fuel is not being pumped directly into the tank of the electric-powered vehicle, fossil fuel is consumed to generate the electricity at the power plant. In fact, the United States as a whole generates around 40 percent of its electricity from coal-burning power plants and around 25 percent from natural gas. An electric vehicle does reduce consumption of an increasingly scarce and expensive resource—petroleum. But if the electricity is generated by natural gas, then plugging a vehicle into the electric grid may conserve petroleum at the expense of more rapid depletion of natural gas. If electricity is generated by coal, a plug-in may cause more air pollution.

Electricity is generated differently across the 50 U.S. states. In the Pacific Northwest, where hydroelectric is the leading source of electricity, recharging electric vehicles will have much less impact on air quality than will be the case in the Midwest (Figure 13-41). States that depend on farm production may benefit from increased use of ethanol. Thus, the “greenest” alternative varies by location.



▲ FIGURE 13-41 ELECTRICITY BY U.S. STATE Dependency on nonrenewable and polluting fossil fuels to generate electricity varies widely among states.

## KEY ISSUE 4

## Why Do Cities Face Challenges?

- Changing Urban Physical Geography
- Changing Urban Social Geography
- Urban Economic Geography Challenges

### Learning Outcome 13.4.1

Describe the processes of deterioration and gentrification in cities.

Most of the land in urban settlements is devoted to housing, where people live. Within U.S. urban areas, the most fundamental spatial distinction is between inner-city residential neighborhoods that surround the CBD and suburban residential neighborhoods on the periphery. Inner cities in the United States contain concentrations of low-income people who face a variety of physical, social, and economic problems very different from those faced by suburban residents.

## Changing Urban Physical Geography

The major physical problem faced by inner-city neighborhoods is the poor condition of the housing, most of which was built before 1940. Deteriorated housing can either be demolished and replaced with new housing, or it can be rehabilitated.

### THE PROCESS OF DETERIORATION

As the number of low-income residents increases in a city, the territory these residents occupy expands. Neighborhoods can shift from predominantly middle-class to low-income occupants within a few years. Middle-class families move out of a neighborhood to newer housing farther from the center and sell or rent their houses to lower-income families.

**FILTERING.** Large houses built by wealthy families in the nineteenth century are subdivided by absentee landlords into smaller dwellings for low-income families. This process of subdivision of houses and occupancy by successive waves of lower-income people is known as **filtering**.

Like a car, clothing, or any other object, the better a house is maintained, the longer it will last. Landlords stop maintaining houses when the rent they collect becomes less than the maintenance cost. In such a case, the building soon deteriorates and grows unfit for occupancy. Not even the poorest families will rent the dwelling. At this point in the

filtering process, the owner may abandon the property because the rents that can be collected are less than the costs of taxes and upkeep. Cities have codes that require owners to maintain houses in good condition. But governments that aggressively go after landlords to repair deteriorated properties may in fact hasten abandonment because landlords will not spend money on repairs that they are unable to recoup in rents. Thousands of vacant houses stand in the inner areas of U.S. cities because the landlords have abandoned them.

Detroit, which declined from 1.8 million inhabitants in 1950 to 700,000 in 2010, is trying to figure out how to shut down and close off entire neighborhoods. The city cannot afford to pay for street lights, garbage pickup, and police protection for the entire 360 square kilometers (139 square miles). So it is encouraging the handful of people still living in the most sparsely inhabited neighborhoods to move to other ones.

One hundred years ago, low-income inner-city neighborhoods in the United States teemed with throngs of recent immigrants from Europe. Such neighborhoods that housed perhaps 100,000 a century ago contain fewer than 5,000 inhabitants today. Schools and shops close because they are no longer needed in inner-city neighborhoods with rapidly declining populations. Through the filtering process, many low-income families have moved to less deteriorated houses farther from the center.

### Pause and Reflect 13.4.1

Between 50 and 100 square kilometers (20 and 40 square miles) of Detroit's 360 square kilometers (139 square miles) are estimated to be vacant. For what purpose might all that vacant land be used?

**REDLINING.** Some banks have engaged in **redlining**—drawing lines on a map to identify areas in which they will refuse to loan money. As a result of redlining, families who try to fix up houses in the area have difficulty borrowing money. Although redlining is illegal, enforcement of laws against it is frequently difficult. The Community Reinvestment Act requires U.S. banks to document by census tract where they make loans. A bank must demonstrate that inner-city neighborhoods within its service area receive a fair share of its loans.

**PUBLIC HOUSING.** During the mid-twentieth century, many substandard inner-city houses were demolished and replaced with **public housing**. In the United States, public housing is reserved for low-income households, who must pay 30 percent of their income for rent. A housing authority, established by the local government, manages the buildings, and the federal government pays the cost of construction and the maintenance, repair, and management that are not covered by rent. In other countries, local governments or nonprofit organization such as charitable groups build and own much of the housing, aided by subsidies from the national government.

Most of the high-rise public-housing projects built in the United States and Europe during the mid-twentieth



▲ **FIGURE 13-41 PUBLIC HOUSING** One of the most notorious public housing projects, Pruitt-Igoe in St. Louis, was constructed during the 1950s and demolished during the 1970s.

century are now considered unsatisfactory environments for families with children. The elevators are frequently broken, juveniles terrorize other people in the hallways, and drug use and crime rates are high. Some observers claim that the high-rise buildings were responsible for the problem because too many low-income families were concentrated into a high-density environment. Because of poor conditions, high-rise public-housing projects have been demolished in many U.S. and European cities (Figure 13-42).

The U.S. government has stopped funding construction of new public housing. A federal program known as Hope VI supports renovation of older public housing, and the Housing Choice Voucher Program helps low-income households pay their rent in private housing. With the overall level of funding much lower, the supply of public housing and other government-subsidized housing in the United States diminished by approximately 1 million units between 1980 and 2000. But during the same period, the number of households that needed low-rent dwellings increased by more than 2 million.

In Britain, the supply of public housing, known as social housing (formerly council estates), has also declined because the government has forced local authorities to sell some of the dwellings to the residents. The British also expanded subsidies to nonprofit housing associations that build housing for groups with special needs, including single mothers, immigrants, disabled people, and elderly people, as well as the poor.

## GENTRIFICATION

An alternative to demolishing deteriorated inner-city houses is to renovate them. **Gentrification** is the process by which middle-class people move into deteriorated inner-city neighborhoods and renovate the housing. Most cities have at least one substantially renovated inner-city

neighborhood where middle-class people live. In a few cases, inner-city neighborhoods never deteriorated because the community's social elite maintained them as enclaves of expensive property. In most cases, inner-city neighborhoods have only recently been renovated by the city and by private investors.

Middle-class families are attracted to deteriorated inner-city neighborhoods for several reasons:

- The houses may be larger and more substantially constructed yet less expensive than houses in the suburbs.
- Houses may possess attractive architectural details, such as ornate fireplaces, cornices, high ceilings, and wood trim.
- For people who work downtown, inner-city living eliminates the strain of commuting on crowded freeways or public transit.
- The neighborhoods are near theaters, bars, restaurants, stadiums, and other cultural and recreational facilities.
- Single people and couples without children are not concerned with the quality of inner-city schools.

Because renovating an old inner-city house can be nearly as expensive as buying a new one in the suburbs, cities encourage the process by providing low-cost loans and tax breaks. Public expenditures for renovation have been criticized as subsidies for the middle class at the expense of people with lower incomes, who are forced to move out of the gentrified neighborhoods because the rents in the area suddenly become too high for them (Figure 13-43). Cities try to reduce the hardship on poor families forced to move. U.S. law requires that they be reimbursed both for moving expenses and for rent increases over a four-year period. Western European countries have similar laws. Cities are also renovating old houses specifically for lower-income families through public housing or other programs. By renting renovated houses, a city also helps to disperse low-income families throughout the city instead of concentrating them in large inner-city public-housing projects.

▼ **FIGURE 13-43 GENTRIFICATION** New York's Soho neighborhood gentrified during the late twentieth century.



## Changing Urban Social Geography

### Learning Outcome 13.4.2

Explain the problems of a permanent underclass and culture of poverty in cities.

Beyond the pockets of gentrified neighborhoods, inner cities contain primarily people with low incomes who face a variety of social problems. Inner-city residents constitute a permanent underclass who live in a culture of poverty.

### UNDERCLASS

Inner-city residents are frequently referred to as a permanent **underclass** because they are trapped in an unending cycle of economic and social problems. The underclass suffers from relatively high rates of unemployment, alcoholism, drug addiction, illiteracy, juvenile delinquency, and crime.

The children of the underclass attend deteriorated schools, and affordable housing is increasingly difficult to find. Their neighborhoods lack adequate police and fire protection, shops, hospitals, clinics, and other health-care facilities. The future is especially bleak for the underclass because they are increasingly unable to compete for jobs. Inner-city residents lack the technical skills needed for most jobs because fewer than half complete high school. Despite the importance of education in obtaining employment, many in the underclass live in an atmosphere that ignores good learning habits, such as regular school attendance and completion of homework. The gap between skills demanded by employers and the training possessed by inner-city residents is widening. In the past, people with limited education could become factory workers or filing clerks, but today these jobs require skills in computing and handling electronics. Meanwhile, inner-city residents do not even have access to the remaining low-skilled jobs, such as custodial and fast-food service jobs, because these jobs are increasingly in the distant suburbs.

Some of the underclass are homeless, sleeping in doorways, on heated street grates, and in bus and subway stations (Figure 13-44). The official U.S. government count in 2011 was 636,000 homeless people on any given night. The figure is much higher when it includes people who are sleeping in a car or on a friend's sofa. Most people are homeless because they cannot afford housing and lack a regular source of income. Homelessness may have been sparked by family problems, job loss, or mental illness. Single men constitute two-fifths of the homeless, and the remainder are women and children. Homelessness is an even more serious problem in developing countries. Several hundred thousand people in Kolkata (Calcutta), India, sleep, bathe, and eat on sidewalks and traffic islands.

### Pause and Reflect 13.4.2

How might the severe recession that started in 2008 have affected the number of homeless people? Why might the number have changed?

### CULTURE OF POVERTY

Inner-city residents are trapped as a permanent underclass because they live in a culture of poverty. Unwed mothers give birth to three-fourths of the babies in U.S. inner-city neighborhoods, and three-fourths of children in the inner city live with only one parent. Because of inadequate child-care services, single mothers may be forced to choose between working to generate income and staying at home to take care of the children.

In principle, government officials would like to see more fathers living with their wives and children, but they provide little incentive for them to do so. Only a small percentage of “deadbeat dads” are tracked down for failing to provide required child-care support. If the husband moves back home, his wife may lose welfare benefits, leaving the couple financially worse off together than apart.

Trapped in a hopeless environment, some inner-city residents turn to drugs. Although drug use is a problem in both the suburbs and rural areas, rates of use in recent years have increased most rapidly in the inner cities. Some drug users obtain money through criminal activities. Gangs form in inner-city neighborhoods to control lucrative drug distribution. Violence erupts when two gangs fight over the boundaries between their drug distribution areas. Most of the murders in Houston in 2011 occurred in low-income minority areas, and most victims, as well as those arrested for murder in Houston, were minorities (refer ahead to Figure 13-47).

Many neighborhoods in the United States are segregated by ethnicity, as discussed in Chapter 7. African

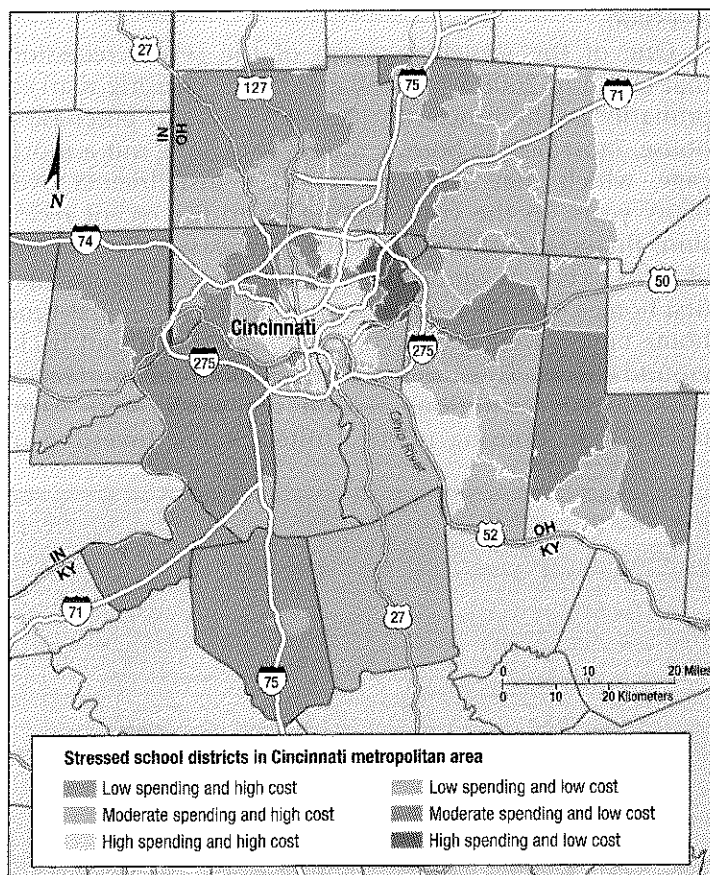
▼ **FIGURE 13-44 HOMELESS** Homeless people live under the I-75 bridge that spans the Ohio River in Cincinnati.



Americans and Hispanics concentrate in one or two large continuous areas of the inner city, whereas whites live in suburbs. Even small cities display strong social distinctions among neighborhoods. A frequently noticed division is between the east and west sides of a city, or between the north and south sides, with one side attracting the higher-income residents and the other left to lower-status and minority families. A family seeking a new residence usually considers only a handful of districts, where the residents' social and financial characteristics match their own. Residential areas designed for wealthy families are developed in scenic, attractive areas, possibly on a hillside or near a water body, whereas flat, dull land closer to industry becomes built up with cheaper housing.

## SUBURBAN STRESS

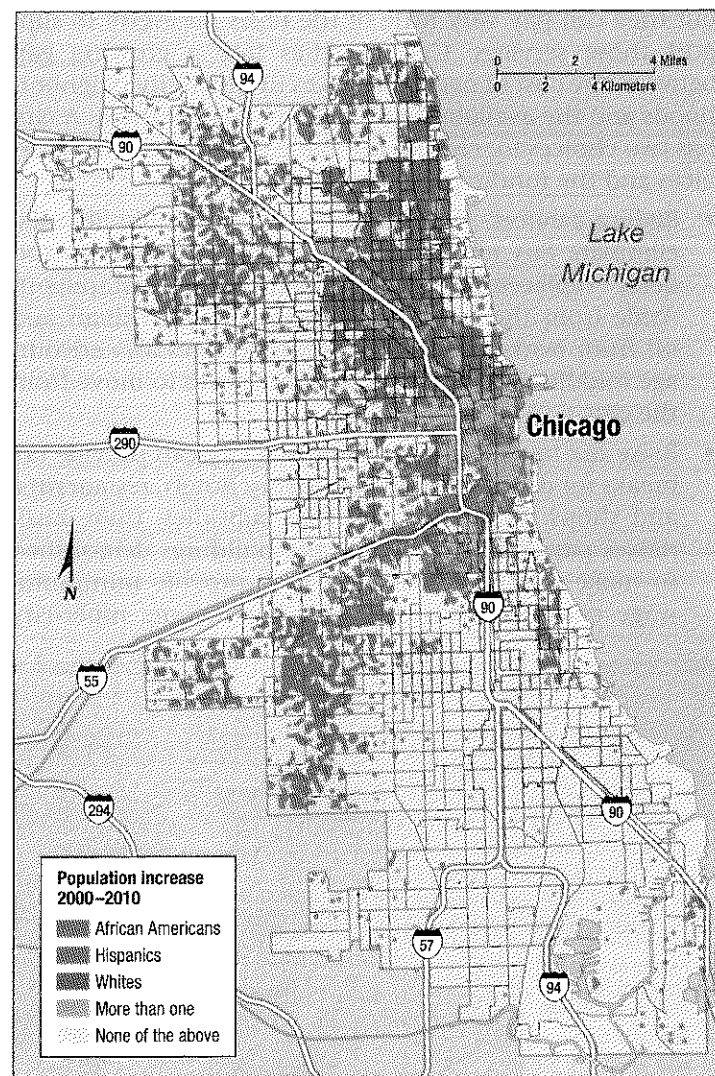
In some metropolitan areas, the inner-city social problems described above are spreading to older suburbs immediately adjacent to the city (Figure 13-45). As portions of



▲ **FIGURE 13-45 SUBURBAN STRESS** In the Cincinnati MSA, the school districts considered high stress are mostly in the suburbs. A high-cost school district has either a rapidly growing or declining enrollment or else a large percentage of students eligible for a free lunch program because of low income.

the inner city are transformed into vibrant communities for higher-income people, inner suburbs become home to lower-income people displaced from gentrifying urban neighborhoods. Meanwhile, middle-class residents move from inner suburbs to newer homes on the periphery. Thus, the inner suburbs are unable to generate revenue to provide for the needs of a poorer population.

In cities where gentrification is especially strong, ethnic patterns are being altered. In Chicago, for example, the white population is increasing in inner-city neighborhoods and declining in the outer-city neighborhoods (Figure 13-46). Conversely, the population of Hispanics is declining in the inner city and increasing in neighborhoods farther from the center.



▲ **FIGURE 13-46 RACIAL CHANGE IN CHICAGO** In Chicago, Hispanics are moving toward the suburbs, whereas whites are moving back into the city, specifically the North Side, where attractive neighborhoods are clustered.

## Urban Economic Geography Challenges

### Learning Outcome 13.4.3

Describe the difficulties that cities face in paying for services, especially in a recession.

The concentration of low-income residents in inner-city neighborhoods of central cities has produced financial problems. The severe recession in recent years has aggravated those problems.

### THE ERODING TAX BASE

Low-income inner-city residents require public services, but they can pay very little of the taxes necessary to support those services. Central cities face a growing gap between the cost of needed services in inner-city neighborhoods and the availability of funds to pay for them. A city has two choices for closing the gap between the cost of services and the funding available from taxes:

- **Reduce services.** For example, a city can close libraries, eliminate bus routes, collect trash less frequently, and delay replacement of outdated school equipment. Aside from the hardship imposed on individuals laid off from work, cutbacks in public services also encourage middle-class residents and industries to move from the city.
- **Raise tax revenues.** For example, a city can provide tax breaks for downtown offices, luxury hotels, restaurants, and shops. Even with generous subsidies, these businesses pay more taxes than the buildings demolished to make way for them, and they provide minimum-wage personal-service jobs for low-income inner-city

residents. But spending public money to increase the downtown tax base can take scarce funds away from projects in inner-city neighborhoods, such as subsidized housing and playgrounds.

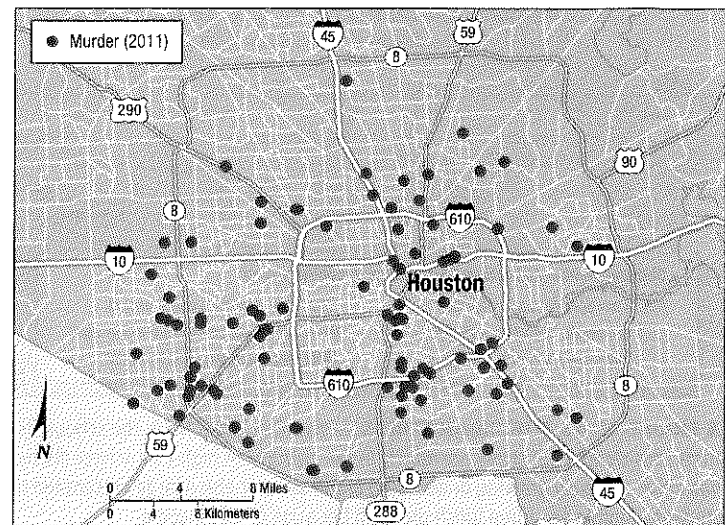
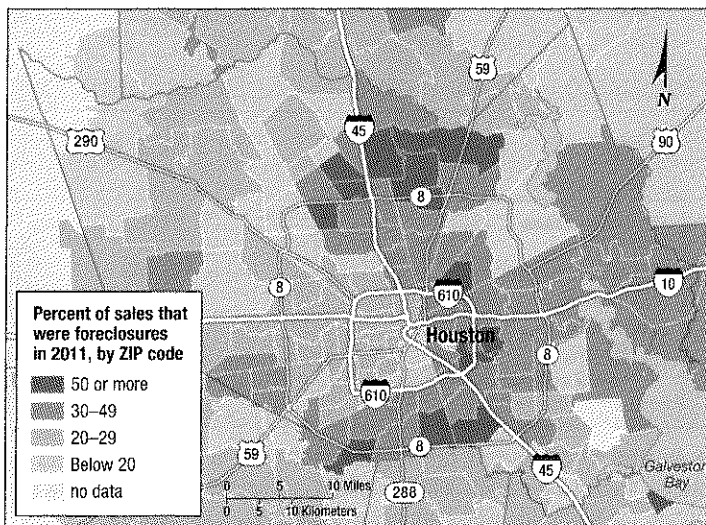
During the mid-twentieth century, inner-city fiscal problems were alleviated by increasing contributions from the federal government. The percentage of the budgets of the 50 largest U.S. cities supplied by the federal government increased from 1 percent in 1950 to 18 percent in 1980. But the percentage shrank substantially afterward, to 6 percent in 1990 and 2000. When adjusted for inflation, federal aid to U.S. cities has declined by two-thirds since the 1980s. To offset a portion of these lost federal funds, some state governments have increased financial assistance to cities.

### THE IMPACT OF THE RECESSION

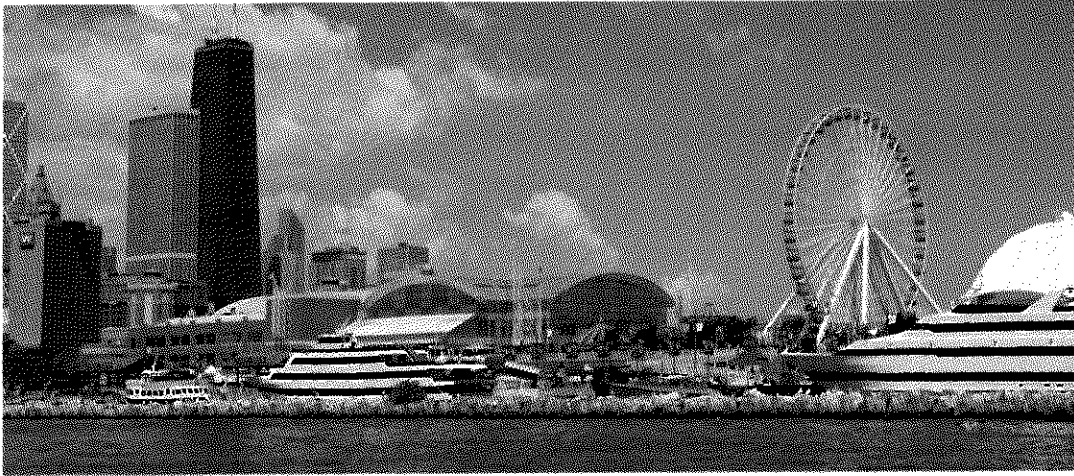
The impact of the severe recession that began in 2008 lingers for many cities. While some sectors of the economy recovered relatively quickly, the financial condition of local governments remains poor for many years following a severe recession.

One of the principal causes of the severe recession that began in 2008 was a collapse in the housing market, primarily in the inner city (Figure 13-47). To purchase a house, most people borrow money by taking out a mortgage, which they repay in monthly installments over many years. In the years leading up to the recent recession, financial institutions sharply increased the number of loans to low-income inner-city households buying their first homes. Despite having poor credit histories, first-time home buyers were approved for mortgages without background checks. These were known as subprime mortgages.

Financial institutions around the world were eager to invest in housing in the United States. Investing in



▲ **FIGURE 13-47 FORECLOSURES AND MURDERS IN HOUSTON** (left) Most of the foreclosures were in areas with high percentages of minorities. (right) Most of the murders in Houston occurred in low-income minority areas, and most victims as well as those arrested for murder in Houston were minorities. Compare with maps of Houston's social areas (Figures 13-12, 13-13, and 13-14).



◀ **FIGURE 13-48 CENTRAL CITY REVIVAL** Chicago's Navy Pier combines retail and leisure services on a former cargo dock.

housing was viewed as providing a higher rate of return at a lower risk than other investment options. Investors reasoned that their loans were safe: House prices had increased rapidly for many years, so even if a few home owners defaulted on their mortgages, investors would still recoup their investment. Inner-city residents were especially targeted for subprime mortgages. As the concentric zone model shows (see Figures 13-9 and 13-12), inner-city residents are more likely to be renters and therefore represent the best opportunity for financial institutions to increase the number of home owners.

When people are unable to repay their loans, lenders can take over the property in what is called a *foreclosure*. In the first year of the recession, 10 percent of all Americans with mortgages were behind in their mortgage payments or were already in foreclosure. Compounding the problem, house prices have fallen in the United States and other developed countries since their peak in 2006. With falling house prices, houses are worth less than in earlier years. In many cases, the amount of the mortgage exceeded the value of the house once prices had fallen (see Figure 9-61).

## REVIVING CONSUMER SERVICES IN THE CBD

Some retailing is thriving in CBDs if it is combined with leisure activities. People are willing to make a special trip to a specific destination downtown for unusual shops in a dramatic setting, perhaps a central atrium with a fountain or a view of a harbor. Several North American CBDs have combined new retail services with leisure services:

- Boston has Faneuil Hall Marketplace, which is located in renovated eighteenth-century buildings.
- Baltimore has Harbor Place, which is built in the Inner Harbor, adjacent to waterfront museums, tourist attractions, hotels, and cultural facilities.
- Chicago has Navy Pier, a former cargo dock, which was converted to shops and attractions (Figure 13-48).
- New York has the South Street Seaport, which integrates the old fish market with retailing and recreational activities.

- San Francisco has the Ferry Building, which is a gourmet food center where San Francisco Bay ferries dock.

These downtown malls attract suburban shoppers as well as out-of-town tourists because in addition to shops, they offer unique recreation and entertainment experiences.

Some CBDs have restored their food markets, with individual stalls operated by different merchants. They may have a high range because they attract customers who willingly travel far to find more exotic or higher-quality products. At the same time, inner-city residents may use these markets for their weekly grocery shopping. The challenges of buying food in some urban areas are discussed in the Sustainability and Inequality in Our Global Village feature.

### Pause and Reflect 13.4.3

**Compare Houston's distributions of murders and foreclosures (Figure 13-47). In what ways are the two distributions similar and different?**

### CHECK-IN: KEY ISSUE 4

#### Why Do Cities Face Challenges?

- ✓ **Neighborhoods in many cities are suffering from physical deterioration as a result of filtering and redlining.**
- ✓ **Cities have large numbers of underclass people who live in a culture of poverty characterized by high rates of unemployment, crime, and substance abuse.**
- ✓ **Cities face economic difficulties that force a choice between raising taxes and reducing services to those in need.**

# Summary

## KEY ISSUE 1

### Why Do Services Cluster Downtown?

Services, especially public and business services, cluster in the CBD; some consumer services, especially leisure, are in the CBD.

**LEARNING OUTCOME 13.1.1:** Describe the three types of services found in a CBD.

- The CBD contains a large percentage of an urban area's public, business, and consumer services.
- Offices cluster in the CBD to take advantage of its accessibility.
- Retail services, as well as manufacturers and residents, are less likely than in the past to be in the CBD.

**LEARNING OUTCOME 13.1.2:** Explain the three-dimensional nature of a CBD.

- A CBD is characterized by an extensive underground city of services and utilities, as well as high-rise buildings.
- Outside North America, CBDs may have more consumer services and fewer high-rise offices.

**THINKING GEOGRAPHICALLY 13.1:** Compare the CBDs of Toronto and Detroit. What might account for the differences?

**GOOGLE EARTH 13.1:** The tallest structure in the CBD of Ghent, Belgium, is Saint Bavo Cathedral, built in the sixteenth century. Fly to Saint Bavo Cathedral, Bisdomein 1-3, Ghent, Belgium, drag to enter street view, exit street view, turn on 3D, exit street view, and zoom out so that the entire cathedral and its surroundings can be seen. What other buildings are highlighted in 3D in the CBD of Ghent?



## Key Terms

**Annexation** (p. 480) Legally adding land area to a city in the United States.

**Census tract** (p. 468) An area delineated by the U.S. Bureau of the Census for which statistics are published; in urban areas, census tracts correspond roughly to neighborhoods.

**Central business district (CBD)** (p. 461) The area of a city where retail and office activities are clustered.

**City** (p. 476) An urban settlement that has been legally incorporated into an independent, self-governing unit.

**Combined statistical area (CSA)** (p. 477) In the United States, two or more contiguous core-based statistical areas tied together by commuting patterns.

**Concentric zone model** (p. 466) A model of the internal structure of cities in which social groups are spatially arranged in a series of rings.

**Core based statistical area (CBSA)** (p. 477) In the United States, the combination of all metropolitan statistical areas and micropolitan statistical areas.

**Council of government** (p. 479) A cooperative agency consisting of representatives of local governments in a metropolitan area in the United States.

**Density gradient** (p. 480) The change in density in an urban area from the center to the periphery.

**Edge city** (p. 482) A large node of office and retail activities on the edge of an urban area.



## KEY ISSUE 2

### Where Are People Distributed Within Urban Areas?

Three models help to explain where different groups of people live within urban areas.

**LEARNING OUTCOME 13.2.1:** Describe the concentric zone, sector, and multiple nuclei models.

- According to the concentric zone model, a city grows outward in rings.
- According to the sector model, a city grows along transportation corridors.
- According to the multiple nuclei model, a city grows around several nodes.

**LEARNING OUTCOME 13.2.2:** Analyze how the three models help to explain where people live in an urban area.

- According to the concentric zone model, housing is newer in outer rings than in inner rings.
- According to the sector model, wealthier people live in different corridors than do poorer people.
- According to the multiple nuclei model, different ethnic groups cluster around various nodes.

**LEARNING OUTCOME 13.2.3:** Describe how the three models explain patterns in European cities.

- In other countries, wealthier people live in different sectors than poorer people, and outer rings have newer housing.
- In cities outside North America, lower-income people are more likely to live in outer rings.

**LEARNING OUTCOME 13.2.4:** Describe how the three models explain patterns in cities in developing countries.

**LEARNING OUTCOME 13.2.5:** Describe the history of development of cities in developing countries.

- Many cities in developing countries were shaped by colonial powers.
- Since gaining their independence, developing countries have seen cities grow rapidly.

**THINKING GEOGRAPHICALLY 13.2:** Officials of rapidly growing cities in developing countries discourage the building of houses that do not meet international standards for sanitation and construction methods. Also discouraged are privately owned transportation services because the vehicles generally lack decent tires, brakes, and other safety features. Yet the residents prefer substandard housing to no housing, and they prefer unsafe transportation to no transportation. What would be the advantages and problems for a city if health and safety standards for housing, transportation, and other services were relaxed?



**GOOGLE EARTH 13.2:** Sectors, nodes, and rings can be seen in a Google Earth image of Chicago. North is to the right in the image. The large white structure along the lakefront is McCormick Place convention center. Is this an example of a sector, node, or ring? The series of large buildings along the river to the top left and top right are factories and warehouses. Are these examples of sectors, nodes, or rings? The structures to the far left and far right of the image are houses, whereas the buildings closer to the CBD are apartment towers. Are these examples of sectors, nodes, or rings?

**Filtering** (p. 490) A process of change in the use of a house, from single-family owner occupancy to abandonment.

**Food desert** (p. 464) An area in a developed country where healthy food is difficult to obtain.

**Gentrification** (p. 491) A process of converting an urban neighborhood from a predominantly low-income, renter-occupied area to a predominantly middle-class, owner-occupied area.

**Greenbelt** (p. 481) A ring of land maintained as parks, agriculture, or other types of open space to limit the sprawl of an urban area.

**Megalopolis** (p. 478) A continuous urban complex in the northeastern United States.

**Multiple nuclei model** (p. 467) A model of the internal structure of cities in which social groups are arranged around a collection of nodes of activities.

## KEY ISSUE 3

### Why Are Urban Areas Expanding?

Urban growth has been primarily focused on suburbs that surround older cities.

**LEARNING OUTCOME 13.3.1:** State three definitions of urban settlements.

- A city is a legally incorporated entity that encompasses the older portion of the urban area.
- An urban area includes the city and built-up suburbs.
- A metropolitan area includes the city, built-up suburbs, and counties that are tied to the city.

**LEARNING OUTCOME 13.3.2:** Describe how metropolitan areas contain many local governments and overlap with each other.

- In some regions, adjacent metropolitan areas overlap with each, creating large contiguous urban complexes.
- The United States has nearly 90,000 local governments, making it difficult to address urban problems.

**LEARNING OUTCOME 13.3.3:** Identify historical and contemporary patterns of suburban expansion.

- In the past, cities expanded their land area to encompass outlying areas, but now they are surrounded by independent suburban jurisdictions.
- Suburban sprawl has been documented to be costly.

**LEARNING OUTCOME 13.3.4:** Explain two ways in which suburbs are segregated.

- Suburbs are segregated according to social class and land uses.

**LEARNING OUTCOME 13.3.5:** Describe the impact of motor vehicles in urban areas.

- Motor vehicles take up a lot of space in cities, including streets, freeways, and parking areas.
- Some cities control the number of vehicles that can enter the center of the city.

**LEARNING OUTCOME 13.3.6:** State benefits and limitations of public transportation.

- Public transit, such as subways and buses, are more suited than private cars to move large numbers of people into and out of the CBD.
- New investment in public transit has occurred in a number of U.S. cities, though less extensively than in other countries.

**LEARNING OUTCOME 13.3.7:** Describe recent and possible future improvements in vehicles.

- Vehicles that are more fuel efficient and less polluting are likely to become more widely available in the future.

**THINKING GEOGRAPHICALLY 13.3:** Draw a sketch of your community or neighborhood. In accordance with Kevin Lynch's *The Image of the City*, place five types of information on the map: districts (homogeneous areas), edges (boundaries that separate districts), paths (lines of communication), nodes (central points of interaction), and landmarks (prominent objects on the landscape). How clear an image does your community have for you?

**GOOGLE EARTH 13.3:** Public transit in Brussels. A #7 tram enters a tunnel near Diamant station. Is this an example of light rail or heavy rail?



**Peripheral model** (p. 476) A model of North American urban areas consisting of an inner city surrounded by large suburban residential and business areas tied together by a beltway or ring road.

**Primary census statistical area (PCSA)** (p. 477) In the United States, all of the combined statistical areas plus all of the remaining metropolitan statistical areas and micropolitan statistical areas.

**Public housing** (p. 490) Housing owned by the government; in the United States, it is rented to residents with low incomes, and the rents are set at 30 percent of the families' incomes.

**Redlining** (p. 490) A process by which banks draw lines on a map and refuse to lend money to purchase or improve property within the boundaries.

**Rush hour** (p. 486) The four consecutive 15-minute periods in the morning and evening with the heaviest volumes of traffic.

**Sector model** (p. 467) A model of the internal structure of cities in which social groups are arranged around a series of sectors, or wedges, radiating out from the central business district.

**Smart growth** (p. 481) Legislation and regulations to limit suburban sprawl and preserve farmland.

**Social area analysis** (p. 468) Statistical analysis used to identify where people of similar living standards, ethnic background, and lifestyle live within an urban area.

**Sprawl** (p. 480) Development of new housing sites at relatively low density and at locations that are not contiguous to the existing built-up area.

**Squatter settlement** (p. 472) An area within a city in a less developed country in which people illegally establish residences on land they do not own or rent and erect homemade structures.

## KEY ISSUE 4

### Why Do Cities Face Challenges?

Cities face physical, social, and economic difficulties, but some improvements have also occurred.

**LEARNING OUTCOME 13.4.1:** Describe the processes of deterioration and gentrification in cities.

- The older housing in the inner city can deteriorate through processes of filtering and redlining.
- Massive public housing projects were once constructed for poor people, but many of them have been demolished.
- Some cities have experienced gentrification, in which higher-income people move in and renovate previously deteriorated neighborhoods.

**LEARNING OUTCOME 13.4.2:** Explain the problems of a permanent underclass and culture of poverty in cities.

- Inner cities have concentrations of very poor people, considered to belong to an underclass, some of whom are homeless.
- A culture of poverty traps some poor people in the inner cities.

**LEARNING OUTCOME 13.4.3:** Describe the difficulties that cities face in paying for services, especially in a recession.

- Cities are faced with the choice of reducing services or raising taxes to pay for needed services.
- The severe recession that started in 2008 continues to hurt the economic condition of cities.
- Some cities have seen a revival of retail services downtown.

**THINKING GEOGRAPHICALLY 13.4:** Jane Jacobs wrote in *Death and Life of Great American Cities* that an attractive urban environment is one that is animated with an intermingling of a variety of people and activities, such as found in many New York City neighborhoods. What are the attractions and drawbacks to living in such environments?

**GOOGLE EARTH 13.4:** City meets country in the United Kingdom. Harlow, a New Town built primarily during the 1950s and 1960s, shows the sharp boundary between a high-density residential suburb and the countryside. How does this landscape differ from the outer edge of a typical U.S. suburb?



**Underclass** (p. 492) A group in society prevented from participating in the material benefits of a more developed society because of a variety of social and economic characteristics.

**Urban area** (p. 477) A dense core of census tracts, densely settled suburbs, and low-density land that links the dense suburbs with the core.

**Urban cluster** (p. 477) In the United States, an urban area with between 2,500 and 50,000 inhabitants.

**Urbanized area** (p. 477) In the United States, an urban area with at least 50,000 inhabitants.

**Zoning ordinance** (p. 465) A law that limits the permitted uses of land and maximum density of development in a community.

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## CAREERS IN GEOGRAPHY

**W**here do you see yourself working in 5 or 10 years after graduation? You could be a retail geographer, analyzing customer behavior for a major department store. You could conduct research on land cover, vegetation structure, and snow cover in Alaska. You could be a social science analyst, evaluating redistricting plans to ensure that they do not disenfranchise voters. Or you could lead a team of experts at one of the world's largest retailers in specific dimensions of sustainable business practices.

What do all these careers have in common? In each case, enterprising individuals have found creative ways to apply the core concepts and skills of geography. An increasing number of students recognize that geographic education is practical as well as stimulating. Employment opportunities are expanding for students trained in geography, especially in geospatial technologies, teaching, government service, and business.

### Geospatial Technologies

In the past 20 years, the field of geospatial technologies has been making rapid advances, thanks to developments in computer software, computer science, and geographic information systems (GIS), including remote-sensing technologies. Today jobs that make use of geospatial technologies and GIS can be found in such private and public sector areas as environmental consulting, software development, air navigation services, spatial database management for mapping companies (Figure A-1), location analysis for retail businesses



▲ FIGURE AF-1 GOOGLE EARTH A Google Earth image of Paris is displayed on a wall-sized monitor in Google's Berlin, Germany, office.

and real estate, corporate transportation and logistics departments, criminology, archaeology, resource management, and infrastructure management, to name just a few.

### Teaching

More than 100 universities in the United States and Canada offer doctorate or master's degrees in geography. A career as a geography teacher is promising because schools throughout North America are expanding their geography curriculum. Educators increasingly recognize geography's role in teaching students about global diversity (Figure AF-2). AP Human Geography is the fastest-growing AP discipline in U.S. high schools.

Some university geography departments have emphasized outstanding teaching, whereas others are concerned primarily with scholarship and research. The Association of American Geographers includes several dozen specialty groups, organized around research themes, including agricultural, industrial, medical, and transportation geography.

### Government Service

Geographers contribute their knowledge of the location of activities, the patterns underlying the distribution of various activities, and the interpretation of data from maps and satellite imagery to local, state, and national governments. Employment opportunities with cities, states, provinces, and other units of local government are typically found in departments of planning, transportation, parks and recreation, economic development, housing, zoning, or other similarly titled government agencies. Geographers may be hired to conduct studies of local economic, social, and physical patterns; to prepare information through maps and reports; and to help plan the community's future.

Many federal government agencies also employ geographers:

- The Department of Agriculture hires geographers for the Forest Service and Natural Resources Conservation Service to enhance environmental quality.
- The Department of Commerce hires geographers for the Bureau of the Census to study changing population trends and for the Economic Development Administration to promote rural development.
- The Department of Defense hires geographers for the Defense Intelligence Agency and the