CHAPTER 25      SUSTAINABLE CITIES

Objectives

1. List five worldwide trends in population distribution. Describe the three major shifts in population distribution in U.S. history. Summarize the factors that contribute to urban growth.

2. List and briefly describe three models of urban structure.

3. Summarize the following urban environmental problems: vegetation, water runoff and flooding, heat islands and dust domes, solid-waste disposal, air pollution, noise pollution, human health, land conversion, and social disruption. List three ways that urban areas positively affect the environment.

4. List the pros and cons of the major urban transportation options: individual transit (walking, biking, and motorized vehicles) and mass transit (rail systems and buses). List three policies that contribute to a positive feedback loop creating more dependence on automobiles. Describe three policies that would create negative feedback loops.

5. Differentiate between conventional and ecological land-use planning. List two means by which local governments can control the rate of development. Summarize obstacles to more ecological land-use planning.

6. Summarize urban maintenance and repair problems.

7. Identify one positive loop that tends to harm urban areas. Briefly consider ways to counteract that loop.

8. List five approaches to improving urban life. Choose one case study from your textbook. Evaluate how far your chosen urban area has come in implementing these five approaches.

Key Terms

ecocities (green cities) (p. 563)  urban heat island (p. 569)  geographic information system (GIS) (p. 576)
built-it-yourself system (p. 564)  light pollution (p. 570)  smart growth (p. 577)
natural increase (p. 564)  slums (p. 570)  new urbanism (p. 577)
immigration (p. 564)  squatter settlements (p. 570)  fundamental land (p. 577)
push factors (p. 564)  shantytowns (p. 570)  urban growth boundary (p. 578)
pull factors (p. 564)  barrios (p. 571)  greenbelt (p. 579)
degree of urbanization (p. 564)  fecal snow (p. 571)  reconciliation ecology (p. 579)
urban growth (p. 564)  compact cities (p. 571)  cluster development (p. 579)
megacities (megalopolises) (p. 564)  dispersed cities (p. 571)  walkability (p. 579)
metropolitan areas (p. 565)  tax shift (p. 573)  mixed-use and diversity (p. 580)
deteriorating services (p. 566)  car-free areas (p. 573)  quality urban design (p. 580)
aging infrastructure (p. 566)  car-sharing networks (p. 573)  environmental sustainability (p. 580)
budget crunches (p. 566)  electronic commute (p. 573)  smart transportation (p. 580)
aging infrastructure (p. 566)  bicycle (p. 574)  ecocity (p. 580)
rising poverty (p. 566)  electric bicycles (p. 574)  green city (p. 580)
urban sprawl (p. 566)  motor scooters (p. 574)  Vision 2000 (581)
megalopolis (p. 568)  heavy-rail (p. 574)  Revision 2000 (p. 581)
Bowash (p. 568)  light-rail (p. 574)  urban sprawl (p. 566)
Ecological footprints (p. 568)  land-use planning (p. 576)  urban sprawl (p. 566)
noise pollution (p. 569)  property taxes (p. 576)  sustainable cities

Learning Log: Answer the following questions for extra-credit on the unit test.

1. Define the boldfaced terms in this chapter. (OMIT)

2. Describe how Curitiba, Brazil has been designed to be a more ecologically sustainable city.
3. List factors that push people and pull people to migrate from rural areas to urban areas.

4. Distinguish between the degree of urbanization and urban growth.

What are five major trends in urbanization and urban growth? What percentage of the population lives in urban areas in (a) the world, (b) developed countries, and (c) developing countries

5. What four shifts in the U.S. population have taken place since 1800? What percentage of the U.S. population lives in (a) urban areas and (b) suburban areas? How has the quality of urban life changed in the United States since 1920?

6. What is urban sprawl? List four factors that have promoted urban sprawl in the United States. List the major harmful effects of urban sprawl in terms of land and biodiversity, human health and aesthetics, water, energy, air, climate, and economic effects.

7. What is a megalopolis? What are the world’s five largest megalopolises?

8. What are the environmental benefits of urbanization?

9. Describe the major resource and environmental problems of urban areas relating to (a) sustainability, (b) resource use, (c) biodiversity preservation, (d) land use, (e) tree cover, (f) food production, (g) microclimate (urban heat islands), (h) water supply and flooding, (i) pollution and human health, (j) noise, (k) excessive light, and (l) poverty and social problems.

10. List four ways in which crime decreases environmental quality.

11. Summarize the major problems of the urban poor. What are the major urban problems of Mexico City?

12. What are the two main types of ground transportation? How does land availability affect urban transportation systems? What are two basic types of cities in terms of population density and transportation systems?

13. What is the role of motor vehicles in the United States?

14. List five personal and economic benefits provided by motor vehicles. List seven harmful effects of motor vehicles in terms of deaths and injuries, air pollution and oil use, land use, congestion, and economic costs.

15. List five ways to reduce dependence on the automobile. List three factors promoting dependence on the automobile in the United States.

16. List the major advantages and disadvantages of (a) bicycles, (b) motor scooters, (c) rail systems within urban areas, (d) high-speed trains between urban areas, and (e) bus systems. Describe how an excellent mass transit system in the United States between the 1920s and 1940s was destroyed.

17. What is conventional land-use planning and explain why it is often a destructive process in the United States. Describe the use of geographic information system (GIS) technology in land-use planning.

18. What is zoning, and what are its advantages and disadvantages?

19. What is smart growth? List tools cities can use to promote smart growth in terms of limits and regulations, zoning, planning, protecting land from development, taxes, tax breaks, and revitalizing and planning cities and towns.

20. Describe how the state of Oregon has used smart growth to help prevent urban sprawl.

21. List five ways to preserve open space.

22. What is cluster development? What is new urbanism?

23. Describe the major characteristics of a more sustainable ecocity or green city.

24. Describe the progress that Chattanooga, Tennessee, has made in becoming an ecocity.
Outline

25-1 Urbanization and Urban Growth

A. Urban populations are attracting more and more people throughout the world, developing into centers of poverty.
   1. About one half of the world’s people live in cities/densely populated urban areas, drawn there for better jobs and a better life.
   2. Cities provide jobs, food, housing, a better life, entertainment, and freedom from the religious, racial, and political conflicts of village life.
   3. People are pushed to cities by poverty, no land, declining work, famine, and war.

B. Urban trends that affect urban growth
   1. The number/proportion of people living in urban areas is growing.
      a. Most urban areas are along countries’ coastal areas.
      b. Most huge urban areas are in developing countries.
   2. The number of large cities (a million or more people) is increasing rapidly.
      a. Megacities or megalopolises contain 10 million+ people.
      b. A megalopolis is a merger of a city (or cities) and adjacent urban areas; two such areas are Bowash (Boston–Washington) and Chipitts (Chicago–Pittsburgh).
   3. Urban population is rapidly increasing in developing countries.
   4. Urban growth is much more rapid in developing countries, but developed countries will be 84% urbanized by 2030.
   5. Poverty is becoming more common in urban areas, especially in developing countries.

C. Three of four Americans live in urban areas; about half of them live in suburban areas. These urban areas are cities with at least a population of 50,000 people.
   1. People first migrated from rural areas to large central cities.
   2. Then, people migrated from large central cities to suburbs/smaller cities.
   3. Next, people migrated from the North and East to the South and West (1980–).
   4. Lastly, some have migrated away from urban areas back to rural areas (1990–).

D. Urban life’s quality in America has improved but problems remain.
   1. Overall, people have better working and housing conditions and improved air and water quality.
      City services have improved.
   2. Older cities have deteriorating services and aging infrastructures.
      a. Budget cuts compromise services and infrastructures.
      b. Poverty in cities is rising, as is unemployment.

E. Urban areas tend to sprawl outward and eat up surrounding countryside—urban sprawl.
   1. Low-density development is growing and encouraging dependence on cars.
   2. Sprawl is a byproduct of affordable land, cars, poor urban planning, and cheap gas.
   3. Problems caused have been decreased energy efficiency; increased urban flooding; destruction of cropland, forest, and open space; and longer travel time.

25-2 Urban Resource and Environmental Problems

A. The advantages of urbanization
   1. Cities are centers of economic development, jobs, commerce, and transportation.
   2. Urban populations are generally healthier with better access to medical care, family planning information, education, and social services.
   3. Recycling is more feasible and environmental protection is better supported.
   4. People concentrated in an area preserves biodiversity and wildlife habitats.

B. The disadvantages of urbanization
   1. Cities do not sustain themselves; they concentrate pollutants and noise, spread infectious diseases, and are centers of crime, poverty, and terrorism.
   2. They threaten biodiversity, produce huge wastes, and consume about 75% of the world’s resources.
   3. Cities huge use of resources depletes the environments around them. Flooding is a problem because of location and water runoff.
   4. The heat produced in cities creates urban heat islands that affect the climate over a large area and keep polluted air from being cleaned.

C. The urban poor and the rural poor both live in unhealthy conditions.
1. Large cities have squatter settlements and shantytowns for the poor—places that provide metal, plastic sheets, scrap wood, and discarded packing crates to build shelters. Some places develop communities with hope for a better life.

2. These urban settlements have the worst/nonexistent services: lack of clean water, sewers, electricity, etc. There are often severe air, water, and hazardous waste pollutants.

3. Governments often force people away; they resettle somewhere else, and the cycle begins again.

4. The rural poor tend to have more children and less educational opportunity.

5. Mexico City is an environmental nightmare and an urban disaster.
   a. The negatives of Mexico City are overwhelming: rapid population growth, severe pollution, disease, and poverty.
   b. About 1 in every 6 Mexicans lives in the city; they suffer from high unemployment, noise, traffic congestion, soaring crime, etc. Barrios are the slum settlements.
   c. Lack of sewage services has produced bacteria-laden, dried, human excrement, which is spread by the wind; it is called fecal snow and causes widespread salmonella and hepatitis.
   d. Breathing the air in Mexico City is the same as smoking three packs of cigarettes per day.
   e. The city’s air and water pollution causes 100,000 premature deaths per year.

25-3 Transportation and Urban Development
   A. The amount of available land determines if a city grows outward or upward as well as the type of transportation systems used.
      1. Those in compact cities, those growing upward, use mass transit systems, walk, or ride bicycles.
      2. Those people in sprawling cities use individual automobile transportation.
   B. Cars rule in the United States because of large areas of relatively cheap land.
      1. The U.S. is overrun with automobiles, using 32% of the world’s cars and consuming 43% of the world’s gas.
   C. Cars have advantages and disadvantages.
      1. Cars make people mobile and fuel the economy.
      2. Cars kill people, pollute, and waste time when traffic jams occur.
   D. To reduce automobile use, users must pay for the car’s harm by paying greater gasoline taxes, giving up the government subsidies for cars, subsidizing mass transit systems, and raising use fees.
   E. Political pressures and the love of the automobile interfere with efforts to decrease the importance/presence of automobiles. Fast, efficient, and reliable mass transit is not available, and people live all over, not in well-defined areas.
   F. The use of any alternative to automobile transportation—bicycles, walking, scooters, buses, subways, rail systems, etc.—would benefit the U.S. environment.
   G. The United States had an efficient streetcar system that was bought and destroyed by an alliance of companies that wanted to promote car and bus sales.

25-4 Urban Land-Use Planning and Control
   A. Most land-use planning in the United States is based on continued population growth and therefore leads to urban sprawl and environmental degradation.
   B. Zoning can be used to control growth and protect certain areas, but can also discourage innovative solutions to environmental problems.
   C. Smart growth discourages urban sprawl, protects ecologically sensitive land and water, and develops environmentally sustainable urban areas. These methods help channel growth to areas where it does less harm.
   D. Oregon developed an efficient land-use planning process in which land was permanently zoned, all urban areas had growth boundaries, and gave control of land-use planning to the Land Conservation and Development Commission.
   E. Open space can be preserved by urban growth boundaries, greenbelts, small and large parks, and cluster developments.
   F. Cluster developments and mixed-used housing and villages are more energy efficient and environmentally sound than the familiar suburban housing developments.

25-5 Making Urban Areas More Livable and Sustainable
   A. Ecocities are people-oriented, preserve biodiversity, and emit low pollution.
      1. Buildings, vehicles, and appliances meet high energy-efficient standards.
2. Native trees and plants abound for noise buffers, pollution reduction, and animal sanctuaries.
3. Urban sprawl is not allowed to gobble up near-by forests, grasslands, wetlands, and farms.
4. Food is raised in the city in community gardens, window boxes, garden rooftops and comes from nearby organic farms and solar greenhouses.
5. There are ecocities all over the world: Waitakere City in New Zealand, Leicester in England, Portland in Oregon, and Chattanooga in Tennessee.

B. Chattanooga, Tennessee, is one of the United States most sustainable and livable cities.
1. In the 1950s, Chattanooga was an industrial wasteland with highly polluted air and toxic water.
2. Local officials and citizens transformed Chattanooga into a beautiful city with zero-emission industry, zero-emission electric buses, satellite parking with bus service, extensive recycling programs, and new tourist attractions.

Summary

1. Almost half of the world’s population lives in urban areas and half in rural areas. Government policies, poverty, lack of land to grow food, declining agricultural jobs, famine, and war that force people out of rural areas are all factors that determine how urban areas develop.

2. Urban areas are rarely self-sustaining, threaten biodiversity, destroy and damage ecosystems, lack trees, grow little of their own food, concentrate pollutants and noise, spread infectious disease, and are centers of poverty, crimes, and terrorism.

3. Urban areas relying on mass transportation spread vertically and urban areas relying on automobiles spread horizontally. Advantages of automobiles include convenience, personal benefits, and boosted economies, Disadvantages include air pollution, promotion or urban sprawl, increase in death rate, and time-an gas-wasting traffic jams. Advantages of bicycles and motor scooters include low cost, little to no air or noise pollution, require little space, and are energy efficient. Disadvantages include little accident protection, impractical for long distances, can be tiring, little parking, and gas scooter engines emit high air pollution. Mass transit rail systems are more energy efficient than cars, produce lower air pollution, require less land, cause fewer injuries and deaths, and reduce car congestion. Disadvantages include high cost to build and maintain, rigid schedules, noise pollution, and they are cost effective only in densely populated areas. Buses are more flexible than rail systems, can easily be rerouted, cost less to develop, and can reduce car use. Disadvantages include rigid schedules, noise pollution, and they are not always cost efficient. Rapid rail systems can reduce car and plane travel, are ideal for long trips, and are more efficient than cars and planes. Disadvantages include high operation and maintenance cost, noise pollution, and they are not always cost efficient.

4. Land-use planning, zoning, and smart growth can be used for planning and controlling urban growth.

5. Cities can be made more sustainable and more desirable places to live by creating parks, greenbelts, urban growth boundaries, cluster developments, mixed-use villages, greenways, and ecocities.