

CHAPTER 25

SUSTAINABLE CITIES

Summary

1. Almost half the world's population lives in urban areas, and the number of megacities is rapidly increasing. In developing countries, poverty is becoming more urbanized, and urban populations are growing rapidly. Urban growth is slower in developed countries. In Canada, between 1870 and 2006, the number of people living in urban centres increased from 20% to 80%. Suburbs have grown and there has been a migration of people to Alberta and British Columbia. Many factors contributed to urban sprawl, including affordable land, automobiles, cheap gasoline, and poor urban planning.
2. Urban areas provide job opportunities, better education, and health care. Concentrating people in one area helps to protect biodiversity elsewhere. However, urban areas are rarely self-sustaining, threaten biodiversity within the city area, destroy and damage ecosystems, lack trees, grow little of their own food, concentrate pollutants and noise, spread infectious disease, and are centres of poverty, crime, and terrorism.
3. Urban areas lose many of the ecological benefits that vegetation provides. Erosion and flooding may increase, and pollutant levels are also higher. Noise pollution can cause permanent hearing loss, diseases spread more rapidly, and the urban heat island effect can alter temperature and precipitation. The incidence of asthma is often elevated, and light pollution can affect plant and animal species. Poverty and crime rates also tend to be higher.
4. 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, urban sprawl, increased death rates, and time-and gas-wasting traffic jams. 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 costs to build and maintain, fixed 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 fixed schedules, noise pollution, and they are not always cost efficient. Rapid rail systems can reduce car and plane travel, are ideal for longer trips, and are more efficient than cars and planes. Disadvantages include high operation and maintenance costs and noise pollution.
5. Land-use planning, zoning, and smart growth can be used for planning and controlling urban growth. Zoning often favours high-priced buildings and housing, rather than the protection of ecologically sensitive areas; it may also increase urban sprawl.
6. 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.

Key Concepts and Learning Outcomes

After completing this chapter, students should be able to answer the following key questions.

25-1 What Causes Urban Growth? Magnets for Business and Hope for the Poor

- A. Urban areas are attracting more and more people throughout the world.
1. People move out of rural areas and into cities because of poverty, no land, declining work, famine, and war (“push” factors).
 2. About one half of the world’s people live in cities, seeking better jobs and a better life (“pull” factors). Cities provide jobs, food, housing, entertainment, and freedom from the religious, racial, and political conflicts of village life.

25-2 What Are the Worldwide Patterns of Urbanization and Urban Growth? More People and More Poverty

- A. The number of people living in cities is growing, and many of these urban areas are developing into centres of poverty.
1. The percentage of a country’s population living in an urban area is called its degree of urbanization.
 2. Urban growth is the rate of increase of urban populations.
 3. There are five main trends in urbanization and urban growth.
 - a. Globally, the proportion of urban dwellers is increasing.
 - 1) People living in urban areas increased from 2% to 54% between 1850 and 2014.
 - 2) The UN predicts that 68% will live in cities by 2050.
 - 3) The global urban population is expected to increase from 3.9 billion (2014) to 6.3 billion in 2050.
 - b. The number of large cities is growing rapidly around the world.
 - 1) In 2004, there were 400 large cities containing a million or more people; by 2012, there were more than 500 cities of this size.
 - 2) There are now 28 megacities, or megalopolises, containing more than 10 million people.
 - c. Urbanization and urban populations are rapidly increasing in developing countries.
 - d. Urban growth is much slower in urbanized, developed countries than in developing countries, but it is projected that developed countries will be 86% urbanized by 2050.
 - e. Poverty is becoming more common in urban areas, especially in developing countries. At least 1 billion poor people live in urban areas in developing countries.

25-3 How Urbanized Are Canada and the United States? City-Dwellers Dominate

- A. Almost 80% of North Americans live in urban areas, and about half of them live in suburban areas.
1. Canadian population distribution has shifted in four phases.
 - a. People first migrated from rural areas to large central cities.
 - b. People then migrated from the centre of large cities to suburbs and smaller cities.
 - c. Over time, the number living in Quebec and the Maritimes decreased, and the number in the West (particularly Alberta and British Columbia) increased.

- d. Since the 1970s, some people have migrated away from urban areas back to rural areas.

25-4 How Has the Quality of Urban Life in North America Changed? Progress and Challenges

- A. In North America, the quality of urban life has improved during the last century, but problems remain.
 - 1. Most people have better working and housing conditions, and improved air and water quality. City services have improved.
 - 2. Older cities in the United States have deteriorating services and aging infrastructures.
 - a. Budget cuts compromise services and infrastructures.
 - b. Poverty in some of the large U.S. cities is rising.

25-5 What Is Urban Sprawl, and What Are Its Effects? Paving Paradise and Driving to Get Anywhere

- A. In urban sprawl, urban areas tend to spread and take over surrounding countryside.
 - 1. There are six factors that promote(d) urban sprawl:
 - a. land availability,
 - b. government-facilitated purchase of single-family homes by World War II veterans,
 - c. low gas prices and government-funded highways,
 - d. tax laws that favour home ownership,
 - e. zoning laws requiring large residential lots, and
 - f. lack of cooperative planning among jurisdictions.
 - 2. Problems caused by urban sprawl include decreased energy efficiency; increased urban flooding; destruction of croplands, forests, wetlands, and open spaces; and longer travel time.
 - 3. As cities grow in numbers and in area, separate urban areas may form a megalopolis. For example, the area from Hamilton, through Toronto, to Oshawa is becoming a megalopolis, and much of the best farmland in Ontario is being lost.

25-6 How Do Land Availability and Transportation Systems Affect Urban Development? Stack or Sprawl

- A. The amount of available land determines if a city grows outward, or upward, as well as the type of transportation systems used.
 - 1. People living in compact cities (i.e., those growing upward) use mass transit systems, walk, or ride bicycles.
 - 2. People in sprawling (dispersed) cities use individual automobile transportation.
 - a. Cities are dispersed in Canada, the United States, and Australia because of cheap gas, plentiful land, and large networks of highways.
 - b. Large amounts of energy and resources must be used to produce motor vehicles and build roads, parking lots, and garages.

25-7 What Is the Role of Motor Vehicles in Canada and the United States? Cars Rule

- A. Each year North Americans drive as far as all people in the rest of the world combined.
 - 1. North Americans (5% of the world's population) own about 33% of the world's cars.
 - 2. They consume 43% of the world's gasoline.
 - 3. Car ownership is growing in China, and if each household had one or two cars, China would need more oil each year than the world now produces.

25-8 What Are the Advantages and Disadvantages of Motor Vehicles? A Troubled Love Affair

- A. Cars have advantages and disadvantages.
1. Cars make people mobile, act as a status symbol, and fuel much of the world's economy.
 2. Cars kill about 1.2 million people each year, are the world's largest source of air pollution, help maintain urban sprawl, cause congestion and waste time when traffic jams occur.

25-9 How Can We Reduce Automobile Use? Use Honest Accounting

- A. To reduce automobile use, users must be required to pay for harmful environmental effects. The following measures could be put in place:
1. Increase gasoline taxes so that they include environmental accounting (user-pays approach).
 2. Use gasoline tax revenues to finance mass transit system, bike paths, and sidewalks.
 3. Increase parking fees and tolls.
 4. Establish car-free areas.
 5. Encourage car-sharing networks.
 6. Enable work-at-home arrangements (electronic commute).

25-10 Is It Feasible to Reduce Automobile Use in Canada and the United States? Kicking Auto Addiction Is Hard

- A. Reducing car use is difficult because there is political opposition and an addiction to car use. Also, good mass transit options and bike paths are not commonly available in North America.

25-11 What Are Alternatives to the Car? Use Your Muscles and Travel with Others

- A. The use of any alternatives (bicycles, walking, scooters, buses, subways, rail systems, etc.) would benefit the environment.
1. Twenty percent of North Americans say that they would bike to work if there were safe bicycle lanes and available bike storage and showers at work.
 2. Toronto and Montreal have efficient subway systems.
 3. Hong Kong's rail system is very successful as the city is densely populated, half the population can walk to the subway station within five minutes, and a car is an economic liability in this city.
 4. In western Europe and Japan, rapid-rail systems reduce the need to travel by car or plane, are ideal for trips of 200 to 1000 kilometres, and are more energy efficient. However, rail systems are expensive, must operate on heavily used routes, and cause noise and vibration for nearby residents.

25-12 What Is Conventional Land-Use Planning? Focusing on Growth

- A. Most land-use planning in Canada and the United States is based on continued population growth and therefore leads to urban sprawl and environmental degradation.
1. Property taxes pay for public services, and local governments promote economic growth to meet the growing needs of communities.
 2. Geographic information systems (GIS) can facilitate land-use planning.

25-13 What Are the Advantages and Disadvantages of Using Zoning to Control Land Use? Useful but Improvable

- A. Zoning can be used to control growth and protect certain areas. However, it can also allow developers to influence decisions, and discourage innovative solutions to environmental problems.
1. Zoning that is too strict can discourage new approaches to urban problems.
 2. Mixed-use-zoning helps to reduce urban sprawl.

25-14 How Is Smart Growth Used to Control Growth and Sprawl? Channelling Growth and Reining in the Car

- A. Smart growth (new urbanism) discourages urban sprawl.
1. It requires less dependence on cars.
 2. It protects ecologically sensitive land and water and develops environmentally sustainable urban areas.
 3. Growth boundaries need to be set around cities to preserve surrounding open space.
 4. Portland, Oregon, controls urban sprawl by encouraging clustered, mixed-use neighbourhoods, mass transit, bike lanes, and walkways.
 5. China has designated 80% of the country's arable land as fundamental land. Strict regulations are in place for potential developers.
 6. Many European cities have been successful in encouraging compact cities.
 7. The Ontario government is trying to control urban sprawl and has produced a growth plan for the Greater Golden Horseshoe (the area that stretches from Niagara to Peterborough and north to Collingwood).

25-15 How Can Urban Open Space Be Preserved and Used? Be Protective and Creative

- A. Open space can be preserved by large and small parks, urban growth boundaries, cluster development, and greenways.
1. The urban growth boundary model preserves space outside a city.
 2. Traditionally, large areas of open space are preserved as municipal parks (Stanley Park in Vancouver and Central Park in New York).
 3. Cities can be surrounded by greenbelts and used for recreation, sustainable forestry, or other nondestructive uses.
 4. Nature can be left to reclaim spaces (reconciliation ecology). Many abandoned railways in Canada have been made into trails or left to become linear wild spaces.

25-16 How Can We Make Cities More Sustainable, Desirable Places to Live? The Ecocity Concept

- A. Ecocities recycle and reuse wastes, grow their own food, and preserve biodiversity.
1. Ecocities are people-oriented rather than car-oriented cities.
 - a. Residents can walk, bike, or use mass-transit.
 - b. Buildings, vehicles, and appliances must meet high energy-efficient standards.
 - c. Native trees and shrubs are planted to provide shade, beauty, and wildlife habitats, and to reduce pollution, noise and soil erosion.
 - d. Small organic gardens and local plants are designed to replace grass lawns.
 - e. Abandoned, polluted, and industrial sites are restored.
 - f. Nearby forests and grasslands are preserved.
 - g. Food is raised within the city in community gardens, window boxes, and garden rooftops, or it comes from nearby organic farms and solar greenhouses.

Sustainable Cities

2. China has plans to develop 10 model ecocities.
3. Currently, ecocities are being planned worldwide, including Suzhou in China and Curitiba in Brazil.