15

Urbanization

Most people have mixed emotions about cities. Cities offer opportunity and excitement, but they can also be dangerous and threatening places. In the midst of their great wealth and beauty, there is also poverty and squalour. Cities are all these things—and much more.

Expressing ideas What do you like most about cities? What do you dislike? Explain your reasons.

Introduction

Think about what life was like for young Canadians in 1871, just four years after Confederation. For most young men, life revolved around their jobs on farms, in lumber mills, at quarries, or in fishing boats. The lives of young women centred on households, with chores such as preparing and preserving food, looking after children, and maintaining homes. Some women worked in their own houses, but many others worked as servants. In 1871, the majority of Canadians were rural dwellers, living in small communities or on isolated farms. Only 18.3 per cent of Canadians lived in towns and cities. By 1971, this percentage had changed drastically. Census figures showed that most Canadians— 76.1 per cent—lived in towns and cities. In the first hundred years or so of its existence, Canada had become an urban nation. Such a movement of people to cities is referred to as **urbanization**.

Urbanization has happened all around the world. Most developed countries became urbanized during the nineteenth and twentieth centuries, and the shift from rural areas to urban centres in these countries is largely complete. The process of urbanization has now shifted to the developing countries of Africa, Asia, and Latin America. In Egypt, for example, less than 50 per cent of the population now lives in cities, while in Rwanda, in central Africa, only 8 per cent do so. These countries are currently experiencing, and will continue to experience, urbanization for some time to come.

The pattern of urbanization became an important global trend only in the twentieth century. In this chapter, you will examine some of the reasons for this trend, and the problems that it has created in cities and their surrounding areas. Why have cities grown up at certain sites, and why have some prospered more than others?

Global Urbanization

In 1900, less than 14 per cent of the world's people were urban dwellers. This reflects the fact that historically, humans have always been rural dwellers, tied to the land that sustained them. The movement of people to cities was prompted by several key developments:

- *Mechanization*, or the use of machinery, displaced workers in mining, fishing, logging, and especially farming.
- *Industrialization*, or the switch to an economy dependent on manufacturing industries, encouraged the concentration of manufacturing at sites that had the right combination of raw materials, power, and transportation facilities. These sites became destinations for workers leaving the rural areas.
- *Technological change in fuel sources*—from firewood to coal and then petroleum—meant that energy supplies could be hauled long distances to cities, to be consumed by the factories and workers housed there.
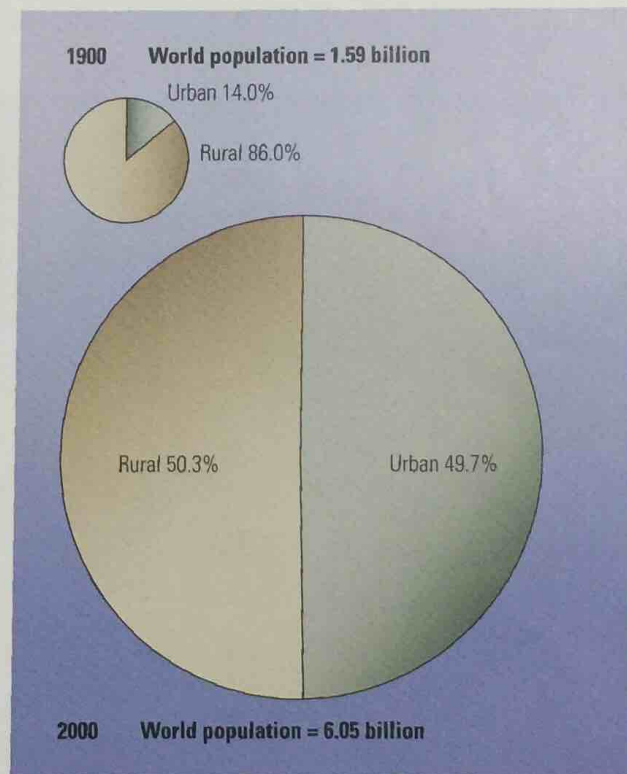

1900   **World population = 1.59 billion**

Urban 14.0%

Rural 86.0%

Rural 50.3%   Urban 49.7%

2000   **World population = 6.05 billion**

Figure 15-1 World urban populations in 1900 and 2000. The size of the circles is in proportion to the total population of the world.

Reading a graph How has the total urban population changed in this period? How has the ratio of urban population to rural population changed?

	1900	1920	1940	1960	1980	2000
Urban Population	223	360	570	1012	1807	3008
Rural Population	1367	1500	1725	1973	2567	3046

Source: United Nations Population Division, 2000.

Figure 15-2 World urban and rural populations (in millions) for the twentieth century.

Interpreting statistics

1. Use the data in the table to construct a line graph showing the trends in world urban and rural population, 1900–2000. You will need one line to show rural population, and one to show urban population. Then, write a caption to describe the trends.

2. Calculate the percentage of the world's population living in urban areas in 2000. Predict, giving your reasons, whether this percentage will rise or fall by 2020.

The first countries to industrialize were the first ones to urbanize. The two trends worked together to transform societies. By the end of the twentieth century, almost half the world's people called cities their home.

You learned in Chapter 13 that world population growth rates in the past decades have been very rapid, particularly in developing countries. The rate at which urban areas are growing is 1.5 times faster than world population growth! So, while cities are experiencing population growth through births, they are also experiencing population growth through **in-migration**, or people moving into cities. Globally, urban areas are growing at an average rate of 2.5 per cent every year— about 3.5 per cent in developing countries and about 1 per cent in developed countries.
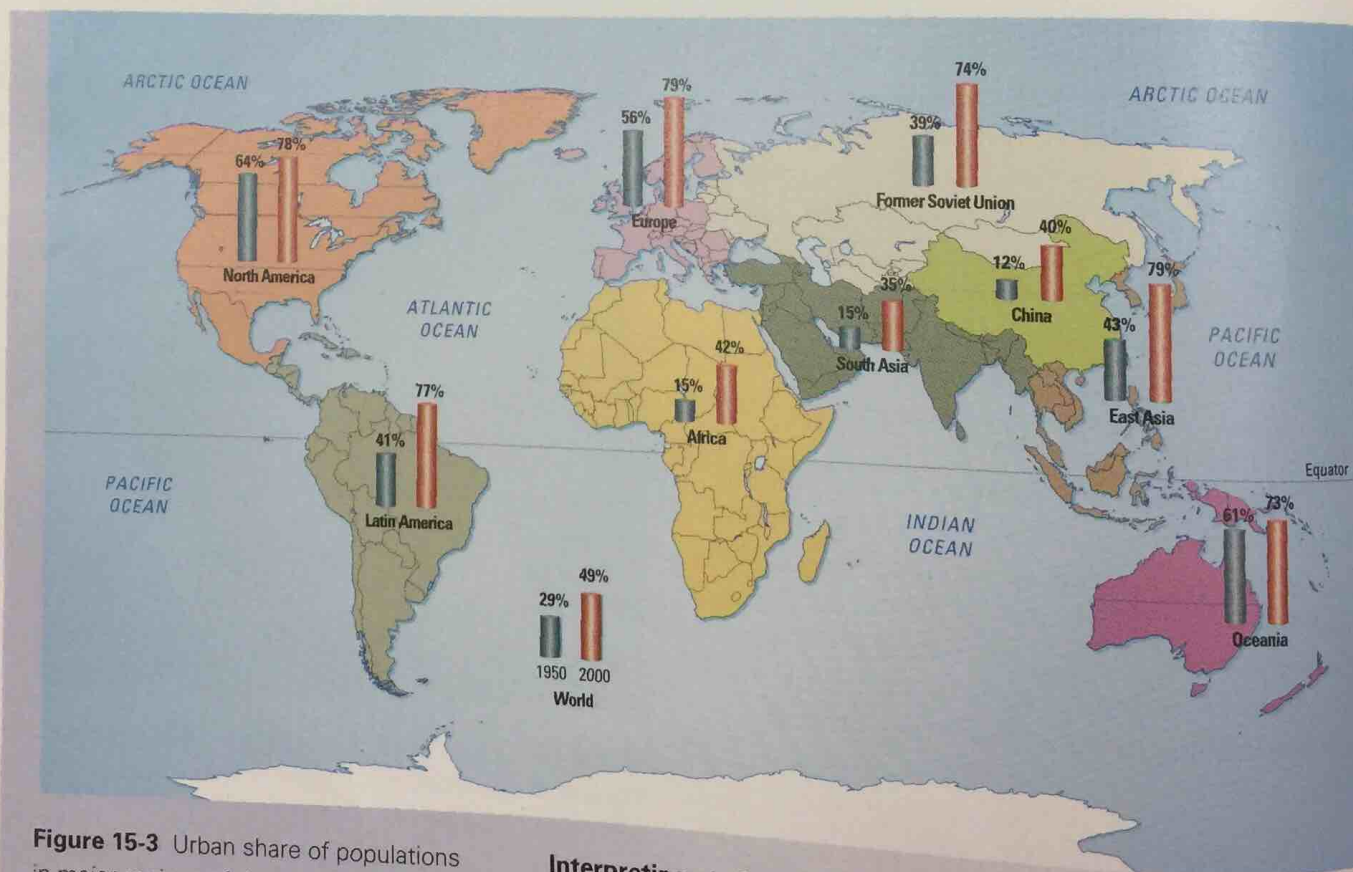

Figure 15-3 Urban share of populations in major regions of the world, 1950 and 2000, by percentage.

Interpreting statistics Which three parts of the world experienced the greatest change over this time period? Which two experienced the least change?

Millionaire Cities

The movement to cities has meant a dramatic jump in the number of cities having over one million people. In 1850, when only a small part of the world was urbanized, just London, Paris, and Beijing had populations of over one million. In 2000, fully 400 cities had over a million residents. With the exception of Australia, cities with over five million people can now be found on every

Reading a map

1. Which continent had the largest number of cities with over five million people?

2. Which two countries had the largest number of "millionaire cities" (with over one million inhabitants)?

3. How would you explain the pattern you have identified?

The World's
Largest Cities

- over 5 million people
- 3–5 million people
- 1–3 million people

City	1950	City	1980	City	2000
New York	12.3	Tokyo	16.9	Mexico City	25.6
London	8.7	New York	15.6	São Paulo	22.1
Tokyo	6.7	Mexico City	14.5	Tokyo	19.0
Paris	5.4	São Paulo	12.1	Shanghai	17.0
Shanghai	5.3	Shanghai	11.7	New York	16.8
Buenos Aires	5.0	Buenos Aires	9.9	Calcutta	15.7
Chicago	4.9	Los Angeles	9.5	Bombay	15.4
Moscow	4.8	Calcutta	9.0	Beijing	14.0
Calcutta	4.4	Beijing	9.0	Los Angeles	13.9
Los Angeles	4.0	Rio de Janeiro	8.8	Jakarta	13.7

Source: Population Reference Bureau, 2000.

Figure 15-5 The populations of the ten largest urban areas in the world, for 1950, 1980, and 2000 (in millions).

Using evidence

1. Use Figure 15-4 and an atlas to locate each of these cities. Which five cities listed in 2000 were not listed in 1950?

2. From what you know, how would you explain their rapid growth?

3. How would you account for London and Paris disappearing from the list by 1980?

continent. By 2015, population experts predict that twenty-seven cities will have populations greater than ten million. The number of huge cities in the developing countries demonstrates the rapid rate of urbanization in those parts of the world.

Dealing with Rapid Urban Growth

Large cities in developing countries are experiencing tremendous difficulties in managing their rapid growth. Most new arrivals find shelter by squeezing into the overcrowded homes of family and friends, and often resort to living on land that they do not own, which is called *squatting*, and constructing makeshift homes out of any materials that they can scrounge. These **shanty towns** grow up on vacant land that is not being used, such as the steep hillsides in Rio de Janeiro, and are often around the edges of large cities. Jakarta, Indonesia, has growth rates of 18 per cent per year in some parts of its shanty-town urban fringe, while half of the eight million people who live in Dhaka, Bangladesh, live in these makeshift neighbourhoods. Some newcomers to cities merely find a place on the street to live and sleep.

Cities in developing countries have few resources to accommodate these extra people. The many new arrivals tend to overload the existing infrastructure of the city. The demands of the exploding population put strains on water supplies, sewage facilities, mass transit, power grids, health and social services, policing, and fire protection. For example, roadways are so crowded in Bangkok, Thailand, that the average driver spends the equivalent of forty-four full days per year sitting in traffic jams. In India's capital city of New Delhi, the electricity is often turned off in some areas for up to six hours a day in order to reduce the load on the system. Efforts on the part of cities to improve conditions are usually futile because of the large numbers of migrants arriving daily. As a result, the growth of these cities is haphazard and unplanned.

Figure 15-6 The shanty town of Huaycan, on the outskirts of Lima, Peru. Shanty towns exist around large cities in most developing countries, though they are called different things. In Peru they are called *pueblos jovenos*, in Brazil they are *favelas*, in Argentina, *villa miserias*, in India, *bustees*, and in Indonesia people use the term *kampung*.

City	People per Room
Lagos, Nigeria	5.8
Guangzhou, China	5.7
Johannesburg, South Africa	5.0
Lahore, Pakistan	4.5
Bombay, India	4.2
Jakarta, Indonesia	3.4
Bangkok, Thailand	3.2
Ho Chi Minh City, Vietnam	3.1
Algiers, Algeria	2.5
Lima, Peru	2.3
Casablanca, Morocco	2.3

Source: *New Internationalist*, June 1999.

Figure 15-7 The number of people per room for some fast-growing large cities. Most North American cities have fewer than one person per room.

Thinking critically

1. Explain how the statistic about number of people per room is useful in showing crowding in urban areas.

2. What might be some problems in using statistics of this type? Which continents have the most crowded cities?

3. Suggest reasons for this pattern.

The Plight of Street Children

The flood of migrants to cities in the developing world has created an urban phenomenon—street children. An estimated 100 million children live on the street worldwide. In São Paulo, Brazil, they make up 10 per cent of the city's population.

The stresses of dealing with poverty, unemployment, inadequate and crowded housing, poor physical environment, and lack of services undermine the social and family structures in these cities. Children are frequent victims. Abandoned by families struggling with poverty, or fleeing abusive homes, the children have to make their own way, living on the streets. Lacking job skills, they turn to the informal economy—begging, peddling inexpensive goods like chewing gum, shining shoes, stealing, or prostitution. Often they become victims of street violence, sexual predators, or substance abuse. In some cities, the police have murdered street children whom they see as a nuisance.

Figure 15-8 On the left, a street child sleeps outside Rio de Janeiro's Central Station as others play, 1999. The lives of street children are often cruel, cold, lonely, and devoid of love and affection. They have been called the "lost generation."

ACTIVITIES

1. The percentage of the population living in urban areas in Canada has stabilized at about 76 per cent. Suggest two reasons that might explain why the rate has not gone much higher.

2. Outline reasons to explain why each of the three factors that are listed on p. 367 were important in encouraging urbanization.

3. Canada has street children living in its big cities, though not in the same numbers as in the cities of developing nations. From what you have learned in this chapter and Chapter 14, speculate on four reasons why the problem is less prevalent in Canada.

4. What solutions would you propose to deal with the issue of street children in **a)** the developing world? **b)** Canada?

People leave rural areas and go to cities because they are being both pushed and pulled there. They are driven by certain factors, called **push factors**, which encourage them to leave their rural homes. For example, they might find rural areas lacking in such things as adequate food supplies, jobs, education, and health care. They are drawn to cities because certain factors, called **pull factors**, attract them there. Most migrants think that they will be better able to meet their needs in urban areas. Cities are seen as places of opportunity, where dreams can be realized. While the reality of city life may not measure up to migrants' perceptions and expectations, people move there with high hopes. All the activities that they seek and that take place in cities are the functions of cities.

Important Early Functions	Example City
Defence — Sites that were easily defended were chosen for many of the oldest cities. Islands, cliffs, and mountains were used for their defensive and tactical advantages.	**Quebec City, Quebec** The cliffs and high land overlooking the St. Lawrence River at the point where the river narrows made the location defensible.
Transportation — Some sites were selected because they facilitated the movement of goods and people. Shallow spots on rivers where people could cross (fords), sheltered bays, mountain passes, and river mouths are important for transportation. These are good sites for setting up supply, repair, and coordination services.	**Halifax, Nova Scotia** The sheltered deep-water harbour on the east coast of North America made Halifax a natural place to prepare for the difficult journey across the Atlantic, or a place to rest after having endured the voyage.
Resource extraction — Communities were needed to house and provide services to people employed in extracting natural resources such as minerals, fishing, farming, or forestry.	**Thompson, Manitoba** The early community was constructed to provide services to the mining companies and miners who worked the vast mineral deposits in the area.
Head of navigation — At **break-of-bulk** points, goods have to be transferred from one method of transport to another. Services such as wharves or terminals are built to make the break-of-bulk work smoothly.	**Thunder Bay, Ontario** Larger vessels could travel westward on the Great Lakes only to this point. Here the cargoes had to be unloaded and transferred to methods that could handle the rugged overland trip.

Figure 15-9 Some original functions of cities. The spark that causes a city to be established in the first place is usually a particular need, such as a need for protection or a need to speed the movement of goods.

Gathering information

1. Which of these early functions apply to your community? Explain your answers.

2. Name urban centres in British Columbia for each of these categories.

3. Working in small groups, research the early functions of the ten largest urban centres in 2000 (see Figure 15-5). Which functions seem to be most important?

It is because of these **urban functions** that cities are established and grow.

Urban functions change over time. The original function of many cities may be long gone, but the city remains. Montreal is a good example. Its early function was to act as the central location for the fur trade in North America, an activity that has lost its importance for the modern city of Montreal. Changes take place, in part, because of changes in technology, such as the improvement of transportation services. Also, cities grow and expand, so that new urban functions emerge over time. Montreal, for example, has become a cultural centre, among other things. In general, the larger the population of an urban centre, the more functions it can offer.

Site and Situation

Most early communities developed because the *site* and *situation* of the place favoured certain activities, such as trade.

- **Site** refers to the physical characteristics of the land on which the city is built. Descriptions of site usually include details about landforms, drainage, and natural vegetation cover. For example, a person describing the site of Vancouver would point out the Fraser River and its delta, natural harbours at Burrard Inlet and False Creek, the mountains and valleys to the north and east, and the Strait of Georgia.
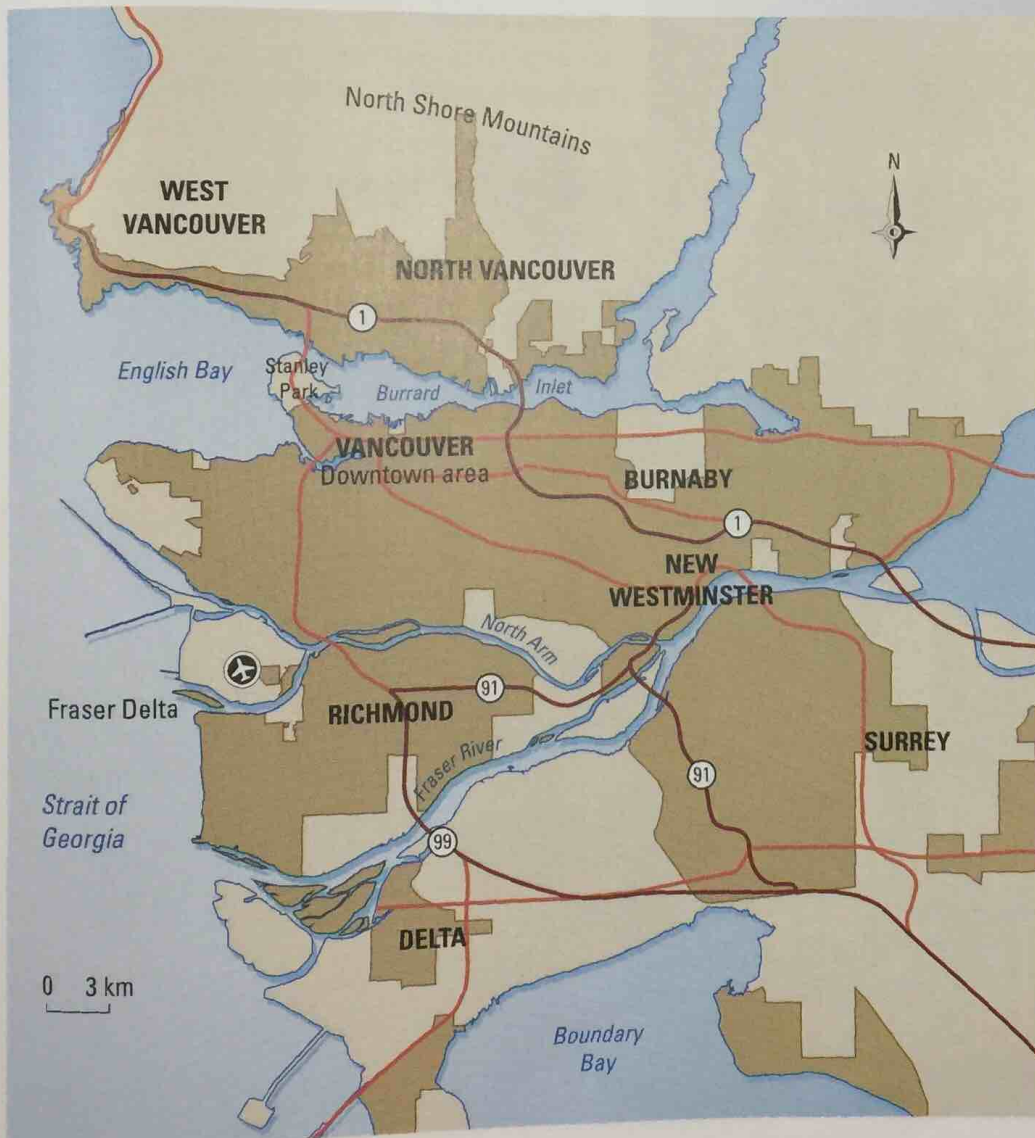

Figure 15-10 The site of Vancouver.

Reading a map
Describe the site of Vancouver in relation to **a)** water bodies; **b)** land forms.

■ **Situation** describes the relationship between the city and its wider surroundings. Details about surrounding landforms may be included, as well as information about the population and economic patterns. A description of Vancouver's situation would make reference to its access to the interior of the province via the river valley, the proximity to the Canada–U.S. border, transportation connections to the Pacific region, and so on.
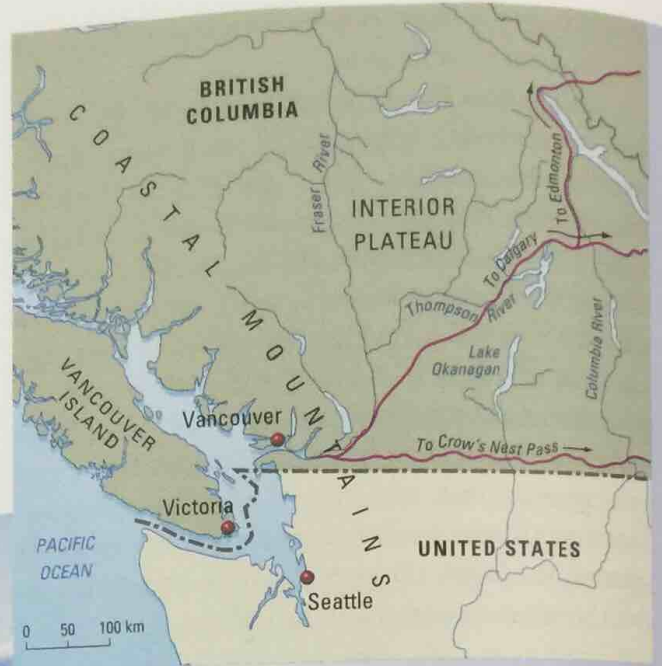

Figure 15-11 The situation of Vancouver.

Reading a map In two or three sentences, describe the situation of Vancouver referring to water bodies, land forms, and the international border.
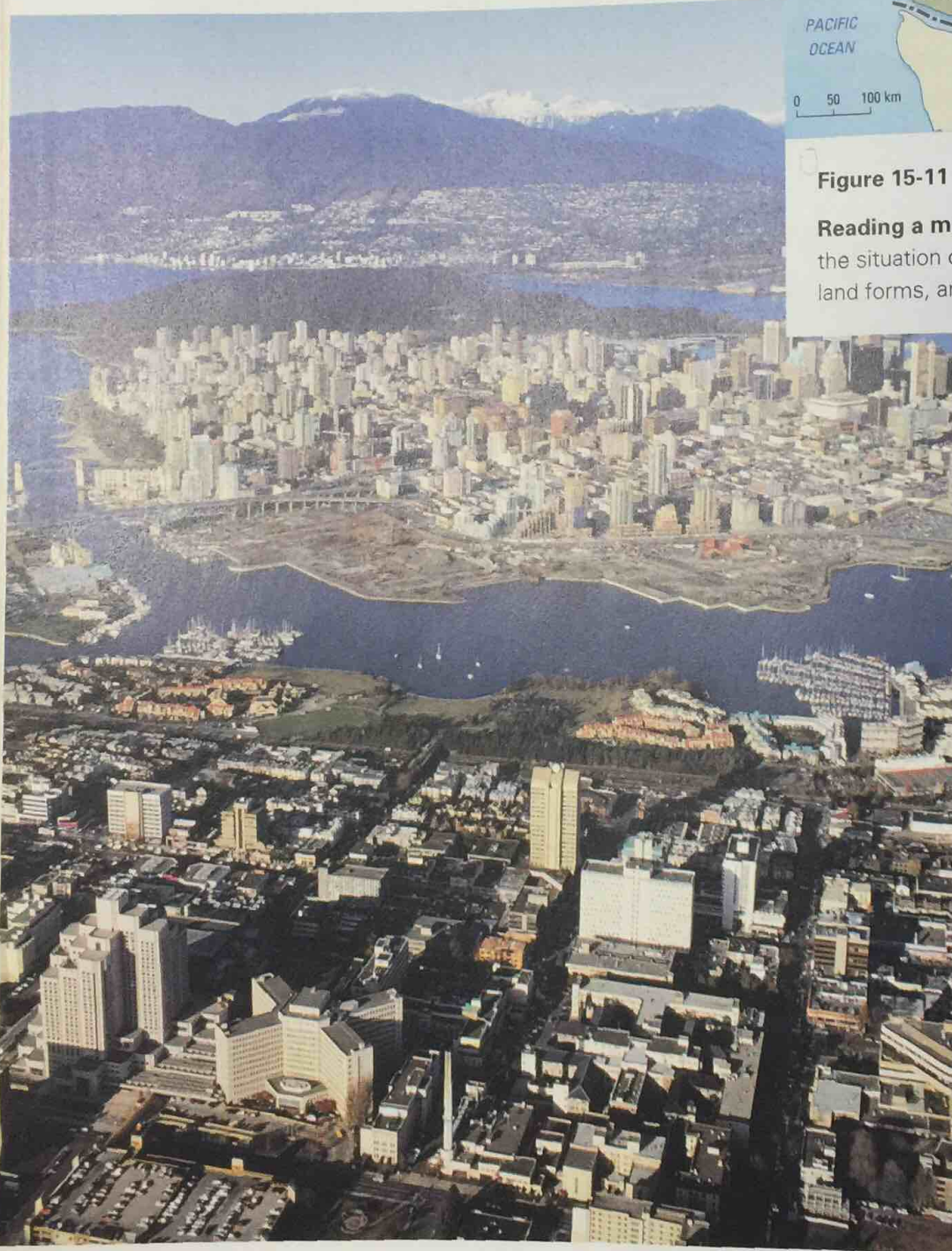

Figure 15-12 Vancouver looking north. The city has both site and situational advantages.

Interpreting an aerial photograph

1. Locate Stanley Park; North Shore Mountains; Burrard Inlet.

2. How can you tell which area is downtown?

3. Locate on Figure 15-10 the area shown in this photograph (remember that the area will be like a pie slice). What do you learn from the photograph that you do not learn from the map? What do you learn from the map that you do not learn from the photograph?

If the site and situation of a location accommodate the kinds of activities that people want to engage in, a community may be established. For example, if there is fertile soil and access to other places for trade, a market town could grow up. If the site and situation remain favourable, the community will grow and prosper. Vancouver, for example, has grown much more rapidly than Victoria because its location puts it closer to raw materials, and it has a large harbour and land-based transportation systems. Because it is directly linked to large cities in the United States, such as Seattle and Los Angeles, and to the other cities of Canada, Vancouver also has a **locational advantage** over Victoria.

Some communities decline and even cease to exist because their sites and situations cannot sustain them. The once-busy mining town of Schefferville, Quebec, is a good example. Only a few hundred people currently live in this boarded-up community now that the mining company has stopped its operations. The area still has plenty of iron ore, but the company has determined that other ore bodies are more profitable to mine. Schefferville's location, far from cheap transportation routes and markets, puts it at a locational disadvantage.
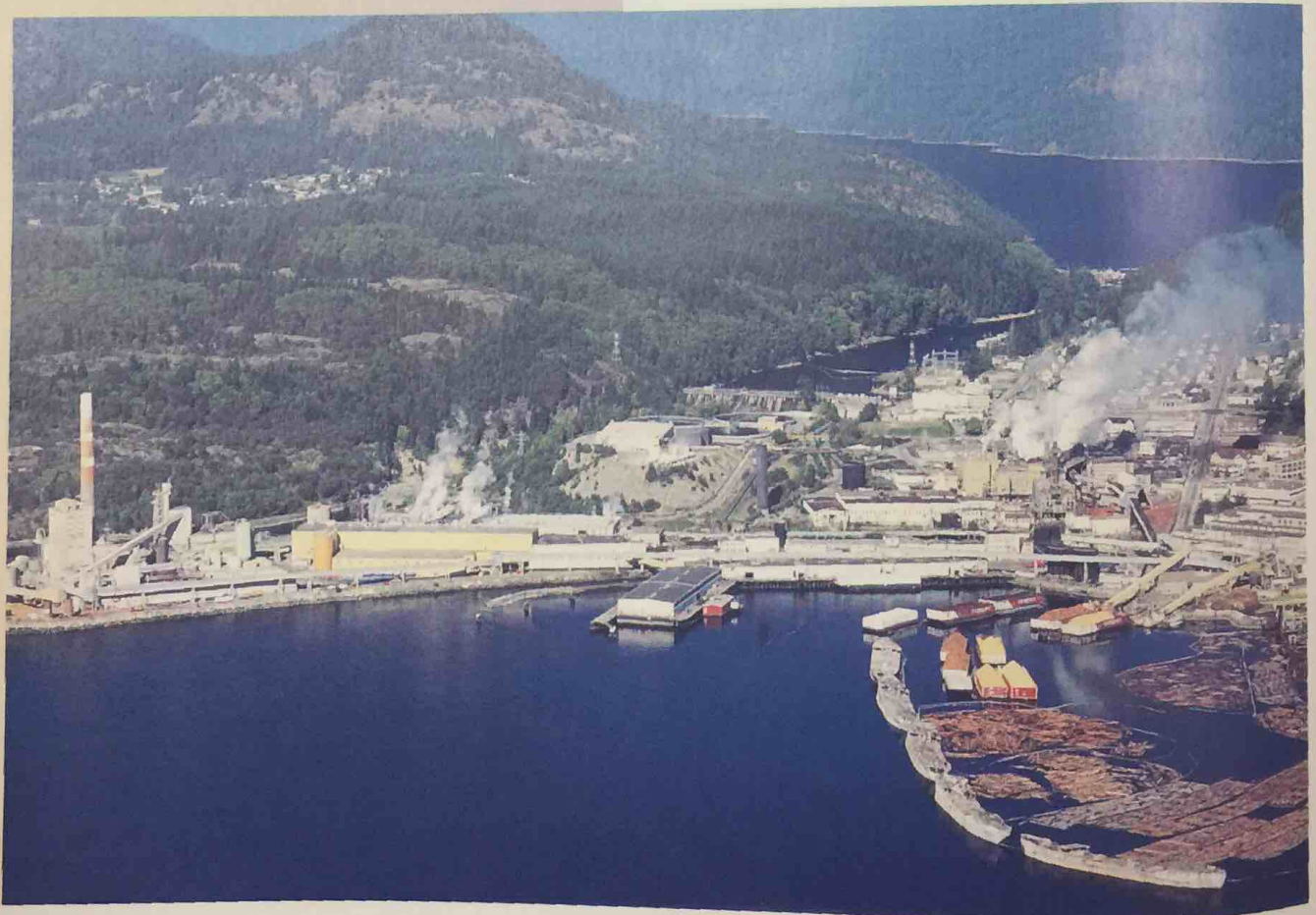
ACTIVITIES

1. Identify three push factors and three pull factors that encourage the movement of rural people to urban areas.

2. Explain how the following technological innovations might affect the urban functions of a city:

   a) Air travel becomes fast, efficient, and cheap.

   b) Telecommunications connect most people using wireless technology (e.g., cell phones).

   c) Monorails are built for public transit, much improving speed and comfort.

3. Suppose you were asked by your city council to analyse the location of your own community.

   a) Describe the site and situation of the community.

   b) Identify one aspect of the location that has been most important in encouraging the growth of the community.

   c) Identify one aspect of the location that has been most detrimental to the growth and development of the community.

4. Use an atlas, as well as print and electronic sources, to research the site and situation of one of the largest cities in Canada or around the world.

Analysing Urban Functions

In general, urban functions can be grouped into two categories: *basic* and *non-basic activities*. **Basic activities** are also referred to as *town-forming activities*. In some cases, industries are the basic activities, such as mills, factories, and mines. Other examples of basic activities include tourism, military facilities, public administration, and transportation. These urban functions serve a larger population than just the community and bring wealth into the area.

Non-basic activities are *town-serving activities* because they exist to meet the needs of the local population. Grocery stores, places of worship, and municipal services such as parks are among these activities. Because these activities circulate the wealth that is within the community but do not generate new wealth, they seldom provide the impetus to begin a community. They are, nonetheless, important and necessary urban functions in a community.

As basic activities grow in a community, the additional wealth stimulates the expansion of the non-basic sector. For example, it has been estimated that for every job created directly in resource extraction industries, three jobs are stimulated elsewhere in the economy. This is called the **multiplier effect**. Earnings of workers in basic industries lead to expansion of the non-basic sector, for example, as more shops and

Figure 15-14 The pulp and paper mill at Powell River, British Columbia.

Developing understanding What makes this mill a basic activity for the nearby town?

services are provided. Unfortunately, the multiplier effect also works in reverse. Job losses in basic activities produce even greater job losses in non-basic activities within the community as stores go out of business and service workers are made redundant.

The multiplier effect leads to unequal growth among different communities. Communities that have a locational advantage enjoy growth in basic activities, and the multiplier effect produces even greater employment in non-basic sectors. These communities grow, and the increased services that are available become magnets for even more activities. Cities such as Toronto and Vancouver in Canada, and Bombay, Cairo, and Jakarta on other continents, have experienced rapid growth. These cities become the engines for the creation of wealth: for example, the city of Seoul earns 23 per cent of South Korea's gross national product, and Bangkok generates 43 per cent of Thailand's wealth.

Poor locations, perhaps in remote or resource-poor areas, result in few basic activities and services. These places do not attract new economic activities and may even lose those that they have to more vibrant communities. A community such as Sydney, Nova Scotia, struggles to maintain its services with the decline and closure of its principal industry, steel making. The growth of central Canada has left this Atlantic community far from the major markets for its products.

The success of large cities produces another problem as well—the depopulation of rural places. At one time, many rural areas in Canada supported active and vibrant communities, often centred on a church or school. Such organizations as the Women's Institute—a networking association for rural women—provided opportunities for geographically isolated people to come together for social and practical purposes. The drift of people to cities caused the rural population to decline, and many small communities ceased to exist. Schools and churches no longer had enough people to support them and were closed. Those people who remained in rural areas found themselves without the support of a close-knit community, making rural life more difficult.

City Forms

The interaction of function, site, and situation gives cities different shapes and appearances. While there is great variety, generally there are five patterns in city forms.

- *Political and religious cities* are designed to serve important religious or political functions such as being the national capital or a holy centre. The elements of the city are usually centred on a temple or place of great religious significance, or important public buildings, connected by grand boulevards arranged in a very structured way according to a model or plan.
- *Organic cities* have evolved quite naturally in ways that fit the physical landscape. Urban functions blend together, with shops, homes, and workplaces all close together.
- *Planned cities* are designed to keep urban functions apart, with separate places for homes, shops, and industries. The areas are linked through transportation connections.
- *Transit cities* are made up of sub-centres linked to a city core by transportation services. Urban functions arrange themselves in a linear fashion along the transit lines, sometimes for quite a distance.
- *Automobile cities* expand outward in all directions from the city core. Roadways link the urban functions that are separated into distinct zones. These cities typically sprawl outwards for many kilometres, adding suburbs to the original city.

Figure 15-15 Different city forms.

a) The Political or Religious City

These cities are often built using a rectangular street grid but based on a prominent axis. The city of Beijing, shown here, is a good example, with the Forbidden City, the former residences of the emperors, at its centre. Washington, DC, is another example.
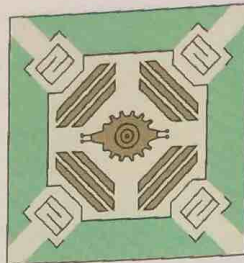

Beijing

b) The Organic City

The close interaction of functions means that organic cities rarely grow very large. They are good cities to walk around in. Cities of this type are often at the core of older cities in many parts of the world, such as Amsterdam, pictured here.
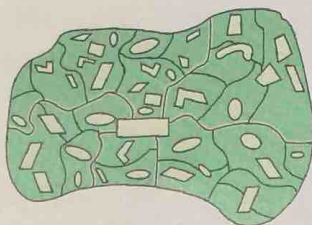

Amsterdam

c) The Planned City

These cities were usually laid out on a rectangular grid pattern because it is easy to design and separate the different functions. Many North American cities, for example, Vancouver, take this form.
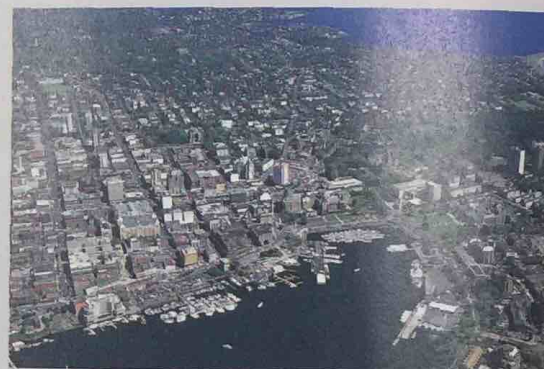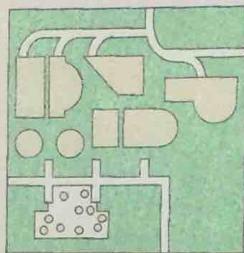
d) The Transit City

The development of high-speed transit systems spurred the growth of cities of this type. The sub-centres develop their own urban functions, but are all linked to the core via the transit connections. New York City is an example.

Vancouver
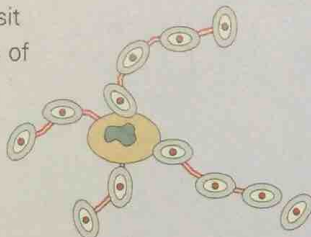
e) The Automobile City

The flexibility of travel allowed by the automobile means that the city can grow outwards in all directions. The prevalence of automobiles makes this the dominant form for cities in the world today. Los Angeles is a good example.
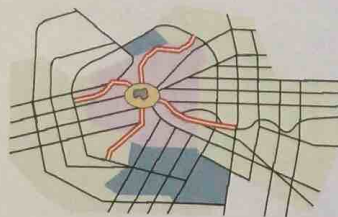
Interpreting a diagram

Decide, giving reasons for your choice, which of the city forms you think would be best for:

1. Developing a strong sense of community?

2. Encouraging industrial growth?

3. Accommodating recreational activities?

4. Adapting to life in the twenty-first century?

Los Angeles

The Automobile and the City

North Americans prefer a city form that allows people to leave the crowded, noisy city to go to homes in the *suburbs*—an environment that is in some ways reminiscent of the peaceful, rural countryside. The suburbs, which have sprung up around virtually every city on this continent, are a *low-density* approach to housing, that is, they have few people per hectare. By living in the suburbs, people avoid the *high-density* life in the inner city, where many people live close together. In the suburbs, most people live in single-family homes or townhouses that consume more land than apartments or condominiums. Many suburbs act as bedroom communities, because jobs are located elsewhere in the city where commercial and industrial activities are found. Cars have allowed us to separate work, home, recreation, and shopping. Unfortunately, they have also resulted in long commutes, daily traffic chaos, increased str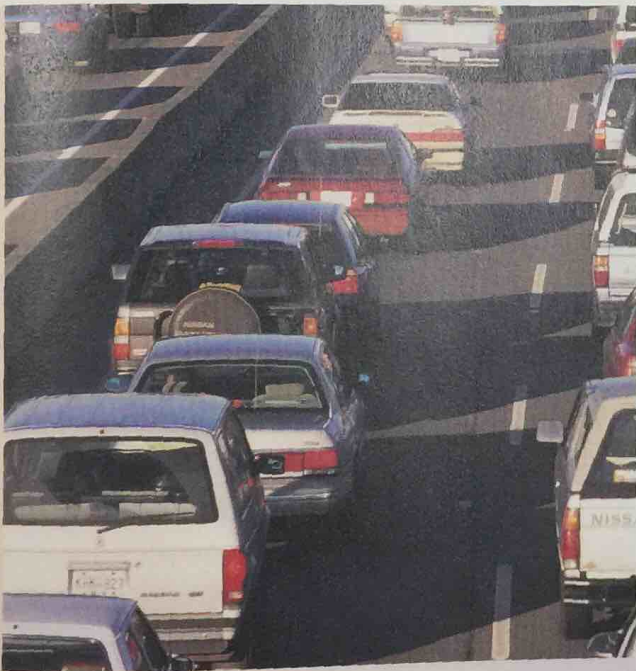ess, polluted air, and looming petroleum short-ages. The sprawling nature of suburban communities makes public transit expensive, further encouraging people to use private cars.

North Americans' dependence on the automobile has had profound impacts on their cities, including the shapes. About one-quarter of all the land in North American cities is used for transportation activities, with most paved over for roadways and parking lots. Every kilometre of expressway takes up about six hectares of land. Expressways give these cities their shape and form, serving as conduits that carry suburban commuters to and from the city.

Automobiles also affect the natural environment in and around cities. Water bodies are channeled and changed to make roadways efficient. Salt- and oil-laden runoff from roads and parking lots washes into streams, damaging their ecosystems. Cars are the largest single source of greenhouse gases that cause global warming (see Chapter 17). They also contribute to smog problems. The combination of paved-over areas and exhaust emissions helps create islands of heat within cities. Summer and winter, urban cores can be much warmer than surrounding areas.

Figure 15-16 Morning rush-hour traffic on Highway 99, northbound to Vancouver, *near the* George Massey Tunnel. North Americans value the personal freedom that automobiles give. Suburbs developed when cars allowed homes to be long distances from places of work.

ACTIVITIES

1. Develop a two-column list summarizing the benefits and disadvantages of the automobile in urban areas.

2. What options do people have for travelling and commuting to work in your region? What other options could be explored?

3. A new freeway has been proposed to go from the centre of a city to the outskirts. In a group of five students, take on the following roles:

   ■ an environmentalist

   ■ a commuter who wants to move outside the city

   ■ a resident of a quiet neighbourhood near the proposed highway site

   ■ a resident whose land may be expropriated (forcibly purchased) to build the highway

   ■ a member of the construction trade.

   In your group, discuss the benefits and drawbacks of the proposal, being sure to keep in your role.

Should There Be Land-Use Controls Against Urban Sprawl?

Cities transform the land on which they sit. Any large city, particularly one that is growing, if not limited by geography or regulations, spreads out into the surrounding countryside. Very often, the best land for suburban development is also the best agricultural land. This competition creates ongoing controversy as cities spread farther and farther into the rural environment.

In the Lower Mainland of British Columbia, farmland is at a premium. The Fraser Valley is less than 200 km long and 100 km or so at its widest and is hemmed in by mountains. The pressures, urban and agricultural, are considerable. Much of the land is in the Agricultural Land Reserve, a forward-looking 1970s policy meant to slow urban sprawl. Large tracts, however, are not covered by this land-use control. These areas are under development as cities such as Langley, Chilliwack, and Abbotsford grow to meet the needs of families looking for homes and jobs. Even some of the low mountains that fringe the valley are covered in subdivisions.

The Case Against Urban Sprawl

Many people are critical of the unchecked growth of cities, citing a number of areas where urban sprawl is considered a detriment to quality of life:

- The infrastructure that supports urban sprawl is expensive. For example, it costs about $10 million to build one kilometre of four-lane expressway. In the United States, the costs of providing the infrastructure for expanding suburbs is estimated at $45 000 (U.S.) per house. Water supplies and sewage treatment are also more expensive.

- Sprawl breeds more sprawl. Building more roadways is seen as the natural way to ease traffic congestion. Studies show, however, that within five years of building an expressway, it becomes clogged. Expressways encourage more people to move out to the fringes of the cities, so suburbs leapfrog outwards. A study in Toronto found that more than 160 000 commuters drove more than 30 km each way to and from work, with many spending in excess of one hour driving.

- Farmland is lost as suburbs expand. Through annexation of surrounding land, boundaries of large cities move outward. About 50 per cent of Canada's population live in urban areas that have been built on the best 5 per cent of the nation's farmland. In the United States, an estimated 400 000 ha of farmland are turned into strip malls, subdivisions, and freeways annually.

- Urban sprawl can be devastating to the social and economic health of a city. In some cases, the older core of the city decays because tax dollars and resources are used to develop the expanding fringe.

- The suburbs do not have the sense of place that characterizes small, vibrant, thriving communities. Land uses are segregated, with strip malls, recreational services, homes, and industries all in distinct zones. The car-based culture of the suburbs encourages shoppers to shift from patronizing locally owned stores and restaurants to patronizing large, regional malls and "big box" superstores.

The Case for Not Controlling Urban Sprawl

There are strong voices that present an alternative view of urban sprawl. These views are supported by the fact that people *choose* to live in suburbs. Suburbs continue to be built to meet a market demand from buyers who want to live in low-density developments on edges of cities. Arguments that support urban expansion include some of these ideas:

- Land costs are lower on the fringes of cities. Because of this, housing is more affordable and a greater number of families can afford newer, spacious dwellings. As an indicator of this trend, ownership of homes in suburbs averages 70 per cent, while in cities the average is 50 per cent.

- The construction of main roads creates natural locations for commercial development. Commercial activities then concentrate in these areas, leaving
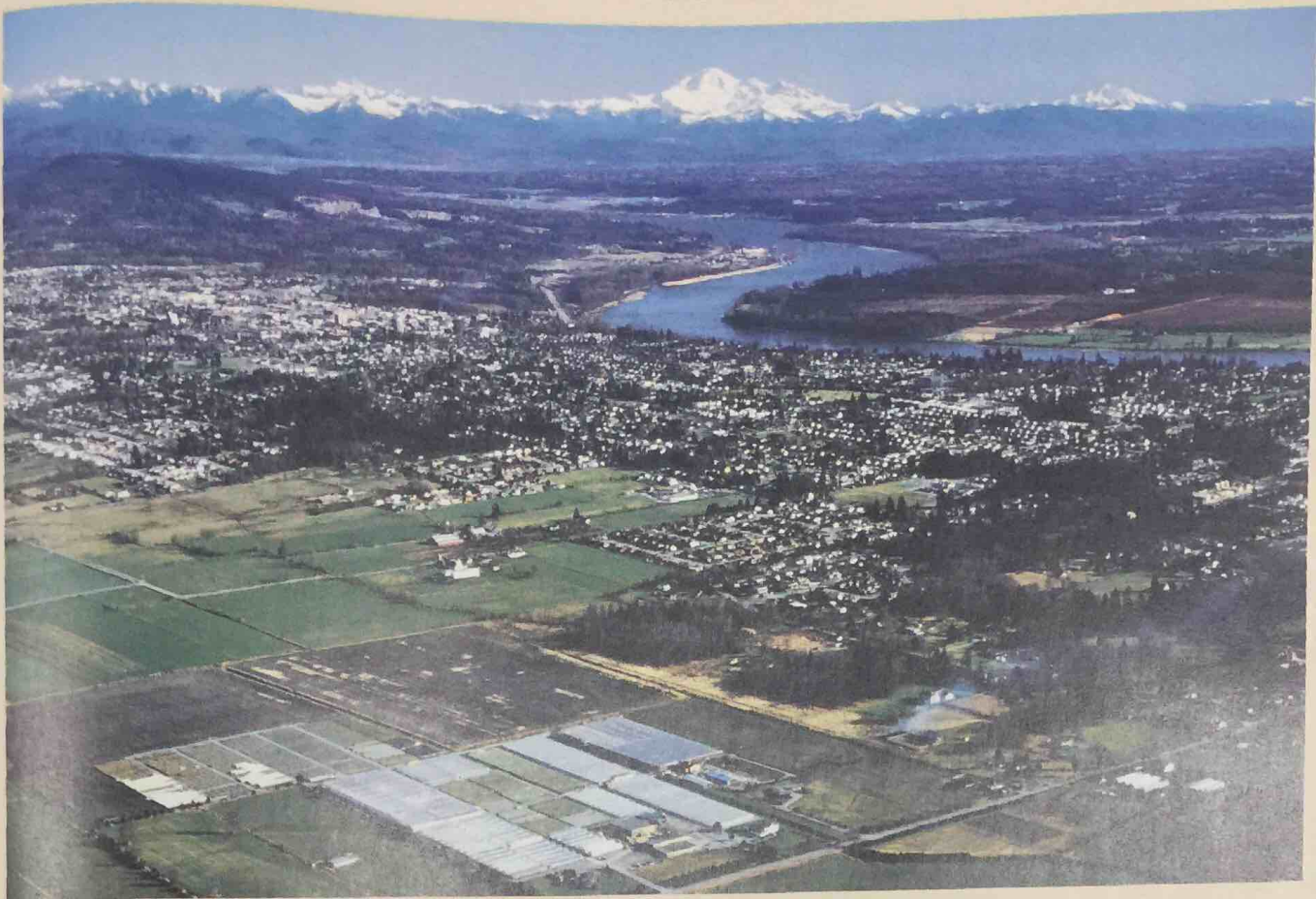
Figure 15-17 The subdivision of Maple Ridge, British Columbia, in the Fraser Valley. Urban developments like this one have encroached on the region's fertile agricultural lands.

residential streets with relatively little traffic. In addition, the concentration of businesses in strip malls reduces overall travel, because customers do not have to drive long distances to shop.

- Homeowners in low-density housing developments plant trees and shrubs and grow lawns that help the environment. Trees and shrubs filter pollutants out of the air, and the lawns are green spaces that help create a more enjoyable landscape. These amenities are not found to the same extent in more densely populated urban areas.

- Jobs are being created in the suburbs. The assumption that people living in the suburbs all drive to work in the city is not accurate. For example, a study in Portland, Oregon, found that only 0.8 per cent of new jobs were created in the urban core. In Los Angeles, just 3 per cent of the region's jobs are downtown.

Analysing the Issue

1. Identify three groups who are likely to oppose suburban development. Who is likely to support the expansion of suburbs?

2. Often, as many as six different municipalities control the land use of areas surrounding a city. How could this situation contribute to further urban sprawl?

3. Suppose you had written a book looking at the whole issue of urban sprawl. What would be five of the chapter titles in the book? Give reasons to explain why you chose these titles.

4. Draw an editorial cartoon to show your views on this issue. Use your cartoon to make a humorous statement either in support of urban sprawl or against it.

5. Is urban sprawl occurring in your community? If so, give your opinion on this development.

Land Uses in Cities

Geographers are interested in how people use land. They categorize how land is used in cities based on the functions. In most cities, functions group together and create **land-use** patterns.

Figure 15-18 Urban land uses.

Developing understanding For each category in this chart, give one example from your local community.

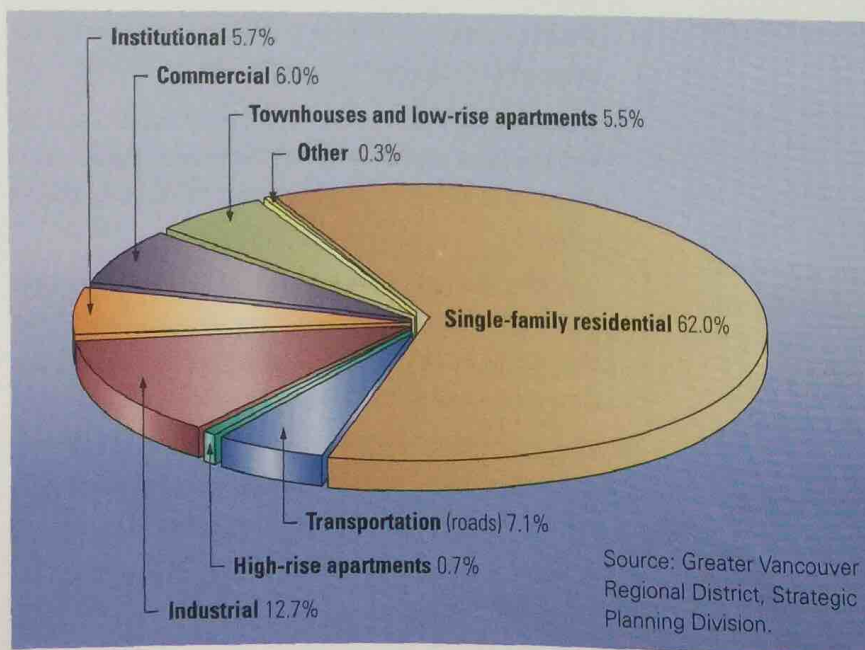| Category	Urban Functions	Examples of Land Uses
Residential	Where people live	• single-family homes • townhouses and duplexes • apartments and condominiums
Industrial	Places that make goods	• light industry, often organized into "industrial parks" • heavy industry, including steel mills and automobile assembly plants
Commercial	Places that sell goods and services	• single shops, such as corner stores • strip plazas, usually along major arteries • shopping malls • central financial districts
Transportation	Land used to provide facilities to move goods and people	• roadways • railways and their stations • airports and terminals • harbours and port facilities
Institutional	Land used to support the culture of the people	• places of worship • educational facilities • libraries
Other	Uses to meet the various needs of people	• public administration uses, such as city hall • recreational areas • cultural facilities (e.g., art galleries) • health care facilities • open space

Institutional 5.7%
Commercial 6.0%
Townhouses and low-rise apartments 5.5%
Other 0.3%
Single-family residential 62.0%
Transportation (roads) 7.1%
High-rise apartments 0.7%
Industrial 12.7%

Source: Greater Vancouver Regional District, Strategic Planning Division.

Figure 15-19 Urban land use in Greater Vancouver (percentage of land area). The figures do not include parks, which are classified as either non-urban or vacant urban lands.

Reading a graph What percentage of land use in Greater Vancouver is residential? Suggest three reasons why so much of the land is used for homes.
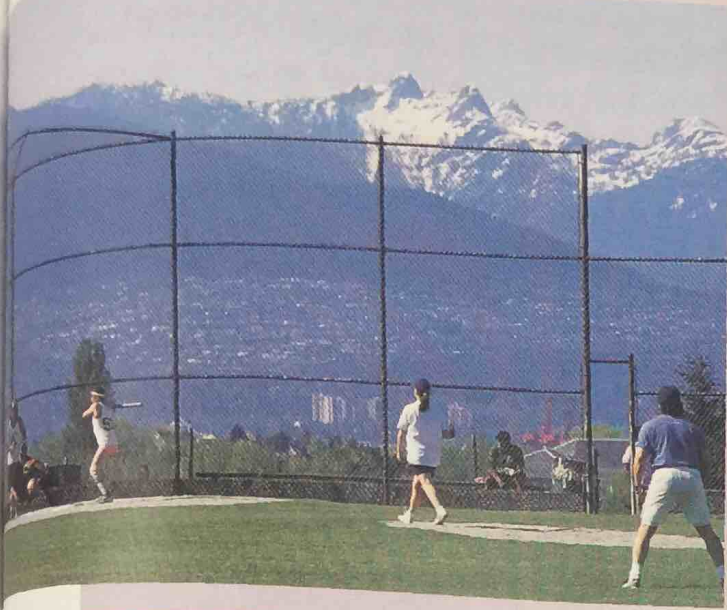
Figure 15-20 Typical land uses in urban areas.

Using evidence Use the land-use categories in Figure 15-18 to identify the land use in each of these photographs.

Analysing Land-Use Patterns

Land uses in cities are not random. Patterns are developed as a result of many forces. Site, situation, and function exert an influence on where land uses are established. Economics and politics are two other factors that we need to examine.

Competition for Land

For most land uses there is an optimum, or best, location. In economic terms, this is where the greatest return on investment can be realized. Businesses need the best locations in order to be successful. Usually conditions that are right for one business may be right for many others, so there is competition for the land. Competition is usually strongest around the most desirable intersections. Sometimes this is in the centre of the city, and sometimes on major transportation arteries, depending on the characteristics of the community. Land costs around these **peak-value intersections** (PVIs) are highest because users are prepared to bid more for the land to increase their chances of being successful. In Vancouver, for example, the intersection of Granville and Robson streets is a PVI. The urban land-value model in Figure 15-21 explains why land uses in cities tend to be clustered.

Land-Use Zoning

The rapid growth of cities has led municipal and provincial governments to set up land-use controls. These are laws that establish what uses will be permitted on the lands in a city. For example, land that permits uses such as stores or banks is zoned commercial. Land where only homes are permitted is zoned residential. These regulations can prevent land-use conflicts, which can result from incompatible land uses, such as car-wrecking yards being located near schools. Land-use conflicts can result from inappropriate zoning, such as allowing high-speed traffic beside a pedestrian walkway (appropriate zoning would keep pedestrians and highways apart). Land-use controls also ensure that municipal services can be provided in the most efficient manner.

Land-use zones are set up by the city after it has established an **official plan**. This is a broad plan for growth and development that is usually drawn up after lengthy consultation with the people of the city. Zoning *by-laws* (local laws or rules) are then used to ensure that people respect the land-use zones and build only what is acceptable for each location. People who support land-use zoning see it as a protection against haphazard growth and inappropriate land use in the city.

Figure 15-21 An urban land-value model. This model helps us see how distance from the PVI affects the cost of land. The **central business district** (CBD) is the core area where most head offices, stores, and government buildings are located. Land values decrease as you move away from the CBD.
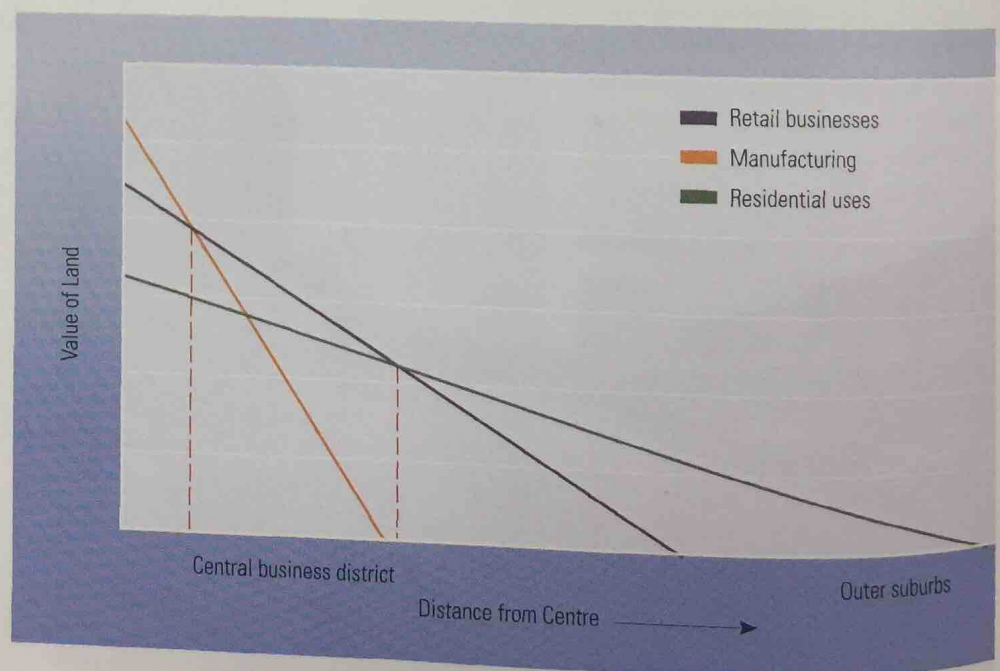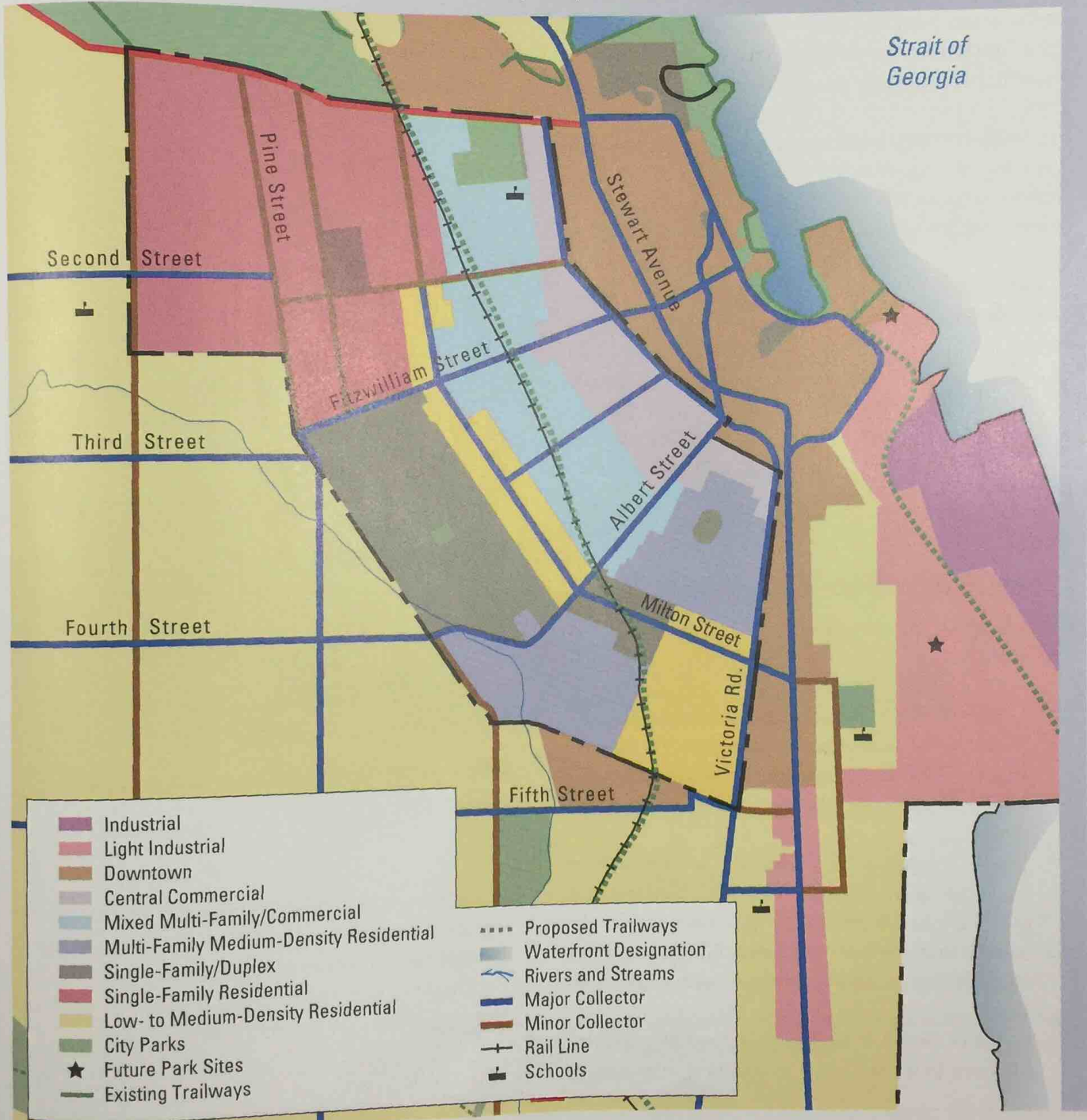

Legend:
- Retail businesses
- Manufacturing
- Residential uses

Value of Land

Central business district

Distance from Centre

Outer suburbs

Figure 15-22 An official community plan for a section of the city of Nanaimo, on Vancouver Island. The colours on the map identify the intended uses. Any proposed development must match the use for the area on the map. If developers want to do something contrary to the plan, they have the option of applying for amendments to the zoning by-law.

Reading a map

1. Locate the downtown area. Why do you think this was the first area to be settled?

2. How are **a)** the street pattern and **b)** street names in the first settled area different from the street pattern and names in the neighbourhood area? How would you explain this?

3. Describe and explain the location of the industrial area in relation to the water body and downtown area.

4. Use the map to describe waterfront use in the downtown area. Do you think this is a suitable use? Explain your answer.

Legend:
- Industrial
- Light Industrial
- Downtown
- Central Commercial
- Mixed Multi-Family/Commercial
- Multi-Family Medium-Density Residential
- Single-Family/Duplex
- Single-Family Residential
- Low- to Medium-Density Residential
- City Parks
- ★ Future Park Sites
- — Existing Trailways
- **····** Proposed Trailways
- Waterfront Designation
- ⤳ Rivers and Streams
- — Major Collector
- — Minor Collector
- ┼ Rail Line
- Schools

Strait of Georgia

Map labels: Pine Street, Second Street, Fitzwilliam Street, Third Street, Fourth Street, Fifth Street, Stewart Avenue, Albert Street, Milton Street, Victoria Rd.

Vertical air photographs are useful tools for analysing geographic patterns. However, objects in the photos look different from what we are used to. In vertical air photographs, the camera is directly above the centre of the photo, pointing straight down at the surface of the land. The roofs of buildings are clearly seen, but not the sides of buildings. You may see shadows from the buildings.

We use the appearance of objects in vertical air photographs to identify them and draw conclusions about land uses. The four characteristics we are most interested in are shape, size, colour or tone, and texture.
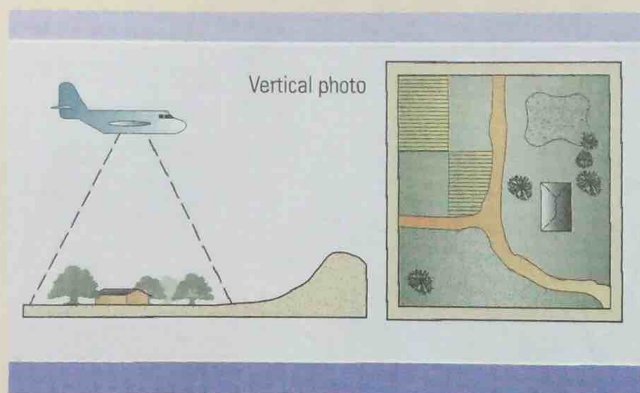

Figure 15-23 The position of a camera taking a vertical air photograph.

- *Shape* — The outline from above gives the shape of images. Think about what your home would look like from directly above. What would a sports track look like?
- *Size* — The size in the photograph will vary according to the height of the camera: the higher the camera, the smaller the image. Compare the size of objects to those that are known. Sometimes shadows can also be used to estimate the height of buildings.
- *Colour or tone* — In black-and-white air photographs, the grey tones are used to interpret information.

Vegetation appears dark, while water, because it reflects more light, is usually light-coloured. Roads show up as dark strips.
- *Texture* — Texture refers to the imagined feeling of touch of the surface. We use words like "smooth" and "grainy" to describe texture. Crops and natural vegetation will have a grainy look in air photographs.
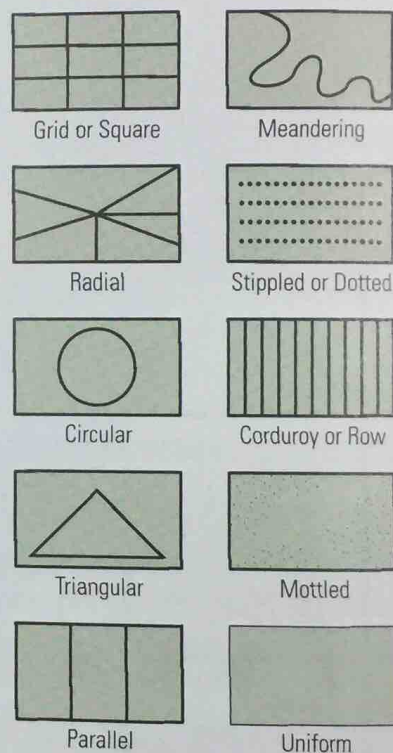

Figure 15-24 The ten basic patterns found in air photographs.

Interpreting air photographs also requires examining the patterns in the image. A pattern is a distinct arrangement of lines, shapes, colours, and the like. People work with the patterns to come to an understanding of the way the land is being used.
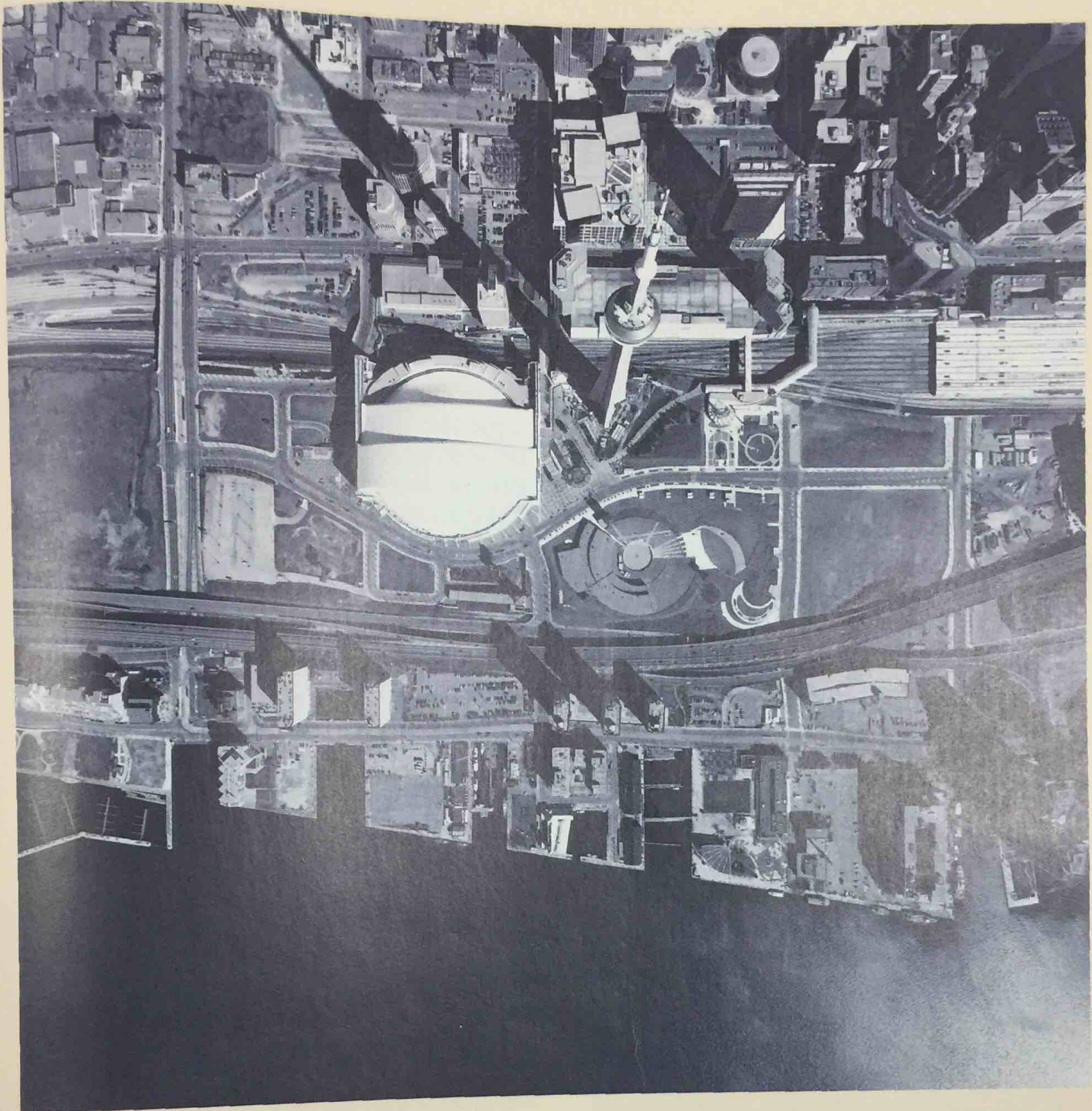
Figure 15-25 A vertical air photograph showing part of Toronto's lakeshore. The patterns and shapes in the photograph reveal information about the land uses in this community.

Applying the Skill

1. Using the air photograph in Figure 15-25, make a sketch to show the pattern of the main roadways.

2. Add to your sketch the water bodies that are shown.

3. Add five features that you have identified using shape, size, colour or tone, texture, and pattern.

4. In a paragraph, describe the land uses in the area shown in the photograph.

Some business people argue that market forces alone will prevent land-use conflicts. It is simply not good business to locate a gas station along a quiet residential street, and the price of land would prevent a car-wrecking yard from locating near a school. They also point out that municipal planners are part of a bureaucracy that has little incentive to make the best decisions. These officials are not dealing with their own land and do not suffer consequences for making poor decisions. Opportunities for innovative uses of the land may be stifled by the zoning regulations that set out what uses are possible. Proponents of civil liberties argue that zoning by-laws infringe on the rights of individuals to make decisions as they see fit in the use of their property.

ACTIVITIES

1. **a)** Explain why commercial land uses are usually located near peak value intersections.

   b) Identify two types of commercial activities that would not find PVI locations suitable. Explain your answer.

2. Compare land-use maps of either Vancouver or Victoria to a prairie city such as Edmonton or Winnipeg. List similarities and differences. Suggest how geography has created these differences.

3. **a)** Contact an official planner for your community, or a representative from a land-use advocacy group, and invite him or her to the class so you can hear his or her views on the question of zoning. Send a list of topics to the guest, and prepare your questions prior to the visit.

   b) After the visit, summarize your views on zoning.

Building Sustainable Cities

Problems that stem from the rapid growth of urban areas in developing countries are easy to see and document. Shanty towns and crowded streets are hard to miss. Sometimes the consequences of urbanization in the developed world are less obvious. Vanessa Baird, writing in *New Internationalist* magazine, expressed her opinion on cities in this way:

> The cities of the world consume 75 per cent of its resources and produce most of its waste. Put bluntly, most big cities today are filthy parasites, which require the "host" hinterland [the areas from which cities draw their supplies] to provide them with food, water, and energy, and depend on global forests, seas, and the atmosphere to act as their dustbins [garbage cans].

Harsh criticism, indeed! Baird and other critics argue that cities, as they now exist, cannot continue on their present path of development. As cities in developing countries continue to grow, global environmental damage will only increase. Abandoning cities and moving to the countryside is not a solution to the problem because it removes the benefits of urban living. The solution, it seems, is to redefine and reshape cities—to make cities more sustainable.

Sustainable cities may be defined as those in which resource decisions today do not compromise the quality of life for future generations. Some qualities found in sustainable cities include:

- an effective transportation system that encourages public transit use and discourages automobile use
- a mix of land uses, in which workplaces are located near residential areas, to reduce commuting
- a variety of affordable housing types, meeting all the diverse needs within the community
- an effective infrastructure, including such things as sewage treatment plants, water, health care, waste recycling, and education
- other civic amenities that lead to a good quality of life, such as parks, green spaces, and unpolluted waterways
- maximum use of alternative energies, such as wind and solar power instead of total reliance on non-renewable sources of energy.

Building healthy, sustainable cities means changing the way we plan and organize space in urban places. We have to shift the way we make

decisions, moving away from the traditional approach, which views the economy as separate and different from the environment and the community. A sustainable approach recognizes that decisions must take into account the community, economy, and environment, and the ways in which these components interact. The benefits of this approach include a healthy community, a healthy environment, and a healthy economy.

City planners think about the option of carless cities, even though the widespread use of automobiles makes this possibility seem absurd. A carless city would have fast, convenient public transit to get people to their jobs. More jobs would be located near to where people live to reduce the need for commuting. Shops and services would be in or near residential areas. Walkways and bicycle paths would criss-cross the community. Services such as health care clinics would be integrated into the community. Planners have estimated that the savings from not having to build the infrastructure for automobiles—roads, parking lots, and so on—would more than pay for the facilities that would be needed in a city without cars.
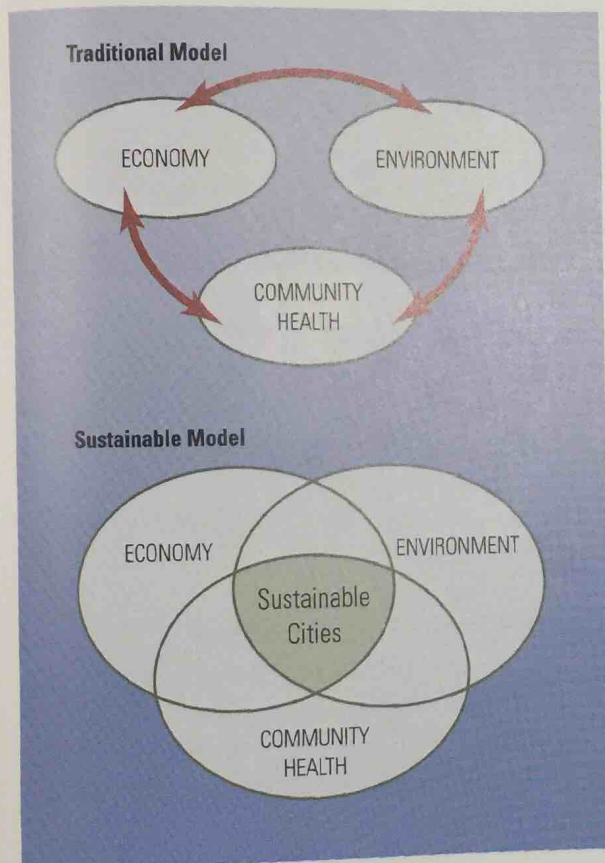
Urban Problems and Sustainable Opportunities

Let's look at some important problems faced by cities, and some potential courses of action that are more sustainable than those currently practised.

Energy Consumption

Cities account for 80 per cent of the world's use of fossil fuels, through residential, industrial, and transportation consumption. In a sustainable city, conservation would reduce the amount of energy
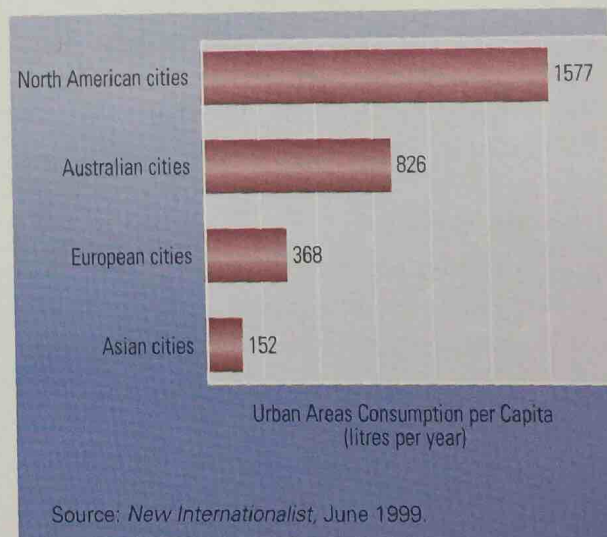
Figure 15-26 Different models for making decisions about urban places. Our use of the traditional model has produced good economic results, but at a heavy cost to the environment.

Expressing ideas

1. Which of the three elements plays the largest role in decision making in the traditional model?

2. What is different about the sustainable model?

3. What are the advantages of the sustainable model? What obstacles stand in the way of achieving this model?

Urban Areas Consumption per Capita
(litres per year)

Region	Consumption
North American cities	1577
Australian cities	826
European cities	368
Asian cities	152

Source: *New Internationalist*, June 1999.

Figure 15-27 Urban gasoline consumption per capita.

Developing understanding What are three factors that might explain the great differences in energy consumption around the world?
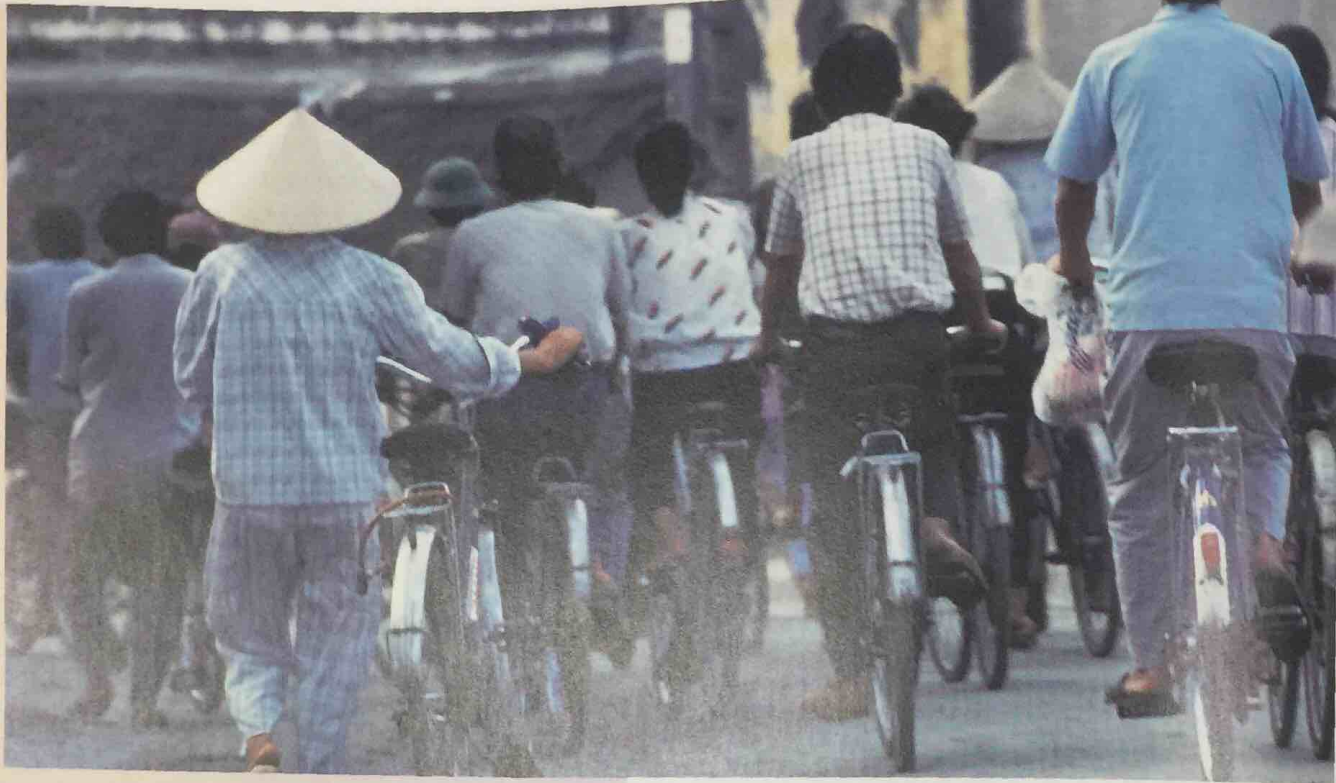
Figure 15-28 Rush hour in Hanoi, Vietnam.

Developing understanding Think of three reasons why North Americans do not use bicycles to the same extent as Asians and Europeans.

required. Local, renewable forms of energy would supply most needs. Solar-electric roof tiles can yield enough power for most buildings where there is enough sun, as in the Okanagan Valley.

Transportation

In North America, up to 94 per cent of urban dwellers commute to work by car. Reducing our reliance on cars in urban areas will reduce pollution, increase space for more beneficial uses, and reduce energy consumption. For example, one transit rider uses 900 L of gasoline per year less than a commuter using an automobile. Cycling is the cleanest and most energy-efficient option available, but other choices exist, such as hydrogen-powered vehicles. The key to making transportation in cities sustainable, however, is to make cities more compact, by building up and not out—to aim for high-density cities.

Food

Almost all food consumed in cities has to be imported, with tremendous costs measured in energy consumption, pollution from transportation, and distribution requirements. Cities could reduce their food needs if people modified their diets to suit local crops rather than imports. They could also use wasted urban spaces, such as roof tops, boulevards, and backyards, to produce food. More local food supplies would be available if zoning protected agricultural areas from urban growth, rather than sacrificing them for expansion.

Wastes

North Americans are the most wasteful people on Earth. A typical person in a North American city discards up to 1.6 kg of waste per day. In cities in other parts of the world, where both incomes and consumption of goods and services are lower, people waste smaller amounts. Recycling has been somewhat effective in controlling the amount of material that ends up in landfill sites. Cities with established programs, such as Nanaimo, have reduced wastes by up to 75 per cent. Recycling also has another benefit: small industries spring up
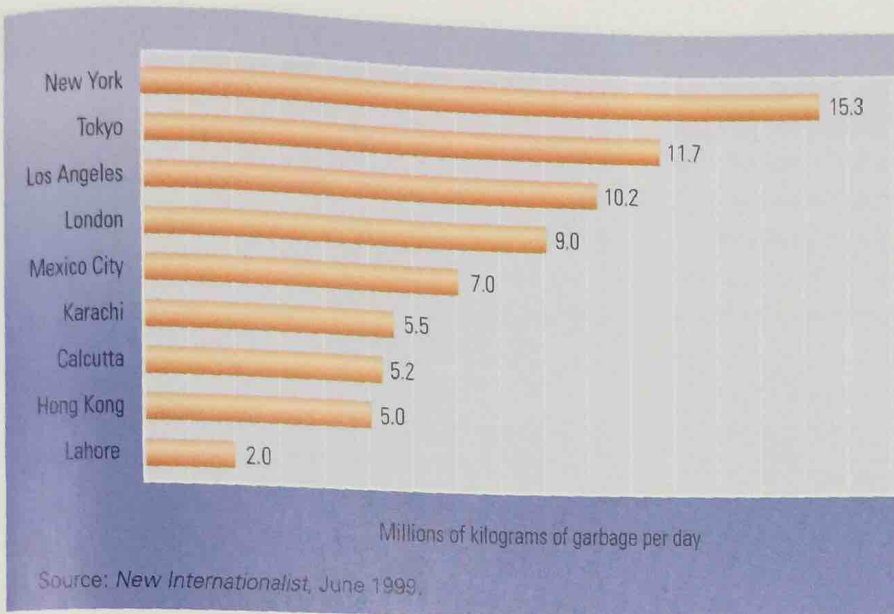
New York 15.3
Tokyo 11.7
Los Angeles 10.2
London 9.0
Mexico City 7.0
Karachi 5.5
Calcutta 5.2
Hong Kong 5.0
Lahore 2.0

Millions of kilograms of garbage per day

Source: *New Internationalist*, June 1999.

Figure 15-29 Amount of garbage created per day for selected cities (millions of kilograms per day).

Interpreting statistics Check the populations of those cities shown here that are listed in Figure 15-5 on page 369. Calculate the per capita amount of garbage by dividing the garbage amount by the population. What pattern do you see in the amounts of per capita garbage?
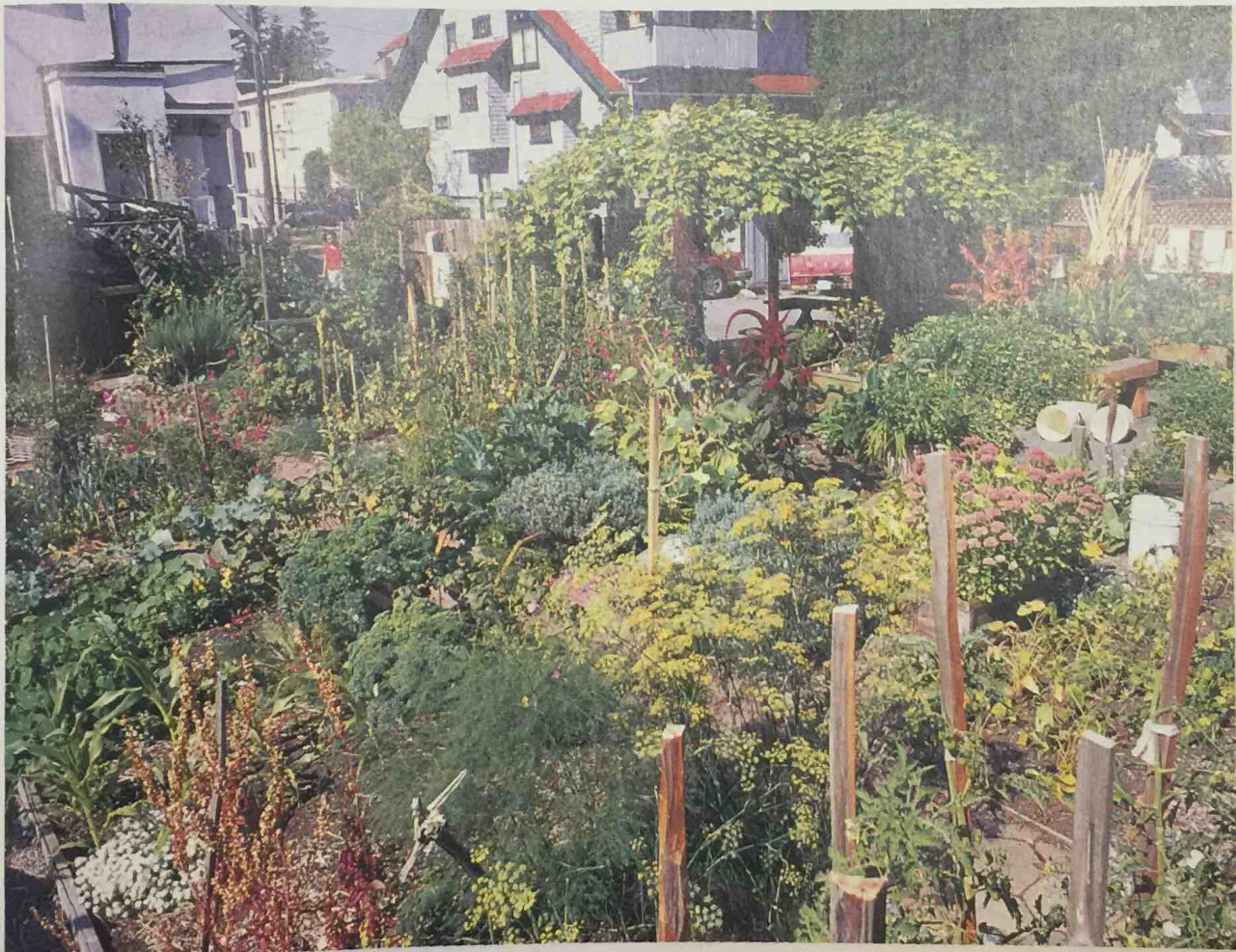

Figure 15-30 At this demonstration garden in Vancouver, city dwellers can learn how to make compost from kitchen and garden waste to fertilize flower beds, lawns, vegetable gardens, window boxes, and houseplants.

Thinking critically Identify three ways in which composting makes a city more sustainable.

Transport Mode	Persons Carried Past a Point in 1 h	Efficiency Compared to Subway
Autos (in one lane of an expressway)		
• 1.2 occupants per auto	2 400	7%
• 4 occupants per auto	8 000	23%
Streetcar or bus (on its own lane)	15 000	43%
Commuter rail	25 000	71%
Subway	35 000	100%
Source: IBI Group.		

Figure 15-31 Capacities of urban transportation modes. The value of 1.2 occupants per automobile is the average load for cars during rush hour today. The subway is clearly the most efficient transportation mode, but it is not always practical. The enormous cost of building a subway, for example, must be considered.

based on recycled materials. For example, aluminum recycling plants use discarded pop cans to create a range of new products. These industries create employment.

Density

Today many cities waste space. People live far apart and drive long distances to work. In a sustainable city, people will use less space. Higher density will be achieved by **infilling,** a process that increases density by rezoning and rebuilding in populated areas to allow more people to live in the same space. The city centre will grow upward, with population densities of 500 to 1000 persons per hectare. People will not need cars, and public transit will be fast and efficient. A sustainable suburb will be much more compact, putting more people into smaller spaces, building up (in apartment towers), and using up all vacant land.

Towards a More Sustainable City

The world is experiencing urbanization, the widespread movement of people from the countryside to cities. Canada's urbanization was complete by 1971, but developing countries are still urbanizing. This process alters the way people live and work.

Cities develop for a reason. The activities that go on in a city are its functions. Functions develop because of the opportunities or limitations imposed by the location's site and situation. As a result of its functions, the city takes on a spatial character, referred to as its urban form. An important factor shaping the urban form of cities is the automobile. It has allowed people to move to the suburbs, producing urban sprawl.

The way we have constructed cities over the past century is not sustainable. Cities have many harmful impacts on the environment and the people who live in them. Making cities more compact is one step towards making them more sustainable.

LOOKING BACK

Develop an Understanding

1. Compare urbanization patterns in the developing world, such as Africa, with those of the developed world, including Canada. Organize your ideas in a comparison chart.

2. You are preparing a Web site on the problems and benefits of urbanization. What topics will you want to have appear on the site's home page?

3. Identify three actions that would make your local urban centre more sustainable.

4. Design an ideas web showing the causes and effects that could turn a small, compact city into urban sprawl.

5. Working in pairs, choose one of the cities listed in Figure 15-5, and decide which of the five city forms applies. Report your findings to the rest of the class, explaining your answer.

6. Create a flow chart to show how the multiplier effect works.

Explore the Issues

7. Design an ideas web to show how municipal governments could restrict urban sprawl through policy and zoning changes.

8. Make a list of ten things that you think city officials and planners must consider when they try to improve city life. Rank the items on your list from the most important to the least important, and offer reasons for your choices.

9. What were the forces that led to the establishment and growth of your own community? Discuss the origin and growth of the community by considering urban functions, site and situation, and urban form.

10. a. What are three issues or problems that work to prevent sustainable lifestyles in your community?

    b. What might be done to overcome these problems?

Research and Communicate

11. Research the changes that have occurred in a city in British Columbia since 1960, using the Internet and other sources. Categorize the changes that you find under the headings: Form, Function, Environmental, Social, Political.

12. Water is an important element in sustainable cities. Do research to find out what problems exist in the supply of water to urban areas, and what are some sustainable opportunities that now exist. Organize your findings into a two-page paper.

13. In pairs, make a land-use map of your local neighbourhood. Clearly identify parkland, business districts, shopping areas, residential areas, schools, hospitals, government buildings, transportation lines, and farmland. Make first-hand observation your primary source of information. What factors seem to affect land uses in your neighbourhood?

14. Prepare an illustrated plan or model for a rapid transit system for your city. Begin by brainstorming the factors that you need to consider in designing such a system. Map out your routes and modes of transportation. Take time to ensure that your proposal is reasonable and realistic given economic, political, and technological realities.

15. Contact the town planning office in your area to find out about the land-use patterns in your community or the largest urban centre near you. Start by identifying the central business district and land use along main transportation arteries.

16. You are a town planner and you've just landed your dream job: to plan your ideal city. A mining company has hired you to plan a city to be located at a newly discovered mineral site. Decide on the makeup of your ideal city, and then prepare a presentation to convince the new city government to follow your plan with the financial assistance of the mining company. Supplement your oral presentation with posters, illustrations, maps, graphs, or other visuals.