

## CHAPTER 22 URBANIZATION AND SUSTAINABLE CITIES

### Chapter Overview

This chapter's material explains the origin and the growth of cities. Students must understand why cities grow and the challenges that people face in both the developing and developed world. They will also explore the concepts of urban sprawl and smart growth.

### Topics and Key Concepts

#### Land and Water Use

- Differentiate urbanization and urban sprawl and define the factors which induce each.
- Explain the development of megacities, urban agglomerations, and core regions.
- Identify advantages and disadvantages of living in urban areas.
- Explain smart growth.

#### Energy Resources and Consumption

- Outline the available human powered and mass transit options available to urban dwellers.
- Relate the development of garden cities, garden rooftops and green spaces to the reduction of runoff and air pollution in cities.
- Differentiate brownfields from highly contaminated Superfund sites. Discuss the societal impact of brownfield reclamation and development.

### Key Terms

brownfield  
city  
conservation  
development  
core region  
garden cities

greenfield  
development  
megacity  
pull factors  
push factors  
rural area  
shantytowns

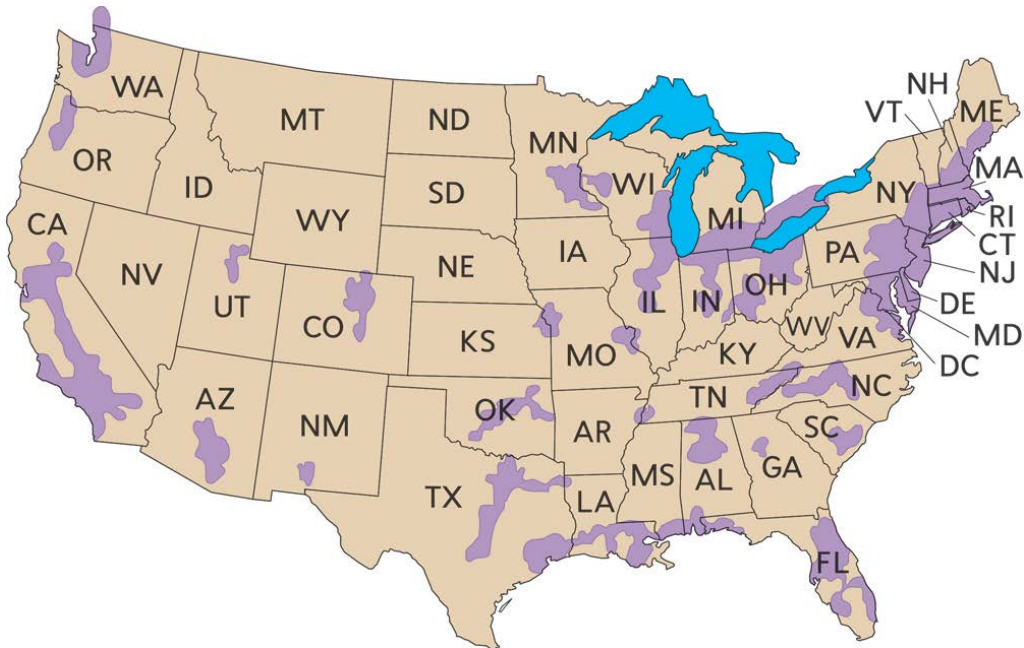
slums  
smart growth  
squatter towns  
urban agglomerations  
urban area  
\*urban sprawl  
village

## Pacing Guide

Land-use planning is a topic of interest to many students, because the use of space and the psychology of overcrowding are topics also covered in many of their other classes. Depending upon the level of student interest, you can spend as few as 3 days or as many as 7 days on this material.

## Approach and Tips

Briefly touch upon the reasons for urbanization, using the definitions given on pp. 500-501. Discuss the benefits as well as the drawbacks of living in each area. As populations grow, urban areas tend to blend together, forming agglomerations. Brainstorm some reasons why cities have grown. Give examples, or have students think of reasons why people migrate to city areas. Have them explain whether these reasons are push or pull factors. Integrate the role of governments in the formation of cities. Explain how populations stabilize based on improvement in living conditions. Address various push/pull factors, including white flight. Students may be unaware of the various factors which lead first to urbanization, then to urban sprawl.



Continue the discussion to include the challenges people and communities face as population increases. You may want to refer back to the demonstration done in freshman biology with cell size and growth. As cities grow, the shortages of food, water, housing, jobs, and services also grow. Another issue is respiratory disease that results from air pollution due to traffic congestion and industry. It is estimated that only 35% of city dwellers in developing countries have sanitation systems. Discuss the issues that cities in the developing world face as their populations increase. About 1/3 of the population in developing cities does not have safe drinking water. 15% of the world's population lives in shantytowns, which have no sewers, water, electricity, or roads.

As urban areas spread into suburbs and rural areas, open space, including agricultural land, is consumed. Suburban development requires new infrastructure, which increases taxes. Suburban development is usually low-density, meaning it takes up more land than corresponding population growth. As development expands farther from city services and jobs, the time and distance to commute increases, as does air pollution from cars and trucks.

The concepts of smart growth, greenfields, and conservation development are important. Make sure students can give examples of each. Compare and contrast each of these development schemes. Smart growth is efficient and effective developments, and provides affordable housing for both multi-age and multi-income groups. Smart growth protects environmental quality by conserving land space and reducing traffic. New towns and garden cities provide greenbelts of fields and forests and limit population size to facilitate social interaction. New urbanism projects are designed to accommodate all ages and income levels in small, walkable settings with a variety of services.

Conservation development is a design strategy to cluster houses and leave open space for recreation and habitat. Developments built on undeveloped farmland, or greenfields, are controversial in part because of the commute distance and housing costs. Discuss how food production can occur in a city. Brownfield development on reclaimed industrial sites helps preserve green space and reduce urban sprawl. Include societal benefits of brownfield reclamation.

If time permits, invite a local developer to give a presentation to the class, and discuss how they incorporate environmental aspects into the planning and design of the particular projected development.

## **Common Mistakes and Misconceptions**

Quite frequently, students don't understand the historical significance of the first agricultural revolution. In addition, urban sprawl is frequently confused with urbanization. Be sure to emphasize the differences.

## **Activities**

### **Mapping Global Urbanization**

The National Geographic Society has an interesting global urbanization activity, where students plot urban agglomerations. This activity helps students realize how megacities and agglomerations are proliferating, and students can research smart growth and how to reduce the environmental impact of these enormous areas. <http://nationalgeographic.org/media/mapping-global-urbanization>

### **Island Land-Use Planning**

In this activity, groups of students will plan a community on an island. Give students basic information they need to make decisions about how to develop the island. They need to include infrastructure and amenities, and they need to decide how many people will live on this island. The age of the people on the island will impact whether or not schools are included in their plan. They must consider transportation to and from the island as well as on the island. Students have the option of traditional development, conservation development, or a combination of the two. This activity is similar to Sim City. Be creative. Encourage students to be creative, imaginative, and to put into their island what they value in life. Each group can present their island to the class.

### **To Build or Not to Build Activity**

In this activity, students will be involved in role-playing. The issue: whether or not to build a new Tri 'n Save supermarket. Assign each student or group of students an identity. Identities include, but are not limited to, supermarket owner, residential owner living in the same neighborhood, residential owner living over a mile away, an unemployed citizen, a town councilman, and a local farmer. Students need to prepare a statement of why or why not the supermarket should be built. They need to be able to discuss the benefits of their plan/the flaws in the opposition's plan in their decision. At the end of the debate, a vote by all students will determine whether or not to build the supermarket.

## Questions for Review

1. Why did cities begin when people became settled?  
*When people no longer were hunters and gatherers, they used agriculture to support their populations. Surpluses gave rise to an increase in population. This increase in population, in turn, resulted in specialization of the population.*
2. What are push and pull factors, and what role do they play in urbanization?  
*Push factors are events that force people out of the country and into cities. Pull factors are ideas/events that draw people into a city. Push factors include rural unemployment, population growth, or conflict. Pull factors include jobs, entertainment, and opportunity.*
3. What are two environmental issues that cities must deal with as the area urbanizes?  
*Poor air quality as a result of traffic congestion, water pollution from insufficient sewage treatment, habitat alteration from continued building of infrastructure.*
4. What is conservation development? How does it attempt to find a common ground with both man and nature?  
*Conservation development involves clustered housing, while maintaining green spaces for other activities. Quite frequently, the green space may have hiking trails or nature walks. This area is preserved for wildlife, while the land used for each house tends to be small.*
5. What is urban sprawl? How does it influence social structure?  
*It is an outward expansion of an urban area. It spreads over the landscape, wastes resources, and consumes open space. Finally, sprawl fosters uniformity and alienation from local history and the natural environment.*

## Practice Questions

### Multiple Choice:

*Directions for questions 1–5:* The lettered choices below correspond to the descriptions given in questions 1–5. Select the one lettered choice that best fits each statement. Each choice may be used once, more than once, or not at all.

- (A) shantytowns
  - (B) garden cities
  - (C) greenfield development
  - (D) brownfield development
  - (E) conservation development
1. projects built on previously undeveloped farmlands or forests on the outskirts of large cities
  2. building on abandoned, reclaimed industrial land
  3. housing development on undeveloped land in which houses are built of corrugated metal or discarded packing crates
  4. cluster housing, or open space zoning, preserves at least half of a subdivision as natural areas, farmland, or other forms of open space
  5. houses clustered in superblocks surrounded by parks, gardens, and sports grounds
  6. All of the following are characteristics of urban sprawl, except
    - (A) centralized planning or control of land.
    - (B) widespread strip malls and big-box stores.
    - (C) decaying city centers.
    - (D) unlimited outward expansion.
    - (E) dominance of freeways and private automobiles.
  7. An urban area that consists of more than 10 million inhabitants is a \_\_\_\_\_.
    - (A) metropolis
    - (B) megalopolis
    - (C) really big city
    - (D) super size city
    - (E) megacity

Use the following for questions 8–10.

| The World's Largest Urban Areas (Populations in Millions) |     |                         |      |
|---|-----|-------------------------|------|
| 1900  |     | 2011                    |      |
| London, England   | 6.6 | Tokyo, Japan            | 37.2 |
| New York, USA   | 4.2 | Delhi, India            | 22.7 |
| Paris, France   | 3.3 | Mexico City, Mexico     | 20.4 |
| Berlin, Germany   | 2.4 | New York-Newark, USA    | 20.4 |
| Chicago, USA  | 1.7 | Shanghai, China         | 20.2 |
| Vienna, Austria   | 1.6 | São Paulo, Brazil       | 19.9 |
| Tokyo, Japan  | 1.5 | Mumbai, India           | 19.7 |
| St. Petersburg, Russia                                    | 1.4 | Beijing, China          | 15.6 |
| Philadelphia, USA   | 1.4 | Dhaka, Bangladesh       | 15.4 |
| Manchester, England                                       | 1.3 | Kolkata, India          | 14.4 |
| Birmingham, England                                       | 1.2 | Karachi, Pakistan       | 13.9 |
| Moscow, Russia  | 1.1 | Buenos Aires, Argentina | 13.5 |
| Beijing, China  | 1.1 | Los Angeles, USA        | 13.4 |

Source: UN Population Division, 2012.

8. Which city has the highest growth rate?
  - (A) London
  - (B) Tokyo
  - (C) New York City
  - (D) Los Angeles
  - (E) Paris
9. How many more times is the population of New York City in 2015 from 1900?
  - (A) 2 times
  - (B) 3 times
  - (C) 5 times
  - (D) 7 times
  - (E) 10 times
10. In 2015, what is the largest city in the Southern Hemisphere?
  - (A) Mexico City
  - (B) Sao Paulo
  - (C) Delhi
  - (D) Jakarta
  - (E) Cairo

Free-Response Question:

*Directions:* Answer all parts of the following question. Where explanation or discussion is required, support your answers with relevant information and/or specific examples. When a calculation is required, be sure to show how you arrived at your answer.

1. Knightland is a community that is experiencing uncontrolled growth outward from the center city.
  - (a) Identify and describe **two** characteristics of urban sprawl.
  - (b) On the east side of town, there is a proposal for a new housing development.
    - (i) Describe **two** characteristics of an environmentally friendly housing development.
    - (ii) Identify **one** federal law that may prevent the construction of the housing development.
  - (c) There are factors that cause people to migrate to an area. Identify and describe **one** of these factors.
  - (d) There are factors that cause people to migrate away from an area. Identify and describe **one** of these factors.



## Answers to Practice Questions

### Multiple Choice:

1. C
2. D
3. A
4. E
5. B
6. A
7. E
8. B
9. D
10. B

### Free-Response Question:

This question is based on 11 points. Students can score a maximum of 10 points only.

1. (a) 4 points total. 1 point for each identification and 1 point for each description. The answers to this question can be found in Table 22.3 (p. 504).
  - (b) (i) 2 points total. 1 point for each characteristic. Characteristics include, but are not limited to, green spaces, parks, conservation developments, green cities, and garden areas.
  - (ii) 1 point total. 1 point for correctly identifying a federal law. Laws include ESA, Clean Water Act, and others that have a good explanation accompanying the identification.
- (c) 2 points total. 1 point for a pull factor, and 1 point for a description of one. Pull factors include: jobs, opportunities, entertainment, and social activities.
- (d) 2 points total. 1 point for a push factor, and 1 point for a description of one. Push factors include: war, famine, religious persecution, and lack of jobs.

**Answers to questions in the Student Edition:**  
**Case Study AP Document-Based Question (page 499)**

- (A) Infrastructure changes needed for a city to reduce its dependency on cars include: better public transportation that includes trains, buses, and trolleys, a easy to use car sharing program for areas that cars are still allowed, a bike sharing program, increased bike lanes and paths, more places to park bikes, and a central city district with shopping, entertainment, doctor's offices, store, banks, schools, etc. within walking distance of residential areas.
- (B) Strategies for increasing urban growth include: highlighting the high cost of owning and maintaining a car and pointing out how much money residents could save by living in the city, emphasizing the damaging effects of a vehicle's carbon dioxide emissions, pointing out the high cost of suburban sprawl, and stressing that living a healthier life can be achieved by giving up cars and walking and biking more. The city structure itself was changed to make schools, child-care services, playgrounds, and sports facilities within easy biking or walking distance. Houses are built with private balconies and gardens and passive house standards that maximize quality of life.

**Use the Math (page 502)**

In 1900, two of the 13 largest cities were in low-income or developing countries (Moscow, Russia, and Beijing, China). In 2016, all but two of the largest cities were in low-income countries of South Asia (India, Pakistan, Bangladesh) or in the middle-income countries of Mexico, Brazil, Argentina, and China.

New York and Tokyo were 94.7% different in 1900  $((4.2 \text{ million} - 1.5 \text{ million}) / ((4.2 \text{ million} + 1.5 \text{ million}) / 2) * 100)$  and 39.2% different in 2016  $((23.6 \text{ million} - 38.8 \text{ million}) / ((23.6 \text{ million} + 38.8 \text{ million}) / 2) * 100)$ .

Between 1900-2016, the percent change in population was 462% in New York  $((23.6 \text{ million} - 4.2 \text{ million}) / 4.2 \text{ million} * 100)$ , 2,453% in Tokyo  $((38.8 \text{ million} - 1.5 \text{ million}) / 1.5 \text{ million} * 100)$ , and 2173% Beijing  $((25.0 \text{ million} - 1.1 \text{ million}) / 1.1 \text{ million} * 100)$ .

**Use the Math (page 508)**

We can feed 1,000,000 less people per year due to urban sprawl. In 20 years, that equals 20,000,000 less people.

**AP Connections Review Answers (pages 516-517)**

**Multiple-Choice**

1. c. Washington, DC is not a megacity, as its population is much less than 10 million.
2. c. The inexpensive cost of rural land has contributed to urban sprawl. Mass transit promotes urban growth, as does increased prices for gasoline. Autos are not a necessity in many urban areas. Jobs would retain people in urban areas.
3. c. There are increased education opportunities in cities in developing countries.

4. b. Characteristics of green cities include decreased use of rural space, increased vegetation to cool the city, fewer automobiles for transit, multiple-family dwellings, and decreased traffic congestion.
5. e. Aging cities experience aging infrastructure.
6. b. Approximately one third of the population in developing world cities do not have access to safe drinking water.

### **Data Analysis and Free-Response Questions**

- 1A The combined population of less developed areas in 2014 is approximately 6 billion people (2.9 billion in urban, less developed, and 3.1 billion in rural, less developed). 52% of this population is rural ( $3.1 \text{ billion} / 6 \text{ billion} * 100$ ).
- 1B The urban, more developed population increased by 80% from 1950-2010.  $((0.9 \text{ billion} - 0.5 \text{ billion}) / 0.5 \text{ billion} * 100)$
- 1C The slope for the urban, less developed line from 2000 to 2010 is 60 million/year. The coordinates used are (2000; 1,900) and (2010; 2,500). If this growth rate continues at the same pace, there will be 4.9 billion people in urban, less developed areas by 2050. ( $60 \text{ million/yr} * 40 \text{ years} + 2,500 \text{ million in 2010}$ ).
- 2A Smart growth, as listed in Table 22.4, means a city is striving to create a positive self-image for the community, with a livable downtown, alleviating substandard housing, solving health concerns such as air, water, toxic waste, and noise pollution, and improving communication and access to the arts among members of the community. On the surface, they have, but they have also excluded a portion of their existing community. This is a social justice issue, and Boulder should address equitable housing and access issues by working with this portion of the existing community.
- 2B Factors that contribute to urban sprawl include cheaper housing and nicer amenities in suburbs for residents, planning authority distribution between many small, local jurisdictions making it hard to regulate, and small towns welcoming new populations for profits from local landowners and businesses.
- 2C Answers will vary. Some answers can include: Concentrated urban areas provide environmental and economic benefits including public transportation (reducing the number of cars on the road, better for the environment and for people who can get rid of car ownership costs) and businesses and community centers in walking distance (encourages walking and healthy living, and also provides easier access to customers for businesses). These concentrated urban areas also result in environmental or economic disadvantages including a higher use of resources such as water and local food sources which could result in a decline in availability and the need to source from farther away, and the cost of living goes up and becomes unaffordable for many current residents.