# CHAPTER 16

# Urban Structure

*Topics 6.5–6.7*

### Topic 6.5 The Internal Structure of Cities

*Learning Objective:* Explain the internal structure of cities using various models and theories. (PSO-6.D)

### Topic 6.6 Density and Land Use

*Learning Objective:* Explain how low-, medium-, and high-density housing characteristics represent different patterns of residential land use. (IMP-6.A)

### Topic 6.7 Infrastructure

*Learning Objective:* Explain how a city's infrastructure relates to local politics, society, and the environment. (IMP-6.B)

*Like a piece of architecture, the city is a construction in space, but one of vast scale.*

—Kevin Lynch, *The Image of the City,* 1960

Peripheral areas of cities in southeastern Brazil exhibit many of the visible landscape elements typical of favelas—steep slope, dense population, and poor construction. (See Topic 6.5 for more on the structure of cities around the world.)

6.5

# The Internal Structure of Cities

Essential Question: How do various models and theories explain the internal structure of cities?

Cities are enormously complex and important centers for much of the world's population. Since cities first emerged in human civilization, they have been centers of economic, political, and cultural power. They have been places of innovation. Cities are growing faster today than ever before in history and that trend is projected to continue.

## Urban Models

Like most other models used by geographers, urban models are based on observations of real places. Though models vary, all models share certain functions:

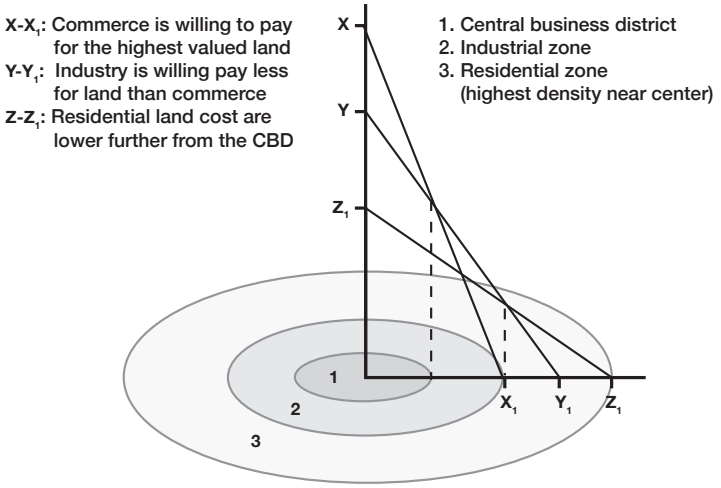
- classifying and categorizing land use in urban areas
- describing how various urban land uses are segregated spatially
- offering explanations for the location of different urban land uses

### *Urban Zones*

One principle underlying all urban models is **functional zonation**, the idea that portions of an urban area—regions, or zones, within the city—have specific and distinct purposes. The various zones fit together like a puzzle to create the entirety of the city. However, unlike a puzzle, the pieces of a city are not clearly delineated, and geographers have tried to identify and classify them with models. The resulting urban models provide geographers with a framework to describe, understand, and analyze cities. Urban areas around the world share three basic zones: the central business district, industrial/commercial, and residential.

**Central Business District** A vital part of any urban model is the **central business district (CBD)**, which is the commercial heart of a city. Often located near the physical center of a city, or the crossroads where the city was founded, the CBD is the focus of transportation and services. The **bid-rent theory** explains agricultural land use, just as it helps explain land use in central business districts. This theory explains that land in the center of a city will have higher value than land farther away from the city's center. Therefore, land use will be more intense and costs will be higher closer to the CBD. This means high-order services often dominate the CBD.

## BID-RENT THEORY FOR CENTRAL BUSINESS DISTRICTS




Competition for valuable space in the CBD gives it certain characteristics:

- In some countries, including the United States and Canada, the CBD has skyscrapers and "underground cities" that might include facilities for parking, shopping, and rapid transit.
- In Europe, many CBDs are located in the historic heart of the city where buildings are shorter but services are still concentrated.
- Because the cost of land is high in CBDs, manufacturing activities are rarely located there.
- High costs and limited space often result in residential portions of CBDs having high-density housing, such as high-rise apartment buildings.

The cultural landscape Chicago's CBD is characterized by high rise office buildings, with few examples of residential life—single-family homes, parks, grocery stores, or schools.

**Industrial/Commercial Zone** The zone outside the central business district is dedicated to industry. These industrial zones may include manufacturing, warehousing, and transportation. Industrial zones are generally separated from residential areas because they are associated with air and noise pollution.

Commercial areas with lower-order services and less-intensive land use are also found outside the CBD. Law firms might locate in the CBD, but department stores usually prefer commercial shopping zone with land values.

Several factors influence the choice of locations for businesses within the commercial zone. First, the land is zoned for commercial use so they are legally allowed there. Second, some industries have a **commensal relationship**, which is when commercial interests benefit each other. For example, restaurants and theaters benefit by being in the same zone, as do clothing stores and shoe stores.

**Residential Zone** All cities have **residential zones,** areas where people live. These are generally separate from the CBD and industrial zones either legally—through government zoning—or simply by the choices of inhabitants.

The different residential zones are distinct from one another. They may be segregated by density, income level, ethnic group, religion and culture, social status, or other characteristics. Which characteristic distinguishes the residential zones depends on the world region where the city is located.

## Models of North American Cities

Three models describe typical urban areas in North America—the concentric zone model, sector model, and multiple-nuclei model. These "classic models" were based on the city of Chicago. It was a good place to examine urban structure without the complications caused by irregular topography.

### *Concentric Zones*

The **concentric zone model** describes a city as a series of rings that surrounds a central business district. It is known as the Burgess model because sociologist E. W. Burgess proposed it in the 1920s. The first ring surrounding the CBD is a transition zone that mixes industrial uses with low-cost housing. Manufacturing benefits from proximity to the city-center workers and affordable land. Housing in this zone is often high-density, consisting of older, subdivided homes.

The next three rings are residential. Moving outward, one is for working-class housing, then one of more expensive housing, and finally, one of larger homes on the edge of the city and in the suburbs. With greater distance from the CBD, land is more plentiful and affordable, so residences are larger and of higher quality, and population densities decrease.

### *Sectors*

In the 1930s, economist Homer Hoyt developed the **sector model,** also called **Hoyt's model**. While Burgess used land-use rings that grew outward from the CBD, Hoyt described how different types of land use and housing were all located near the CBD early in a city's history. Each grew outward as the city expanded, creating wedges, or sectors of land use, rather than rings.

Hoyt's model describes sectors of land use for low-, medium-, and high-income housing. The model locates the sectors for the low-income, lower-quality housing next to these industrial and transportation zones, and it places high-income residences extending in a wedge away from these zones

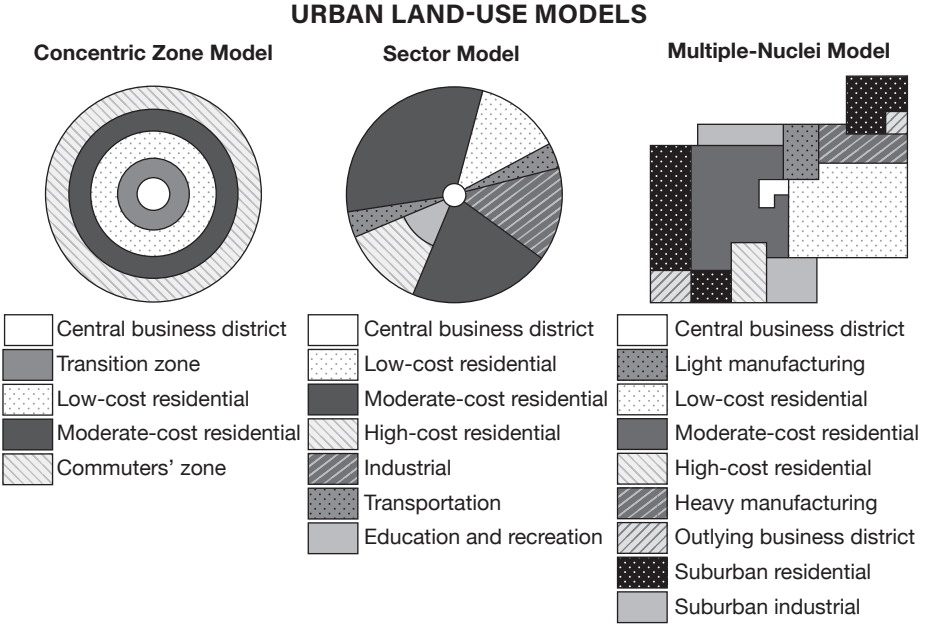
along wide tree-lined boulevards or on higher ground. The model also notes a sector for transportation extending from the city's center to the edge. This sector would contain rail, canal, and other transport networks within it. The transportation sector would also favor an adjacent zone of manufacturing.

### *Multiple Nuclei*

Geographers Chauncy Harris and Edward Ullman developed the **Harris and Ullman multiple-nuclei model** by studying changes in cities in the 1940s. This model suggested that functional zonation occurred around multiple centers, or nodes. The characteristics of each node either attracted or repelled certain types of activities. The result was a city that consisted of a patchwork of land uses, each with its own center, or nucleus.

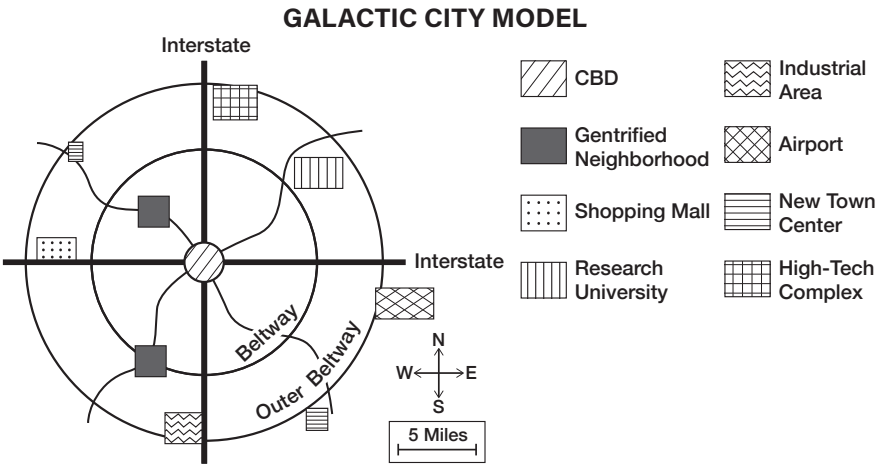
In the multiple-nuclei model, the CBD and related functions continued to exist but were joined by smaller business districts that emerged in the suburbs. A zone of industry could be in a variety of locations, including the traditional CBD or port, or it could move to new outlying locations near an airport or other transportation junction. This industrial zone would attract related industries and an area of higher density housing. A university or a business park might attract nearby restaurants, theaters, and other amenities. As a result, people might create a district of student housing or high-quality homes nearby.

The **peripheral model**, a variant of the multiple-nuclei model, describes suburban neighborhoods surrounding an inner city and served by nodes of commercial activity along a ring road or beltway. This model's name derives from the role of the service nodes with the related suburbs that develop on the periphery of the original city.



### *Galactic Cities*

Beginning in the 1950s, suburban growth in the United States skyrocketed as governments built highways that improved transportation in and out of cities and subsidized home purchase. Based on this process in Detroit, Chauncy Harris developed the **galactic city model.** In it, an original CBD became surrounded by a system of smaller nodes that mimicked its function. As suburbs grew, they took on some CBD functions. At key locations along transportation routes, people created mini-downtowns of hotels, malls, restaurants, and office complexes. Some of these nodes grew large enough to become **edge cities** (see Topic 6.2.), but they left behind a declining inner city.




The image above illustratates the geographic distribution of zones in a galactic city.

## World-Regional Models

Geographers have also developed models to describe cities outside of North America. Rings, sectors, and multiple-nuclei are found in these models, along with some additional elements. But the models share the same basic characteristic of North American models, that of functional zonation.

### *European Cities*

Many of today's cities in Europe grew out of medieval and pre-industrial cities. City walls, which were built for protection before the wide use of gunpowder weapons, restrained growth. These cities grew slowly and with little planning for centuries. The result is now a dense mix of commercial and residential land use with narrow, winding streets. Distinct land-use zones are difficult to find in the core areas of these cities. Later urban renovations cut through areas to produce elegant, wide boulevards with high-quality housing and shops.

CBDs in Europe differ in important ways from those in North America. Attempting to preserve their historic urban cores, city leaders have limited new construction and restricted the height of buildings. Often, former palace grounds have become large urban parks. European CBDs also have many more

**Source:** Getty Images

Aerial view of Paris with Eiffel Tower and skyscrapers of La Defense. Paris is a planned city with the historical districts in the center of the city. The newer skyscraper business district is outside the city center.

residents living in relatively low-rise apartment buildings. As a result of the larger population living downtown, commercial uses go beyond those in North America and include many more small businesses such as vegetable markets, bakeries, and butcher shops. The result supports a very walkable lifestyle.

Also in contrast to North America, European suburbs are likely to have a higher percentage of tall buildings. Most are apartment buildings, so population densities are higher in the suburbs of Europe compared to North America. International immigration creates ethnic diversity in the suburbs, and this diversity often reflects the colonial heritage of the country. For example, suburban London includes a large number of South Asians and their descendants, and suburban Paris includes people of North African heritage.

### *Middle Eastern and Islamic Cities*

The spread of Islam shaped many cities in the Middle East, North Africa, and parts of Spain, East Africa, and Southeast Asia. Dominating these cities is a central mosque that includes one or more tall and highly visible minarets, or tall slender towers. The principal **mosque** in the center of an Islamic city is usually surrounded by a complex of structures to serve the public, such as schools and soup kitchens. As cities grew, additional mosques were added in outlying neighborhoods.

Many Islamic cities were built with a defensive **citadel**, a fort designed to protect the city, with its related palace and barracks for soldiers. Walls with gates and towers were typical in earlier times and they, or their remnants, still survive in many modern Islamic cities. Major roads connect the gates of the citadel to the city center. Along these roads are traditional outdoor markets or covered bazaars, called **suqs**. These markets often exhibit spatial differentiation with shops selling luxury items near the center of the city, with bulkier, less-valuable materials for sale near the wall and gates.

Explain the similarities and differences between the market in the photo and a local grocery store or convenience store.

Residential neighborhoods often reflect differences in ethnicity or branch of Islam in their organization and architecture:

- Streets and alleys are usually twisting and often dead-end.
- Homes have central courtyards rather than yards in front or back.
- Windows are small and located above eye level.

The above features create shady areas, which suggests they might be cultural adaptations to the sun and heat of the Middle East. These features also imply that privacy is an important value within Islam.

### *Latin American Cities*

The **Griffin-Ford model** is often used to describe Latin American cities. It places a two-part CBD at the center of the city—a traditional market center adjacent to a modern high-rise center. The most desirable housing in the city is located there, next to the developed center of the city. This high-quality housing extends outward from the urban core, accompanied by a **commercial spine** of development. Theaters, restaurants, parks, and other amenities are also located along this spine, or corridor. The spine ends in a growing secondary center, also called a **mall**.

In contrast to the concentric zone model in North America, as distance increases from the center of Latin American cities, the quality of housing decreases. Public transportation, the urban water supply, and access to electricity all decrease farther away from the center, sometimes disappearing altogether. Often, Latin American cities have a zone of *in situ accretion* that acts as a transitional area between the older areas of the central city and the peripheral outer ring. The outer ring of the city, the **periférico,** shows poverty, lack of infrastructure, and areas of poorly built housing known as **shantytowns**. Often, the residents of shantytowns are recent migrants to the city. The model notes the possible presence of an industrial node closer to the commercial spine.

Many Latin American cities include **favelas**, or **barrios**, which are neighborhoods marked by extreme poverty, homelessness, and lawlessness. Most favelas are in **disamenity zones**, areas not connected to city services and under the control of criminals. They are often in physically unsafe locations, such as on steep, unstable mountain slopes. Structures are poorly constructed, often by the residents themselves, and densely packed together.

### *African Cities*

Large cities were rare in most of Africa until the 19th century, when Europeans colonized the continent. But in recent decades, urban areas in Africa have grown rapidly. New cities have been built next to or on top of existing ones. These new cities can include several identifiable regions:

- The **traditional CBD**, which existed before European colonization, has small shops clustered along narrow, twisting streets. It includes the formal economy—permanent stores with full-time jobs that comply with local regulations and have set wages.

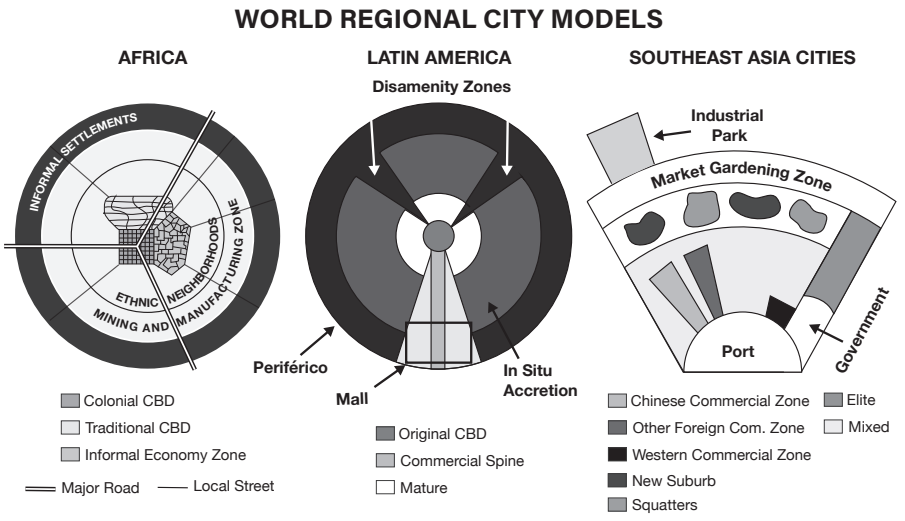
- The **colonial CBD** has broad, straight avenues and large homes, parks, and administrative centers.
- The **informal economy zone** thrives with curbside, car-side, and stall-based businesses that often hire people temporarily and do not follow all regulations. This zone also includes **periodic markets**, where small-scale merchants congregate weekly or yearly to sell their goods.
- A zone of mining and manufacturing is often found in cities.
- Residential zones are often based on ethnicity. These mirror the multi-ethnic makeup of African countries.

The periphery of cities often consists of densely populated **informal settlements**, called **squatter settlements.** They often lack sufficient public services for electricity, water, and sewage. Similar to Latin American favelas, they face problems with drugs, crime, and disease. One of the largest squatter settlements in the world is Kibera, on the western edge of Nairobi, Kenya.

### *Southeast Asian Cities*

The **McGee model** describes the land use of many large cities in Southeast Asia, where the focus of the modern city is often a former colonial port zone. This export-oriented zone shares commercial uses similar to the CBD in North American cities. Additionally, these cities might include a government zone. If the city is a national or regional capital, it might have a commercial zone dominated by foreign merchants and ambassadors. A belt of market gardening often surrounds and supplies these cities.

Cities in Southeast Asia have a history of Chinese immigration and commercial interest that dates back a few centuries. As a result of this immigration, many cities include a secondary commercial zone dominated by Chinese businesses. As the importance of industry in Southeast Asia has risen in the last few decades, industrial parks and regions of manufacturing have emerged on the peripheries of some cities.



## REFLECT ON THE ESSENTIAL QUESTION

**Essential Question:** *How do various models and theories explain the internal structure of cities?*

| Model or Theory | City Structure Within Model |
| --- | --- |
| | |

## KEY TERMS

functional zones
central business district (CBD)
bid-rent theory
commensal relationshhip
residential zones
concentric zone model
sector model (Hoyt's model)
Harris and Ullman multiple-nuclei model
peripheral model
galactic city model
edge cities
mosque
citadel
suqs
Griffin-Ford model
commercial spine
mall
periférico
shantytowns
favelas (barrios)
disamenity zones
traditional CBD
colonial CBD
informal economy zone
periodic markets
informal settlements
squatter settlements
McGee model

6.6

# Density and Land Use

**Essential Question**: How do low-, medium-, and high-density housing characteristics represent different patterns of residential land use?

Residential zones have different population and building densities. These differences can reflect the city's culture, landscape and lifestyle preferences, and social divisions.

## Local Regulations on Land Use

Sometimes individuals or groups have conflicts over how to use land in a city. For example, most homeowners want a place that is quiet at night so they can sleep. However, a factory owner might want to continue production, which can be noisy, around the clock. To balance competing desires, cities and counties use **zoning ordinances**, regulations that define how property in specific geographic regions may be used. Local governments use three general zoning categories:

- residential, where people live
- commercial, where people and businesses sell goods and services
- industrial, where businesses make things

Governments use zoning ordinances as a tool of **urban planning**, a process of promoting growth and controlling change in land use. Zoning laws can result in very clear land-use segregation. However, not all cities have zoning ordinances, and most include undeveloped areas yet to be zoned.

### *Residential Zones*

Those areas of a city devoted to where people live rather than to commercial or industrial functions are **residential zones**. Ordinances set limits on the density and size of houses within specific zones. For this reason, some residential neighborhoods contain only large homes and lots, while others are composed of small homes and lots, and still others contain apartment buildings.

Zoning can create various types of neighborhoods that appeal to people with various housing needs and lifestyles. However, it can also be used to prevent socioeconomic diversity or ethnic diversity in a neighborhood.

In North America, residential areas surrounding the CBD are known as the **inner city**. Apartment buildings and townhomes dominate the residential zone, which has the highest population density of the zones. As one moves farther from the inner city, population and housing-unit density declines, and types of housing change. This variation is known as the **residential density gradient**.

Suburbs are often characterized by single-family detached houses. More than half of all Americans now live in suburbs. Many suburbs are noticeably homogenous in terms of housing size and style. However, in recent years, homeowners have been tearing down existing homes and building new ones that are much larger. These new homes, known as McMansions, do not always conform to the style of other homes in the neighborhood.

**Source:** David Palmer

When homes age or people of higher income move into a neighborhood, older homes may be torn down and replaced. What are the advantages and disadvantages of this process?

## *Cycles of Residential Zones*

Neighborhoods undergo transformations over time as existing residents move out and new ones move in. Through a process known as **filtering**, houses pass from one social group to another. This usually occurs when people with less wealth move into the houses after wealthier residents move. This creates a ripple effect down the social scale. The filtering process might include changing the use of a house. For example, a home built for a single family might be subdivided for use by two or more families or replaced with apartments.

Filtering is most noticeable when an ethnic enclave neighborhood changes to another group. The term **invasion and succession** refers to the process by which one social or ethnic group gradually replaces another through filtering. An important result of filtering is a changing landscape through the process of sequent occupancy. (See Topic 3.2.)

The rise of *gated communities* (see Topic 6.10) is another example of change in suburbs and occasionally in cities. These neighborhoods are planned to control access and promote aesthetics within the community. They are fenced, or walled, with a limited number of streets going in and out. Security guards and cameras are sometimes found at the entrances. The landscaping, housing styles, and other visual elements of the community are strictly regulated.

Many communities today use **urban infill** in suburbs as one way to reduce urban sprawl on the outer edges of the city. Urban infill is the process of increasing the residential density of an area by replacing open space and vacant housing with residences. As land becomes more valuable in a suburb, bid-rent may make it profitable to replace lower-density houses with the large yards of

higher density housing, multi-family housing, or even apartments.

Another change involves the availability of businesses. Suburban residents have always been able to find shops for food and necessities in their neighborhoods. In recent decades, there has been an increase in the number and size of businesses in suburbs:

- Strip malls and shopping malls have become common.
- Big-box retail stores have been successful.
- Offices and business services have moved to the suburbs.

All of these changes are part of the **suburbanization of business**, the movement of commerce out of cities to suburbs where rents are cheaper and commutes for employees are shorter. As a result, many cities have faced declines in job opportunities, consumer choices, and services.

### *Residential Land Use Outside North America*

Outside of the United States and Canada, the residential density gradient does not usually run from higher to lower the farther one goes from the CBD. Instead, population density tends to increase in the suburbs even though land is more plentiful. In Europe, as explained earlier, the centers of cities contain many historic structures, and population densities are fairly low. The suburbs on the edges of the central cities contain multistory apartment complexes and have very high population densities.

In Latin America, the peripheral areas of cities may contain suburbs typical of the United States, with single-family houses and lower densities, and also suburbs similar to Europe with high-rise apartments. In addition, very densely settled squatter settlements, or favelas, are where the poorest residents live. Gated communities are increasingly common in Latin America as the region develops. Because of their popularity with wealthy urban elites, these security-minded neighborhoods are emerging in residential areas in all regions of the world today.

REFLECT ON THE ESSENTIAL QUESTION

**Essential Question:** *How do low-, medium-, and high-density housing characteristics represent different patterns of residential land use?*

| Type of Residential Land Use | Characteristics |
|---|---|
| | |

KEY TERMS

| | | |
|---|---|---|
| zoning ordinances | inner city | invasion and succession |
| urban planning | residential density gradient | urban infill |
| residential zones | filtering | suburbanization of business |

6.7

# Infrastructure

**Essential Question**: How does a city's infrastructure relate to local politics, society, and the environment?

Critical to the functioning of any city is its **infrastructure**, the facilities and systems that serve the population. The infrastructure of any city has many elements:

- transportation features, such as roads, bridges, parking lots, and signs
- communications features such as cell phone towers, television cables, and Internet service
- distribution systems for water, gas, and electricity
- buildings, such as police stations, courthouses, and fire stations
- collection systems for sewage and garbage
- entertainment venues, such as museums, theaters, and sports facilities
- open spaces, such as public parks and town squares

Building, repairing, and replacing infrastructure is costly and, in a busy urban setting, disruptive to people who live and work there. The infrastructure of older cities around the world is often in poor condition.

Deciding who pays for elements of infrastructure, where they should be built, and what economic and social benefits they offer are usually hotly debated issues. For example, using public resources to build sports stadiums is particularly controversial, and the results are difficult to predict. In Denver, building a baseball stadium for the Colorado Rockies served as an anchor for economic development that helped revitalize a dilapidated area. In Atlanta, building a stadium displaced African American neighborhoods and provided limited economic benefits to the community.

## Political Organization and Infrastructure

A city is a political entity. The term **municipal** refers to the local government of a city or town and the services it provides. For example, a mayor and city council make up the core of the municipal government, and the local water supply is the municipal water supply. **Municipality** refers to a local entity that is all under the same jurisdiction. The municipal government is responsible for managing infrastructure at the local scale, although the federal government often subsidizes large expenses.

As cities have grown in the past two centuries, they have expanded in physical size, pushing their boundaries farther from the original core. When

these settled areas move beyond the legal boundaries of the city, the inhabitants may be left without political representation or services from the city. The process of adding land to a city's legally defined territory is known as **annexation**. Annexation generally requires a vote by residents in the affected areas.

Sometimes, residents who live beyond the legal boundaries of the city do not desire to become part of the central city. In such cases, residents may choose the option of **incorporation**, the act of legally joining together to form a new city. One reason is that the newly-created municipality is smaller and political representation is more "local" than if the residents had opted for annexation. Often many of these peripheral municipalities are cities only in terms of legal and political considerations. They usually lack a true CBD and continue to function as **bedroom communities**, or commuter suburbs, within the larger metro area.

Some populated regions do not fall within the legal boundary of any city or municipality. These are known as **unincorporated areas**. On a political map, these are the areas between the legal boundaries of cities. Usually a nearby municipality provides their services and administration, through some higher division of civil government such as a county, borough, parish, or province. Over time, people of these areas may consider annexation by an existing city or incorporation as their own city.

### *Infrastructure and Economic Development*

Economic wealth is not evenly distributed across the globe. Some cities are located in wealthier countries and, therefore, can spend more money on developing, maintaining, and improving infrastructure.

**Frankfort** For example, Frankfurt, Germany, is centrally located in Europe and is within a two-hour flight to most European capitals. The Frankfurt airport provides service to more than 100 countries. Its rail transportation is highly developed with nearly 1,800 trains that move people about the city each day. In addition, telecommunications are an integral part of the city's infrastructure. At the national scale, Frankfurt is considered the most important Internet exchange center in Germany. At the global scale, the city is one of the world's largest and most reliable data transfer sites.

**Lagos** By comparison, Lagos, Nigeria, with almost 20 million people, is one of the world's most populous megacities. Lagos is a vibrant city with a significant amount of commerce, accompanied by dynamic music, fashion, and film industries.

However, due to extensive unplanned population growth, Lagos faces significant obstacles in the areas of public transportation, utilities, and sanitation. Roads are in severe disrepair, and often become nothing more than pathways of mud when heavy rains occur. The lack of sufficient roads limits the movement of residents and commerce in many parts of the city. While the city of Lagos has planned to improve communication infrastructure, it still lacks much of the technology of more-developed regions.

### *Infrastructure and Social Development*

Urban planning and smart-growth policies are often implemented as urban and suburban populations continue to grow. *Smart-growth policies* (see Topic 6.8) encourage sustainable development economically and socially to increase efficiencies and protect the environment. Many aspects of smart-growth are illustrated in the infrastructure and social development of a city. Creating more walkable areas (both paved and nature trails), bike lanes, and common public spaces encourages a sense of place and community belonging.

Improvements in infrastructure dramatically improve the living conditions in the poorest areas of the world. More indoor plumbing can help improve the sanitation conditions of people in some of the more densely populated cities like Kolkata, India; Port-au-Prince, Haiti; and Nairobi, Kenya. Expanding access to educational opportunities and healthcare, especially for females, helps to strengthen society. People with more educational opportunities tend to have higher earning potential over the course of their lifetimes, which means they are more likely to have the financial resources to meet basic needs such as housing and healthcare.

## Transportation and Urban Infrastructure

Running a city is complex and a challenge to all levels of government, especially smaller less-funded municipal governments. Local governments have to provide services that meet the needs of sometimes rapidly growing populations. Governments must build and care for infrastructure, maintain order, and mediate competing interests for the benefit of the entire population.

### *Public Transportation*

The dense population of cities, combined with the high number of suburban residents who commute to central cities for jobs each day, places great demands on the transportation system. The use of large numbers of individual automobiles creates a multifaceted problem:

- environmental—air pollution and excessive use of nonrenewable energy sources
- social—congested roads and long commute times
- economic—valuable real estate used for parking areas and costs associated with car ownership

One solution to moving people around an urban area is **public transportation**—buses, subways, light rail, and trains that are operated by a government agency. Some cities in the United States—such as New York City, Washington, DC, and San Francisco—are known for the success of their mass transit systems. However, few cities have extensive systems and ridership is often low in these cities so fares rarely cover operating costs.When fares increase, passenger numbers decline and the poor, who need public transportation the most, are often not able to use the system.

In contrast, governments in other countries have placed a higher priority on building, maintaining, and promoting the use of public transportation. A much higher percentage of the population of cities in Europe, Latin America, and parts of Asia rely on public transportation. Of the ten most-used urban train systems in the world, only New York City is in the United States. Of the top 50, only New York City and Washington, DC, are in the United States.

### *Automobiles in Urban Areas*

Along with the importance of public transportation, automobile ownership has continued to grow in the 21st century. Collecting data about automobile use and applying it to improve traffic flow is critical to transportation in large cities. The use of this data by cities is an example of applied geography.

Traffic patterns change throughout the day as commuters come into the city in the morning and leave again in the afternoon. Lunch rush hours, weekends, and holiday data is also collected.

Once a city knows when and where the traffic issues are, the primary tool used to encourage efficient flow is the traffic signal. Cameras mounted at intersections and along major transportation arteries allow cities to adjust traffic flows in response to vehicle accidents and weather in real time. Emergency vehicles benefit from the data collected in both setting up signal patterns ahead of time and adjusting them from real-time data collection. A great deal of planning goes into decisions about signal lengths and coordination to keep cars moving efficiently.

REFLECT ON THE ESSENTIAL QUESTION

**Essential Question:** *How does a city's infrastructure relate to local politics, society, and the environment?*

| Element of Infrastructure | Importance to Society |
|---|---|
| | |

KEY TERMS

infrastructure
municipal
municipality
annexation
incorporation
bedroom communities
unincorporated areas
public transportation

## GEOGRAPHIC PERSPECTIVES: *WHERE THE WEALTHY CHOOSE TO LIVE*

One basic geographic decision that nearly every person makes is where to live. Since they have more money than others, wealthy people have more options. The choices they make reflect what people value in a particular culture. In turn, these choices shape the spatial distribution of public services.

**Different Places, Different Choices**

In Europe and Canada, wealthy people have traditionally chosen to concentrate in densely-populated central cities. They have always valued having a short commute to their place of work, as well as easy access to concerts, plays, museums, and other forms of entertainment.

In contrast, in the United States, wealthy citizens have been more likely to choose to live in suburbs where population densities are lower. The attractions of spacious homes, large yards, and clean air have outweighed the longer commute to work. Smart-growth approaches have transformed large swaths of sprawled suburbia into lively, walkable, and wealthy neighborhoods.

**The Impact of Choices**

The distribution of wealth, by area, affects the distribution of political power. The strong core of wealthy residents in central cities in Europe and Canada has created political pressure on governments to provide excellent public transit and other public services to these areas. In U.S. cities, without as many wealthy people, the pressure for those services has been less—but pressure to provide suburban rail lines and freeways has been greater.

Geographers study how changes in work and public policy affect choices about where people live. As more people work at home, they worry less about a long commute to an office. And as more people fly for work, living near an airport becomes a bigger benefit. For these reasons, more wealthy people in Europe and Canada are moving to the suburbs.

At the same time, increasingly strict pollution regulations have cleaned up the air and water in central cities, making them more desirable places to live. Since families are smaller today, the desire for a large house and yard is less important than it once was. For these reasons, in recent decades more wealthy people in the United States are moving downtown, and these areas are increasing their political power.

1. If you just graduated from college and have accepted your first professional job offer in a major metropolitan area, describe where you think the most desirable place to live would be.
2. How do level of education, cultural perceptions, and income level affect a person's choice about where they live?
3. Explain the types of public services each of the following groups of people living in the United States often want in urban areas in which they live:
   - married couple, both recent college graduates, no kids
   - single parent with a teenager, an elementary-age child, and a baby
   - retired couple in good health

## THINK AS A GEOGRAPHER: *DATA AND INFRASTRUCTURE PLANNING*


| | COOK COUNTY, ILLINOIS | MARION COUNTY, INDIANA |
|---|---|---|
| **Area, in Square Miles** | 1,635 | 403 |
| **Number of Municipalities** | 135 | 1 |
| **Major City** | Chicago | Indianapolis |
| **Population** | 5,238,000 | 939,000 |
| **North-South Distance** | c. 48 miles | c. 20 miles |
| **East-West Distance** | c. 32 miles | c. 20 miles |

1. Explain how the different physical shapes of the counties might affect how each county is governed.
2. Describe the borders within each county and what that suggests about the role of county government.
3. How might the difference in population explain the differences in the number of municipalities?
4. How does the number of communities in each county affect how the government operates?

# CHAPTER 16 REVIEW:
## Urban Structure

*Topics 6.5–6.7*

### MULTIPLE-CHOICE QUESTIONS

**Question 1 refers to the photograph below.**

**1.** Which phrase best describes the urban central business district (CBD) shown in the photograph?

(A) European CBD that mixes low-rise historic buildings with new skyscrapers

(B) Latin American CBD that mixes traditional markets with modern high-rises

(C) European suburban CBD with high-rise residential buildings and high population

(D) African colonial CBD with broad avenues, large homes, and administrative centers

(E) North American CBD near the city's center, offering commercial space, parking, and transportation

**2.** Which best provides a general explanation of functional zonation?

(A) Urban areas pass laws to define how property in specific areas can be used in order to separate commercial and residential spaces.

(B) A city is made up of a series of rings that surrounds the central business district, each having a different function.

(C) Different portions of an urban area have specific and separate purposes, which fit together to create the entirety of the city.

(D) In cities around the world, residential areas are based on ethnicity, and cities are thus divided into ethnic enclaves.

(E) An urban area's inner city has its highest population density, and population density declines in areas farther from the city.

**3.** Which urban model would best describe a city that includes edge cities along its beltways?

(A) Galactic city

(B) Concentric zone

(C) Multiple-nuclei

(D) Sector

(E) Griffin-Ford

**4.** Why do many African cities contain multiple commercial districts?

(A) Colonial central business districts emerged separately from the traditional commercial centers.

(B) Africans were traditionally not allowed to use the central business districts used by Europeans.

(C) African governments promoted multiple central business districts through urban planning.

(D) One central business district is not enough to serve Africa's fast-growing urban population.

(E) Locations of Africa's business districts were poorly chosen, requiring multiple downtowns.

**5.** Which of the following represents a key difference between European cities and North American cities?

(A) European cities do not contain suburbs.

(B) North American suburbs have a higher population density.

(C) European CBDs are less walkable than North American CBDs.

(D) Public transportation is better developed to serve North American cities.

(E) European suburbs are more ethnically diverse.

**Question 6 refers to the photograph below.**

**6.** T wide, tree-lined avenues, tall office buildings, and mansions of Mexico City's Paseo de la Reforma, illustrate what feature of many large Latin American cities?

(A) Disamenity zone

(B) Periférico

(C) Favelas

(D) Commercial spine

(E) Zone in transition

**7.** Which best explains why European central business districts have largely resisted the construction of skyscrapers and the resulting impressive skylines that typify American cities?

(A) Competition for valuable commercial space is not as keen in European cities as it is in the United States.

(B) European culture prefers lower buildings and has negative attitudes toward commercialism and skyscrapers.

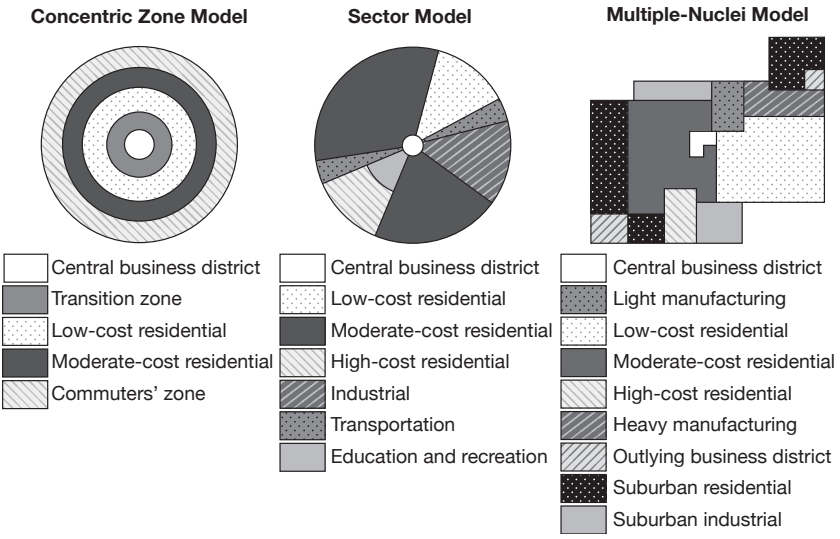
(C) The centers of European cities contain many historically significant buildings that leaders choose to preserve.

(D) The European Union regulates the height of buildings and has forbidden tall buildings because of safety concerns.

(E) European cities tend to have stronger mass transit systems, so people do not need to be as concentrated in CBDs.

## FREE-RESPONSE QUESTION

**1.** The diagrams show three early models of urban development and land use in North America.




(A) Using the sector model, explain the rationale for the location of the industrial sector.

(B) Choose one of the models and explain in detail the rationale for a different specific land use location.

(C) Describe TWO similarities that North American models share in how they describe land use.

(D) Using the multiple-nuclei model, explain why some businesses relocate near the suburbs.

(E) Compare these models with one pattern of urban development and land use on a continent other than North America and account for the differences.

(F) Describe ONE positive of zoning regulations related to urban planning.

(G) Describe ONE negative of zoning regulations related to urban planning.