

## KEY ISSUE 2

# Where Are Consumer Services Distributed?

- Central Place Theory
- Hierarchy of Consumer Services
- Market Area Analysis

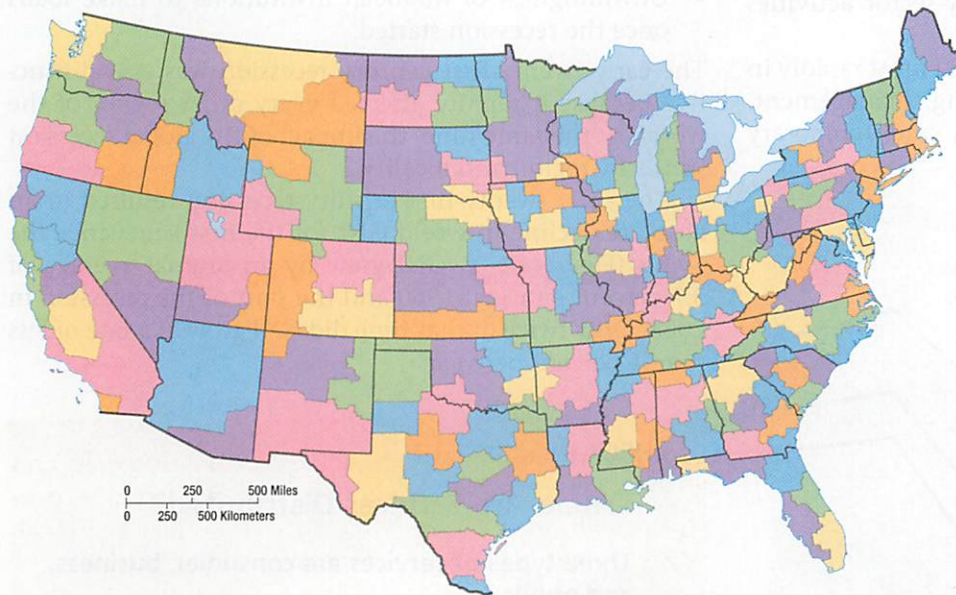
### Learning Outcome 12.2.1

Explain the concepts of market area, range, and threshold.

Consumer services and business services do not have the same distributions. Consumer services generally follow a regular pattern based on size of settlements, with larger settlements offering more consumer services than smaller ones. The next Key Issue will describe how business services cluster in specific settlements, creating a specialized pattern.

## Central Place Theory

Selecting the right location for a new shop is probably the single most important factor in the profitability of a consumer service. **Central place theory** helps to explain how the most profitable location can be identified.



▲ **FIGURE 12-8 DAILY URBAN SYSTEMS** The U.S. Department of Commerce divided the 48 contiguous states into “daily urban systems,” delineated by functional ties, especially commuting to the nearest metropolitan area. This division of the country into daily urban systems demonstrates that everyone in the United States has access to services in at least one large settlement. Compare this information to the information on TV market areas in Figure 1-18.

Central place theory was first proposed in the 1930s by German geographer Walter Christaller, based on his studies of southern Germany. August Lösch in Germany and Brian Berry and others in the United States further developed the concept during the 1950s.

## MARKET AREA OF A SERVICE

A **central place** is a market center for the exchange of goods and services by people attracted from the surrounding area. The central place is so called because it is centrally located to maximize accessibility. Businesses in central places compete against each other to serve as markets for goods and services for the surrounding region. According to central place theory, this competition creates a regular pattern of settlements.

The area surrounding a service from which customers are attracted is the **market area**, or **hinterland**. A market area is a good example of a nodal region—a region with a core where the characteristic is most intense. To establish the market area, a circle is drawn around the node of service on a map. The territory inside the circle is its market area.

Because most people prefer to get services from the nearest location, consumers near the center of the circle obtain services from local establishments. The closer to the periphery of the circle, the greater the percentage of consumers who will choose to obtain services from other nodes. People on the circumference of the market-area circle are equally likely to use the service or go elsewhere. The United States can be divided into market areas based on the hinterlands surrounding the largest urban settlements (Figure 12-8). Studies conducted by C. A. Doxiadis,

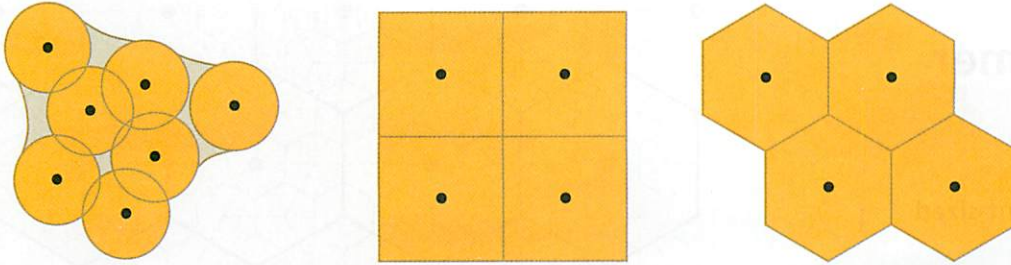
Brian Berry, and the U.S. Department of Commerce allocated the 48 contiguous states to 171 functional regions centered around commuting hubs, which they called “daily urban systems.”

To represent market areas in central place theory, geographers draw hexagons around settlements (Figure 12-9). Hexagons represent a compromise between circles and squares. Like squares, hexagons nest without gaps. Although all points along the hexagon are not the same distance from the center, the variation is less than with a square.

### Pause and Reflect 12.2.1

What occurs in nature in the shape of hexagons? Google “naturally occurring hexagons.” Infer why human economic activities also create a hexagonal pattern.





▲ **FIGURE 12-9 WHY GEOGRAPHERS USE HEXAGONS TO DELINEATE MARKET AREAS** (left) **The problem with circles.** Circles are equidistant from center to edge, but they overlap or leave gaps. An arrangement of circles that leaves gaps indicates that people living in the gaps are outside the market area of any service, which is obviously not true. Overlapping circles are also unsatisfactory, for one service or another will be closer, and people will tend to patronize it. (center) **The problem with squares.** Squares nest together without gaps, but their sides are not equidistant from the center. If the market area is a circle, the radius—the distance from the center to the edge—can be measured because every point around a circle is the same distance from the center. But in a square, the distance from the center varies among points along a square. (right) **The hexagon compromise.** Geographers use hexagons to depict the market area of a good or service because hexagons offer a compromise between the geometric properties of circles and squares.

## RANGE AND THRESHOLD OF A MARKET AREA

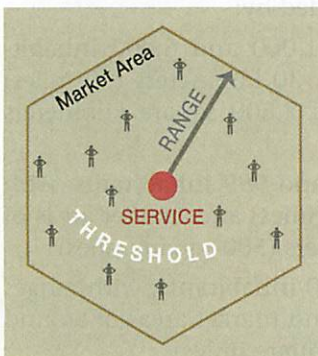
The market area of every service varies. To determine the extent of a market area, geographers need two pieces of information about a service: its range and its threshold (Figure 12-10).

**RANGE OF A SERVICE.** How far are you willing to drive for a pizza? To see a doctor for a serious problem? To watch a ball game? The **range** is the maximum distance people are willing to travel to use a service. The range is the radius of the circle (or hexagon) drawn to delineate a service's market area.

People are willing to go only a short distance for everyday consumer services, such as groceries and pharmacies. But they will travel longer distances for other services, such as a concert or professional ball game. Thus a convenience store has a small range, whereas a stadium has a large range. In a large urban settlement, for example, the range of a fast-food franchise such as McDonald's is roughly 5 kilometers (3 miles); the range of a casual dining chain such as Steak 'n Shake is roughly 8 kilometers (5 miles), and the range of a stadium is 100 kilometers (60 miles) or more.

As a rule, people tend to go to the nearest available service: Someone in the mood for a McDonald's hamburger is likely to go to the nearest McDonald's. Therefore, the

◀ **FIGURE 12-10 MARKET AREA, RANGE, AND THRESHOLD** The market area is the area of the hexagon, the range is the radius, and the threshold is a sufficient number of people inside the area to support the service.



range of a service must be determined from the radius of a circle that is irregularly shaped rather than perfectly round. The irregularly shaped circle takes in the territory for which the proposed site is closer than competitors' sites.

The range must be modified further because most people think of distance in terms of time rather than in terms of a linear measure such as kilometers or miles. If you ask people how far they are willing to travel to a restaurant or a baseball game, they are more likely to answer in minutes or hours than in distance. If the range of

a good or service is expressed in travel time, then the irregularly shaped circle must be drawn to acknowledge that travel time varies with road conditions. "One hour" may translate into traveling 90 kilometers (60 miles) while driving on an expressway but only 50 kilometers (30 miles) while driving congested city streets.

**THRESHOLD OF A SERVICE.** The second piece of geographic information needed to compute a market area is the **threshold**, which is the minimum number of people needed to support the service. Every enterprise has a minimum number of customers required to generate enough sales to make a profit. So once the range has been determined, a service provider must determine whether a location is suitable by counting the potential customers inside the irregularly shaped circle. Census data help to estimate the potential population within the circle.

How expected consumers inside the range are counted depends on the product. Convenience stores and fast-food restaurants appeal to nearly everyone, whereas other goods and services appeal primarily to certain consumer groups:

- Movie theaters attract younger people; chiropractors attract older folks.
- Poorer people are drawn to thrift stores; wealthier ones might frequent upscale department stores.
- Amusement parks attract families with children; nightclubs appeal to singles.

Developers of shopping malls, department stores, and large supermarkets may count only higher-income people, perhaps those whose annual incomes exceed \$50,000. Even though the stores may attract individuals of all incomes, higher-income people are likely to spend more and purchase items that carry higher profit margins for the retailer.



## Hierarchy of Consumer Services

### Learning Outcome 12.2.2

Explain the distribution of different-sized settlements.

Only consumer services that have small thresholds, short ranges, and small market areas are found in small settlements because too few people live in small settlements to support many services. A large department store or specialty store cannot survive in a small settlement because the threshold (the minimum number of people needed) exceeds the population within range of the settlement.

Larger settlements provide consumer services that have larger thresholds, ranges, and market areas. Neighborhoods within large settlements provide services that have small thresholds and ranges. Services patronized by a small number of locals (“mom-and-pop stores”) can coexist in a neighborhood with services that attract many from throughout the settlement. This difference is vividly demonstrated by comparing an on-line business directory for a small settlement with one for a major city. The major city’s directory is much more extensive, with more services and diverse headings showing widely varied services that are unavailable in small settlements.

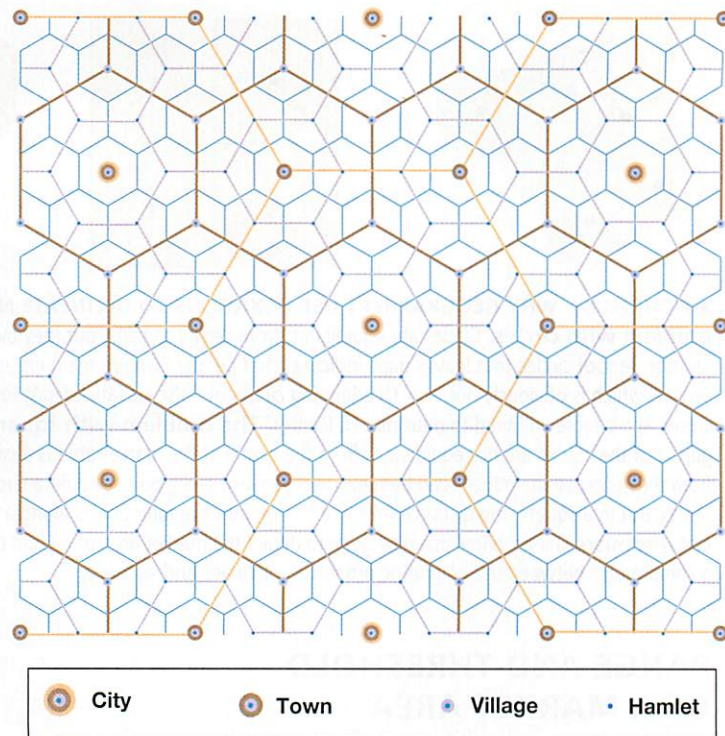
We spend as little time and effort as possible in obtaining consumer services and thus go to the nearest place that fulfills our needs. There is no point in traveling to a distant department store if the same merchandise is available at a nearby one. We travel greater distances only if the price is much lower or if the item is unavailable locally.

### NESTING OF SERVICES AND SETTLEMENTS

According to central place theory, market areas across a developed country would be a series of hexagons of various sizes, unless interrupted by physical features such as mountains and bodies of water. Developed countries have numerous small settlements with small thresholds and ranges and far fewer large settlements with large thresholds and ranges.

The nesting pattern can be illustrated with overlapping hexagons of different sizes. Four different levels of market area—hamlet, village, town, and city—are shown in Figure 12-11. Hamlets with very small market areas are represented by the smallest contiguous hexagons. Larger hexagons represent the market areas of larger settlements and are overlaid on the smaller hexagons because consumers from smaller settlements shop for some goods and services in larger settlements.

In his original study, Walter Christaller showed that the distances between settlements in southern Germany



**▲ FIGURE 12-11 CENTRAL PLACE THEORY** According to central place theory, market areas are arranged in a regular pattern. Larger market areas, based in larger settlements, are fewer in number and farther apart from each other than smaller market areas and settlements. However, larger settlements also provide goods and services with smaller market areas; consequently, larger settlements have both larger and smaller market areas drawn around them.

followed a regular pattern. He identified seven sizes of settlements (market hamlet, township center, county seat, district city, small state capital, provincial head capital, and regional capital city). In southern Germany, the smallest settlement (market hamlet) had an average population of 800 and a market area of 45 square kilometers (17 square miles). The average distance between market hamlets was 7 kilometers (4.4 miles). The figures were higher for the average settlement at each increasing level in the hierarchy. Brian Berry has documented a similar hierarchy of settlements in parts of the U.S. Midwest.

Across much of the interior of the United States, a regular pattern of settlements can be observed, even if not precisely the same as the generalized model shown in Figure 12-11. North-central North Dakota is an example (Figure 12-12). Minot—the largest city in the area, with 41,000 inhabitants—is surrounded by:

- 7 small towns of between 1,000 and 5,000 inhabitants, with average ranges of 30 kilometers (20 miles) and market areas of around 2,800 square kilometers (1,200 square miles)
- 15 villages of between 100 and 999 inhabitants, with ranges of 20 kilometers (12 miles) and market areas of around 1,200 square kilometers (500 square miles)
- 19 hamlets of fewer than 100 inhabitants, with ranges of 15 kilometers (10 miles) and market areas of around 800 square kilometers (300 square miles)



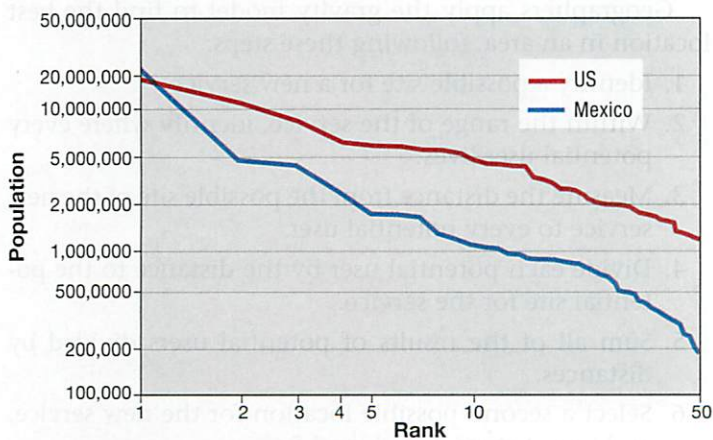


◀ **FIGURE 12-12 CENTRAL PLACE THEORY IN NORTH DAKOTA** Central place theory helps explain the distribution of settlements of varying sizes in North Dakota. Larger settlements are fewer and farther apart, whereas smaller settlements are more numerous and closer together.

### RANK-SIZE DISTRIBUTION OF SETTLEMENTS

In many developed countries, geographers observe that ranking settlements from largest to smallest (population) produces a regular pattern. This is the **rank-size rule**, in which the country's *n*th-largest settlement is  $1/n$  the population of the largest settlement. In other words, the second-largest city is one-half the size of the largest, the fourth-largest city is one-fourth the size of the largest, and so on. When plotted on logarithmic paper, the rank-size distribution forms a fairly straight line. In the United States and a handful of other countries (Figure 12-13), the distribution of settlements closely follows the rank-size rule.

If the settlement hierarchy does not graph as a straight line, then the country does not follow the rank-size rule.



▲ **FIGURE 12-13 RANK-SIZE DISTRIBUTION OF SETTLEMENTS IN THE UNITED STATES AND MEXICO** The size of settlements follows the rank-size rule in the United States and the primate city rule in Mexico.

Instead, it may follow the **primate city rule**, in which the largest settlement has more than twice as many people as the second-ranking settlement. In this distribution, the country's largest city is called the **primate city**. Mexico is an example of a country that follows the primate city distribution. Its largest city, Mexico City, is five times larger than its second-largest city, Guadalajara.

The existence of a rank-size distribution of settlements is not merely a mathematical curiosity. It has a real impact on the quality of life for a country's inhabitants. A regular hierarchy—as in the United States—indicates that the society is sufficiently wealthy to justify the provision of goods and services to consumers throughout the country. Conversely, the absence of the rank-size distribution in a developing country indicates that there is not enough wealth in the society to pay for a full variety of services. The absence of a rank-size distribution constitutes a hardship for people who must travel long distances to reach an urban settlement with shops and such services as hospitals. Because most people in developing countries do not have cars, buses must be provided to reach larger towns. A trip to a shop or a doctor that takes a few minutes in the United States could take several hours in a developing country.

#### Pause and Reflect 12.2.2

According to the rank-size rule, the second-largest city in a country should have one-half the population of the largest city, and the tenth-largest city should have one-tenth the population of the largest city. Does Peru follow the rank-size rule or the primate city rule? Google "most populous cities in Peru."



## Market Area Analysis

### Learning Outcome 12.2.3

Explain how to use threshold and range to find the optimal location for a service.

Geographers apply central place theory to create market area studies that assist service providers with opening and expanding their facilities. And in a severe economic downturn, market area analysis helps determine where to close facilities.

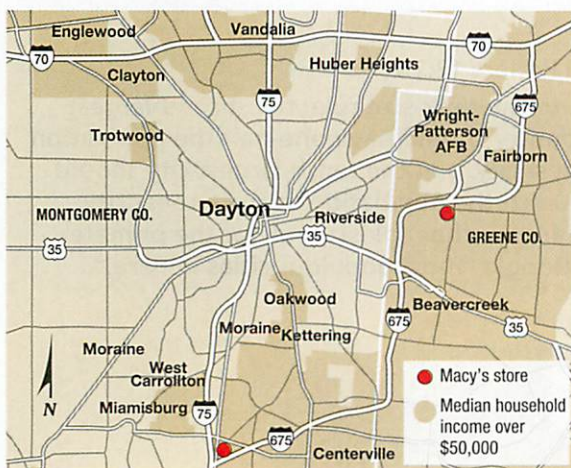
Manufacturers must balance a variety of site and situation factors, as discussed in Chapter 11. In contrast, service providers often say that the three most important factors in determining whether a particular site will be profitable are “location, location, and location.” What they actually mean is that proximity to customers is the only critical geographical factor in locating a service.

The best location for a factory is typically described as a region of the world or perhaps a large area within a region. For example, auto alley—the optimal location for most U.S. motor vehicle factories—is an area of roughly 100,000 square kilometers. For service providers, the optimal location is much more precise: One corner of an intersection can be profitable and another corner of the same intersection unprofitable.

### PROFITABILITY OF A LOCATION

A large retailer has many locations to choose from when deciding to build new stores. A suitable site is one with the potential for generating enough sales to justify using the company’s scarce capital to build it. Would a new department store be profitable in your community (Figure 12-14)? The two components of central place theory—range and threshold—together determine the answer. Here’s how:

1. **Compute the range.** You might survey local residents and determine that people are generally willing to travel up to 15 minutes to reach a department store.



▲ FIGURE 12-14 MACY’S DEPARTMENT STORES NEAR DAYTON  
Stores are in areas with higher incomes.

2. **Compute the threshold.** A department store typically needs roughly 250,000 people living within a 15-minute radius.
3. **Draw the market area.** Draw a circle with a 15-minute travel radius around the proposed location. Count the number of people within the circle. If more than 250,000 people are within the radius, then the threshold may be high enough to justify locating the new department store in your community. However, your store may need a larger threshold and range to attract some of the available customers if competitors are located nearby.

The Contemporary Geographic Tools feature shows how geographers might use this process to determine the best locations for supermarkets in a region.

The threshold must also be adjusted because the further customers are from the service, the less likely they are to patronize it. Geographers have adapted the gravity model from physics. The **gravity model** predicts that the optimal location of a service is directly related to the number of people in the area and inversely related to the distance people must travel to access it. The best location will be the one that minimizes the distances that all potential customers must travel to reach the service.

According to the gravity model, consumer behavior reflects two patterns:

1. The greater the number of people living in a particular place, the greater is the number of potential customers for a service. An area that contains 100 families will generate more customers than a house containing only one family.
2. The farther people are from a particular service, the less likely they are to use it. People who live 1 kilometer from a store are more likely to patronize it than people who live 10 kilometers away.

Geographers apply the gravity model to find the best location in an area, following these steps:

1. Identify a possible site for a new service.
2. Within the range of the service, identify where every potential user lives.
3. Measure the distance from the possible site of the new service to every potential user.
4. Divide each potential user by the distance to the potential site for the service.
5. Sum all of the results of potential users divided by distances.
6. Select a second possible location for the new service, and repeat steps 2, 3, 4, and 5.
7. Compare the results of step 5 for all possible sites. The site with the highest score has the highest potential number of users and is therefore the optimal location for the service.

### Pause and Reflect 12.2.3

When you order a pizza for carry out or delivery, do you get it from the nearest place? Why might you get it from a more distant location?



## CONTEMPORARY GEOGRAPHIC TOOLS

# Locating a New Supermarket

A large retailer has many locations to choose from when deciding to build new stores. A suitable site is one with the potential for generating enough sales to justify using the company's scarce capital to build it. Major U.S. supermarkets, department stores, mall developers, and other large retailers employ geographers to determine the best location to build new stores. Here are the steps for a large supermarket:

1. **Define the market area.** The first step in forecasting sales for a proposed new retail outlet is to define the market or trade area where the store would derive most of its sales. Analysis relies heavily on the company's records of its customers' credit-card transactions at existing stores. What are the zip codes of customers who paid by credit card? The market area of a department store is typically defined as the zip codes where two-thirds to three-fourths of the customers live.
2. **Estimate the range.** Based on the zip codes of credit-card customers, geographers estimate that the range for a large supermarket is about a 10-minute driving time.
3. **Estimate the threshold.** The threshold for a large supermarket is about 25,000 people with appropriate income levels who live within the 15-minute range. Walmart typically is attracted to areas of modest means, whereas supermarkets such as Kroger, Publix, and Safeway prefer to be near higher-income people. In the Dayton, Ohio, area, for example, Kroger has more stores in the relatively affluent south and east, whereas Walmart has more stores in the relatively poor north and west (Figure 12-15).
4. **Predict the market share.** The proposed new supermarket will have to share customers with competitors. Geographers typically predict market share through the so-called analog method. The

geographer identifies one or more existing stores in locations that he or she judges to be comparable to the location of the proposed store. The geographer then applies the market share of the comparable stores to the proposed new store.

Information about the viability of a proposed new store is depicted through Geographic Information Systems (GIS). One layer of the GIS depicts the trade area of the proposed store. Other layers display characteristics of the people living in the area, such as distribution of households, average income, and competitors' stores.

The ability of the retail geographer is judged on the accuracy of the forecasts. After a new store is open for several years, how close to the actual sales were the forecasts that the geographer made several years earlier?



▲ **FIGURE 12-15** WALMART AND KROGER STORES NEAR DAYTON (left) Walmart stores are in outer suburbs because that is where most of Walmart's customers live. (right) Kroger stores are more numerous to the south and east where most Kroger customers live.



## PERIODIC MARKETS

### Learning Outcome 12.2.4

Understand the role of periodic markets in the provision of services in developing countries.

Services at the lower end of the central place hierarchy may be provided at a periodic market, which is a collection of individual vendors who come together to offer goods and services in a location on specified days. A periodic market typically is set up in a street or other public space early in the morning, taken down at the end of the day, and set up in another location the next day (Figure 12-16).

A periodic market provides goods to residents of developing countries, as well as rural areas in developed countries, where sparse populations and low incomes produce purchasing power too low to support full-time retailing. A periodic market makes services available in more villages than would otherwise be possible, at least on a part-time basis. In urban areas, periodic markets offer residents fresh food brought in that morning from the countryside (Figure 12-17).

Many of the vendors in periodic markets are mobile, driving their trucks from farm to market, back to the farm to restock, then to another market. Other vendors, especially local residents who cannot or prefer not to travel to other villages, operate on a part-time basis, perhaps only a few times a year. Other part-time vendors are individuals who are capable of producing only a small quantity of food or handicrafts.

The frequency of periodic markets varies by culture:

- **Muslim countries.** Muslim countries typically conform to the weekly calendar—once a week in each of six cities and no market on Friday, the Muslim day of rest.

▼ **FIGURE 12-16 PERIODIC MARKET** The weekly market at Bati is considered the largest in Ethiopia.



▲ **FIGURE 12-17 BRINGING FOOD TO THE PERIODIC MARKET** Meat is carried to the periodic market at Gongtan, China.

- **Rural China.** According to G. William Skinner, rural China has a three-city, 10-day cycle of periodic markets. The market operates in a central market on days 1, 4, and 7; in a second location on days 2, 5, and 8; in a third location on days 3, 6, and 9; and no market on the tenth day. Three 10-day cycles fit in a lunar month.
- **Korea.** Korea has two 15-day market cycles in a lunar month.
- **Africa.** In Africa, the markets occur every 3 to 7 days. Variations in the cycle stem from ethnic differences.

### Pause and Reflect 12.2.4

Identify an example of a periodic market in developed countries.

### CHECK-IN: KEY ISSUE 2

#### Where Are Consumer Services Distributed?

- ✓ Central place theory helps determine the most profitable location for a consumer service.
- ✓ A central place is surrounded by a market area that has a range and a threshold.
- ✓ Market areas of varying sizes nest and overlap.
- ✓ Regular patterns of settlements that provide consumer services can be observed, especially in developed countries.



## SUSTAINABILITY AND INEQUALITY IN OUR GLOBAL VILLAGE

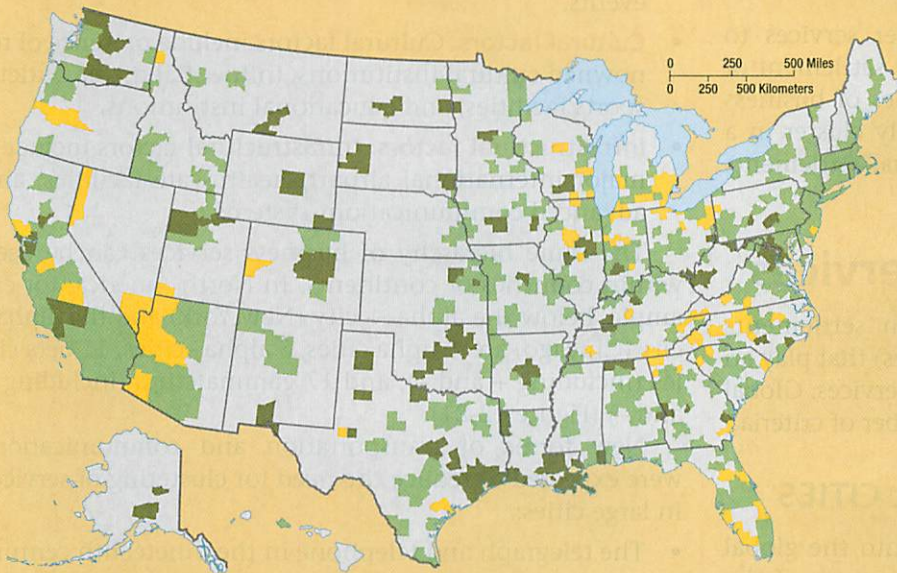
# Unequal Spatial Impacts of the Severe Recession

The severe global recession that began in 2008 hit some communities harder than others. As Figure 12-7 shows, developed countries were more severely impacted by the global recession. GNI declined more sharply in developed countries than in developing countries. The countries least affected by the global recession were

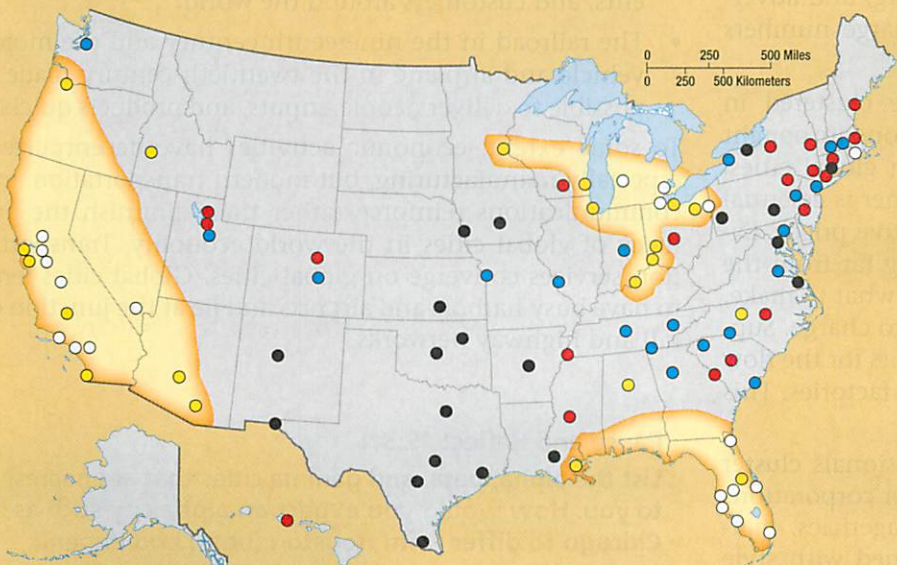
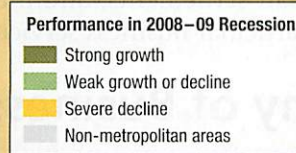
the poorest countries of sub-Saharan Africa. Those countries are the most peripheral to the global economy.

Within the United States, the recession hit some communities harder than others (Figure 12-18). Some of the hardest-hit communities were industrial centers in the Midwest, where bankrupt carmakers

Chrysler and GM were based. But most of the hardest-hit communities were in the South and West, regions that had been the most prosperous. Those communities were especially affected by declines in services, especially real estate and finance (Figure 12-19).



▼ **FIGURE 12-18 IMPACT OF SEVERE RECESSION** The impact of the recession was especially strong in Florida, the Southwest, and the Great Lakes area.



▼ **FIGURE 12-19 IMPACT OF SEVERE RECESSION ON 100 LARGEST U.S. METROPOLITAN AREAS** California and Florida had the largest number of the weakest performing cities.

