Hands-on Learning About Urban Sprawl

Abstract

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The traditional emphasis on instructor-centered teaching is being replaced by a focus on student-centered learning. *Human Geography in Action*, a combination textbook-lab manual-CD, comprises 14 hands-on chapters that challenge students to collect, manipulate, display, and interpret geographic information. The chapter on urban sprawl involves an interactive case study of urban growth in Colorado Springs. The activity has three parts. In the first, students run a computerized animation of the growth in Colorado Springs from 1950 to 2000 assessing the relationship between transportation development and the pattern of urban growth. In the second, they use GIS to explore five urban-growth scenarios (infill, urban villages, beltway, growth corridors, and leapfrog) and overlay several different data layers to determine what effect the scenarios have on transportation and sensitive ecological zones. The five scenarios were among those actually considered by city planners in 2000. The third part involves a structured role-playing debate in which students as stakeholders express preferences for a particular form of urban growth and then break into citizen action committees charged with making a single recommendation to the City. The chapter conveys the difficult choices facing 21st Century cities, and the different perspectives people have about these choices.

What is Human Geography in Action?

- The traditional emphasis on instructor-centered teaching is being replaced by a focus on student-centered learning, in which instructors are facilitators and students are active participants in the learning process. Students retain more with student-oriented approaches than with the traditional model of instructor as lecturer and student as listener.
- The purpose of *Human Geography in Action* is for students to learn geography by doing geography. It comprises 14 stimulating, hands-on chapters that challenge students to collect, manipulate, display, and interpret geographic information.

Chapter 11
The Disappearing Front Range: Urban Sprawl in Colorado

Activity 1: Transportation and Urban Growth
Activity 2: Urban Sprawl Scenario Analysis
Activity 3: Urban Sprawl Debate and Consensus Building

Learning Outcomes
After completing the chapter, you will be able to:

- Assess the relationship between urban growth and transportation technology.
- Articulate the causes of urban sprawl.
- Use GIS layering to visualize the uneven geographic effects of urban sprawl.
- Evaluate the alternative solutions to urban sprawl and recognize the inherent trade-offs among them.
- Advocate a position on urban sprawl.
- Negotiate an acceptable solution to urban sprawl with those who hold a different position.

Activity 1: Transportation & Urban Growth

- In this activity you will watch Colorado Springs spread before your very eyes from 1950 to 2000 and assess the relationship between transportation and the pattern of urban growth.
- The idealized model of how urban growth is related to the spatial configuration of each new transportation technology (Fig. 11.2) was based on the history of midwestern cities like Chicago and St. Louis.
- Very often, one can learn just as much about a process by the way the model *doesn't* fit as by the way it does. As you look at the animation, think about why growth patterns in Colorado Springs do or do not fit the predicted model.
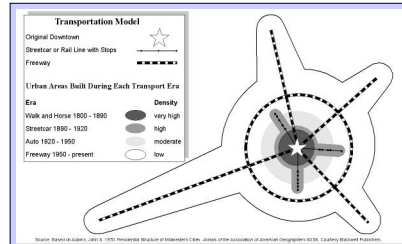

Figure 11.2 New transportation technology has made new areas of the urban fringe accessible to the city center. Each transport era was accompanied by residential construction more spread out so that the previous due to the increasing ease of movement. The spatial structure of today's cities reflects that different parts were built in different eras.

Activity 2: Urban Sprawl Scenario Analysis

- In this section, you will use the power of GIS to explore five urban-growth scenarios for Colorado Springs. For each scenario, you will be able to overlay several different data layers to see what effect the scenario might have on transportation and sensitive ecological zones.
- In the following table, identify the scenario(s) that are best performing and worst performing on each criteria.
- In the final column, write the rationale you used. By "rationale" we mean not only the source (e.g., map, table), but also what you looked for on the map or table.
- Based on your completed table and any other information at your disposal, explain (a) the main geographic differences and (b) the main trade-offs between the following scenarios.

	Beltway	Urban Villages	Leapfrog	NE-SE	Infill
New housing units	72,000	72,000	72,000	72,000	72,000
Dwelling units per acre	8.4	8.4	3.58	3.58	16.8
Acres of land converted	10,865	10,743	20,035	20,097	7,548
Relative cost to provide electricity	medium	medium	high	medium	low
Relative cost to upgrade roads	medium	medium	low	medium	high
Approximate cost for sewer/water lines	$262 million	$257 million	$627 million	$627 million	$147 million
Impact on central city traffic	slight increase	reduced	reduced	no change	increased
Potential for nonmotorized transit (walk, bike, skate)	low	high	low	low	high
Percent detached houses / percent condos or townhouses	92/8	88/12	93/7	92/8	88/12
Average detached house value	$180,000's	$200,000's	$120,000's	$200,000's	$160,000's
Average condo value	$120,000's	$150,000's	$80,000's	$140,000's	$100,000's

Criteria	Best	Worst	Rationale
Preservation of rural land generally			
Preservation of *sensitive* open space in particular			
Potential for nonmotorized trips			
Service by existing transit routes			
Inner-city congestion			
Suburban congestion			
Water, sewer, and electricity infrastructure expenses			
New road-building expenses			
Detached-housing prices			
Condo and townhouse prices			
Variety of types of residences within the new neighborhoods			
Revitalization of the CBD			
Proximity of housing to shopping, jobs, and services			
Air pollution			

Activity 3: Urban Sprawl Debate and Consensus Building

- Urban sprawl is a complex issue to resolve, in part because different stakeholder groups value different things and have different visions for the future.
- In Activity 3 you will play the role of one of the stakeholder groups. You will first participate in a debate about the issues.
- Then you will be appointed to a citizens' working group charged with reaching consensus and making a recommendation to the City Council.

The major stakeholder groups include:

1. Low-income single mother
2. Real estate developer
3. Middle-class family with school-age children, new migrant to Colorado Springs
4. Middle-class family with school-age children, previously (3 years earlier) bought home on urban fringe
5. Environmentalist
6. Elderly person
7. Young, single urban professional ("Yuppie")
8. Farmer on urban fringe
9. Fast-growing high-tech employer

Steps in the Debate

Step 1: Prepare a written position statement for which scenario your stakeholder group prefers, and why.

Step 2: Read your position statement aloud.

Step 3: Form Citizen's Committees made up of one student from each stakeholder group, reach a consensus recommendation to the City Council, and prepare a position statement.

Step 4: Present your new position to the class.

Collaborative Learning Structured Debate

To enhance team functioning and facilitate completion of this step, students will be assigned to particular tasks by counting off within their groups.

Timekeeper/Taskmaster, who keeps the group on schedule:

Recorder, who drafts the statement in Step 2:

Consensus Checker/Gatekeeper

Before statements are presented, the instructor will randomly assign a number to the role of *spokesperson*, regardless of which role that student was previously. All students should be prepared to argue their team's position.

All Five Growth Scenarios are Real Options Considered by the City, and Add 72,000 Housing Units between 2000 and 2020

- **Eastern Beltway:** Development clustered around proposed Eastern beltway.
- **Leapfrog Development:** Urban development on the eastern prairie beyond the urban fringe.
- **Northeast-Southeast Extension:** Contiguous growth channelized in two corridors extending out from already developed areas.
- **Urban Village:** A concentration of commercial land uses and higher-density housing outside of the region's main central business district--planned to be a focal point of shopping and employment for surrounding residential areas.
- **Infill Development:** Higher-density development in smaller patches of undeveloped or redevelopable land inside of the urban boundaries.

Figure 11.10 Urbanized areas along the Colorado Front Range stretch from Fort Collins to Pueblo.
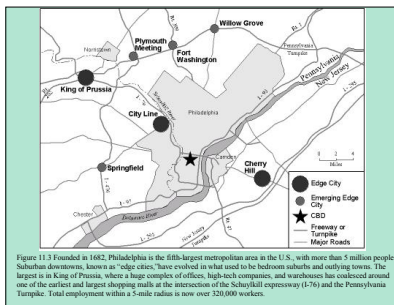

Figure 11.3 Founded in 1682, Philadelphia is the fifth-largest metropolitan area in the U.S., with more than 5 million people. Suburban downtowns, known as "edge cities," have evolved in what used to be bedroom suburbs and outlying towns. The largest is in King of Prussia, where a huge complex of offices, high-tech companies, and warehouses has coalesced around one of the earliest and largest shopping malls at the intersection of the Schuylkill expressway (I-76) and the Pennsylvania Turnpike. Total employment within a 5-mile radius is now over 320,000 workers.
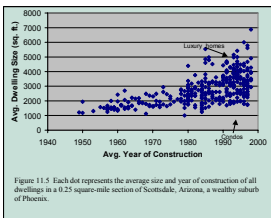

Figure 11.5 Each dot represents the average size and year of construction of all dwellings in a 0.25 square-mile section of Scottsdale, Arizona, a wealthy suburb of Phoenix.
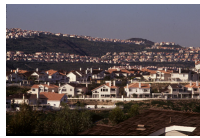

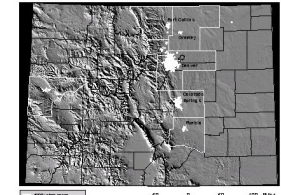Figure 11.1 New suburban growth encroaching on foothills in Laguna Michel, California.

Figure 11.4 Housing developments isolated from the urbanized area are known as "leapfrog" developments. The contiguous edge of the suburbs is several miles behind the point from where this photo was taken.

Figure 11.9 These multifamily homes in an infill development (on Ash Street south of University Dr.) in Tempe, Arizona reduce outward sprawl and encourage alternate modes of transportation.
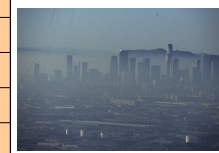

Figure 11.7 Smog continues to degrade the quality of life in American cities. Automobiles are the number-one contributor to urban air pollution.

Figure 11.6 Commuting in traffic jams is a daily routine for many Americans, as seen here in Los Angeles.

Figure 11.8 Web advertisement encouraging a vote against a recent growth management initiative in Colorado.