

Chapter 14

Land

Section 2: Urban Land Use

Urbanization

- **Urbanization** is an increase in the ratio or density of people living in urban areas rather than in rural areas.
 - People usually leave rural areas for more plentiful and better paying jobs in towns and cities.
- In developed countries, urbanization slowed in the second half of the 20th century.
- As urban populations have grown, many small towns have grown together and formed large urban areas called metropolitan areas.
 - An example would be **Washington D.C.-Baltimore**.

Urbanization

- Urban areas that have grown slowly are often relatively pleasant places to live, in part because roads and public transportation have been built to handle the growth allowing traffic to flow freely.
- Buildings, roads, and parking lots are mixed with **green spaces** that provide these urban areas with much needed ecosystem services such as
 - **moderation of temperature**
 - **infiltration of rainwater runoff**
 - **aesthetic value**

The Urban Crisis

- **Infrastructure** is the basic facilities of a country or region, such as roads, bridges, sewers, and railroads.
- A rapidly growing population, however, can overwhelm the infrastructure, leading to:
 - **traffic jams**
 - **substandard housing**
 - **polluted air and water**
- When more people live in a city than its infrastructure can support, the living conditions deteriorate.
- This growth problem has become so widespread throughout the world that the term **urban crisis** was coined to describe it.

Urban Sprawl

- **Urban sprawl** is the rapid spread of a city into adjoining suburbs and rural areas.
- Much of this growth results in the building of suburbs, or housing and associated commercial buildings on the boundary of a larger town.
- Many of these suburbs are built on land that was previously used for food production.
- In fact, each year suburbs spread over another 1 million hectares (**2.5 million acres**) of land in the United States.

Development on Marginal Lands

- Many cities were first built where there was little room for expansion.
- As the cities grew, suburbs were often built on **marginal land**, or land that is poorly suited for building.
- For example, Los Angeles was built in a basin, and has expanded onto slopes that are prone to landslides.
- Structures built on marginal land can become **difficult or impossible to repair** and can be expensive to insure.

Other Impacts of Urbanization

- Environmental conditions in the center of a city are different from those of the surrounding countryside, as cities both generate and trap more heat.
- **Heat island** is an area in which the air temperature is generally higher than the temperature of surrounding rural areas.
- Heat is **generated** by the infrastructure that makes a city run.
 - Roads and buildings **absorb** and retain heat longer than vegetation does.

Other Impacts of Urbanization

- Scientists are beginning to see that heat islands can affect **local weather patterns**.
 - Hot air rises over a city, cooling as it rises, and eventually produces rain clouds.
- In Atlanta, Georgia, and many other cities, **increased rainfall** is a side effect of the heat island effect.
- The heat-island effect may be moderated by **planting trees for shade and by installing rooftops that reflect rather than retain heat**.

Urban Planning

- **Land-use planning** is a set of policies and activities related to potential uses of land that is put in place before an area is developed.
- The federal government requires developers to prepare detailed reports assessing the environmental impact of many projects, and the public has a right to comment on these reports.
- Developers, city governments, local businesses, and citizens often disagree about land-use plans.

Intelligent Design

- Land-use planners have sophisticated methods and tools available to them today.
- The most important technological tools for land-use planning involve using the **geographic information system**.
- A geographical information system (GIS) is an automated system for **capturing, storing, retrieving, analyzing, manipulating, and displaying geographic data**.

Intelligent Design

- GIS software allows a user to enter different types of data about an area, such as
 - **the locations of sewer lines**
 - **roads**
 - **parks to then create maps with the data**
- Each image corresponds to a different combination of information.
- The power of GIS is that it allows a user to display **layers of information about an area and to overlay these layers**, like overhead transparencies, on top of one another.

Transportation

- Most cities in the United States are difficult to travel in without a car.
- Most cities in the United States were constructed after the invention of the **automobile**.
 - In addition, availability of land was not a limiting issue, so many American cities sprawl over large areas.
- By contrast, most cities in Europe were built before cars, and are compact with narrow roads.

Transportation

- In many cities, **mass transit systems** were constructed in order to get people where they wanted to go.
 - Mass transit systems use **buses and trains** to move many people at one time.
- Mass transit systems:
 - **save energy**
 - limit the **loss of land** to roadways and parking lots
 - **reduce highway congestion**
 - **reduce air pollution.**
- Where the construction of mass transit systems is not reasonable, **carpooling** is an important alternative.

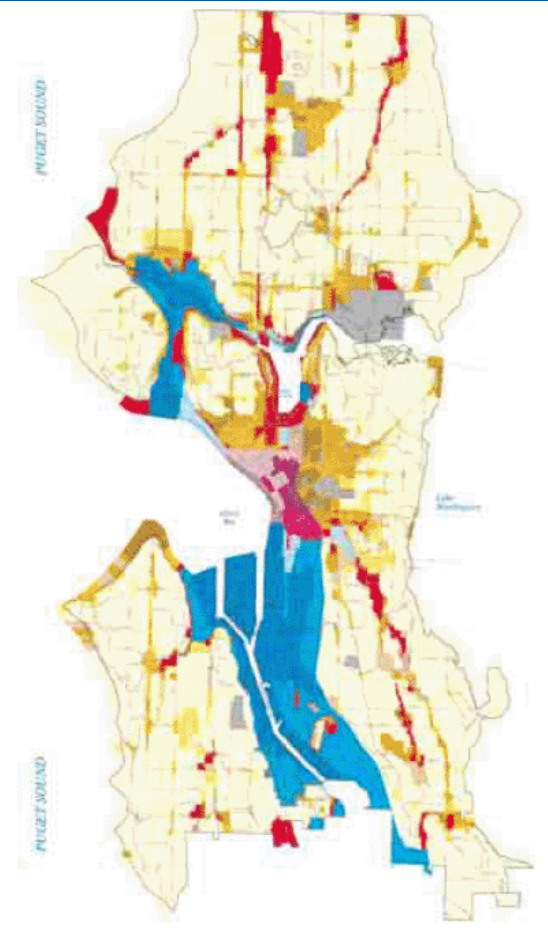
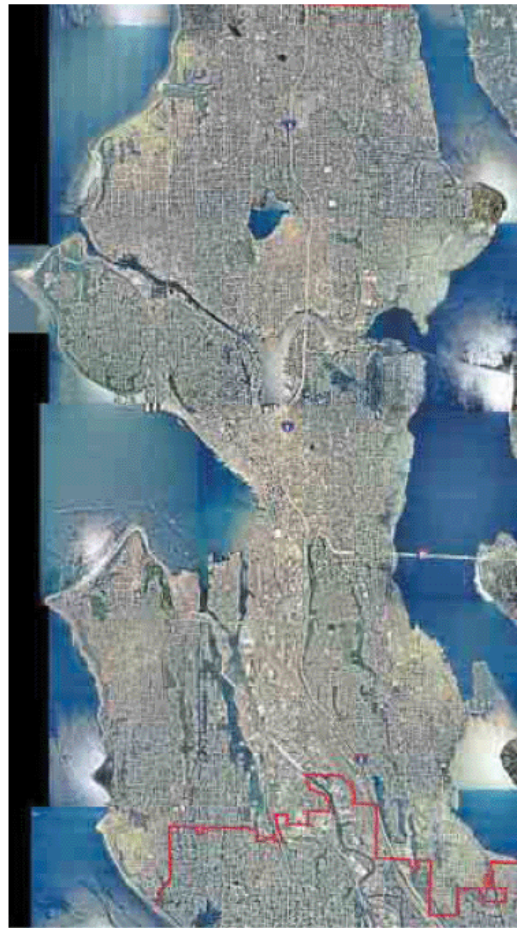
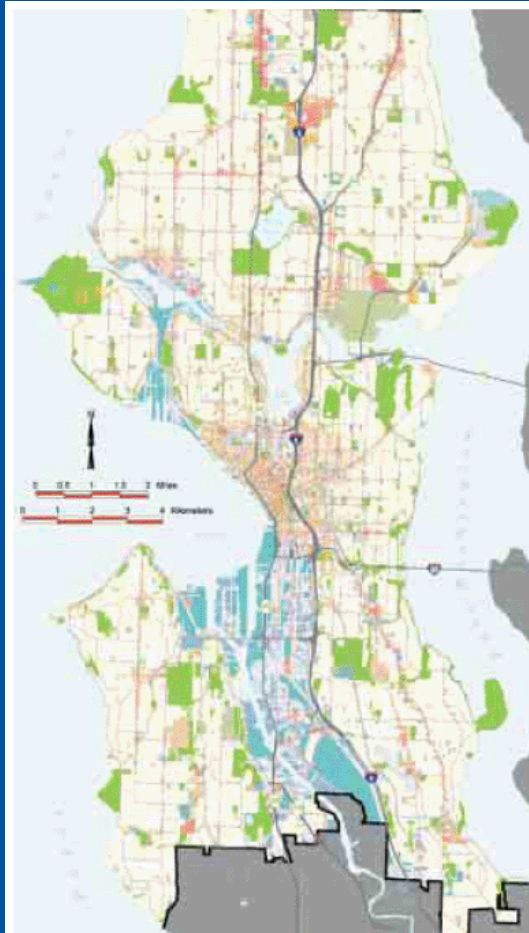
Open Space

- **Open space** is land within urban areas that is set aside for scenic and recreational enjoyment.
 - It also has many environmental benefits and provides valuable functions.
- Open spaces include parks, public gardens, and bicycle and hiking trails.
- Open spaces left in their natural conditions are often called **greenbelts**.
 - These greenbelts provide important ecological services.

Open Space

- The plants in open spaces absorb carbon dioxide, produce oxygen, filter out pollutants from air and water, and help keep a city cooler in the summer.
- Open spaces, especially those with vegetation, also **reduce drainage problems** by absorbing more of the rainwater runoff from building roofs, asphalt, and concrete resulting in less flooding.
- These open spaces also proved urban dwellers with much-needed places for exercise and relaxation.

GIS Views of Seattle, Washington



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