Chapter 22: Sustainable Cities

APES 2013

Ecocities: Curitiba, Brazil

City planners focused on mass transit rather than for cars

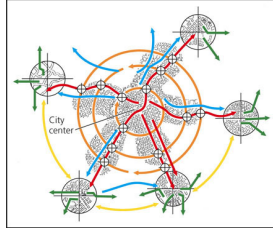> 72% of the population (total population = 3.2 million people) use the bus system each day

> Cars are banned in the city center

Converted flood-prone areas to parks

Planted 1.5 million trees (cant be cut down without a permit and two trees must be planted for every one cut down)

Recycle 70% of paper and 60% of glass, metal, and plastic

Poor receive free medical, dental, child care, job training

Route
— Express — Interdistrict — Direct — Feeder — Workers
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Urbanization

Half of the world's people live in urban areas

Megacities - 10 million people or more
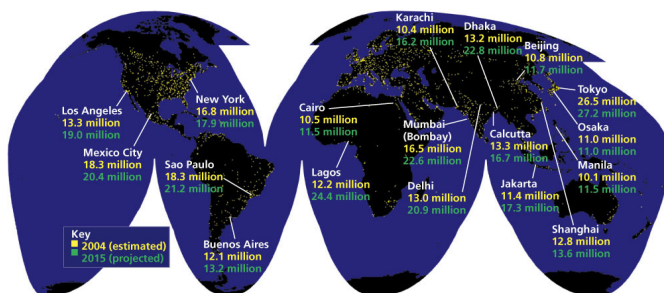
Hypercities - 20 million people or more (Tokyo)

Natural increase - more births than deaths

Immigration from rural areas (pushed and pulled)

Urban growth is slower in developed countries

Poverty is becoming urbanized

Fig. 22.2

Karachi
10.4 million
16.2 million

Dhaka
13.2 million
22.8 million

Beijing
10.8 million
11.7 million

New York
16.8 million
17.9 million

Los Angeles
13.3 million
19.0 million

Mexico City
18.3 million
20.4 million

Sao Paulo
18.3 million
21.2 million

Cairo
10.5 million
11.5 million

Mumbai
(Bombay)
16.5 million
22.6 million

Lagos
12.2 million
24.4 million

Delhi
13.0 million
20.9 million

Calcutta
13.3 million
16.7 million

Tokyo
26.5 million
27.2 million

Osaka
11.0 million
11.0 million

Manila
10.1 million
11.5 million

Jakarta
11.4 million
17.3 million

Shanghai
12.8 million
13.6 million

Key
2004 (estimated)
2015 (projected)

Buenos Aires
12.1 million
13.2 million

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United States Urbanization

Four phases (1800-2008):

- Migration from rural areas to large central cities

- Migration from large central cities to suburbs and smaller cities

- Migration from North and East to South and West

- Migration from cities and suburbs to developed rural areas

Fig. 22.4

Urban Sprawl

Growth of low density development on the edges of cities and towns

Factors contributing to urban sprawl:

- Ample land

- Federal government loans

- Low-cost gasoline (highways)

- Tax laws encouraging home ownership

- State and local zoning laws

- Multiple political jurisdictions: poor urban planning

Figs. 22-5 & 22-6

NATURAL CAPITAL DEGRADATION

Urban Sprawl

Land and Biodiversity	Water	Energy, Air, and Climate	Economic Effects
Loss of cropland	Increased use of surface water and groundwater	Increased energy use and waste	Decline of downtown business districts
Loss of forests and grasslands	Increased runoff and flooding	Increased air pollution	Increased unemployment in central city
Loss of wetlands	Increased surface water and groundwater pollution	Increased greenhouse gas emissions	Loss of tax base in central city
Loss and fragmentation of wildlife habitats	Decreased natural sewage treatment	Enhanced global warming	

Urban Sprawl: Megalopolises

Fig. 22-7

Bowash

Bowash (Boston to Washington)

Boston
Springfield
Hartford
Providence
Allentown
Newark
New York
Harrisburg
Philadelphia
Baltimore
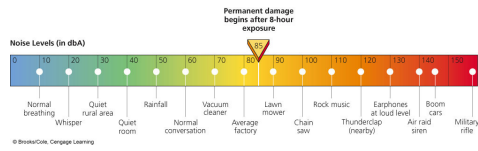Washington

Urbanization

Advantages: economic development, innovation, education, technological advances, and jobs

- Better access to medical care, recycling

- Reduces stress on wildlife habitats

Disadvantages: huge ecological footprint, lack vegetation, water problems, concentrate pollution and health problems, excessive noise, and different climate and light pollution

- Heat island

Figs. 22.8 & 22.9

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Urban Poor

Slums - areas dominated by tenements and rooming houses

Squatter settlements/ shantytowns - build shacks from scavenged materials

Difficult living conditions: no sewage disposal, no clean water, rats

Governmental help

Fig. 22-10

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Compact vs. Dispersed Cities

Compact cities - small land area with high population density (grow up not out)

- Mass transit

Dispersed cities - population spread over a wider area (grow out not up)

- Car centered cities

  - Cars offer convenience, economic benefits

  - Cars also cause accidents and deaths, largest source of outdoor air pollution, create urban sprawl

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Reducing Automobile Use

Full-cost pricing - gasoline taxes to offset the harmful impacts of driving (estimated an additional $12 per gallon)

Raise parking fees

Toll roads

Car-sharing

Promoting alternatives: bicycles, heavy-rail systems, light-rail systems, buses, rapid rail systems

Figs. 22.11-22.14

Proposed Mass Transit

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Fig. 22-15

Destroying U.S. Mass Transit

National City Lines

Company created by General Motors, Firestone Tire, Standard Oil, Phillips Petroleum, and Mack Truck

Purchased privately owned electric streetcar systems in 83 major cities and dismantled them

Companies were found guilty of conspiring to eliminate the light-rail system and the executives were fined $1 each and each company paid $5000 in fines (less than profit from replacing one street car)

Land Use Planning

Fig. 22-16

Encourages future population growth

Economic development (regardless of of environmental and social consequences)

Revenues: property taxes

Smart growth

  Reduces dependence on cars

  Controls and directs sprawl

  Cuts wasteful resource

  Portland, OR; San Francisco, CA; Boston, MA

SOLUTIONS
Smart Growth Tools

Limits and Regulations
Limit building permits
Urban growth boundaries
Greenbelts around cities
Public review of new development

Zoning
Encourage mixed use of housing and small businesses
Concentrate development along mass transportation routes
Promote high-density cluster housing developments

Planning
Ecological land-use planning
Environmental impact analysis
Integrated regional planning
State and national planning

Protection
Preserve existing open space
Buy new open space
Buy development rights that prohibit certain types of development on land parcels

Taxes
Tax land, not buildings
Tax land on value of actual use (such as forest and agriculture) instead of on highest value as developed land

Tax Breaks
For owners agreeing not to allow certain types of development (conservation easements)
For cleaning up and developing abandoned urban sites (brownfields)

Revitalization and New Growth
Revitalize existing towns and cities
Build well-planned new towns and villages within cities

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Preserving Open Spaces

Urban growth boundary (Washington, Oregon, and Tennessee)

Form municipal parks (Central Park, NYC; Grant Park, Chicago)

Greenbelts - surrounding a city with and open area for recreation (Canada - Vancouver and Toronto)

Fig. 22.17

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New Urbanism

Conventional housing development - rows of houses on standardized lots

Cluster development - high density housing in on portion with the rest of the land (30-50%) as shared open space

New urbanism - develop entire villages and mixed use neighborhoods with several basic principles:

  Walkability, mixed-use and diversity, quality urban design, environmental sustainability, smart transportation
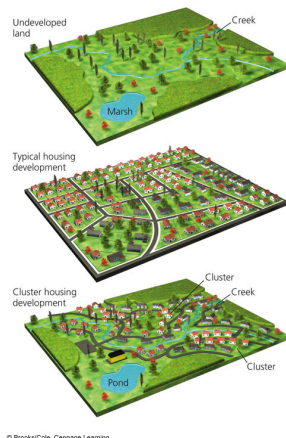

Undeveloped land
Creek
Marsh

Typical housing development

Cluster housing development
Cluster
Creek
Cluster
Pond

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Fig. 22.18

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Ecocity Concept

Build and design cities for people not for cars

Use renewable energy resources

Recycle and purify water

Use energy and matter resources efficiently

Prevent pollution and reduce waste

Recycle, reuse, and compost MSW

Protect and support biodiversity

Urban gardens and farmer's markets

Zoning and other tools for sustainability

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