Urbanization and Sustainable Cities

Urbanization

- Vast majority of humanity has always lived in rural areas where they subsisted on natural resources
  - Since beginning of Industrial Revolution cites have grown rapidly in size and power
  - Over next 3 decades, 3 billion people will crowd into cities
  - Huge urban agglomerations (mergers of multiple municipalities) appearing around world

Urban Share of Total Population

TABLE 22.1

Urban Share of Total Population (Percentage)

	1950	2000	2030*
Africa	18.4	40.6	57.0
Asia	19.3	43.8	59.3
Europe	56.0	75.0	81.5
Latin America	40.0	70.3	79.7
North America	63.9	77.4	84.5
Oceania	32.0	49.5	60.7
World	38.3	59.4	70.5

*Projected

Source: United Nations Population Division, 2004.

What is a City?

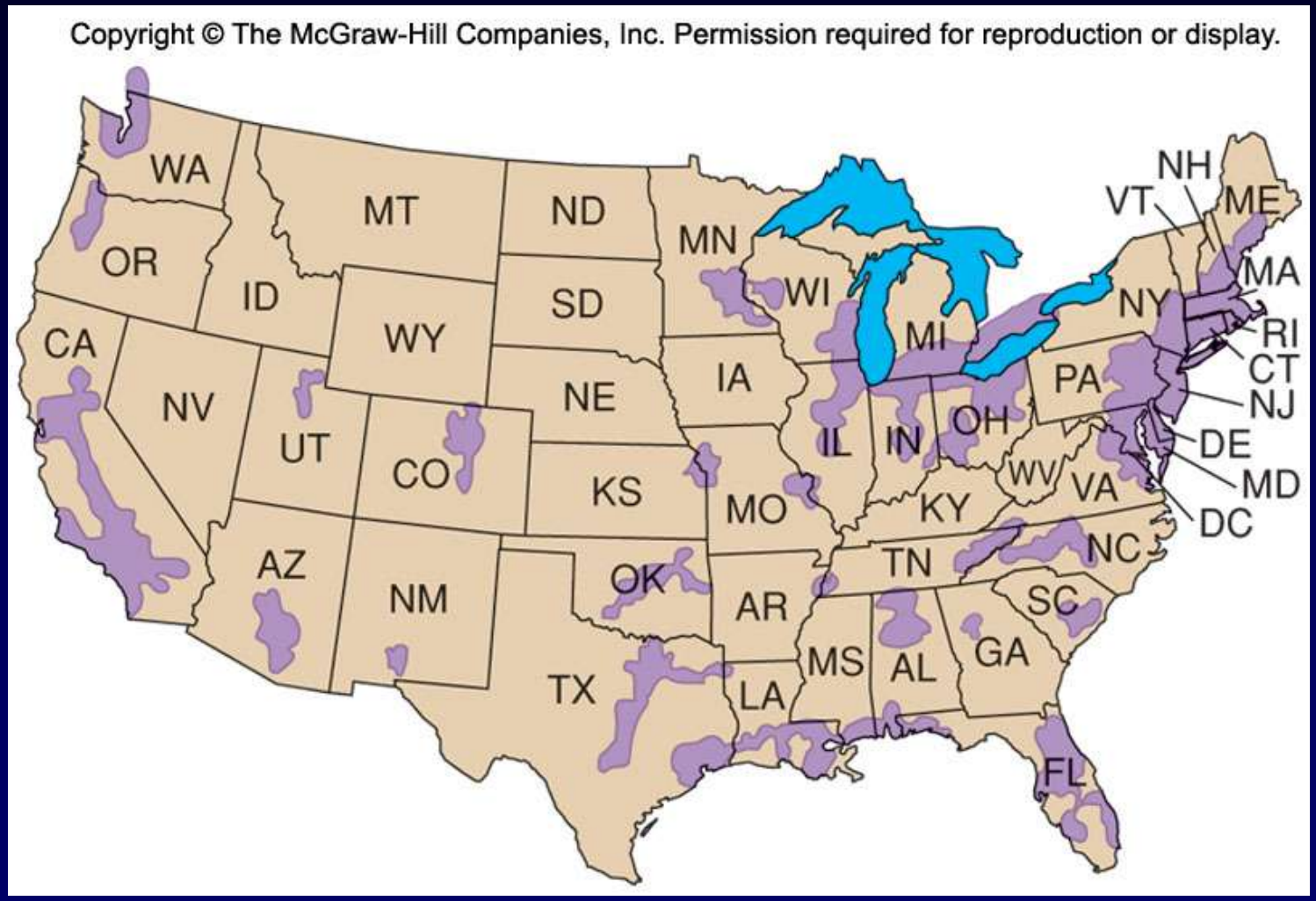
- U.S. Census Bureau considers any incorporated community a city, and any city with more than 2,500 residents as urban.
  - In rural areas, most residents depend on natural resources for their livelihood.
  - In urban areas, most people are not directly dependent on natural resource-based occupations.

What is a City?

- A village is a collection of rural households linked by culture, customs, family ties, and association with the land.
  - A city has a large enough resource base to allow residents to specialize in arts, crafts, services, or professions other than resource-based occupations.
    - A megacity is an urban area with more than 10 million inhabitants. The largest megacity (Chongquing) has 30 million.

Cities

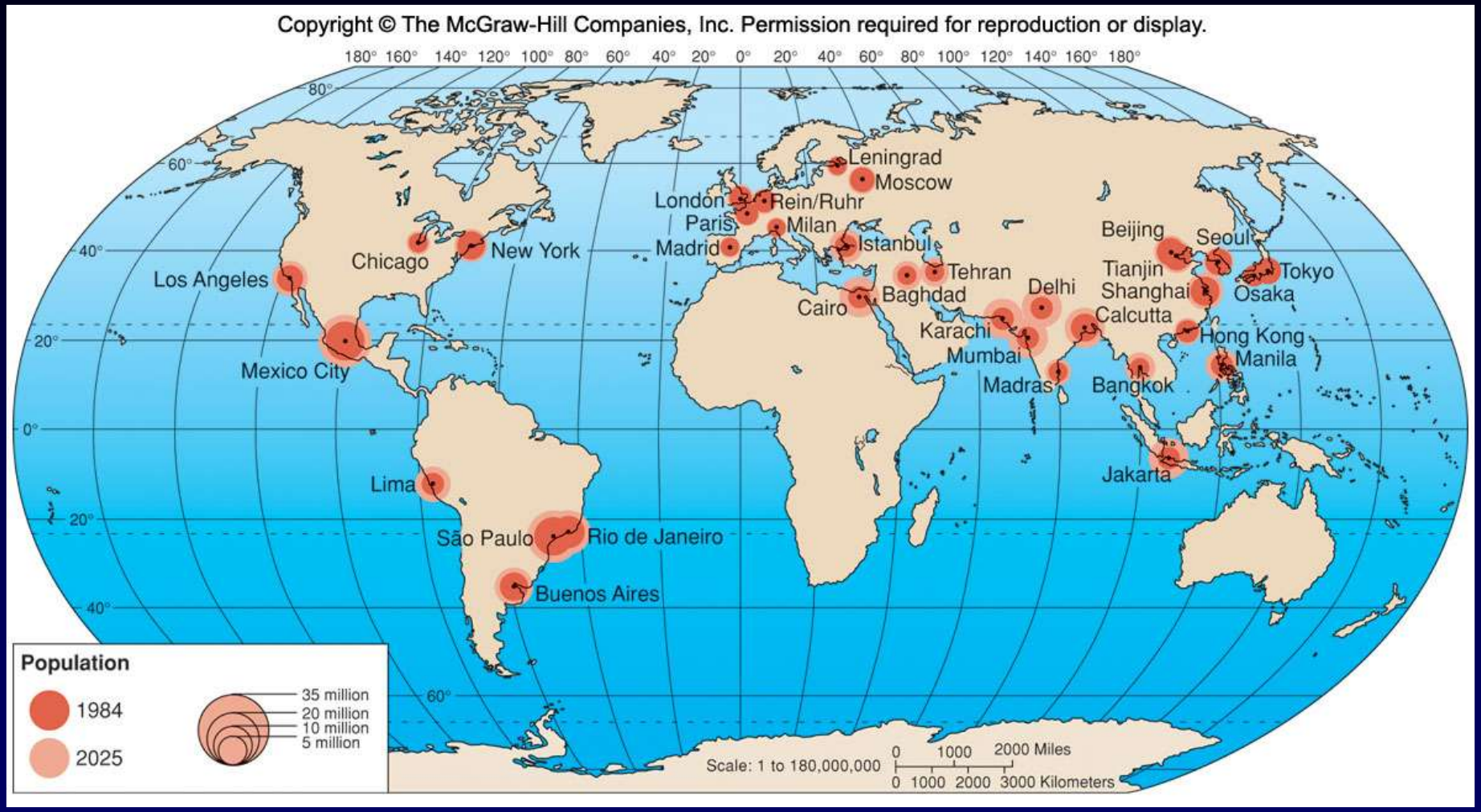
- As urban areas merge into nearly continuous megacities, some geographers have begun to refer to them as urbanized core regions.



World Urbanization

- In 1900, only 13 cities had populations greater than 1 million.
- By 2007, there were 300 such cities.
- None of the top 13 are in Europe and only New York and Los Angeles are in a developed country.
- China represents largest demographic shift to cities. Already half the concrete and 1/3 of steel used in the world are consumed in China's buildings.

Cities Larger Than One Million in 2025



Causes of Urban Growth

- Two main avenues of urban growth:
  - Natural Increase
    - Fueled by improved food supplies and better sanitation
  - Immigration
    - Caused by push factors forcing people out of the country, and pull factors drawing them into cities

Immigration Push Factors

- Overpopulation in Countryside
- Economics
- Racial or Religious Conflicts
- Land Ownership by wealthy
- Changes in Agriculture
  - Large Monoculture Farms

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Immigration Pull Factors

- Excitement and Vitality of Cities
- Jobs
- Housing
- Entertainment
- Social Mobility and Power
- Specialization of Professions

Government Policies Can Drive Urban Growth

- Government policies often favor urban over rural areas in push and pull factors.
  - Developing countries often spend majority of budgets on improving urban areas.
    - Major cities gain a monopoly on new jobs, education, and general opportunity, which attracts more people.
    - Governments manipulate exchange rates and food prices to benefit the more politically powerful urban populations.

Urban Challenges in the Developing World

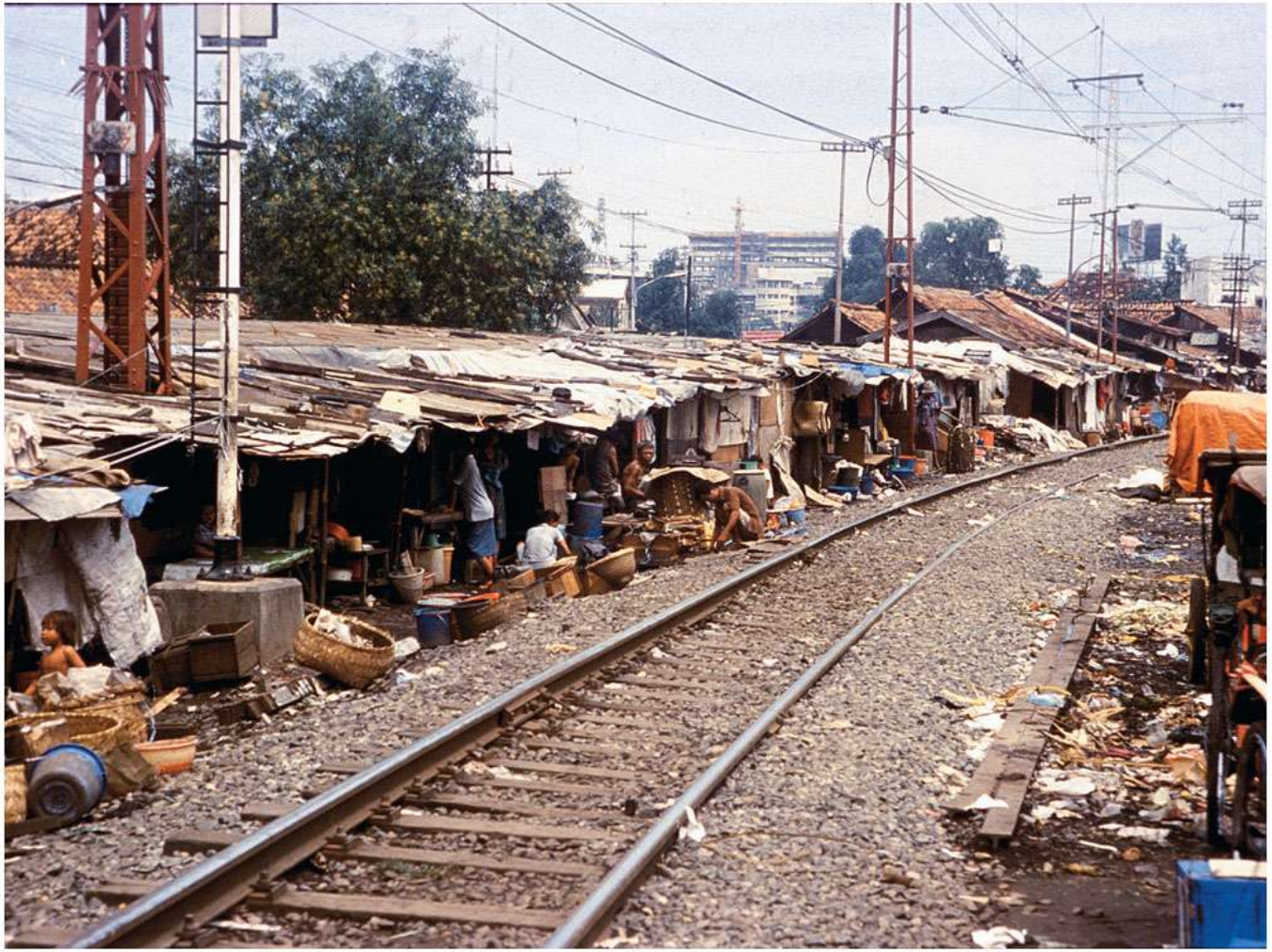
- Uncontrollable Growth
  - Traffic and Congestion - the number of vehicles in many urban areas is growing faster than the pace of road construction.
  - Air Pollution – poorly maintained vehicles, smokestacks from factories and wood or coal fires for cooking or heating work together to create poor air quality in supercities.
  - Sewer Systems and Water Pollution
    - Only 35% of urban residents in developing world have satisfactory sanitation.
    - One third do not have safe drinking water.

Sewage in Jakarta, Indonesia

Current World Problems

- Housing
  - At least 1 billion people live in slums (legal but inadequate multifamily tenements) of central cities and in shantytowns (settlements created when people build their own shacks on the outskirts of cities).
  - Sometimes people simply occupy land that they neither own nor rent, creating squatter towns which can have thousands.
  - Around 100 million people have no home at all.

Shantytown



Courtesy Dr. Helga Leitner

Current World Problems

- The Developed World
  - Rapid growth of cities that accompanied industrialization has mostly slowed or reversed
    - Many of the environmental problems have been reduced.
    - Automobiles and computers enable workers to live outside cities.
    - Many of major polluters have moved to developing countries.
    - In U.S., businesses have moved west and south.

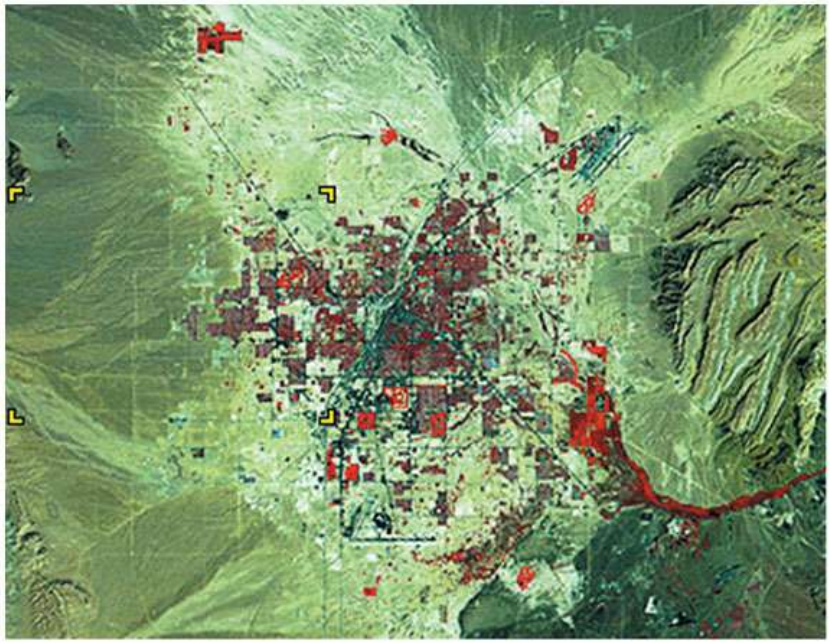
Developed World

- Urban Sprawl
  - In most American metropolitan areas, the bulk of new housing is in large, tract developments that leapfrog beyond city edges in search of inexpensive land
    - Consumes about 200,000 ha of U.S. agricultural land annually
    - Planning authority is often divided among many small local jurisdictions, and there is no way to regulate growth.

Urban Sprawl Consumes Land

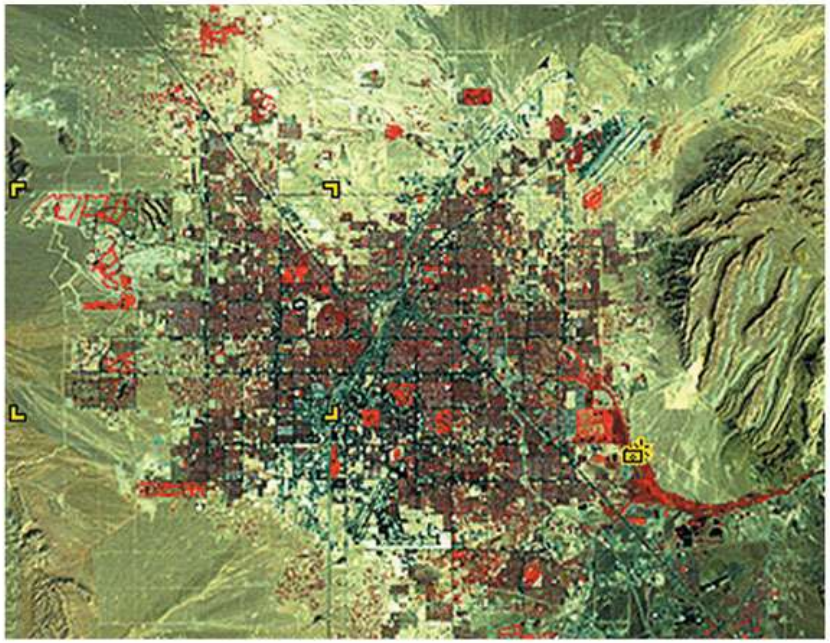
- Developers claim that growth benefits the suburbs, but the opposite is often true because the new sites must build roads, water, sewers, schools, etc. This is a big expense.
- In Atlanta, the population grew 32% between 1990 and 2000, but the land area it occupied grew 305%.
- The U.S. Department of Housing and Urban Development estimates that urban sprawl consumes 500,000 acres (200,000 ha) of farmland per year.
- Las Vegas is the fastest growing metropolitan region in the United States.

Growth of Las Vegas, Nevada



(a) 1972

U.S. Geological Survey



(b) 1992

U.S. Geological Survey

Expanding Suburbs Cause Long Commutes

- Because many Americans live far from work, they consider a private automobile essential
  - Average U.S. driver spends the equivalent of one 8 hr day/week behind the wheel
  - In some metropolitan areas, it is estimated one-third of all land is devoted to automobile infrastructure
    - Traffic congestion costs U.S. $78 billion annually in wasted fuel and time

Social Consequences of Urban Sprawl

- With a reduced tax base and fewer civic leaders living or working in downtown areas, the city is unable to maintain its infrastructure.
- Poor who are left behind when upper and middle classes move to suburbs, have no jobs and no way to commute to suburbs.
  - One third of Americans too young, too old, or too poor to drive. Car oriented development causes isolation.
- Sprawl promotes a sedentary lifestyle.

Mass Transit Makes Cities More Livable

- Mass transit could make cities more livable.
  - Model of Curitiba, Brazil where high speed buses carrying 270 passengers each travel on roadways closed to all other traffic. Everyone in city is within walking distance of a bus stop and entire system is handicapped accessible.
  - City was able to construct this system for 10% the cost of light rail or freeway and 1% the cost of subway

Smart Growth

- Smart Growth makes efficient and effective use of land resources and existing infrastructure.
  - Minimizes wasted space and money
  - Makes land-use planning democratic
  - Mixes land uses
  - Encourages diversity
  - Preserves natural spaces

Garden Cities and New Towns

- New Towns - numerous experiments to try and combine best features of rural village and modern city
  - Ebenezer Howard (1898) proposed congestion of London could be relieved by moving whole neighborhoods to garden cities separated from the central city by a greenbelt of forest and fields.
    - Two such communities were built

- Planned communities in U.S. include Reston, VA and Columbia, MD

New Urbanist Movement

- Recapture small town feel in big city
- Organize city into modules of 30,000 to 50,000 people
- Determine in advance where development will take place
- Locate everyday services more conveniently
- Increase jobs in a community by locating offices and commercial centers near suburbs
- Encourage walking and low-speed vehicles
- Promote diversity in housing designs
- Create housing “superblocks”

Green Urbanism

- New urbanism has often been greenfield development, building on farmland or forest.

- Green urbanism redevelops existing cities to be ecologically sound.
  - Focus on in-fill and brownfield development
  - Build high density, low-rise, mixed income housing near city centers
  - Provide incentives for alternative transportation
  - Encourage ecological building techniques

Green Urbanism

- Encourage co-housing, groups of houses around a common green space
- Provide recycling facilities
- Invite public participation in decision-making

- Photo is from the Netherlands

(a)

(b)

(c)

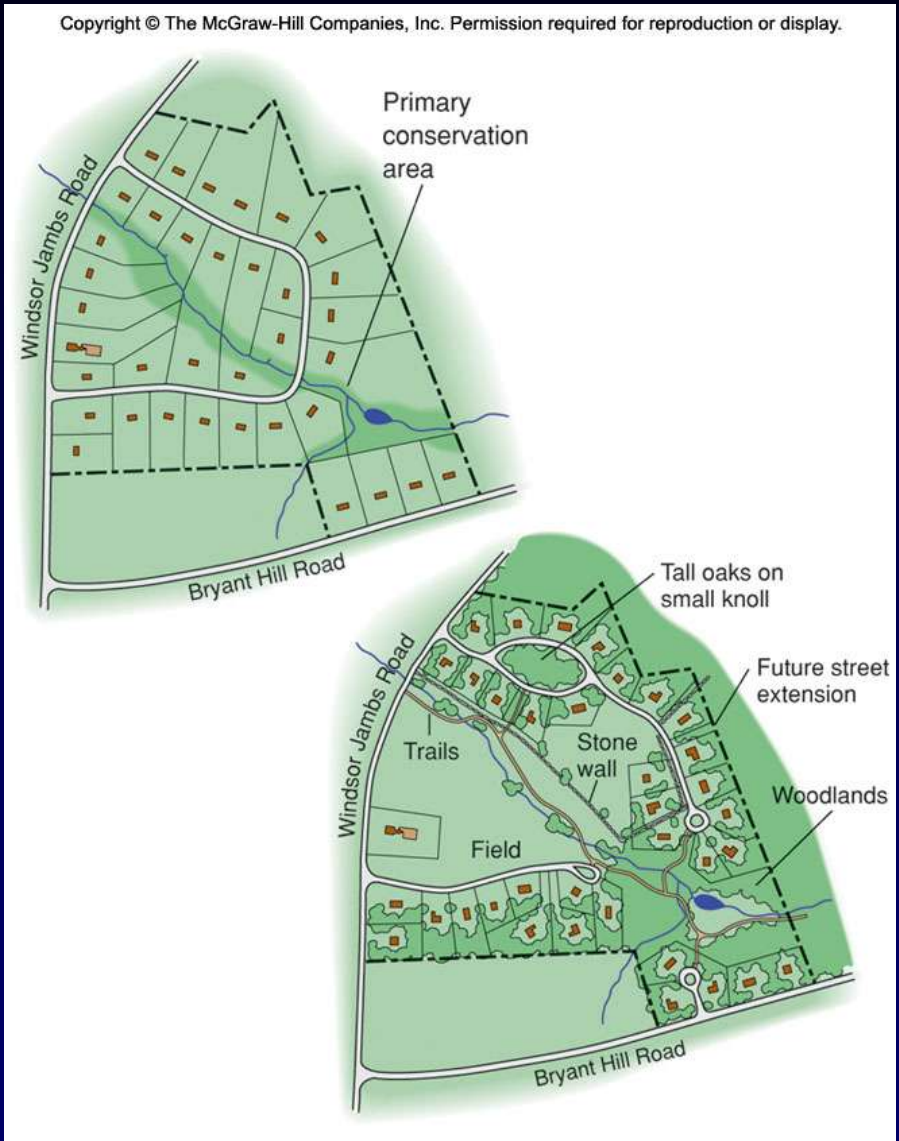
A New Vision For Smart Cities

- Smart cities of the future will have minimal environmental impacts:
  - Roof top solar panels and wind turbines will generate energy.
  - Plug-in hybrid cars will serve as a dispersed electrical storage grid.
  - Food will be grown in rooftop gardens.
  - Mass transit will move people quickly and inexpensively.
  - Rainwater will be filtered and re-used.
  - Recycling of metal and glass will be standard.

Open Space Design Preserves Landscapes

- Traditional suburban development typically divides land into a checkerboard layout of nearly identical 1-5 ha parcels with no designated open space
  - It consumes agricultural land and fragments wildlife habitat
  - Conservation Development – (also called cluster development) preserves at least half of a subdivision as natural areas, farmland, or other forms of open space

Designing for Open Space



Open Space Design

- People want view of interesting landscape with wildlife and walking paths.
- By clustering homes, a conservation subdivision can have same number of lots, but more open space.