Core Case Study: The Ecocity Concept in Curitiba, Brazil

List 5 things that make Curitiba, Brazil an Ecocity:

1. *an efficient mass transit system*
2. *stores located on the bottom floors of apartment buildings*
3. *cars are banned in the center of downtown, so it is pedestrian friendly*
4. *recycles 70% of its paper and 60% of its metal, glass, and plastic*
5. *planted more than 1.5 million trees*

22-1: What Are the Major Population Trends in Urban Areas?

Define: Urbanization- *creation and growth of cities and their surrounding developed land*

Urban Growth- *the rate of increase of urban populations*

Urban areas grow in 2 ways:	4 major trends in urban population dynamics:
1. *Natural increase (more births than deaths)* 2. *Immigration mostly from rural areas to find jobs, food, housing, education, etc*	1. *Proportion of the global population living in urban areas is increasing* 2. *Urban areas are expanding rapidly in number and size* 3. *Urban growth is much slower in developed countries* 4. *Poverty is becoming increasingly urbanized, mostly in developing countries*

Case Study: Urbanization in the US

Between 1800- 2008, the population living in urban areas increased from 5% to *79* %, and this occurred in 4 phases:

1. *People migrated from rural areas to large central cities.*
2. *Many people migrated from large central cities to suburbs and smaller cities.*
3. *Many people migrated from the North and East to the South and West.*
4. *Some people have fled both cities and suburbs and migrated to developed rural areas.*

What are some issues the US is facing with urbanization?

Aging infrastructures, budget issues, decreasing public services, rising poverty

Looking at Figure 22-4, most major urban areas are located near water. Why do you think that is?

Define: Urban Sprawl- *growth of low-density development on the edges of cities and towns*

6 factors promoting urban sprawl in the US:	Undesirable impacts of urban sprawl:
1. *Ample land available for cities to spread outward* 2. *Federal govt. loans guarantees single-family housing for WWII veterans* 3. *Low-cost gas for commuting* 4. *Tax laws encouraged home ownership* 5. *Most state and local zoning laws*	Land and Biodiversity: *Loss of cropland, forests, grassland, and wetlands; habitat fragmentation* Water: *Increased use of surface and groundwater, increased runoff and flooding, increased*

favored large residential lots and separation of residential and commercial areas 6. *Most urban areas consist of multiple political jurisdictions which rarely work together for developing a plan for growth*	*water pollution* Energy, Air, and Climate: *Increased energy use and waste, increased air pollution and greenhouse gas emissions, enhanced global warming* Economic Effects: *Decline of downtown business districts, increased unemployment, loss of tax base in central city*

Define: Megalopolis- *chain of roughly adjacent metropolitan areas; very large cities*

22-2: What Are the Major Urban Resource and Environmental Problems?

Advantages of Urbanization	*Cities are centers of economic development, innovation, education, technological advances, and jobs* *Urban residents tend to live longer and have a lower infant mortality rate- better access to medical care, family planning, and social services* *Environmental advantages- recycling is more feasible, reducing stress on wildlife, saves energy when relying on mass transit*
Disadvantages of Urbanization	Huge Ecological Footprints: *consume most of Earth's resources and produces most of the carbon dioxide emissions, high resource input of food, water, and materials resulting in high waste output* Lack Vegetation: *vegetation is destroyed to make way for roads, buildings, and housing therefore cities do not benefit from natural absorption of air pollution, oxygen output, and shade* Water Problems: *water demands increase, deeper well drilling, flooding due to a lot of impermeable surfaces and destroyed wetlands* Concentrated Pollution and Health Problems: *pollution levels are higher because pollution is produced in a smaller area and cannot be dispersed and diluted* Excess Noise: *urban dwellers are subject to noise pollution- any unwanted or harmful sound that interferes with hearing, causes stress, etc (sound pressure becomes painful at 120 decibels and deadly at 180 decibels)* Different Climate and Light Pollution: *cities are generally warmer, rainier, and cloudier; the enormous amount of heat generated by factories, lights, air conditioners, etc. create an urban heat island surrounded by a cooler suburb; light pollution affects some plants and animals*

Define: Slums- *areas dominated by tenements and rooming houses where several people may live in a single room*

Shantytowns- *shacks are built on the outskirts of town*

Squatter Settlements- *people take unoccupied land without permission for survival*

What can governments do to address these problems? *Slow migration from rural to urban by improving educational opportunities, health care, and family planning; designate land for squatters and provide clean water and sanitation*

Case Study: Mexico City- World's 2nd most populous city

Why is this an urban area in crisis?

Severe air pollution, many are unemployed, overcrowded, high crime, lack of sanitation

22-3: How Does Transportation Affect Urban Environmental Impacts?

If a city cannot spread outward, it must grow *upward*.

Define: Compact Cities- *high density like Hong Kong, Tokyo where people get around by foot, bike, or mass transit, many high rise apartment buildings*

Dispersed Cities- *city is more spread own because of plentiful land, cheap gasoline, and a network of highway systems*

Car-Centered Cities- *ample land is available for outward expansion resulting in urban sprawl, passenger vehicles are the main mode of transportation*

Advantages of Motor Vehicles	*Mobility, convenient, economic gain for car industries, helps create urban sprawl*
Disadvantages of Motor Vehicles	*Many deaths from crashes, increased greenhouse gases, increased photochemical smog, congestion*

How can automobile use be reduced?

Suggested that users pay directly for health and environmental costs of driving a car, tax on gasoline to cover harmful effects, build better infrastructure for walking and biking, raise parking fees

22-4: How Important Is Urban Land Use Planning?

Define: Land Use Planning- *to determine the best present and future use of land*

-most land use planning encourages future population growth and economic development regardless of environmental and social consequences

Zoning- *parcels of land are designated for certain uses; used to control growth and protect certain areas from development, however developers can easily get the zone modified for their purpose*

Smart Growth-*a way to encourage more environmental sustainable development; encourages clustered, mixed use neighborhoods*

Examples of Smart Growth Tools:	Limits and Regulations- *limit building permits, add greenbelts around the city, public review of new development* Zoning- *encourages mixed used of housing and small businesses,*

	concentrate development along mass transit lines Planning- *ecological land use planning, env impact analysis, state and national planning* Protection- *preserve existing open space, buy new open space, buy development rights that prohibit certain types of development* Taxes- *tax land not buildings, tax land on value of actual use* Tax Breaks- *for owners agreeing not to allow certain types of development, for cleaning up and developing brownfields* Revitalization and New Growth- *revitalize existing towns, build well-planned new towns within cities*

How can open space be used and preserved? *Urban Growth Boundaries to increase housing density inside the boundaries; unintended consequences- encourages low density housing and urban sprawl*

22-5: How Can Cities Become More Sustainable and Livable?

Describe what a cluster development looks like.

High density housing units are concentrated on one portion of a parcel and the rest of the land is used for commonly shared open space (live, work, play communities)

New Urbanization is a new trend in developments (aka old villageism). Principles of this type of development are:

- *Walkability- most stores and recreational activities located within 10 minute walk of homes and apartments*
- *Mixed Use and Diversity- provides a mix of pedestrian friendly shops, offices, and homes to encourage people of all ages and races to move in*
- *Quality Urban Design- emphasizes beauty, aesthetics, and architect*
- *Environmental Sustainability- based on development and minimal env impact*
- *Smart Transportation- well designed train and bus systems connecting neighborhoods, towns, and cities*

Green cities emphasize the following goals:

Build and design cities for people, not cars
Use solar and locally available renewable energy and design buildings to heat and cool as naturally as possible
Depend largely on recycled water that is purified to use again and again
Prevent pollution and reduce waste
Recycle, reuse, and compost at least 60% of all MSW
Promote urban gardens and farmer's markets

Case Study: What does China envision for their ecocity, Dongtan?

wants this to be the first "carbon-neutral" city in which all carbon emissions are offset by its carbon absorption
goal is to cut the cities ecological footprint to half that of comparable cities
all of cities energy to come from renewable sources