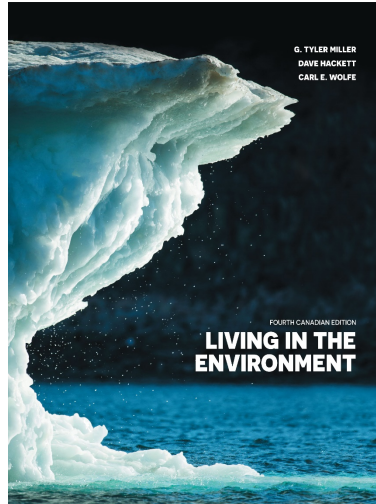


**NETA PowerPoint® Slides**  
to accompany



prepared by  
Ian Dawe

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## **Chapter 25**

### **Sustainable Cities**

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## Key Concepts

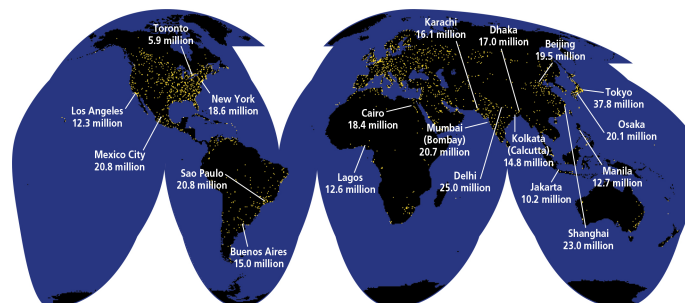
- Cause and control of urban growth
- Major resource and environmental problems in urban areas
- Effects of transportation systems in urban growth
- Making cities more sustainable and livable

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## Urbanization and Urban Growth

- Currently, 54% of people live on 2% of the world's land area.
- Canada's biggest city (Toronto) is relatively small.



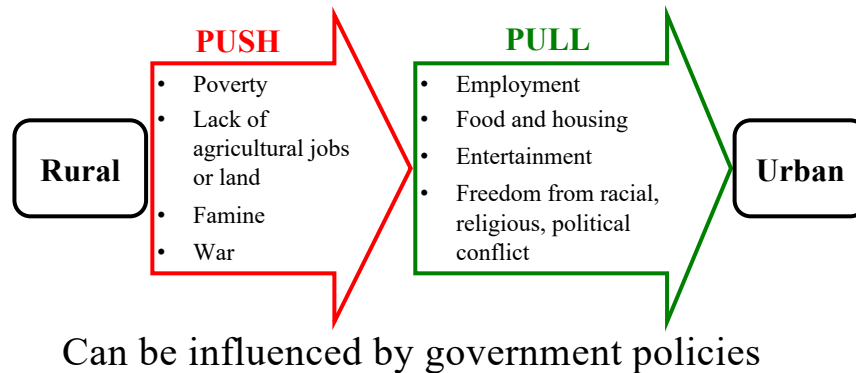
National Geophysical Data Center/National Oceanic and Atmospheric Administration and United Nations.

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## What Causes Urban Growth?

- Natural growth
- Immigration



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## Worldwide Patterns of Urbanization and Urban Growth

- Increased proportion of population in urban areas
  - From 2% to 54% from 1850 to 2014
- Increased number of large cities
  - 2014: 28 megacities (>10 million people)
- Rapidly increasing urbanization in developing nations
- Slower urban growth in already heavily urbanized developed nations
- Poverty becoming increasingly urbanized

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## Five Major Trends

1. The proportion of the global population living in urban areas is increasing.
2. The number of large cities is mushrooming.
3. Urbanization and urban populations are increasing rapidly in developing countries.
4. Urban growth is slower in developed countries.
5. Poverty is becoming urbanized in developing countries.

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## How Urbanized Is Canada?

### Phases of Urban Migration

1. From rural areas to **large central cities**
2. From city centres to **suburbs or smaller cities**
3. From East to **West**
4. From urban back to **rural (post-1990)**

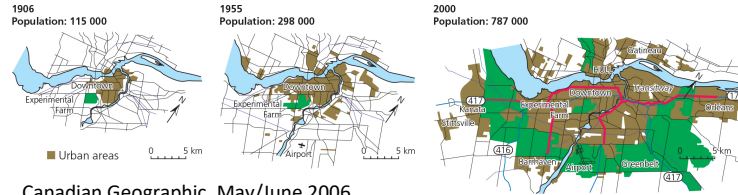
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## What Is Urban Sprawl?

Growth of low-density development at the periphery



- Ample available **land**
- Government-facilitated **housing**
- **Automobile** accessibility
  - Cheap gas + highways
- **Tax** law favours home ownership
- **Zoning** laws
- Poor urban planning due to political **jurisdiction** issues

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## What Are Some of the Effects of Urban Sprawl?

- **Land and Biodiversity**
  - Loss of cropland, forest, grassland; fragmentation of wildlife habitat; increased soil erosion
- **Human Health and Aesthetics**
  - Contaminated drinking water, noise pollution, traffic congestion
- **Water**
  - Contamination; increased groundwater use; increased flooding; lower natural sewage treatment

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## What Are Some of the Effects of Urban Sprawl? Continued

- **Energy, Air, and Climate**
  - Increased energy use, waste, air pollution, greenhouse emissions
- **Economic Effects**
  - Higher taxes; higher unemployment; decline in downtown business districts

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## Urban Areas: Inputs *versus* Outputs

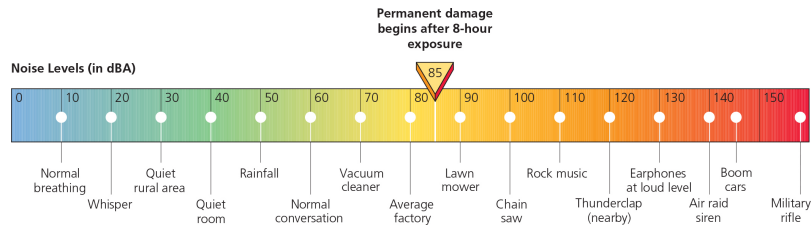
Urban areas are not self-sustaining systems.



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## Noise Pollution

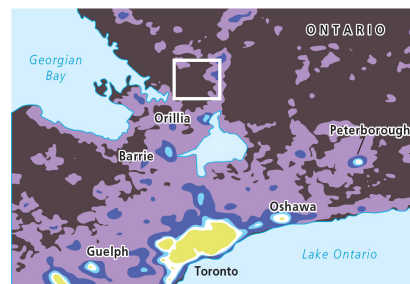


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## Light Pollution

- Stargazing
- Astronomical research
- Changing animal migration
- Aquatic ecosystems, algae and water quality



Muskoka Heritage Foundation

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## Case Study: Urban Poor in Developing Countries

- Slums
- Illegal settlements
  - Squatter settlements
  - Shantytowns
- Crowding
- Absence of sanitation and limited services
- Poverty and unemployment
- Better access to services and community than rural

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## Transportation and Urban Development

- **Land availability**
    - Determines growth pattern of a city
      - Vertical or horizontal
    - Determines viable transportation options
      - Individual or mass transit
- Compact cities

  - Hong Kong, Tokyo

Dispersed cities

  - in Canada, the United States
- 

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## What Is the Role of Motor Vehicles in Canada?

In North America,

- 5% of world population = 33% of all cars

Cars are used for

- 98% of urban transportation
- 90% of commuting

and

- 75% of trips are less than 1.6 km from home
- 75% of commuting cars are single-occupant

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## What Are the Advantages and Disadvantages of Motor Vehicles?

### Advantages

- Personal mobility
- Convenience
- Job creation
  - Auto industry
  - Roads, services, etc.

### Disadvantages

- Kill or injure people
- Air pollution
- Promote urban sprawl
- Congestion
- Economic costs

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## How Can We Reduce Automobile Use?

### Strategies

- Taxation
- Tolls
- Car-free zones
- Car-sharing networks
- Telecommuting
- Strategies

### Challenges

- Political opposition
  - Public
  - Auto industry
- Absence of alternative transit infrastructure

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## Bicycles: Trade-offs

### Advantages

- Affordable
- Produce no pollution
- Quiet
- Require little parking space
- Easy to manoeuvre in traffic
- Take few resources to make
- Very energy efficient
- Provide exercise

### Disadvantages

- Little protection in an accident
- Do not protect riders from bad weather
- Not practical for trips longer than 8 kilometres (5 miles)
- Can be tiring (except for electric bicycles)
- Lack of secure bike parking

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## Motor Scooters: Trade-offs

### Advantages

- Affordable
- Produce less air pollution than cars
- Require little parking space
- Easy to manoeuvre in traffic
- Electric scooters are quiet and produce little pollution

### Disadvantages

- Little protection in an accident
- Does not protect drivers from bad weather
- Gasoline engines are noisy
- Gasoline engines emit large quantities of air pollutants

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## Mass Transit Rail: Trade-offs

### Advantages

- More energy efficient than cars
- Produces less air pollution than cars
- Requires less land than roads and parking areas for cars
- Causes fewer / injuries and deaths than cars
- Reduces car congestion in cities

### Disadvantages

Expensive to build and maintain  
 Cost effective only along a densely populated narrow corridor  
 Commits riders to transportation, schedules  
 Can cause noise and vibration for nearby residents

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## Buses: Trade-offs

### Advantages

- More flexible than rail system
- Can be rerouted as needed
- Cost less to develop and maintain than heavy-rail system
- Can greatly reduce car use and pollution

### Disadvantages

Can lose money because they need low fares to attract riders  
Often get caught in traffic unless operating in express lanes  
Commits riders to transportation schedules  
Noisy

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## Rapid Rail: Trade-offs

### Advantages

- Can reduce travel by car or plane
- Ideal for trips of 200-1000 kilometres (120-620 miles)
- Much more energy efficient per rider over the same distance than a car or plane

### Disadvantages

- Expensive to run and maintain
- Must operate along heavily used routes to be profitable
- Causes noise and vibration for nearby residents

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## Conventional Land-Use Planning

- Prioritizes growth and development
- Typically poorly controlled expansion
- Reliance on property taxes encourages expansion

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## Using Zoning to Control Land Use

### Advantages

- Can be used to control growth
- Protect areas from some types of development

For example, zone for high-density development along mass transit corridor

### Disadvantages

- Developers exert considerable influence
- Favours high-priced developments over environmental/social concerns
- Disfavours innovation due to strict zoning

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# Smart Growth Tools: Solutions

Figure 25-15 Solutions

## Smart Growth Tools

Smart growth or new urbanism tools used to prevent and control growth and sprawl



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### Limits and regulations

- Limit building permits.
- Set urban growth boundaries.
- Establish greenbelts around cities.
- Allow for public review of new developments.

### Zoning Limits and regulations

- Limit building permits.
- Set urban growth boundaries.
- Establish greenbelts around cities.
- Allow for public review of new developments.



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### Planning

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

### Protection

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



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### Taxes

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

### Tax breaks

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

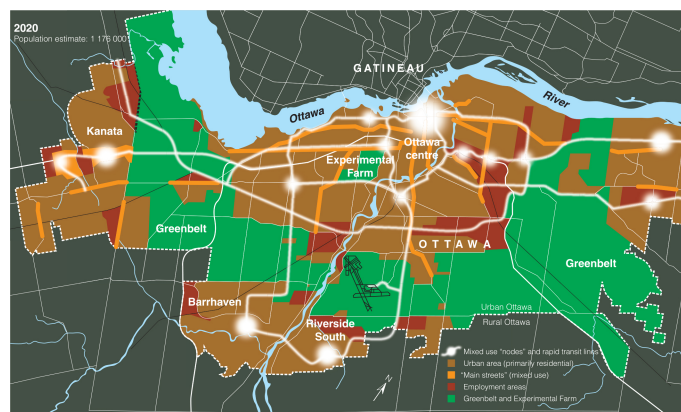
### Revitalization and new growth

- Revitalize existing towns and cities.
- Build well-planned new towns and villages within cities.

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## Preservation of Urban Open Spaces: Ottawa

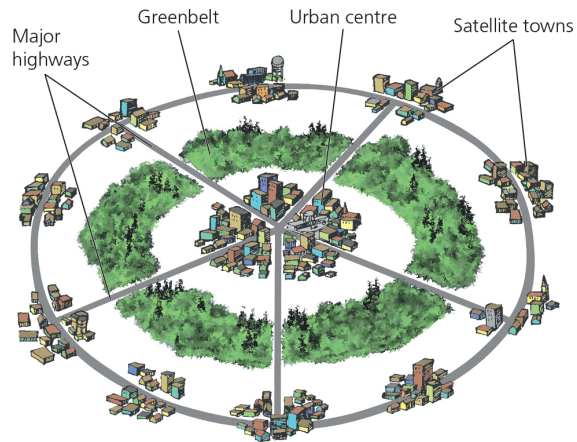


Canadian Geographic, May/June 2006

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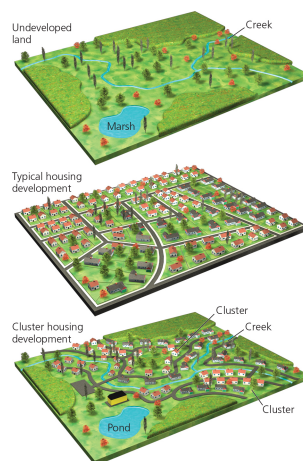
## Preservation of Urban Open Spaces: Vancouver and Toronto



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## Different Visions of Neighbourhood Development



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## Making Urban Areas More Livable and Sustainable

### Ecocity / Green City

- Preventing pollution and reducing waste
- Efficient use of energy and matter
- Recycle and reuse > 60% of solid waste
- Solar and other renewable resources
- Protect biodiversity by land preservation
- Urban gardens and farm markets
- Green design of buildings

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## Spotlight: Vancouver - A Showcase for Urban Renewal

- Vertical neighbourhoods
- Attracting people to downtown core to both live *and* work
- Sustainable community on False Creek
- Features safe travel routes: A downtown safe for children



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## Urban Rooftop Gardens

- Cover roof with vegetation
- Advantages:
  - Insulation
  - Lower summer temperatures
  - Improve water quality
  - Carbon sink
  - Add natural habitat
  - Local food
  - Beauty



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## Conclusion

- Urbanization has advantages and disadvantages, both ecologically and economically.
- Transportation is a major challenge.
- Creative urbanization can create more sustainable cities.

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