

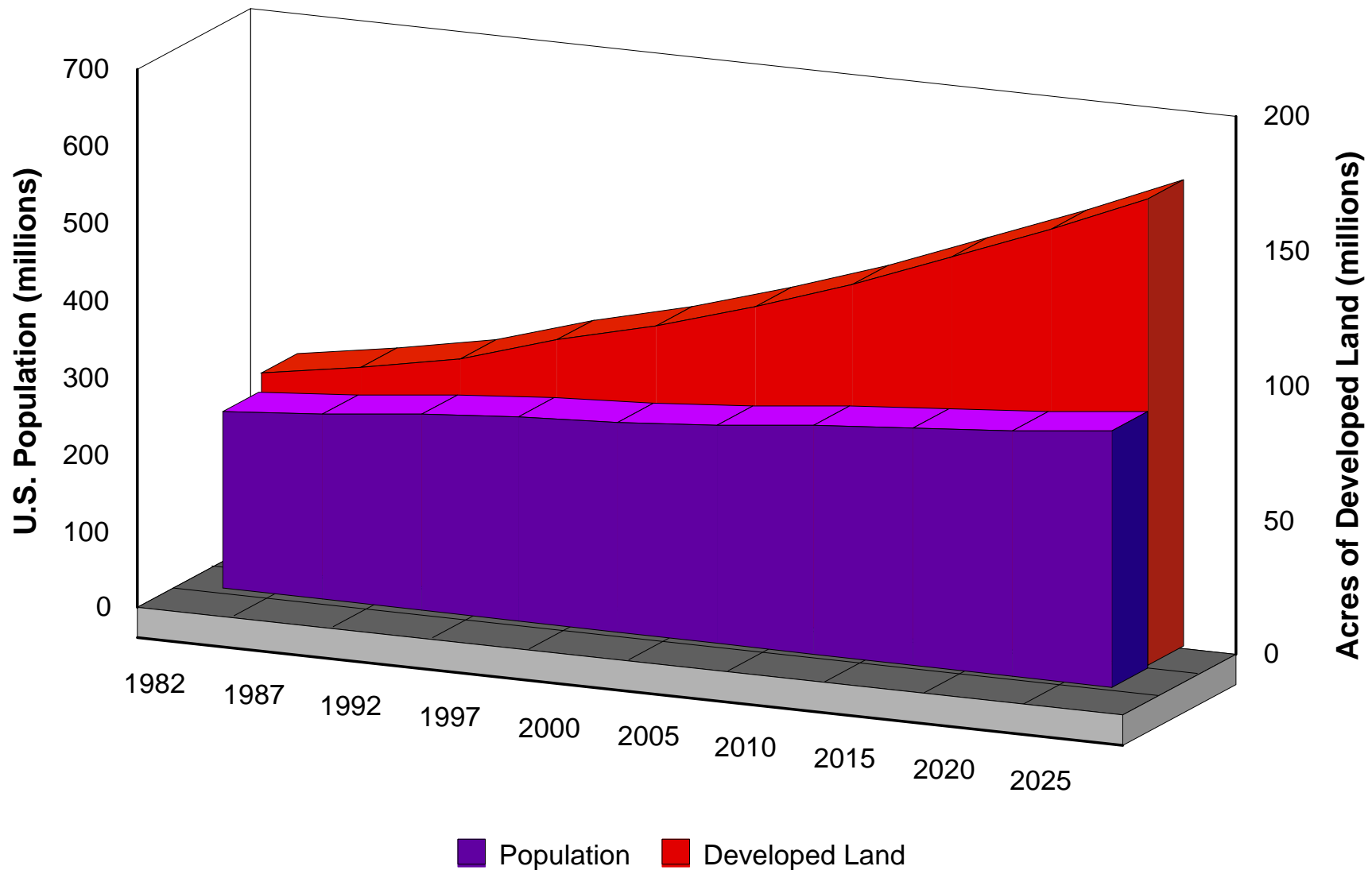
Making Great Neighborhoods: Linking Land Use and Water Quality



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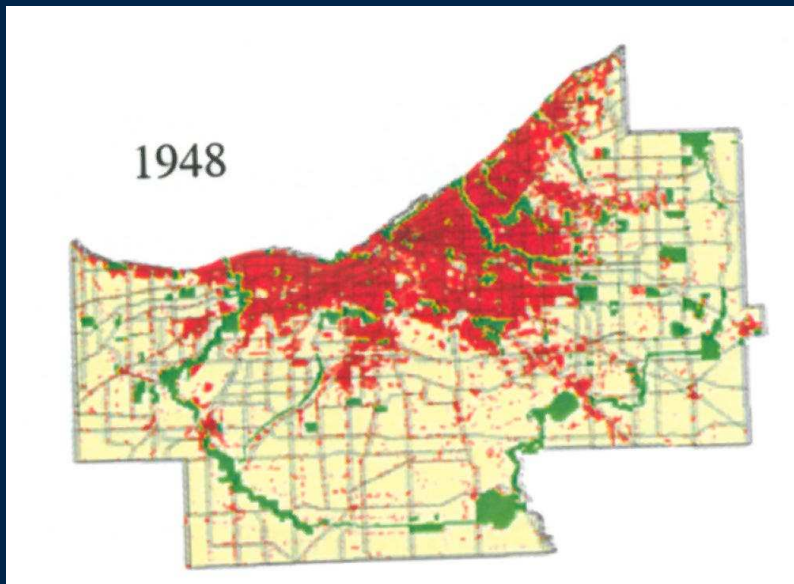
U.S. Environmental Protection Agency
Smart Growth Program

We're consuming land faster than our population is growing.

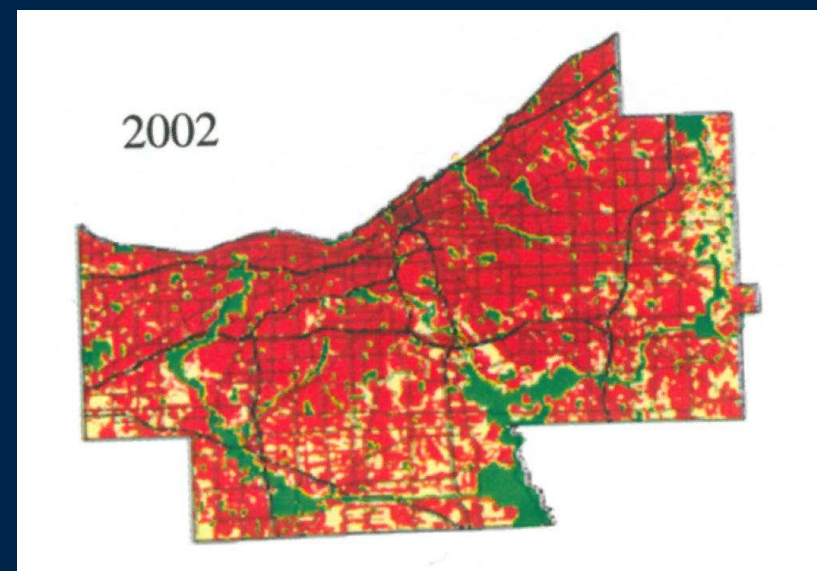


Source: Data and extrapolations from National Resources Inventory 2001; U.S. Census Bureau 2000.

Expansion with little population growth



U.S. Census 1950
1,389,582 pop.



U.S. Census 2002
1,393,978 pop.

Source: Cuyahoga Co Land Use Maps – Cuyahoga County, Ohio, Planning Commission

Environmental impacts:



➤ Air quality:

- Since 1990, carbon dioxide emissions from personal vehicles rose by 23% and emissions from trucks have risen by 80%*
- Buildings and transportation together account for about 2/3 of U.S. GHG emissions**

➤ Water quality:

- EPA estimates that over 70% of urban water bodies are impaired
- Dispersed development affects more area and produces almost 50% more stormwater runoff than compact development;

➤ Loss of habitat and critical areas

- Habitat destruction is the main factor threatening 80% or more of the species listed under the Endangered Species Act.

*FHWA. *Highway Statistics Series*

**EPA. 2009 Inventory of Greenhouse Gas Emissions and Sinks

What is smart growth?

EPA's mission is to protect human health and the environment.
Where and how we build affects our land, air, and water resources.

Smart growth development revitalizes neighborhoods, uses resources efficiently, protects farmland and open space, keeps housing affordable, and provides more transportation choices.

It is development that is good for the economy, the community, public health, and the environment.



The Smart Growth Network



1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable neighborhoods
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, natural beauty, and critical environmental areas
7. Strengthen and direct development towards existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair, and cost-effective
10. Encourage community and stakeholder collaboration in development decisions

Adopted by 38 Smart Growth Network Partners, 50 units of government, 40 NGOs, and 13 private sector groups

Smart growth at the community level.



Development is intense around transit stations and commercial corridors and transitions to neighborhoods of single-family homes and leafy streets

Smart growth has environmental and community benefits:

- Reduces emissions
 - An EPA/DOT funded study found that more compact development along with complimentary pricing strategies could reduce CO2 emissions by 18-24% by 2050.*
- Reduces water demand
 - Homes on 1/5 acre use 50% less water than those on 1/2 acre.
- Cleans up brownfields and returns them to productive use.
 - The GAO estimates there are 425,000 brownfields sites nationwide
 - Redevelopment helps preserve open space and efficiently uses existing infrastructure.
- Creates more walkable, healthier neighborhoods.
 - People in walkable neighborhoods are 7% less likely to be obese.
 - In Minneapolis, greenhouse gas savings from walking and biking equal shifting 12% of vehicles to hybrids.**



Compared with conventional development patterns Atlantic Station, a 139-acre redevelopment in midtown Atlanta, had significant environmental reductions for the region:

- Avoided 20 million cu/ft of runoff
- Protected 1000+ acres of development***
- Residents travel half as much as the regional average 13.9 vs. 33.7 miles per day****

*Moving Cooler An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, Urban Land Institute, July 2009.

**The Short Trip with Big Impacts: Walking, Biking, and Climate Change, Rails to Trails Conservancy, August 2007.

***EPA unpublished modeling analysis, 2004

****Summary report of the Atlantic Steel redevelopment Project XL is required under section VIII.H of the Final Project Agreement between EPA and Jacoby Development, Inc, September 7, 1999.

To best protect (or enhance) water quality...

Preserve, Recycle, Reduce, Reuse

- **Preserve:** Protect and enhance natural features, such as undisturbed forests, meadows, wetlands, and other natural areas.
- **Recycle:** Recycle land by directing development to already degraded land, e.g., parking lots, vacant buildings, abandoned malls.
- **Reduce:** Reduce land consumption and development footprint by using land efficiently
- **Reuse:** Capture and reuse stormwater by directing it back into the into the ground through infiltration, evapotranspiration, or reuse.

Possible SW Management Frameworks

➤ Look past the site

- Develop different standards for greenfield development and redevelopment
- Develop standards for the watershed or sewershed

➤ Consider land use

- Recognize that some land use strategies that have a *direct* water quality benefit
- Link SW management impacts to a wide range of local codes and ordinances

EPA's Water Quality Scorecard

Provides over 200 policy suggestions



WATER QUALITY SCORECARD

Incorporating Green Infrastructure Practices at the Municipal, Neighborhood, and Site Scales



Identifies the drivers of impervious cover across the municipal, neighborhood, and site scales across multiple city departments

Possible framework in action...

- All development must use green infrastructure approaches to manage stormwater on site.
 - Meet a numeric performance standard: 90 % of average annual storm event ($WV = 1$ inch)
- **Looks off site**: municipalities must complete audit of all land development regulations
- **Considers costs**: For projects that cannot meet 100% of the requirement on-site, two alternatives are available: off-site mitigation and payment in lieu.



Possible framework in action...

- **Considers land use:** The permit recognizes the water quality benefit of some land use strategies
 - Provides a 10% reduction from the performance standard:
 - Redevelopment
 - Brownfield redevelopment
 - High Density (7 or more units per acre)
 - Vertical density (18 or more units or 2.0 FAR)
 - Mixed Use and Transit-Oriented Development
 - The largest reduction any one project could receive is 50%
- **Begins thinking about retrofits**
 - Road and sidewalk projects are required to consider implementing green infrastructure approaches during any construction projects

