



Trends in Sustainability



US EPA Region III
Center for Sustainability

www.epa.gov/region3/sdwork/index.htm

Sustainable Development

Definitions

- ✓ PCSD/EPA : SD meets the needs of the present without compromising the ability of future generations to meet their own needs
- ✓ RIII Work Group: New way of thinking that links environmental protection, economic growth, and community goals. Represents a shift from conflict to collaboration.

Why Should Government Be Involved in Sustainability?

- Government Performance and Results Act (GPRA)
- Land-Use and Development Trends Threaten EPA's Progress
- People's Values, Choices and Preferences Matter

Center for Sustainability

Cornerstones

- 1. Sustainable Development Challenge Grants**
- 2. "Trends in Sustainability" Indicators and Workshop**
- 3. "Sustainability in Action" Outreach Program**
- 4. Regional Sustainability Network**

Goals of Sustainability Indicators

- "Widen the Frame" on Environmental Change in Region
- Link Key Economic, Social, & Environmental Trends
- Encourage and Involve Public to Adopt more Sustainable Living Patterns
- Point out Actions, Policies, and Programs Needed to Support Sustainability

Themes of Sustainability

1. **Encouraging Livable Communities - Old and New**
2. **Protecting Vital Resource Lands**
3. **Reversing Unsustainable Transportation Trends**
4. **Conserving Energy and Non-Renewable Resources**
5. **Enhancing our Quality of Life by Linking Environmental, Economic and Social Goals**
6. **Realizing a New American Dream**

Why Should Citizens Care About Sprawl?

- ▶ Loss of Open Space
- ▶ Loss of a Sense of Place in your Community
- ▶ Waste of Time in Congestion
- ▶ Inability to Walk Places

Region III has 4 of the Top 20 Areas Threatened from Sprawl

1. Atlanta, GA
2. St. Louis, MO
3. **Washington, DC**
4. Cincinnati, OH
5. Kansas City, MO
6. Denver, CO
7. Seattle, WA
8. Minneapolis-St. Paul, MN
9. Ft. Lauderdale, FL
10. Chicago, IL
11. Detroit, MI
12. **Baltimore, MD**
13. Cleveland, OH
14. Tampa, FL
15. Dallas, TX
16. **Hampton Roads, VA**
17. **Pittsburgh, PA**
18. Miami, FL
19. San Antonio, TX
20. San Bernardino, CA

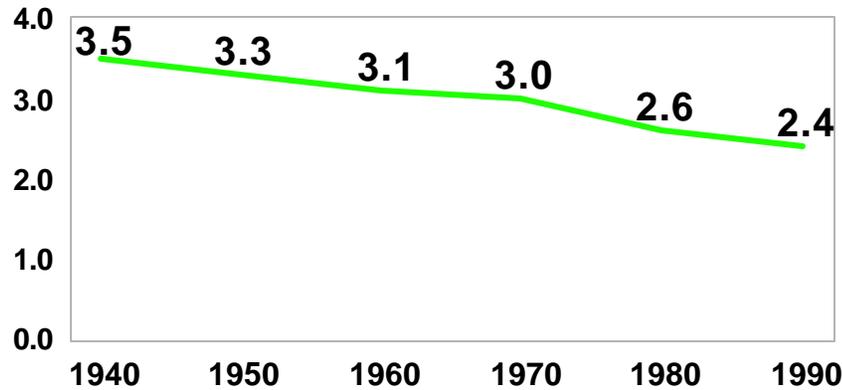


Source: Sierra Club

Sprawl is an inefficient use of land. It increases energy use, pollution and infrastructure cost; erodes the municipal tax base, isolates inner cities; is difficult to service and requires extensive use of automobiles and consumes large areas of land.

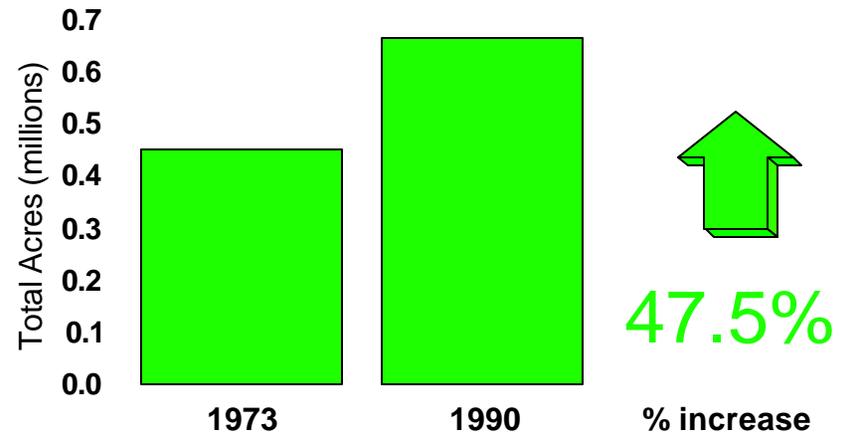
Trends in Growth

Household Size Decreasing (National)



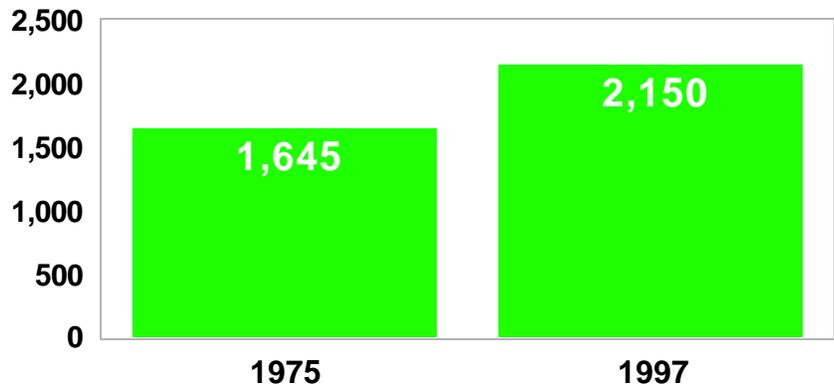
Source: US Census Bureau

Residential Development Increasing in MD



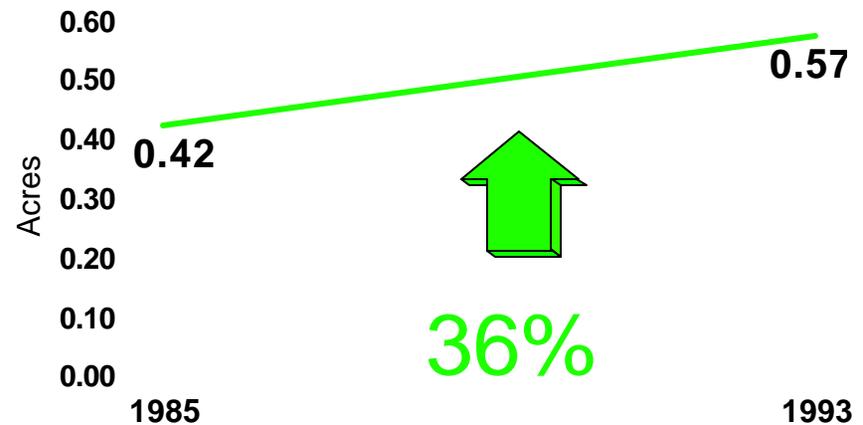
Source: MD Office of Planning

Avg. Sq. Ft. of New Single Family Homes (National)



Source: NAHB Economics Department

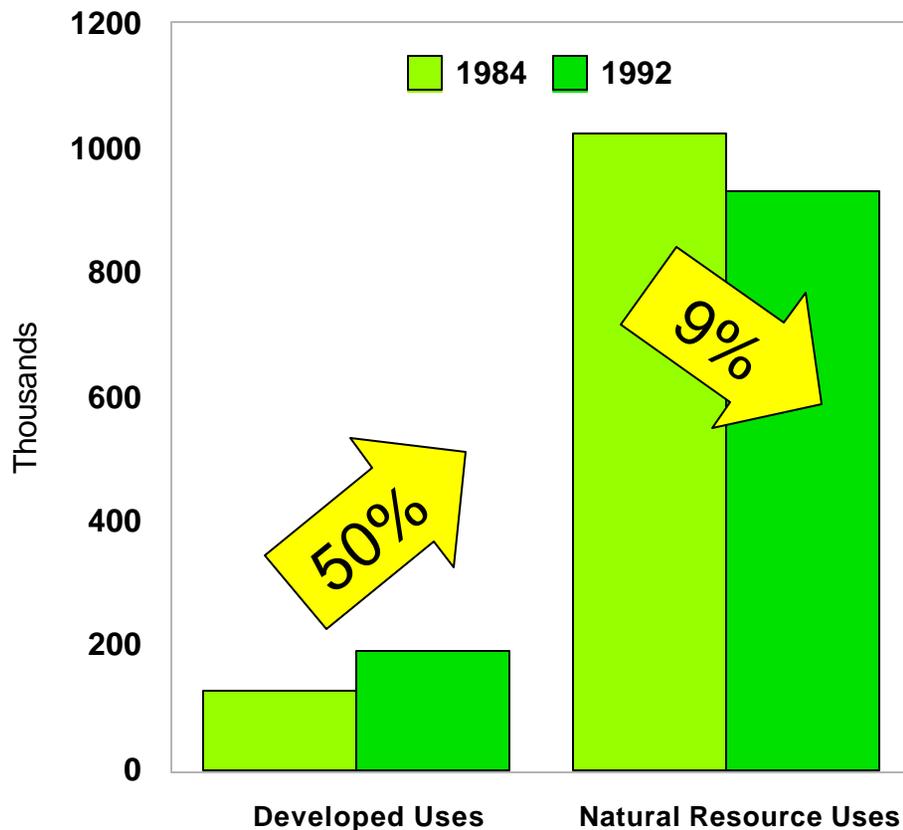
Average Lot Size Increasing in MD



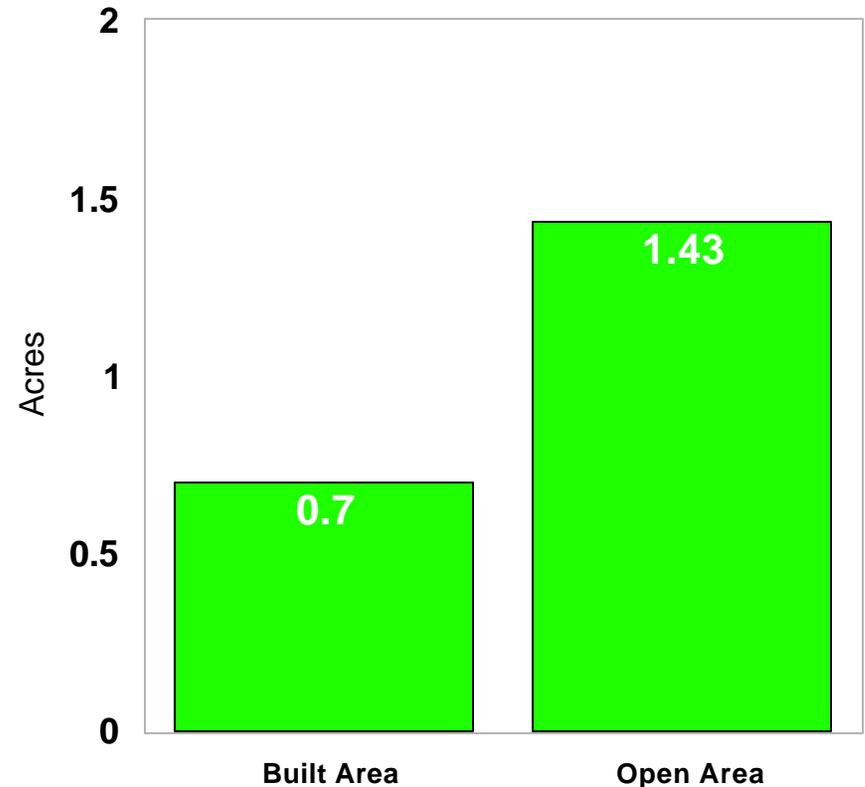
Source: MD Office of Planning

Delaware's Natural Resources Consumed by Unplanned Rural Growth

Change in Delaware's Land Use



Average Lot Size in Areas of New Castle County



Source: 1997 Annual Assessment Report; Delaware Office of State Planning Coordination

Source: 1997 Annual Assessment Report; Delaware Office of State Planning Coordination

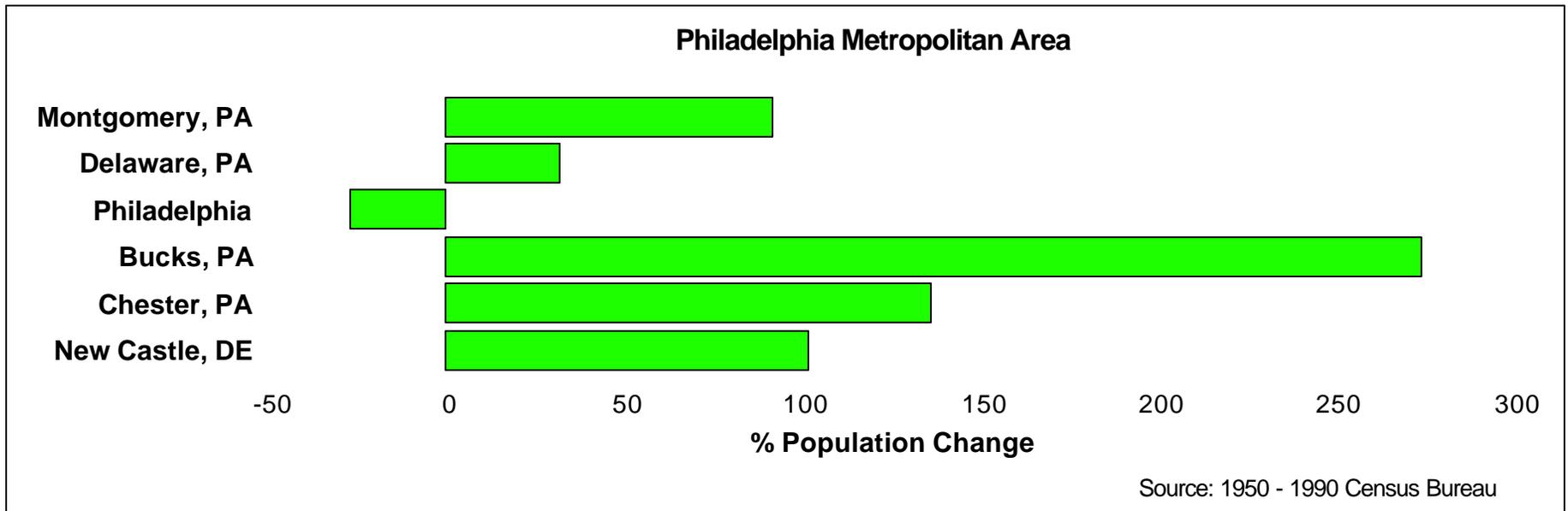
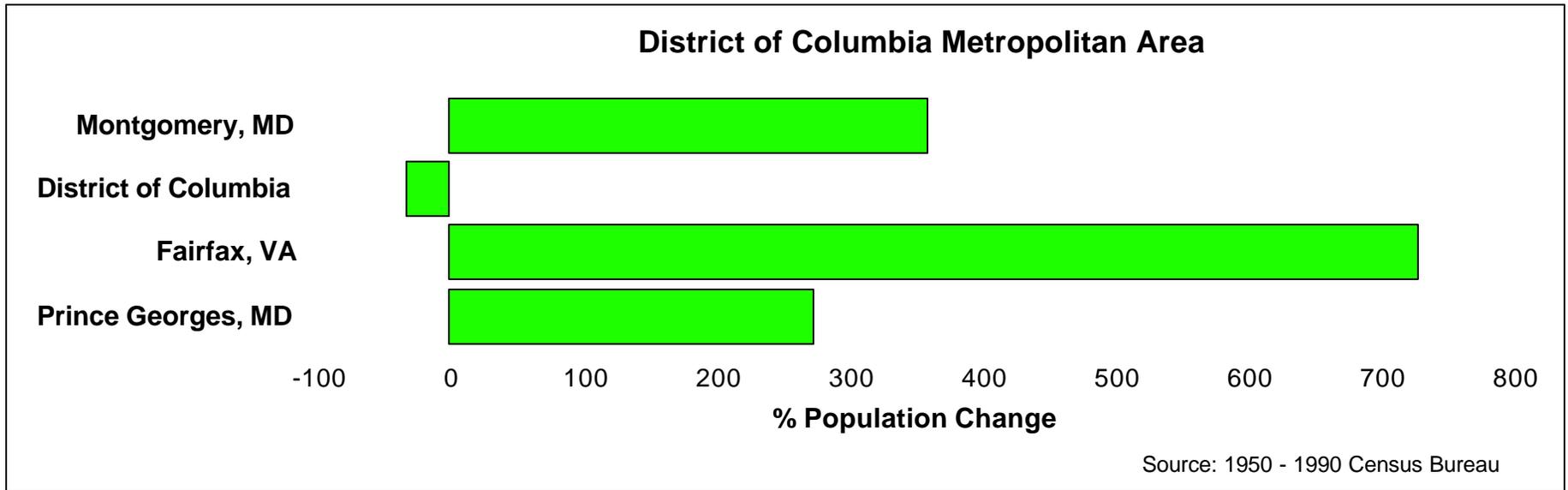
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Washington, DC Area Housing Growth is #1 in the Nation

- ▶ **35% greater than population growth**
- ▶ **330,000 housing permits from 1990 to 1997.**
- ▶ **most dramatic growth in distant suburbs**
- ▶ **permits issued at twice the rate as Los Angeles**



Urban Areas Continue to Lose Population

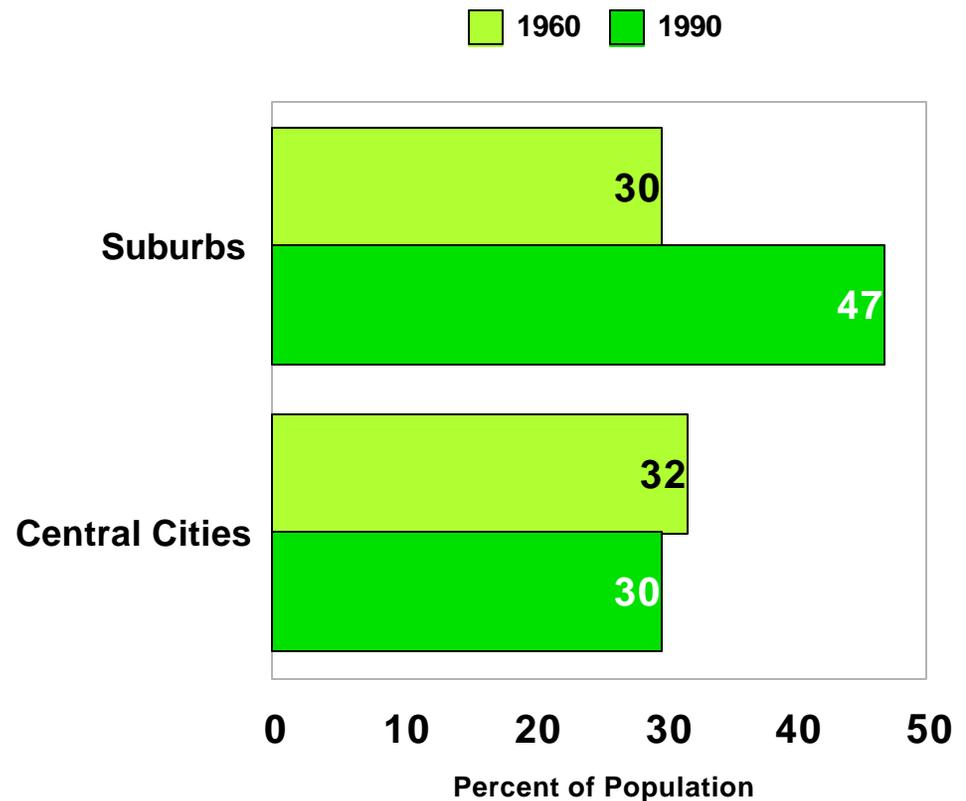


More People Living in Suburbs

One Maryland county closed over 60 existing schools only to build the same number in outlying areas at a cost of \$500 million over a 20 year period.

Source: CBP, LGSS/LGAC Report
"Who Pays for Sprawl?"

Population Distribution (National)



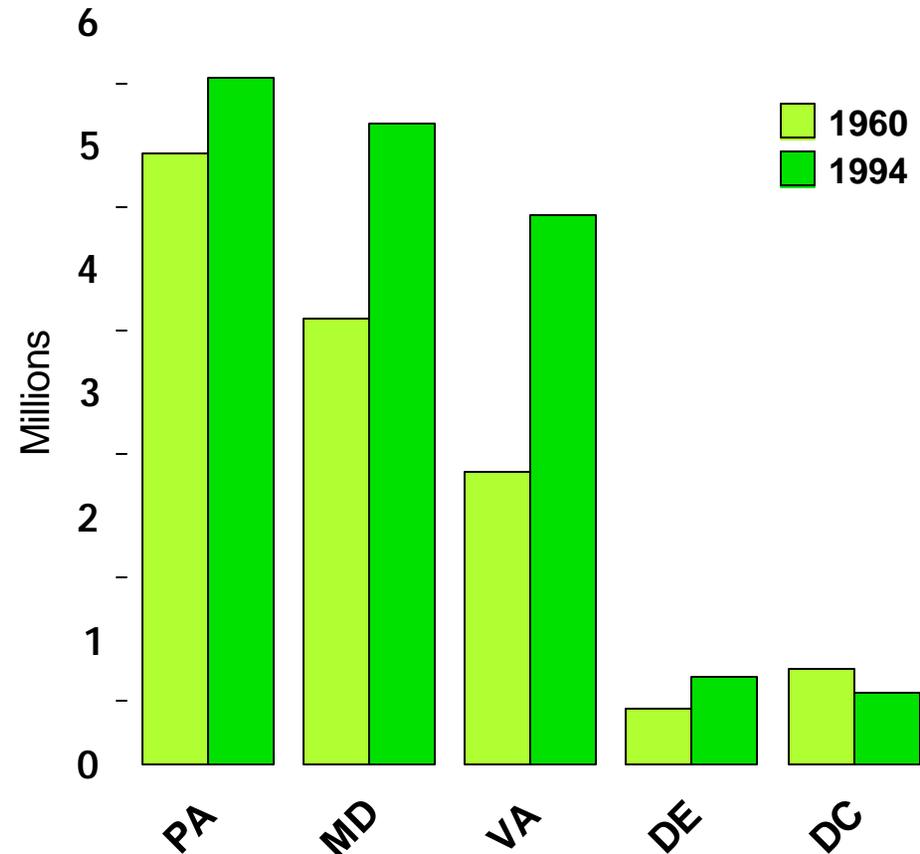
Source: US. Census

1

Population Growth Impacting Coastal Areas

- ✘ 40% vs. 21%
- ✘ Vulnerability to Weather Damage
- ✘ Destruction of Natural Absorbing Capacity of Wetlands

Population in Coastal Counties: 1960 to 1994*

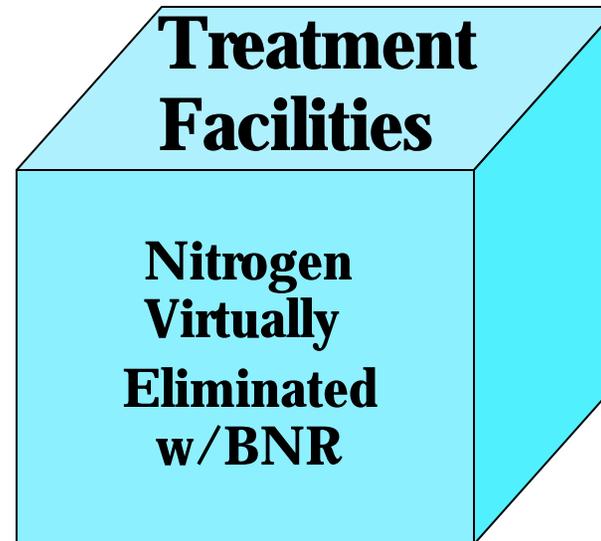


Source: NOAA and US Census Bureau
*1994 is estimated

1

Septic Systems Not Sustainable in Developing Areas

- Unplanned growth beyond the urban fringe relies on septic systems.
- Septic system technology that reduces Nitrogen is too expensive for most local communities.



Environmental Impacts of Impervious Surfaces

- **Parking Lots 70 degrees higher than grass**
- **Runoff causes erosion and carries pollution into sewers**
- **Urban Heat-Island Effect causes urban areas to be 6 to 12 degrees warmer than nearby rural areas**
- **Increase need for air conditioning**
- **Solutions:**
 - ▶ **parking garages which don't take up as much ground**
 - ▶ **smaller and fewer parking spaces**
 - ▶ **white concrete**
 - ▶ **lots with islands of trees and shrubs**
 - ▶ **areas for runoff to filter back into the ground**

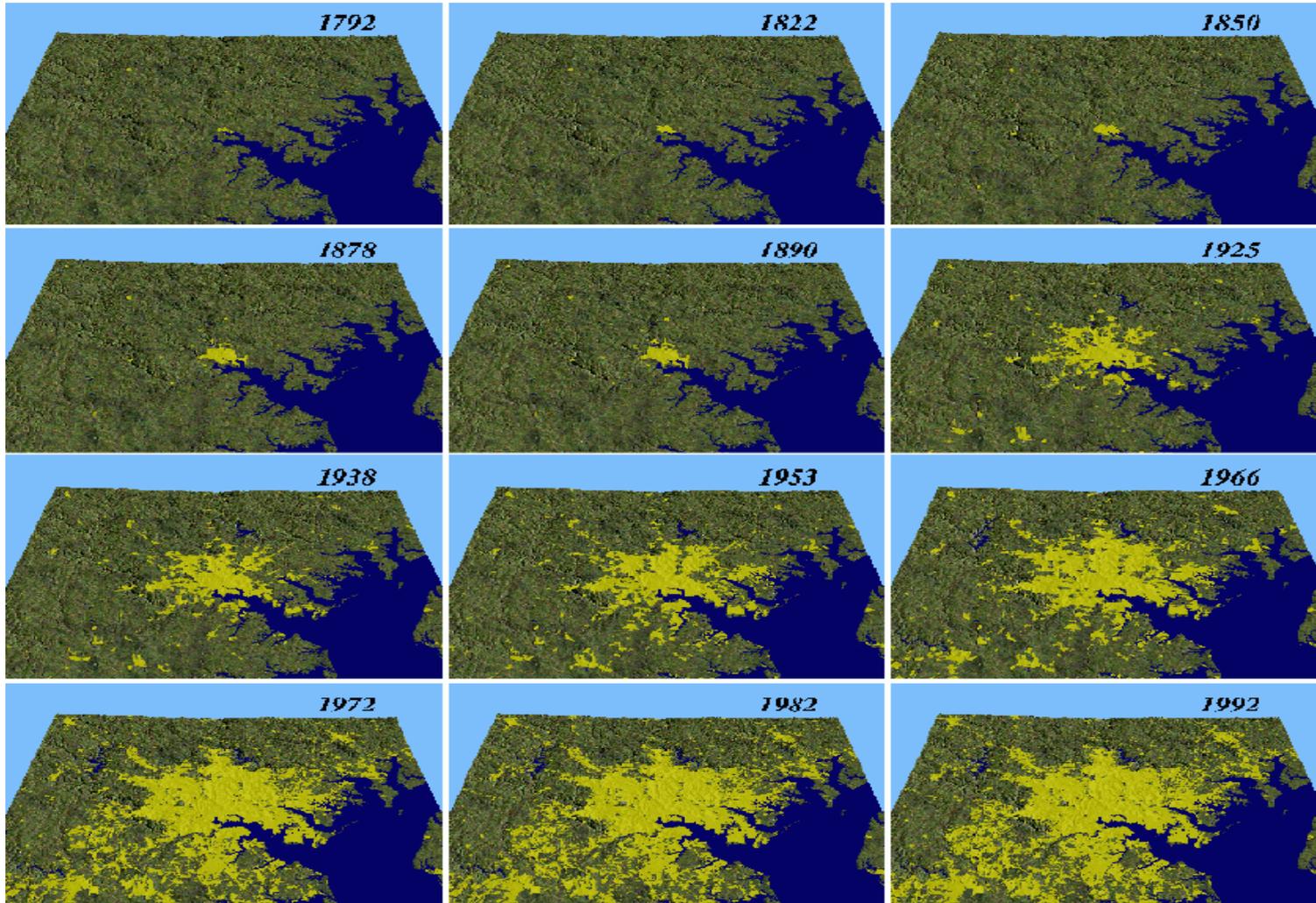
Summary of Sprawl Indicators

- ✓ Sprawl is a problem in Region III
- ✓ Fewer people living on more land
- ✓ Resource lands losing ground to unplanned growth
- ✓ Region III has #1 Growth area in country
- ✓ More Impervious surfaces decrease water quality

Themes of Sustainability

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5. Enhancing our Quality of Life by Linking Environmental, Economic and Social Goals
6. Realizing a New American Dream

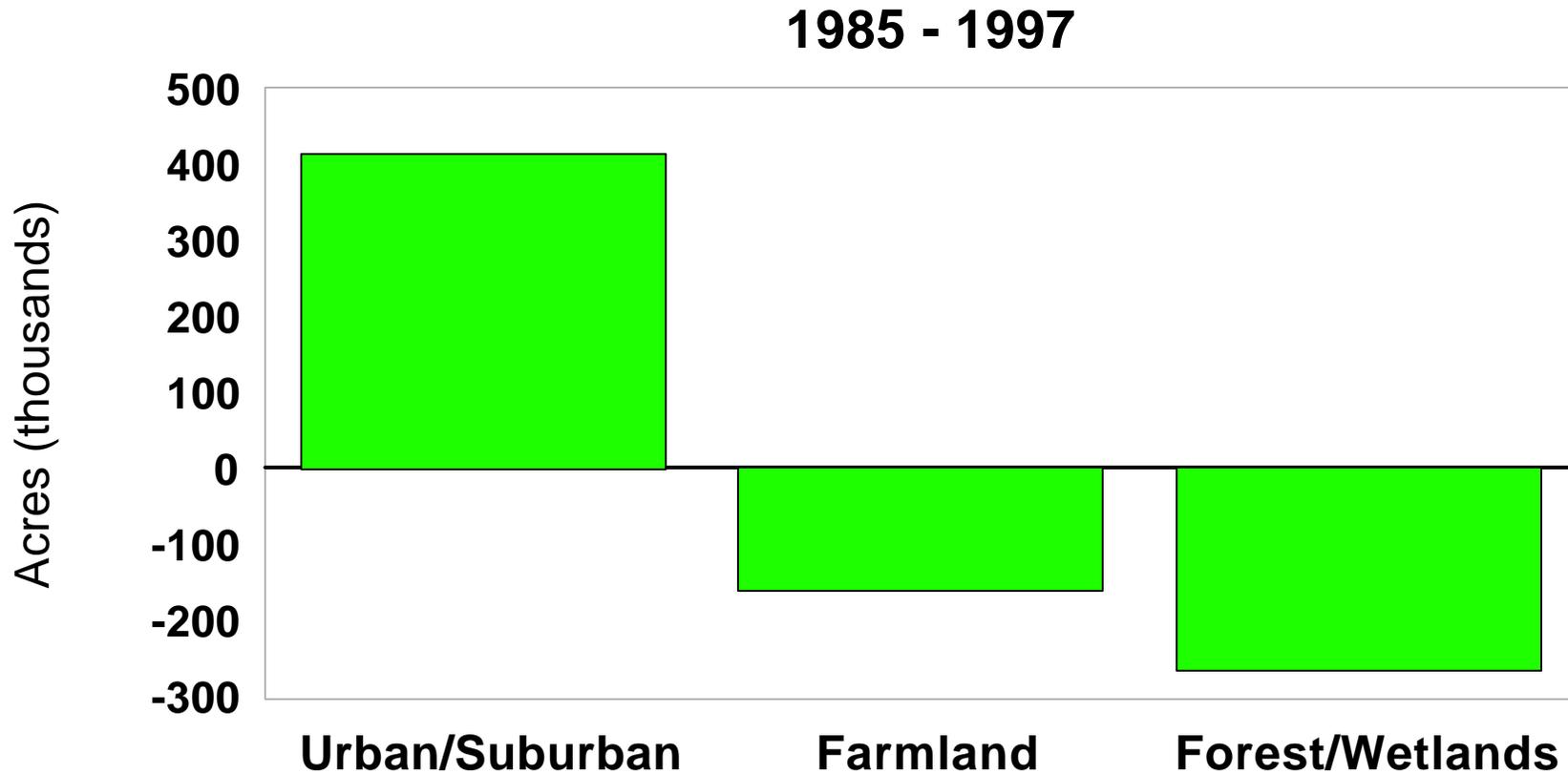
Vital Resource Lands Consumed by Sprawling Baltimore Area



Source: Visualization by Penny Masouka, UMBC, NASA Goddard Space Flight Center and William Acevedo, USGS, NASA Ames Research Center

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Chesapeake Basin Losing Resource Lands to Development

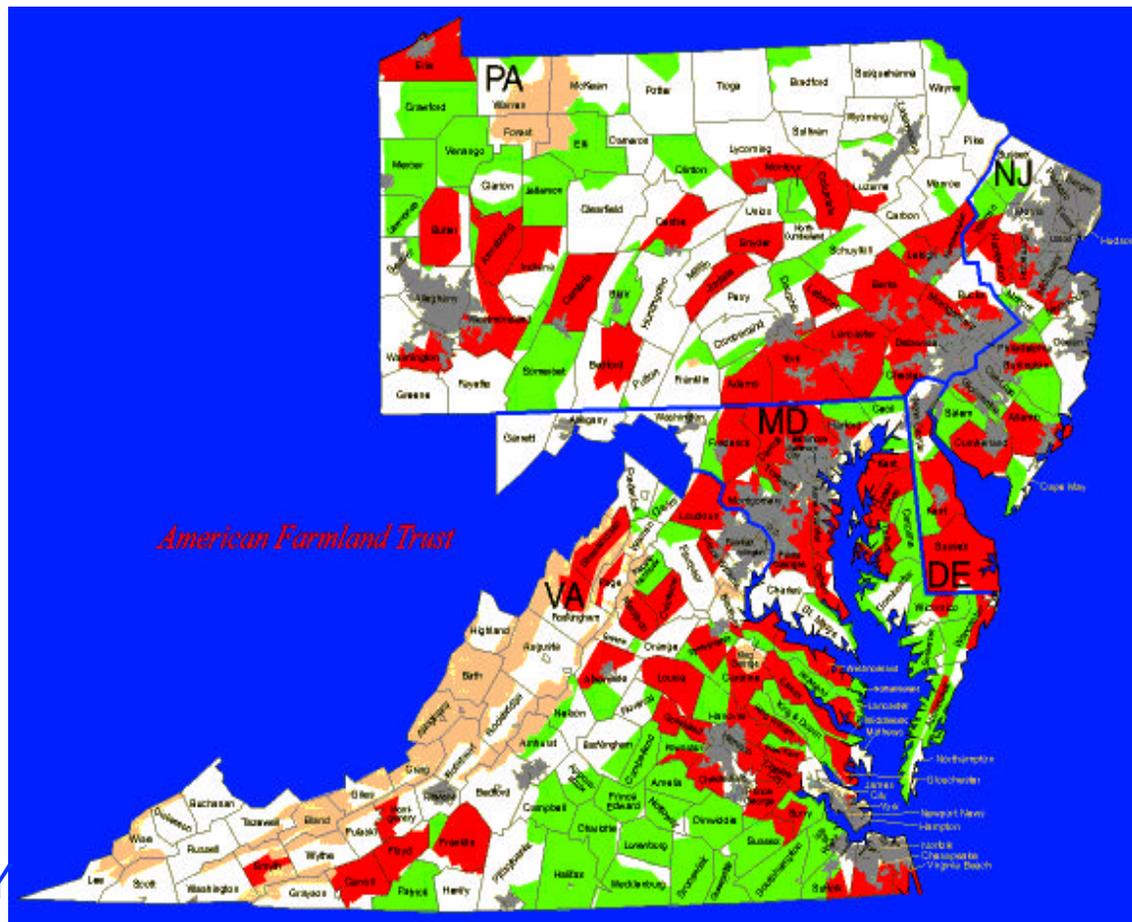


Source: CBP Phase IV Watershed Model

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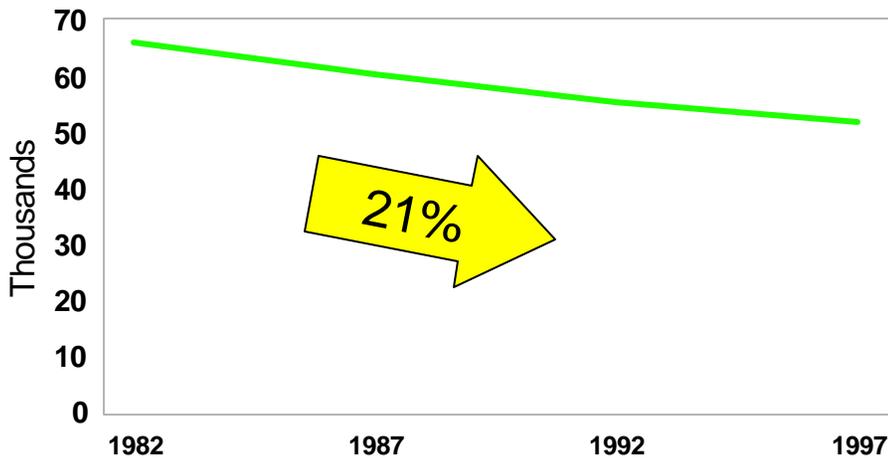
Region III has 2 of the Top 10 Most Threatened Farming Areas

1. Sacramento and San Joaquin Valley, CA
2. Northern Piedmont (MD, PA, VA)
3. Southern Wisconsin and Northern Illinois Drift Plain
4. Texas Blackland Prairie
5. Willamette Valley, OR, and Puget Sound Valley, WA
6. Florida Everglades
7. Eastern Ohio Till Plain
8. Lower Rio Grande Plain, TX
9. Mid-Atlantic Coastal Plain (MD, DE)
10. New England and Eastern NY Upland



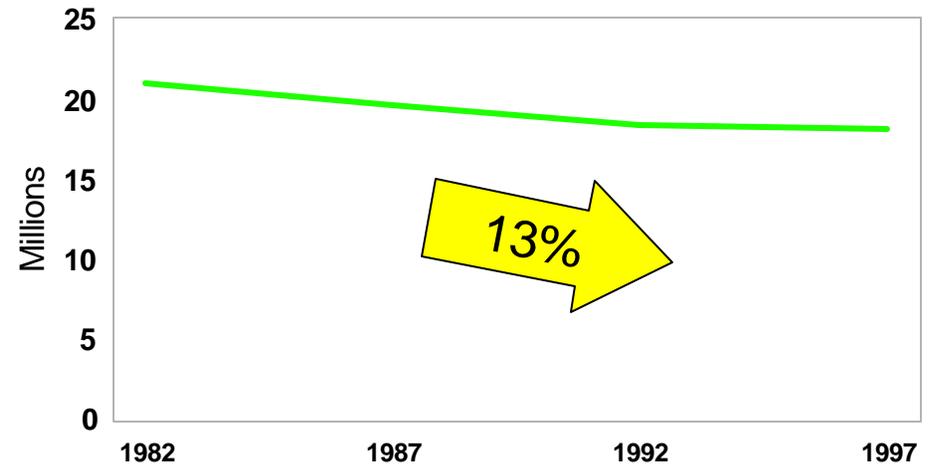
Farms and Farmland Lost to Development

Full Time Farms



Source: Census of Agriculture, USDA

Land In Farms



Source: Census of Agriculture, USDA



Agriculture is a Significant Part of Regional Economy

MARYLAND - 1991

🌾 14% of the GSP

🌾 provides 13% Jobs

VIRGINIA - 1992

🌾 12% of the GSP

🌾 provides 15% Jobs

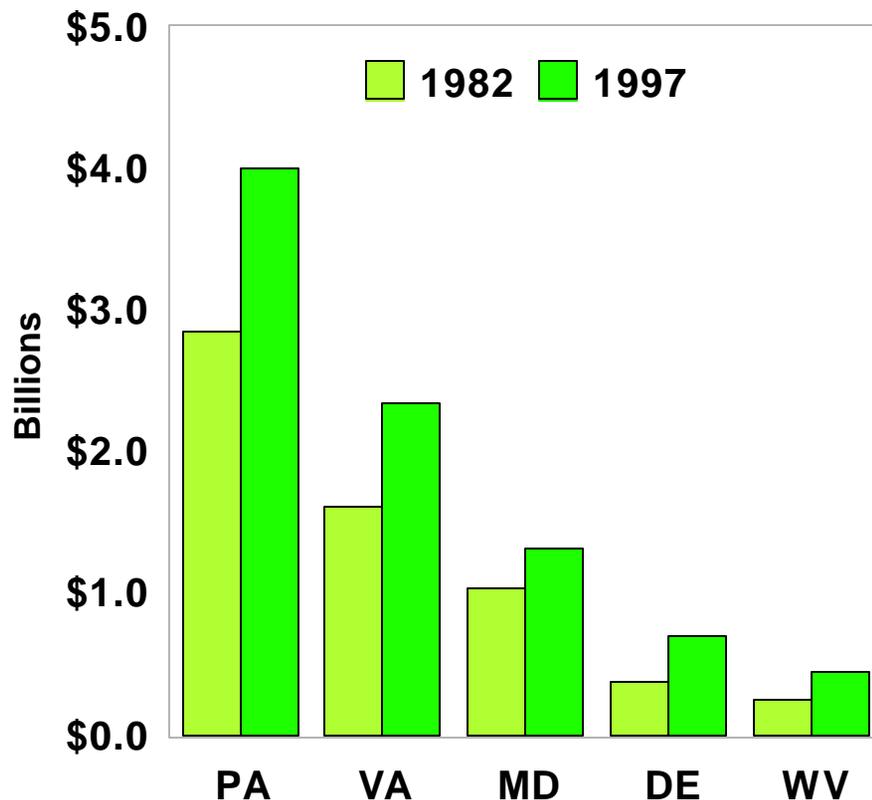
PENNSYLVANIA - 1996

🌾 12% of the GSP

🌾 provides 20% Jobs

Source: NASS, USDA

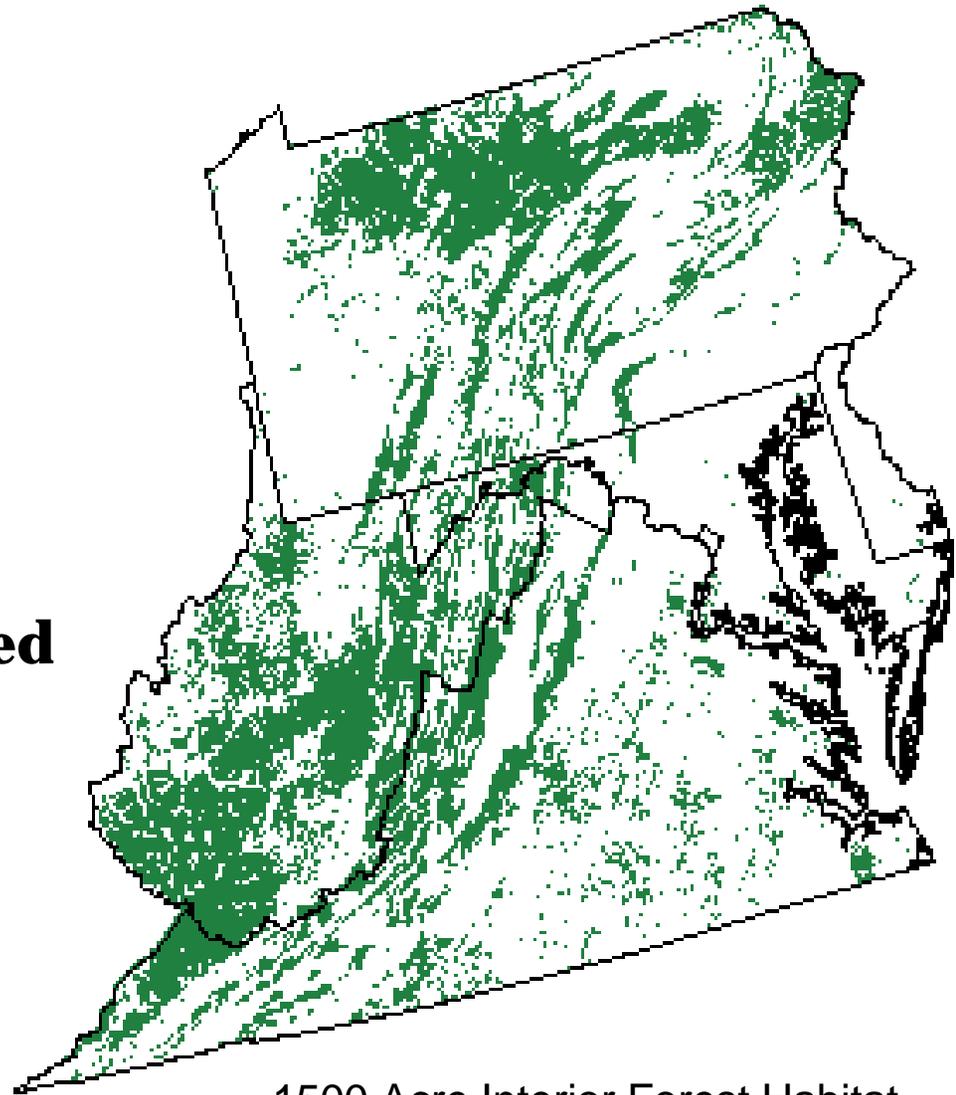
Market Value of Agricultural Products Sold



Source: Census of Agricultural, USDA

As Forests Become Fragmented...

- ❁ **Animal Populations are Isolated and Species Diversity is Threatened**
- ❁ **Destructive Insects and Exotic/ Invasive Species Take Over**
- ❁ **Natural Corridors and Connections are Disrupted**
- ❁ **Waterflows Increase and Waterways become sedimented**
- ❁ **Air Quality Decreases**
- ❁ **Economic Base of Forest Products is Reduced**



1500 Acre Interior Forest Habitat

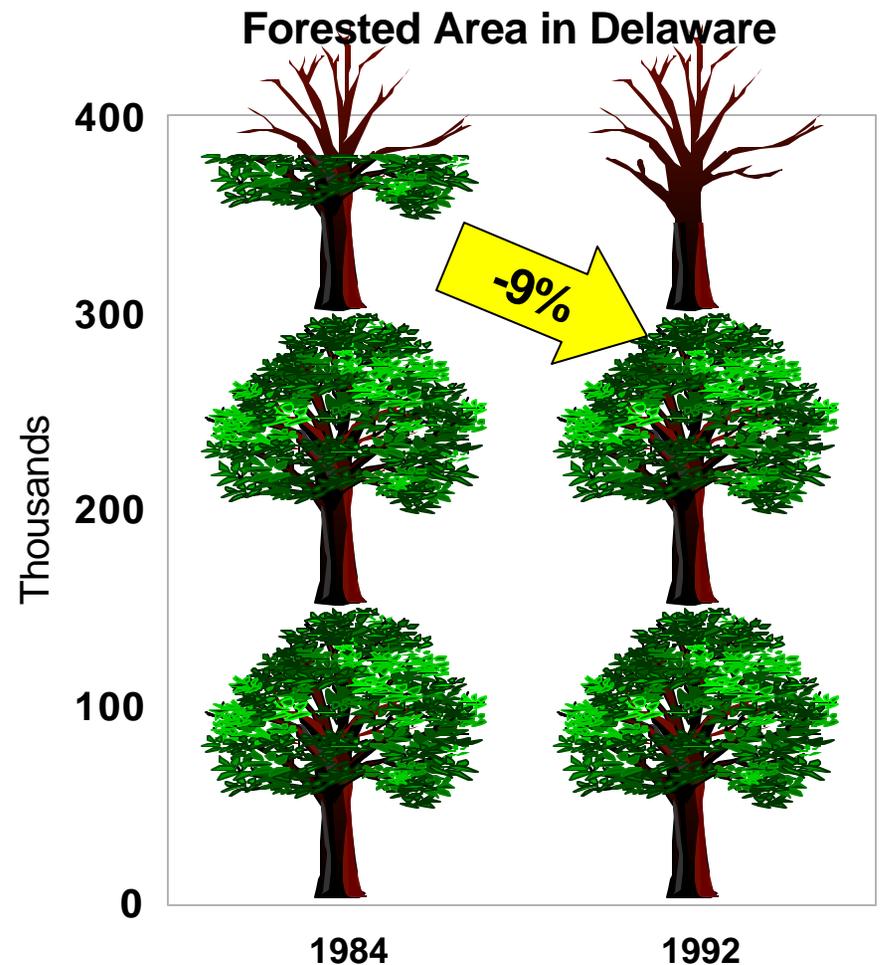
Source: EPA/ORD: An Ecological Assessment of the United States Mid-Atlantic Region, November 1997.

2

Delaware Forests Converted to Urban Development

Forests are invaluable to environmental protection because they:

- control stormwater
- remove air pollutants
- filter pollutants from surface and groundwater
- provide habitat for animal populations
- offer shading and cooling



Source: DE Dept. of Agriculture

2

Forests Consumed by Suburban Development and Agriculture

🍁 Forest Consumption

- suburban developments, office parks, and strip malls
- agriculture

🍁 Parcelization

🍁 Current Policy & Social Encourage Loss

- local property tax issues
- land ownership changing
- estate tax - 36%



Forestry Provides \$15.5 billion in Sales and 369,370 Jobs

PENNSYLVANIA

- ✦ 4th largest industry
- ✦ > \$4.5 billion in sales
- ✦ > 100,000 jobs
- ✦ largest hardwood producer in the nation

VIRGINIA

- ✦ 2nd largest agricultural crop
- ✦ \$9.8 billion/year added to economy
- ✦ 228,370 jobs
- ✦ \$1.7 billion in recreational value

MARYLAND

- ✦ 5th largest industry
- ✦ \$302 million in sales
- ✦ > 41,000 jobs
- ✦ > \$1 million in payroll

Source: USDA, Forest Service Report: "Conserving the Forests of the Chesapeake..." and other State Departments of Forestry Reports

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Open Space and Farms Save Local Governments \$\$\$

Cost of Services for \$1 in Tax Payments



Source: American Farmland Trust
"Saving American Farmland: What Works"

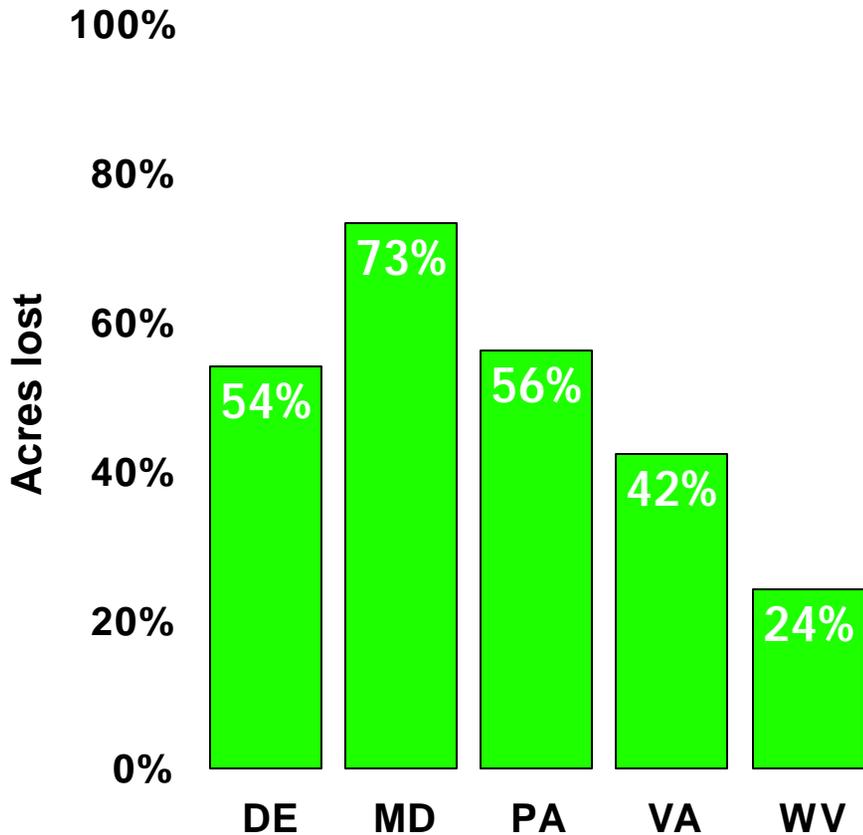
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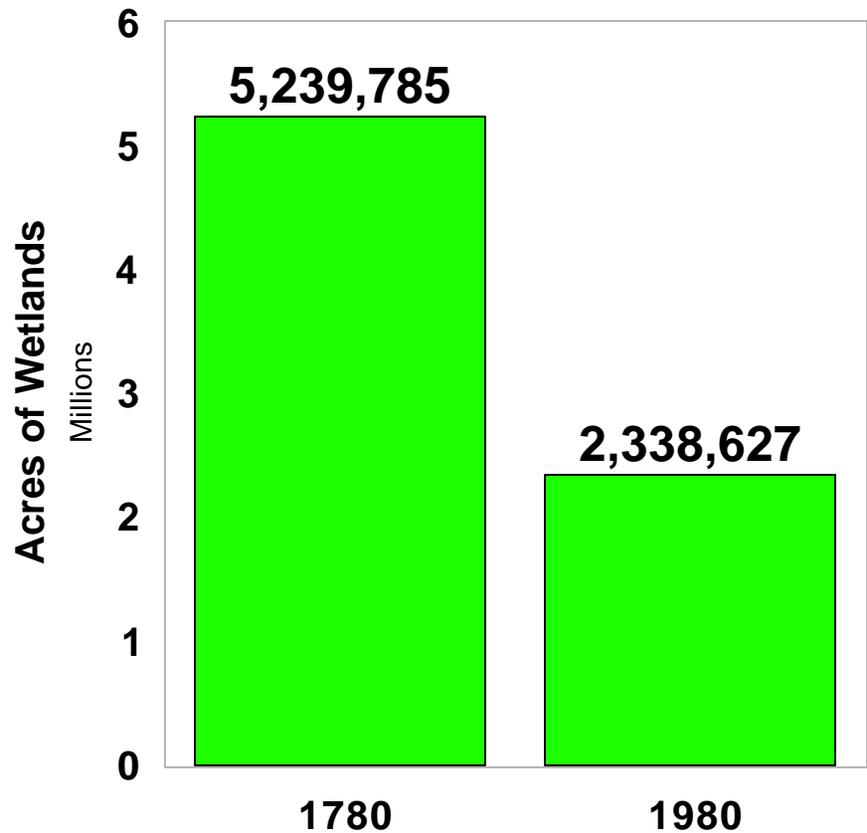
Half of All Wetlands Have Disappeared

State Losses



Source: National Wetlands Inventory and Chesapeake Bay Program

Almost 3 Million Acres Lost



Source: National Wetlands Inventory and Chesapeake Bay Program

Summary of Resource Indicators

- ✓ **farmland and full time farms decreasing**
- ✓ **loss of forests to development, agriculture, and social change**
- ✓ **regional economy based on natural resources**
- ✓ **open space and farms pay for the services they require**
- ✓ **one half of all wetlands are gone**

Themes of Sustainability

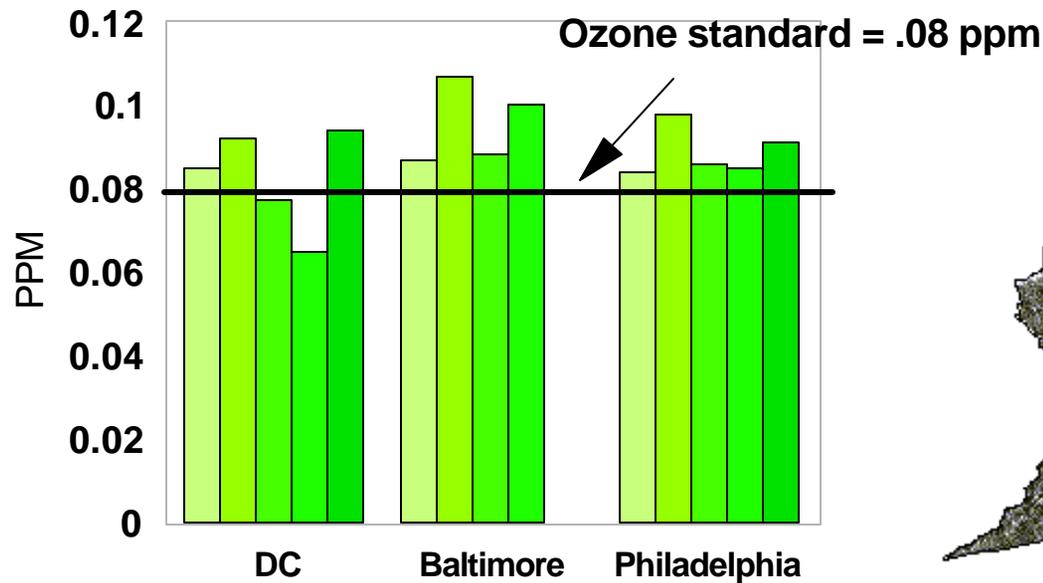
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Opportunities Associated with Reducing Auto Use

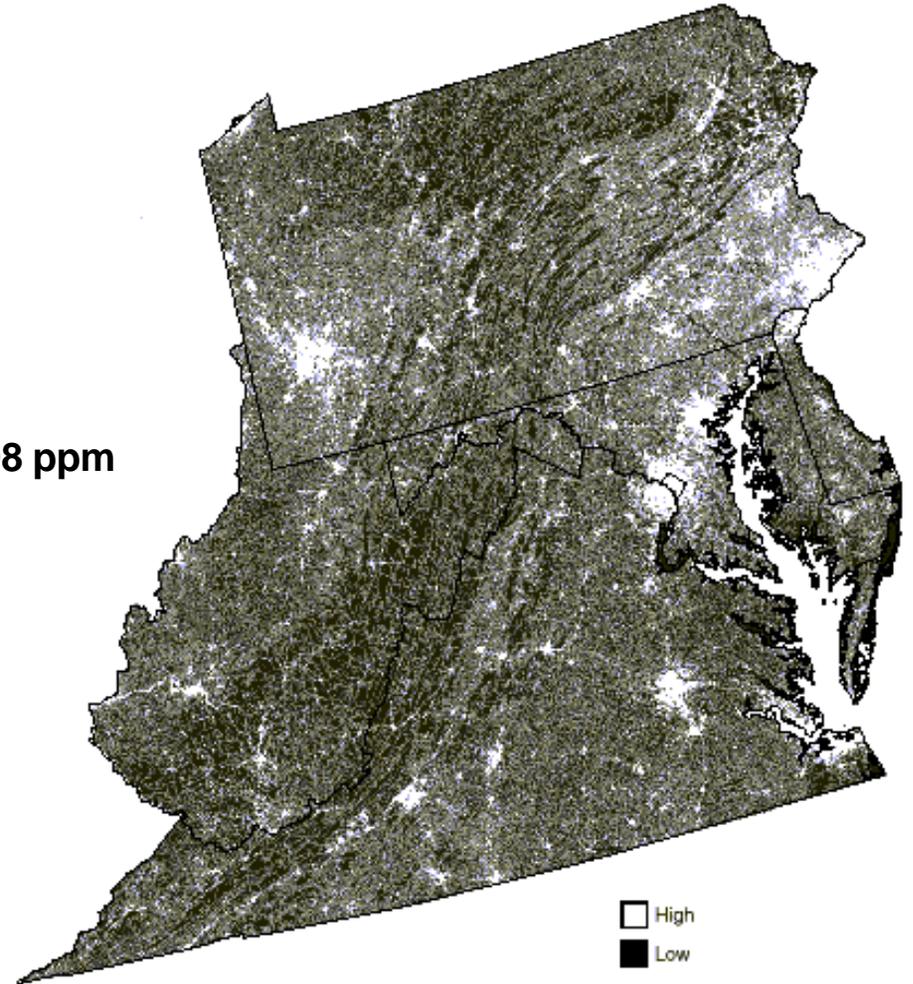
- 1. Less Sprawl**
- 2. Less Air Pollution**
- 3. More Time**
- 4. Less Energy Use**
- 5. Less Cost**

The Increase in Roads and Cars is Changing the Landscape and Environment

Ambient Ozone Levels for Region III Metropolitan Counties



Source: US EPA; AIRS.
* Trend from 1994 to 1998



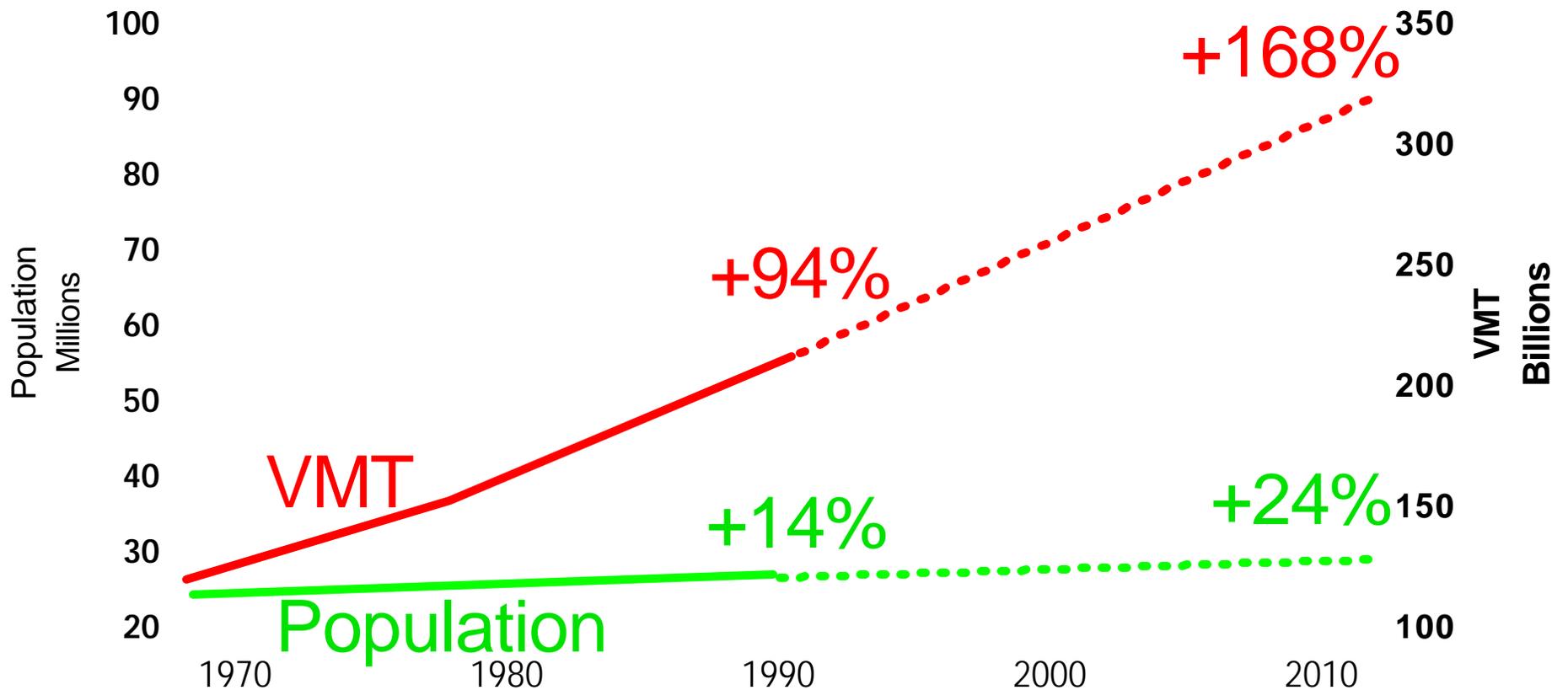
Road Density in Region III

Source: EPA/ORD: An Ecological Assessment of the United States Mid-Atlantic Region, November 1997.



VMT Increases Dramatically Compared to Population

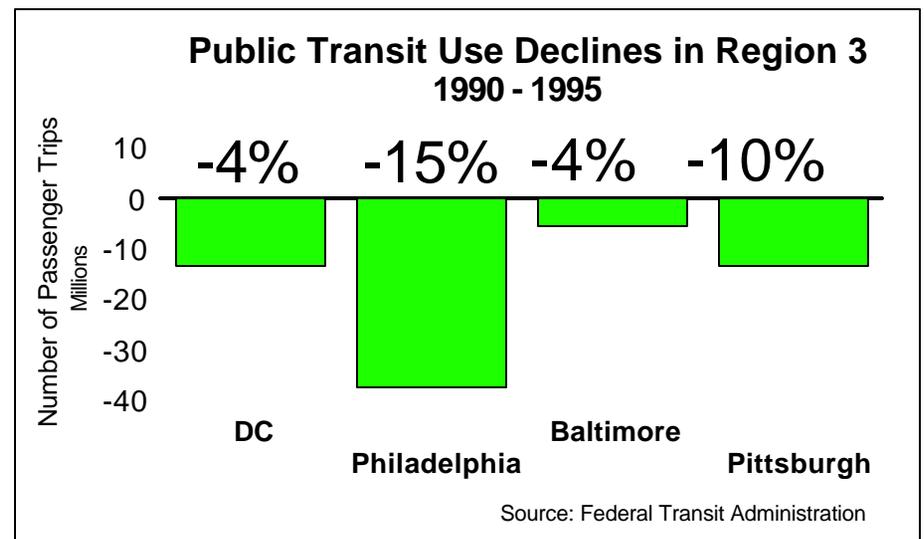
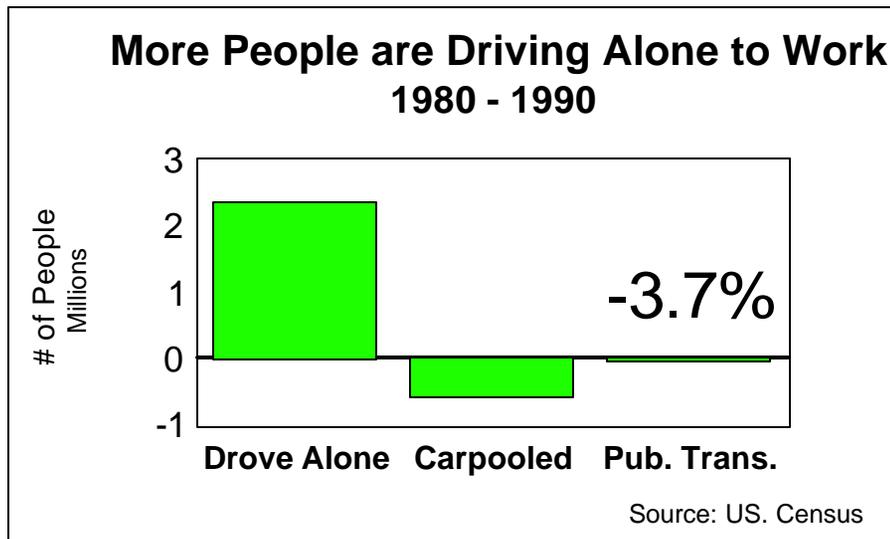
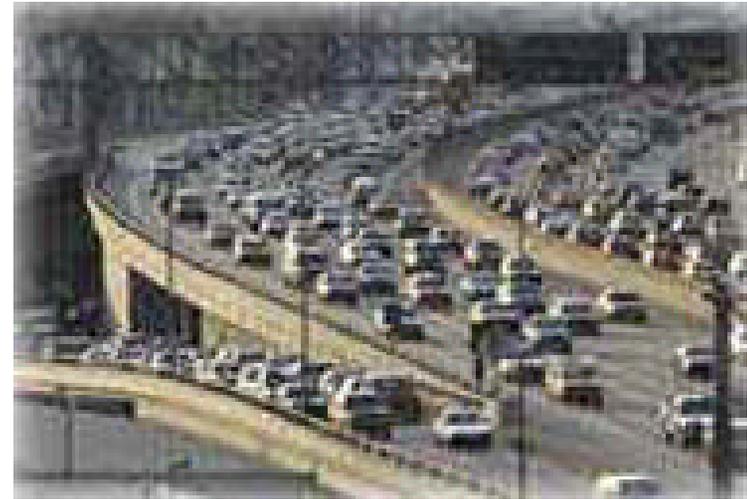
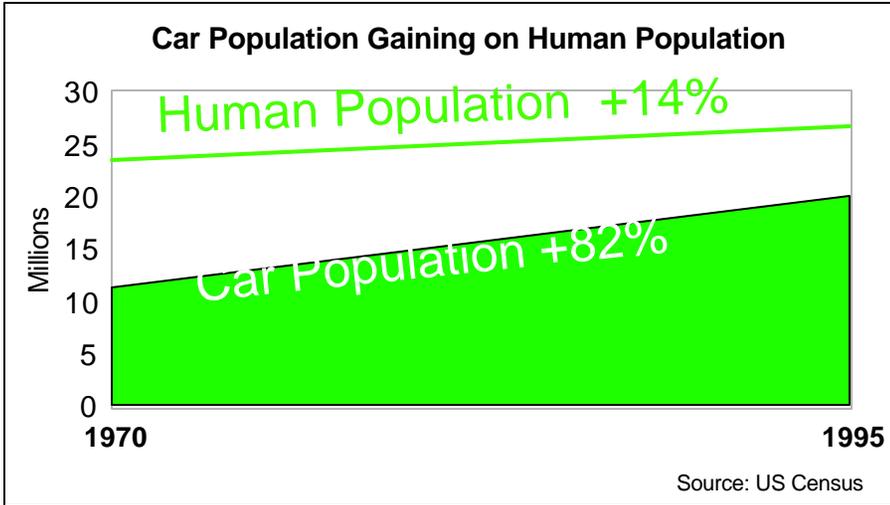
1970 to 2010



Source: EPA OAQPS; US. Census
(Projected from 1994 to 2010)

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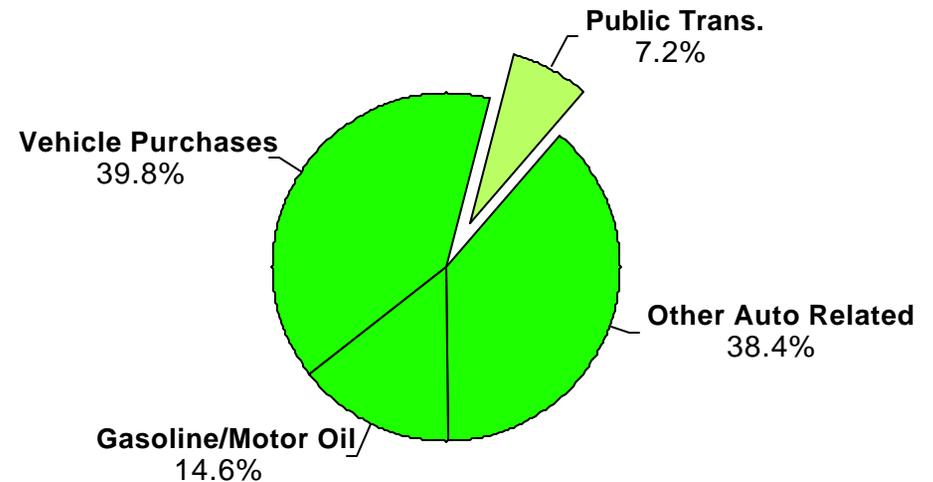
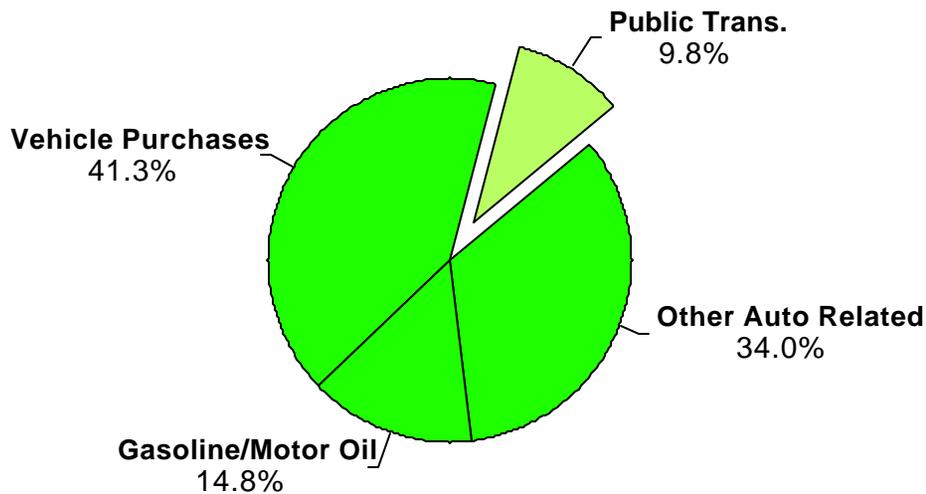
More Cars and Less Transit Use = More Congestion, Stress and Less Time in Region III



\$1 out of \$5 Spent on Transportation and Only \$.07-.10 is on Mass Transit

Washington, DC MSA

Philadelphia, PA MSA



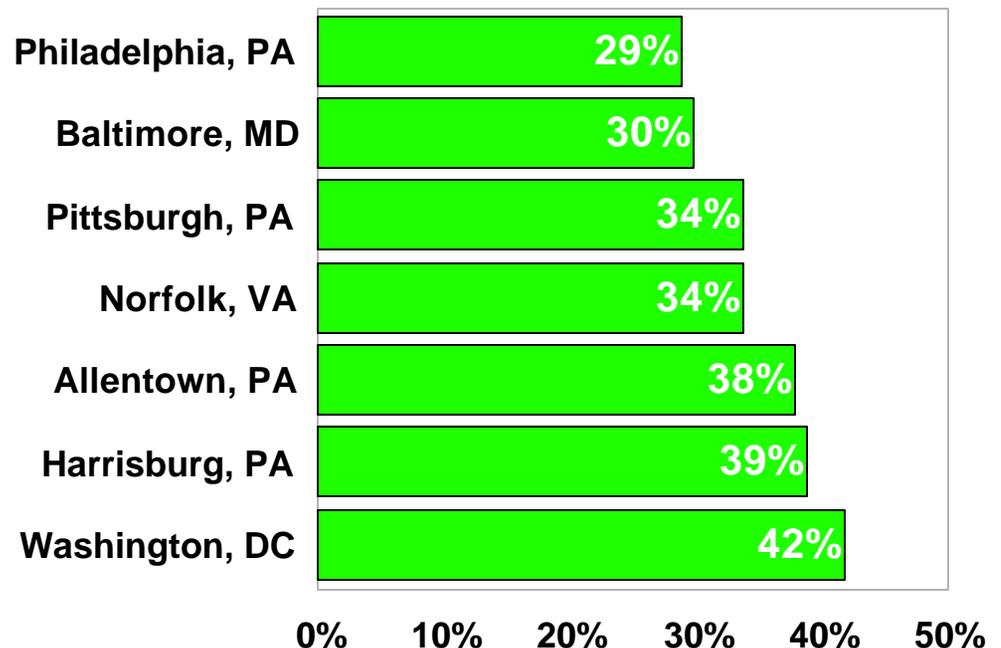
Other auto related refers to maintenance, repairs, insurance, finance charges, etc.

Source: 1994-95 Consumer Expenditure Survey, Bureau of Labor Statistics

Highway Construction is an Ineffective Means of Managing Congestion

- **Induced Travel Theory**
- For every 1% increase in new lane miles there is a 0.9% increase in traffic in less than 5 years.
- **Region III metro areas would have to add 453 new lane miles/year for a cost of over \$2 billion to hold congestion levels constant.**

Percent Growth in Lane Miles (1982 - 1996)
Average growth: 37%



Source: Surface Transportation Policy Project Report
"An Analysis of the Relationship Between Highway Expansion and Congestion in Metropolitan Areas"

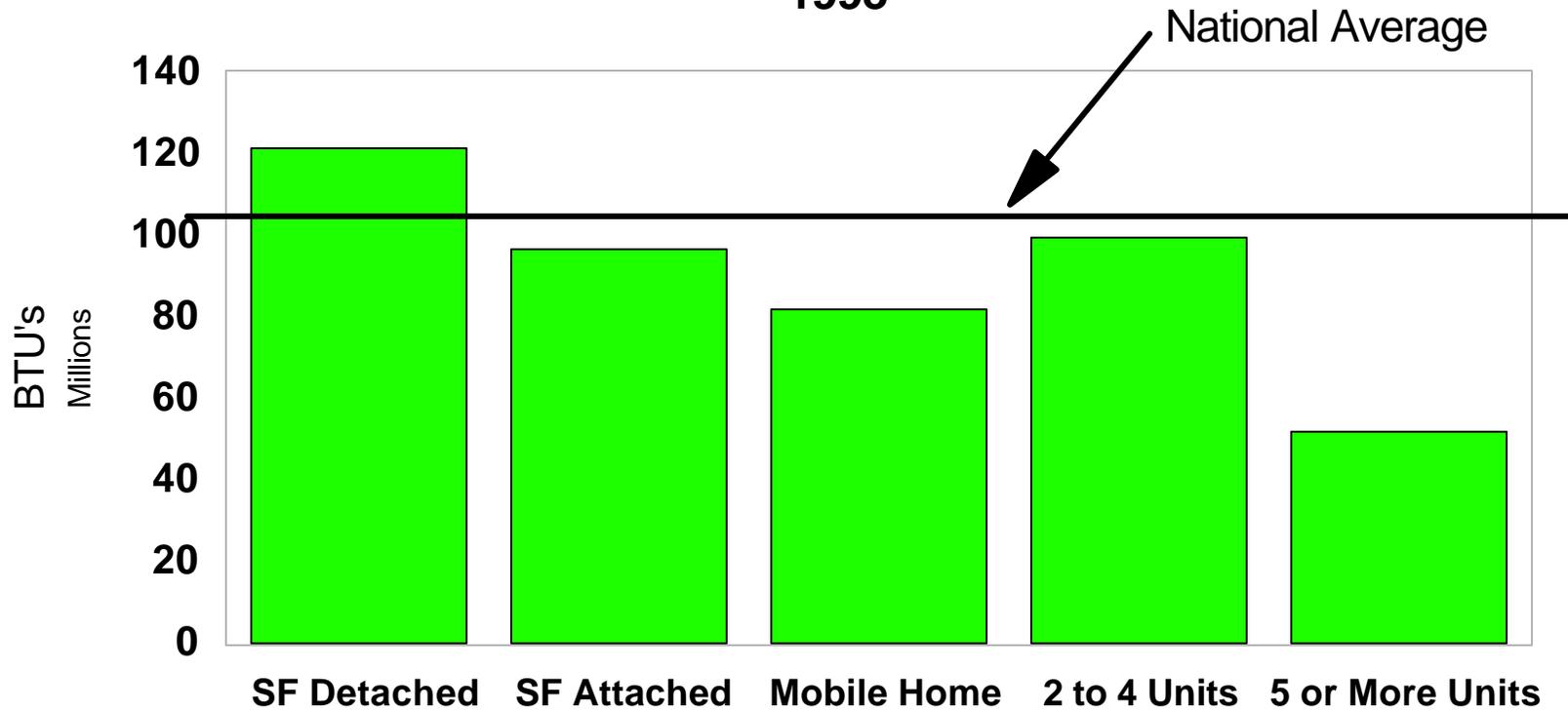
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Single Family Homes Use More Energy

Average Annual Household Energy Consumption
by Housing Type
1993

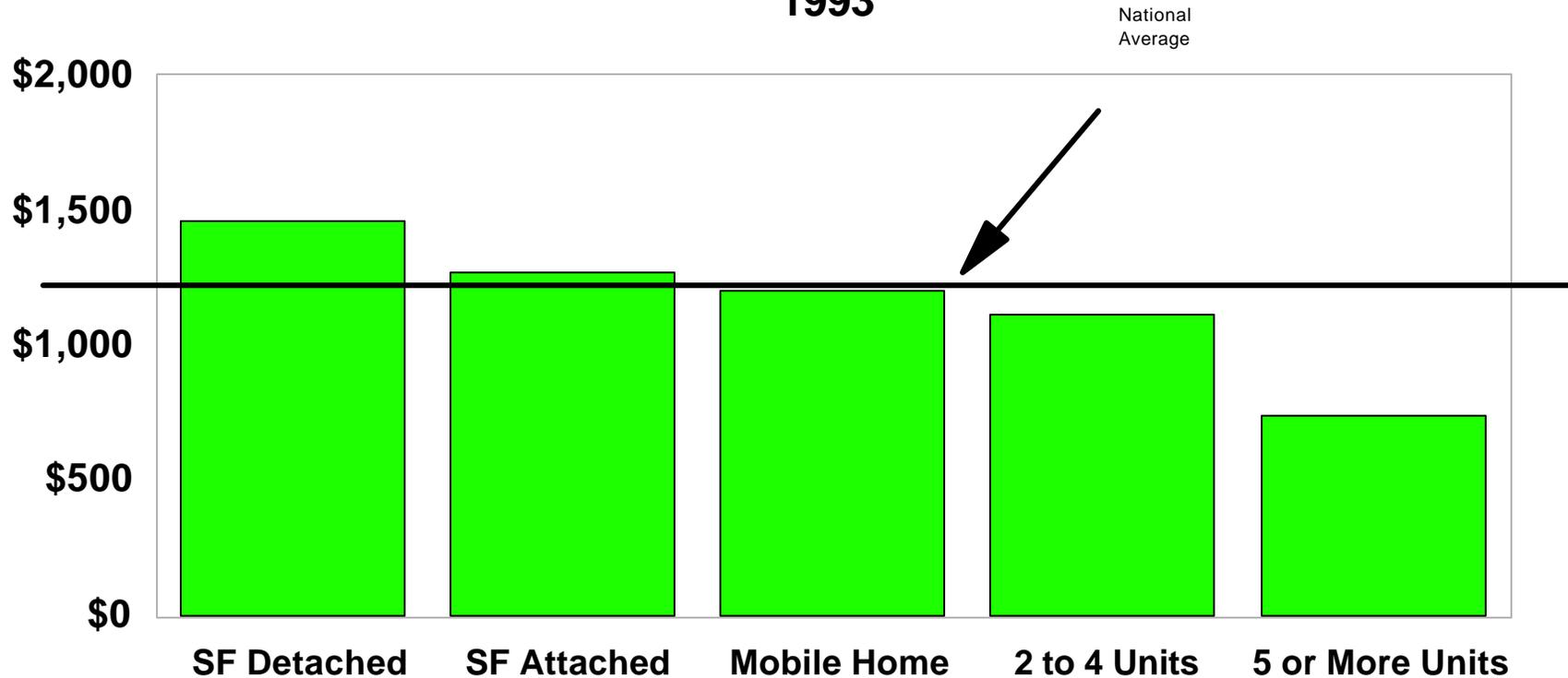


Source: Energy Information Administration



Single Family Homes Spend More on Energy

Average Annual Household Energy Expenditures
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1993

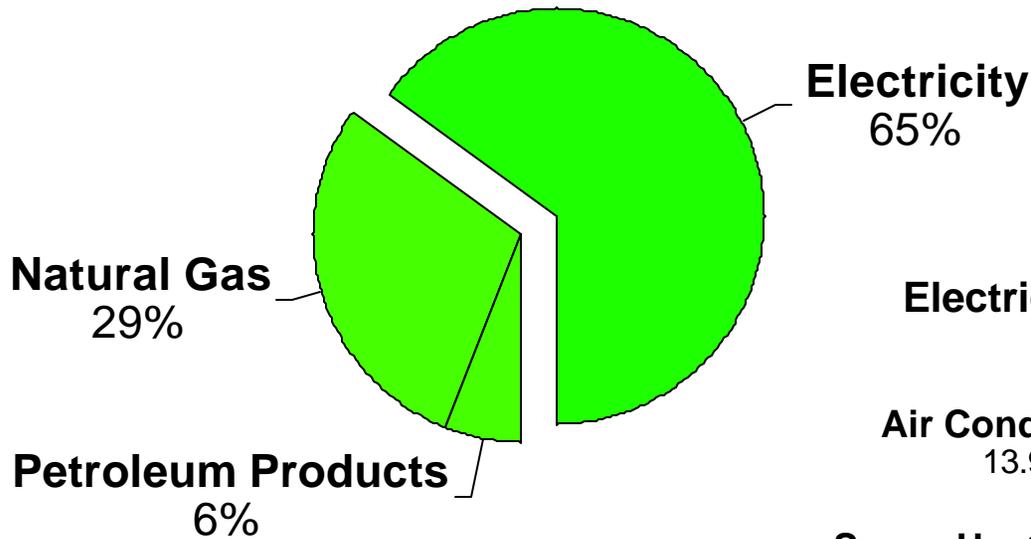


Source: Energy Information Administration

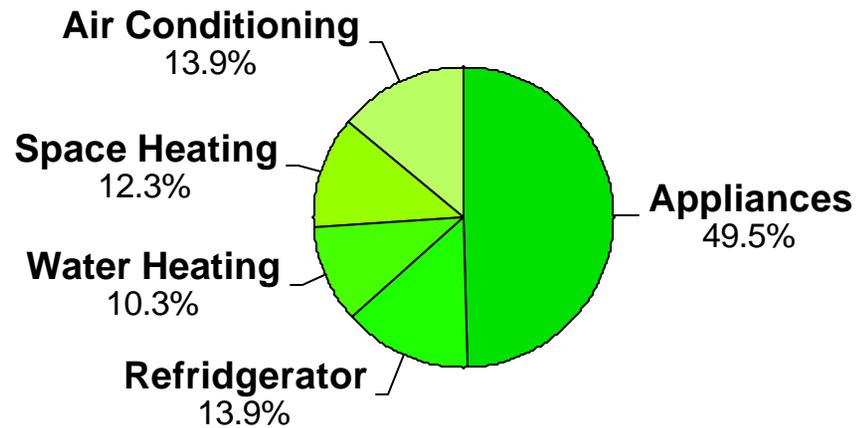


Appliances Account for Half of Electricity Consumption

Household Energy Expenditures by Type



Electricity End Use Consumption 1993



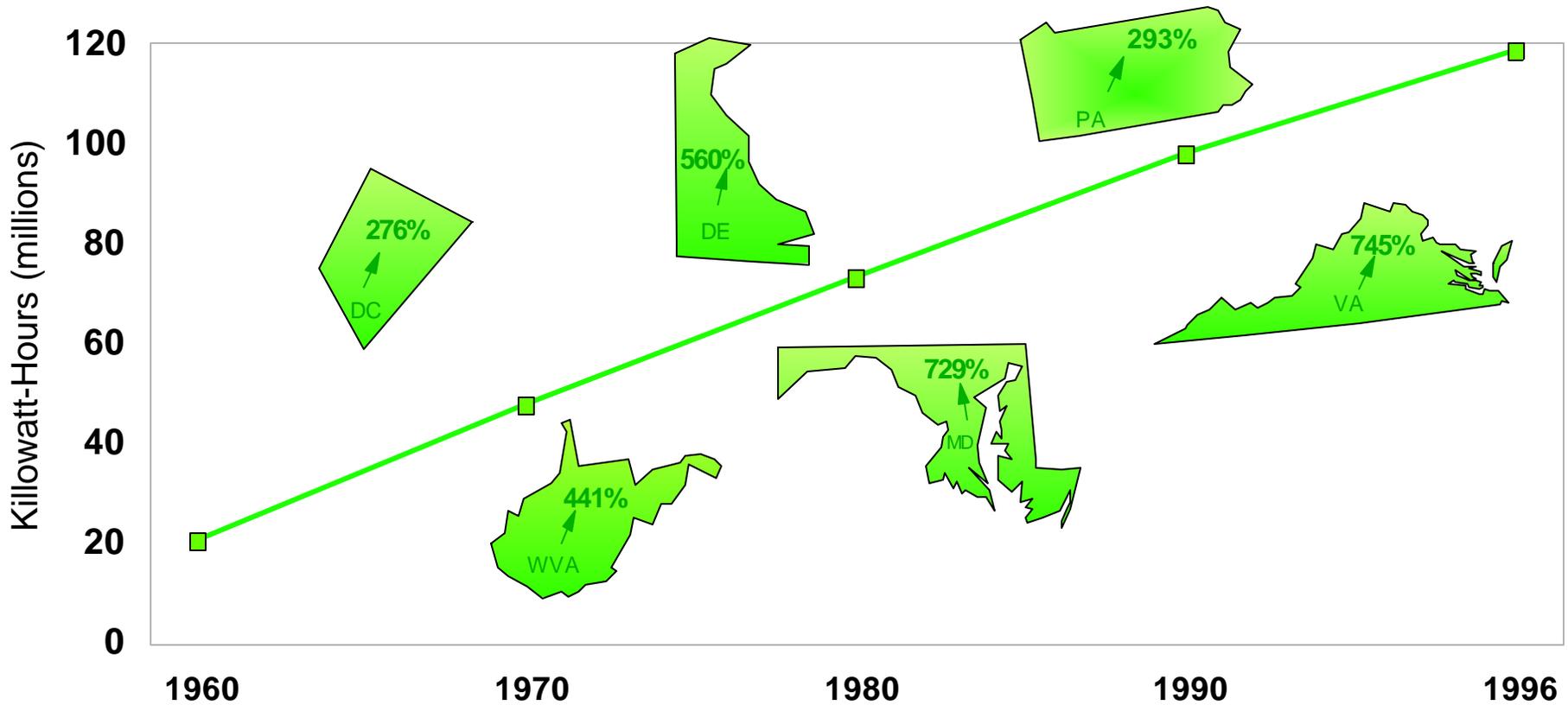
In 1993, \$1,166 was spent on energy by an American household.

Source: Energy Information Administration



Electricity Use in Region Has Increased More Than 450%

Electricity Use in Region III
1960 - 1996

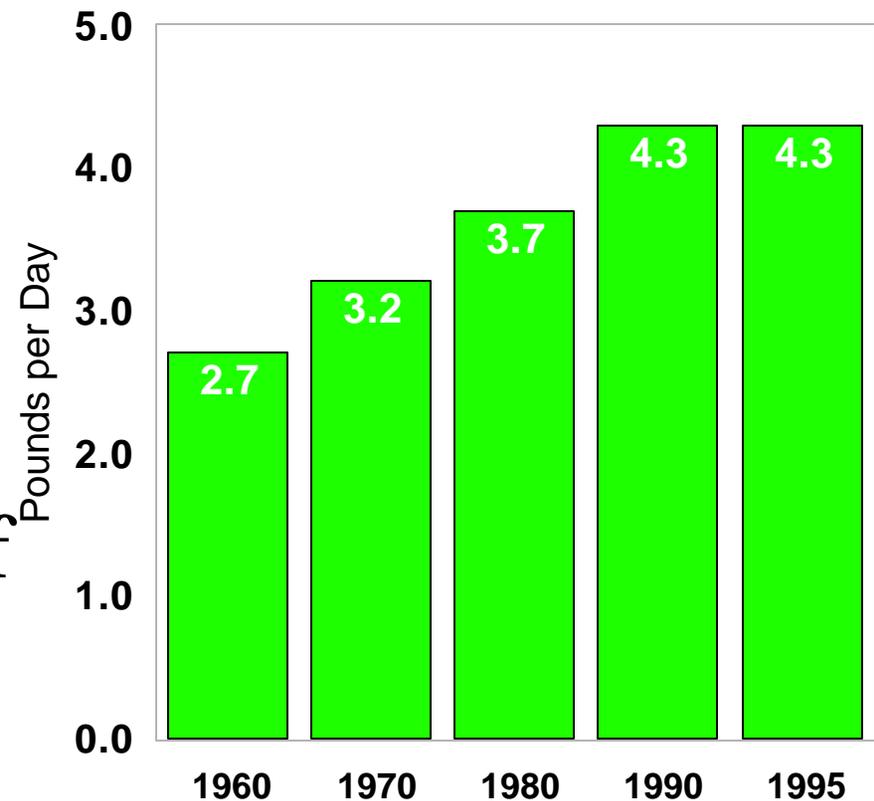


Source: Energy Information Administration

PA and VA Take More Waste

- Pennsylvania is the largest importer of waste in the U.S. with a total of 6.3 million tons/year.
- VA is the second largest with a total of 4.6 millions tons/year.

Daily Generation of Waste per Person
National



Source: US EPA, Office of Solid Waste and US Census Bureau
*1995 Population is Estimated



Water Resources

- ♠ 2/5 of the waterways in the United States are too dirty for fishing and swimming
- ♠ 20,000 rivers, lakes, and bays impacted
- ♠ "non-point source" pollution from agriculture and urban runoff accounts for 60% of current pollution

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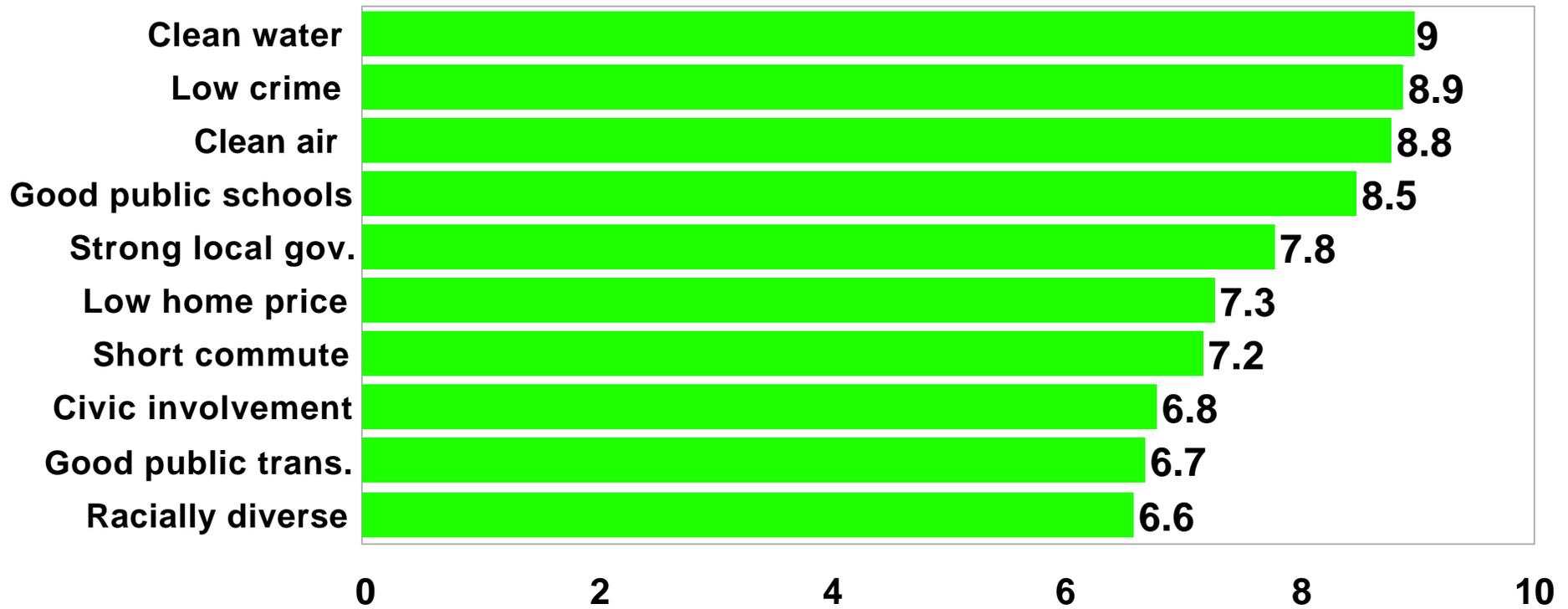
Quality of Life...

What does it mean?

- ✓ Good Health
- ✓ Clean Environment/Beautiful Surroundings
- ✓ Safety from Crime
- ✓ Lifelong Education
- ✓ Sense of Community
- ✓ Easy Access to Stores, Schools, Activities
- ✓ Time to Enjoy Life

Clean Environment, Low Crime, Good Schools Important

On a scale of 1 to 10, how would you rate the importance of the following factors in choosing a place to live?



Source: Money Magazine, Bestplaces to Live in 1998
Starch/Roper Survey, 1998

Roper Surveys Support Sustainable Development

Public's Fundamental Concern is Human Needs

1. Health and happiness of people

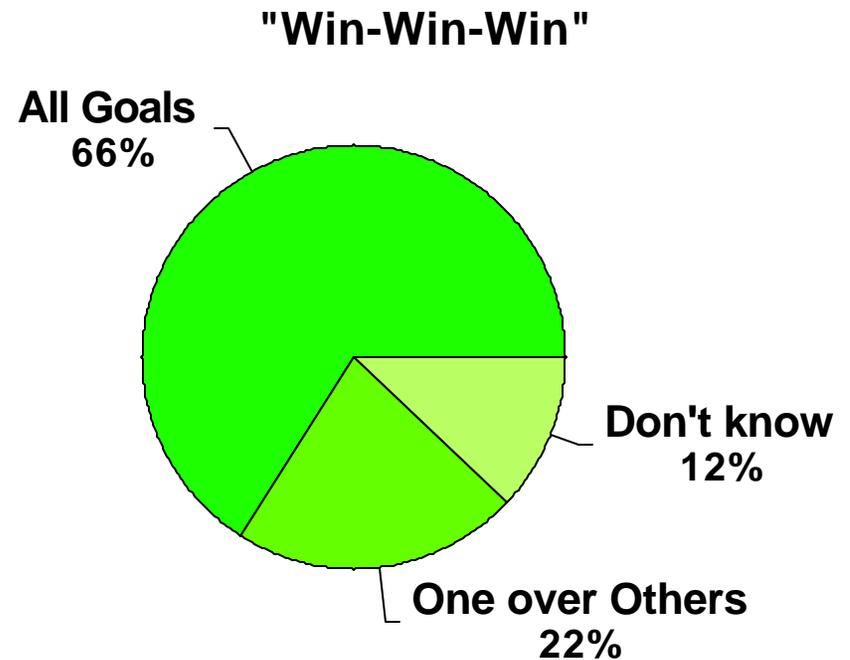
- ▶ crime and drugs
- ▶ disease
- ▶ health care costs
- ▶ education

2. Economic Development

- ▶ jobs

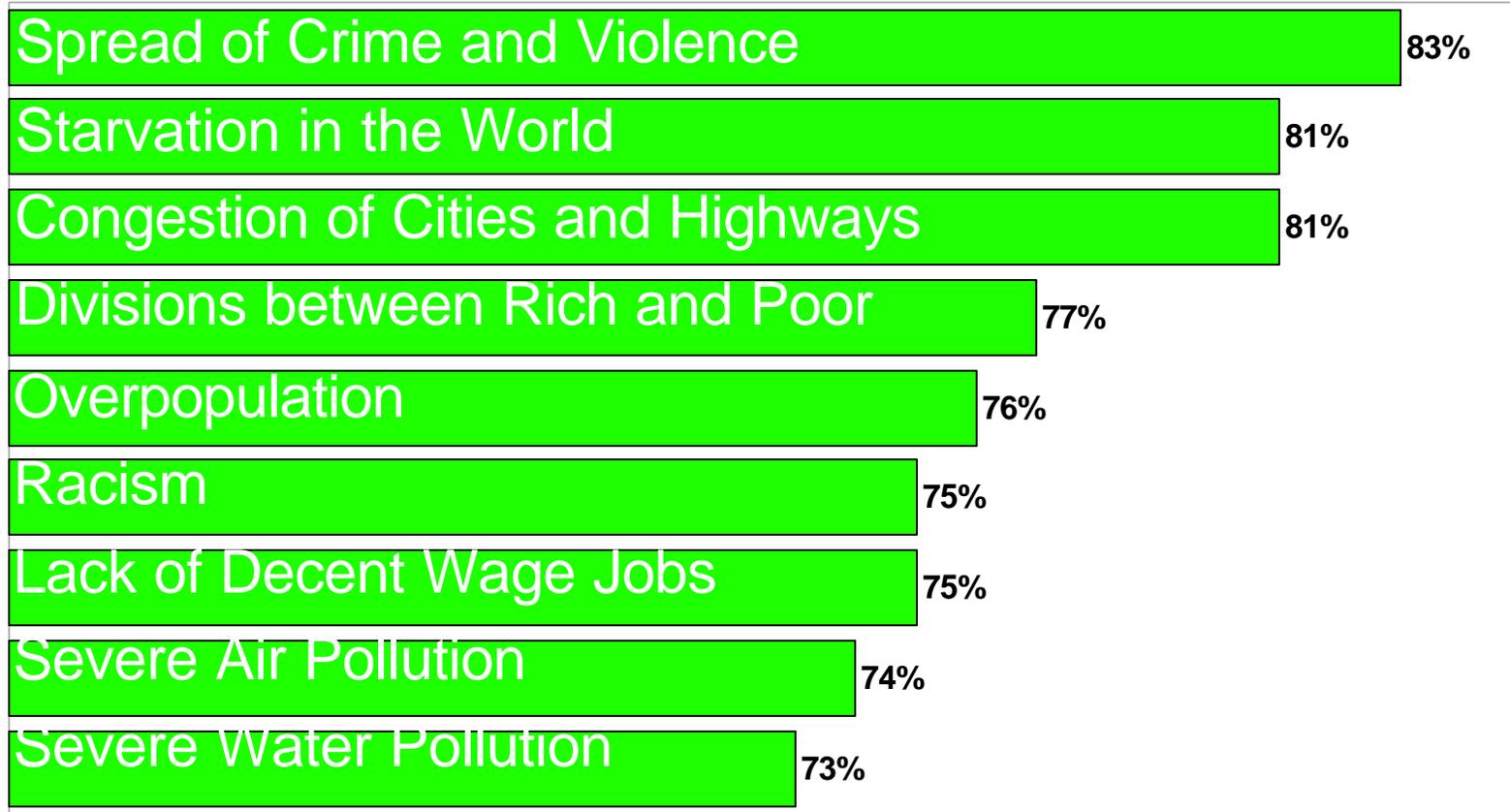
3. Environmental Protection

- ▶ Concern for the environment as a top priority peaked in 1991



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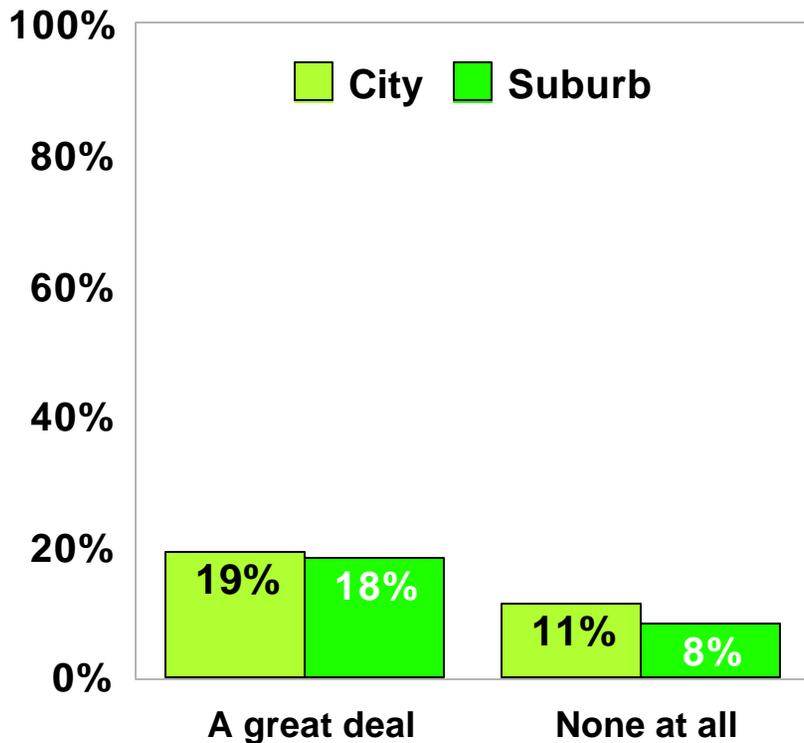
Problems Likely to Threaten your Children in 25 to 50 years



Source: 1996 Roper Survey

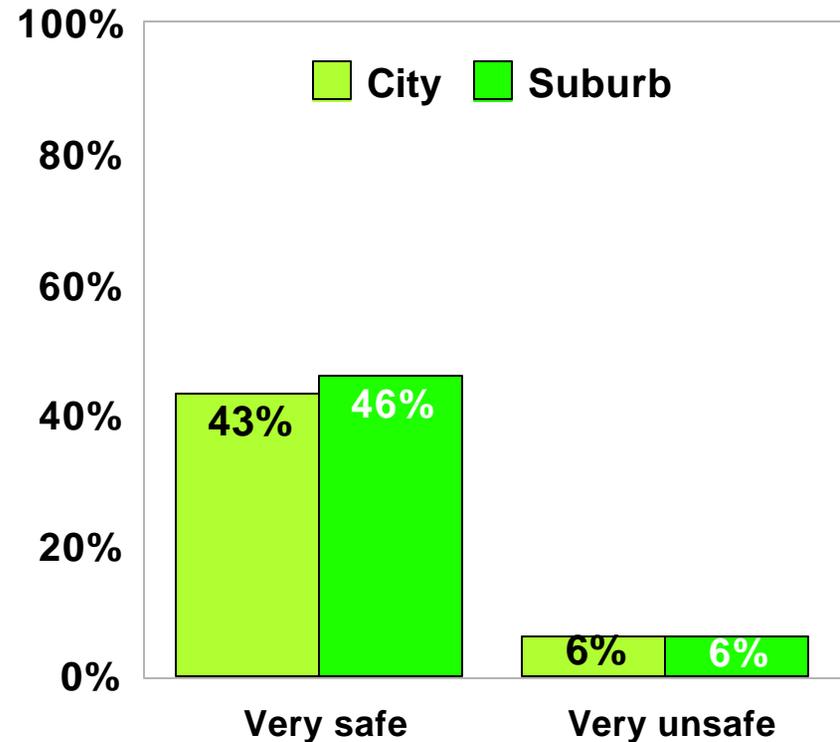
Perception of Safety from Crime is Similar in Cities and Suburbs

Reported confidence in ability of police to protect from violent crime (National)



Source: Sourcebook of Criminal Justice Statistics, 1996
Bureau of Justice Statistics Publication

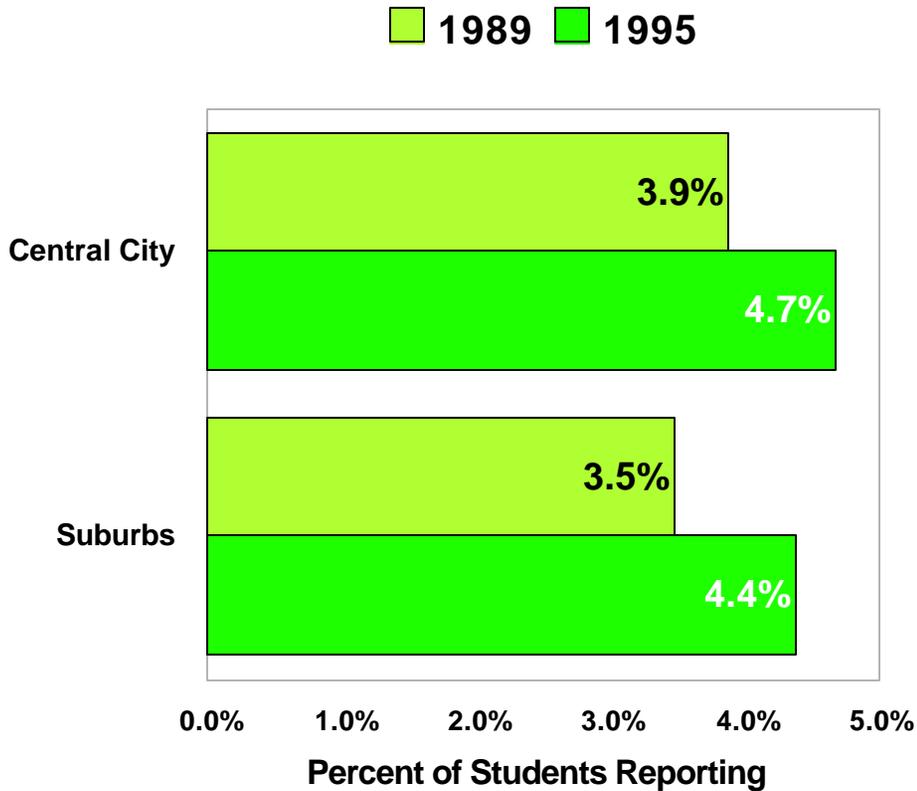
Respondents' feelings of safety alone at night at home (National)



Source: Sourcebook of Criminal Justice Statistics, 1996
Bureau of Justice Statistics Publication

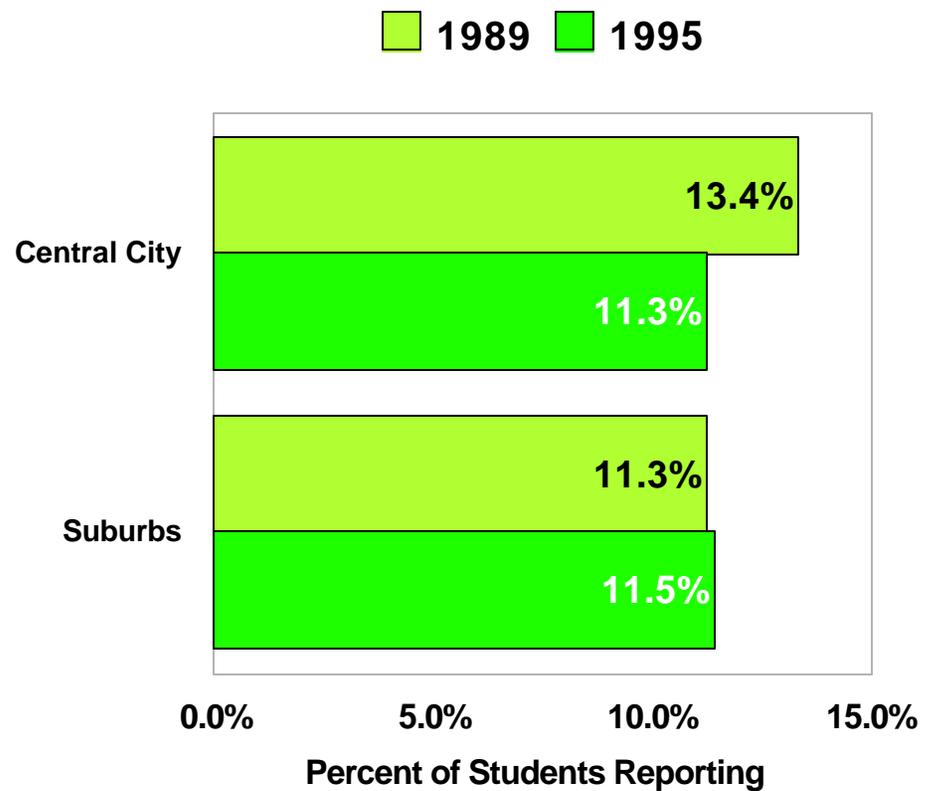
Incidence of Crime Similar at Urban and Suburban Schools

Violent Victimization at school,
by place of residence (National):
1989 and 1995



Source: US. Dept. of Justice, Bureau of Justice Statistics

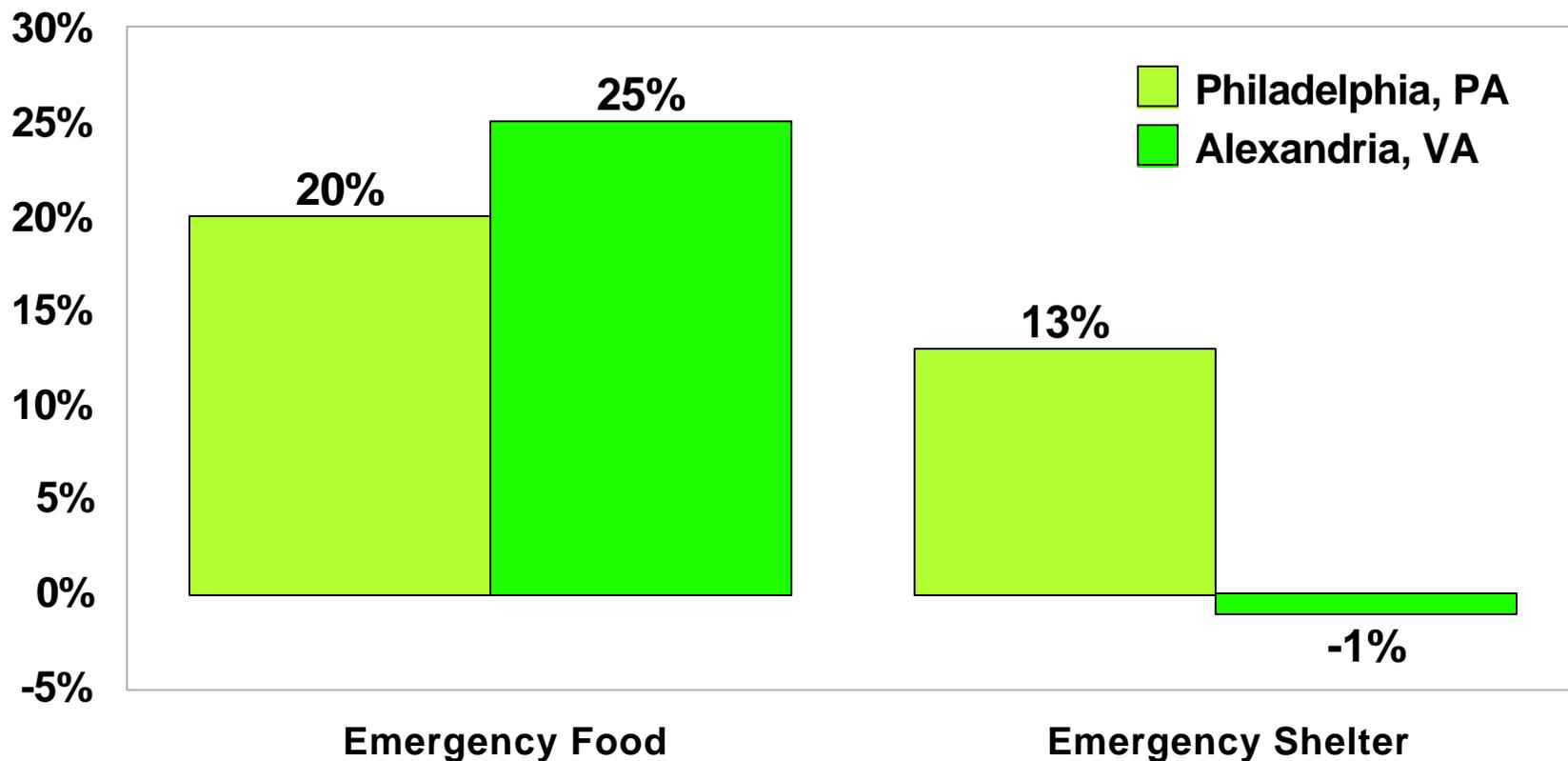
Property Victimization at school,
by place of residence (National):
1989 and 1995



Source: US. Dept. of Justice, Bureau of Justice Statistics

Cities Battle with Hunger and Homelessness

Increases in Demand for Public Services
from 1997 to 1998

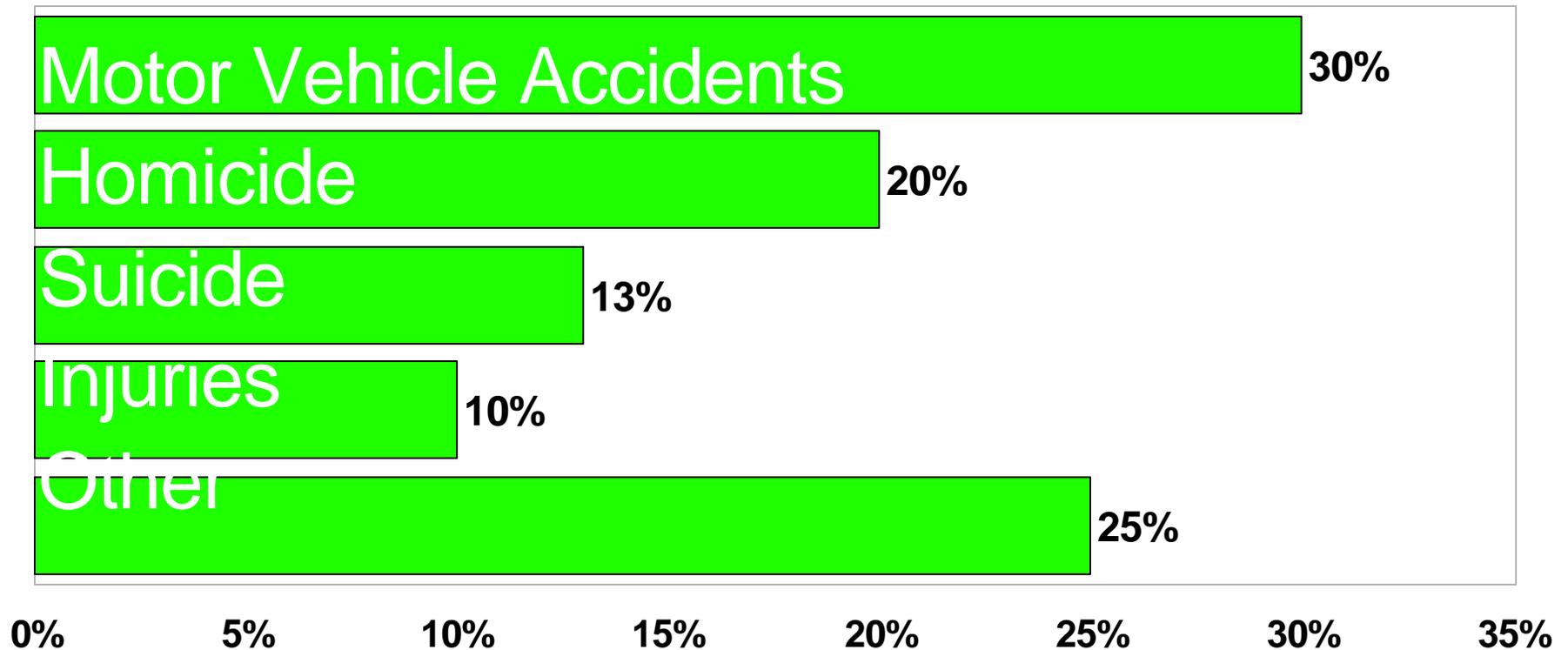


Source: "1998 Status Report on Hunger and Homelessness in American Cities"; The U.S. Conference of Mayors

5

Motor Vehicle Accidents are the #1 Cause of Youth Death

Leading Causes of Death Among People
10 - 24 Years Old (1979-1994)

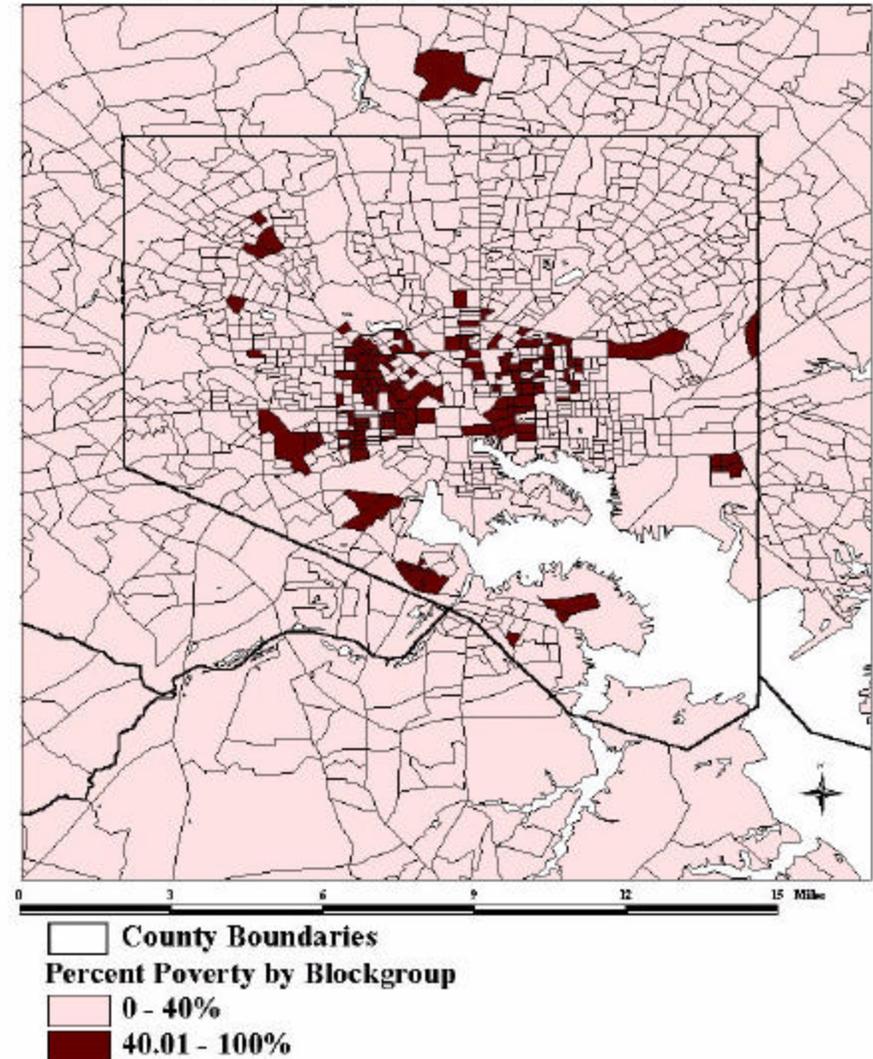


Source: Centers for Disease Control and Prevention
Injuries include falls, drownings, poisonings
Other includes cancer, heart disease, and illnesses

Public Perception about Poverty, Education, and Crime

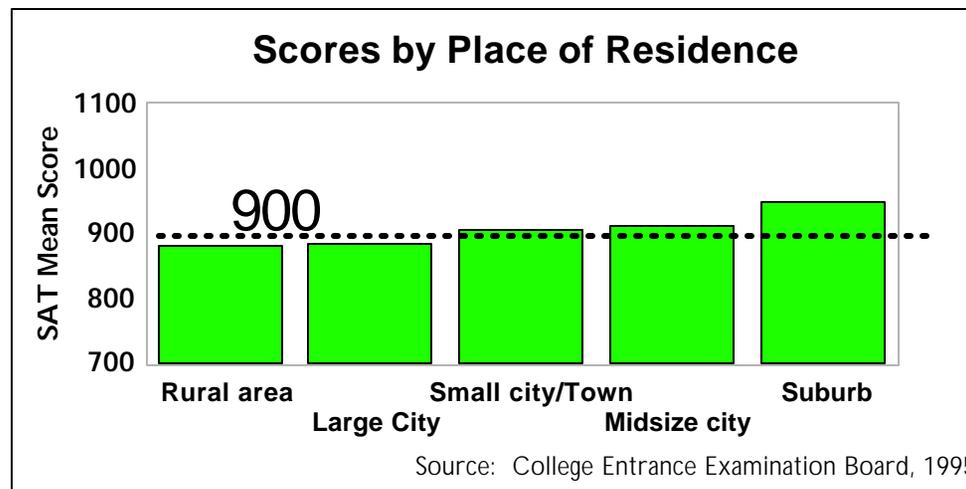
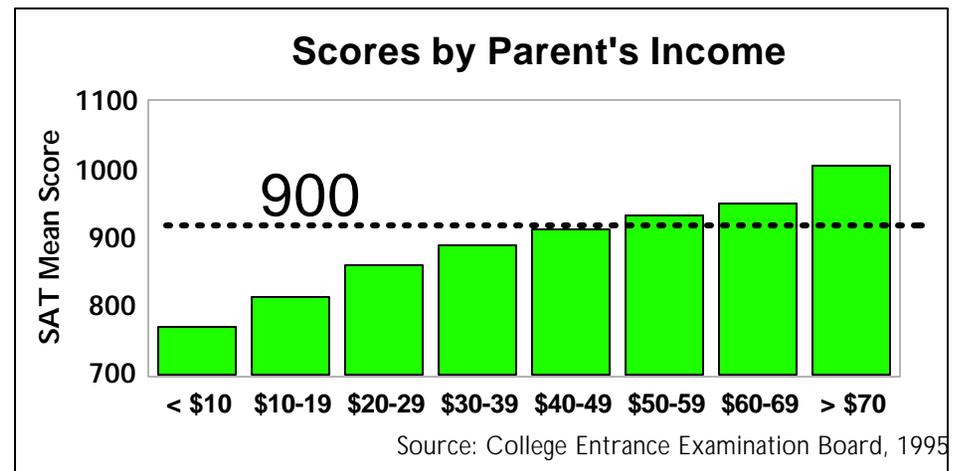
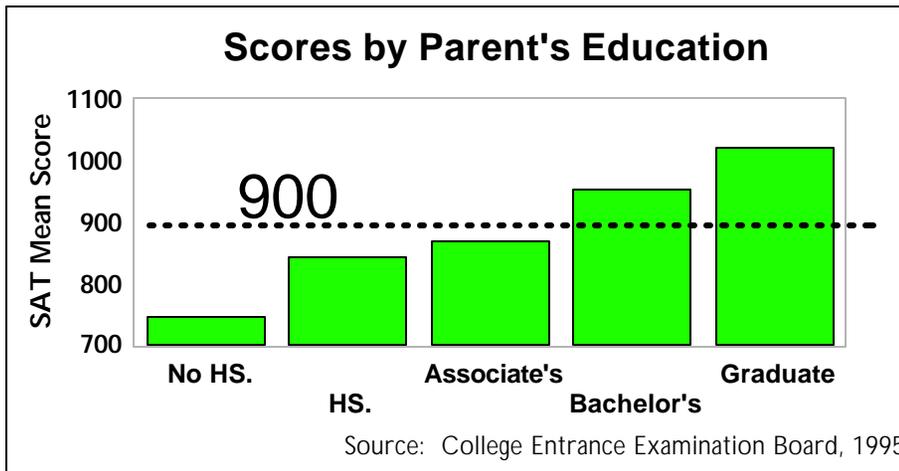
- Poverty tends to be concentrated in urban areas.
 - ▶ Concentration of poverty contributes to some of the problems in urban schools.
 - ▶ Lack of access to lifelong learning contributes to rising crime rates.

Concentrated Poverty in Baltimore, MD



Source: Cost of Sprawl Review, LGAC, CBP

Parent's Education and Income Predictors of SAT Performance



Half of Income Goes to Housing and Transportation

Philadelphia, PA MSA Population: 4,170,855	Percent of Total 1986-87	Percent of Total 1994-95
Housing	30.7%	32.4%
Transportation	18.4%	17.1%
Food	16.0%	14.6%
Clothing	6.5%	5.2%
Health Care	3.9%	4.6%
Education	2.0%	4.1%
Other	22.4%	22.2%
Total Annual Expenditures	100%	100%

Washington, DC MSA Population: 2,911,779	Percent of Total 1986-87	Percent of Total 1994-95
Housing	33.2%	34.5%
Transportation	17.4%	16.2%
Food	11.1%	11.8%
Clothing	6.4%	5.0%
Health Care	4.5%	4.3%
Education	1.7%	2.4%
Other	25.7%	25.8%
Total Annual Expenditures	100%	100%

Source: 1990 US. Census; Consumer Expenditure Survey, Bureau of Labor Statistics.

Themes of Sustainability

1. **Encouraging Livable Communities - Old and New**
2. **Protecting Vital Resource Lands**
3. **Reversing Unsustainable Transportation Trends**
4. **Conserving Energy and Non-Renewable Resources**
5. **Enhancing our Quality of Life by Linking Environmental, Economic and Social Goals**
6. **Realizing a New American Dream**



Activities that Support Sustainable Development:

- ✓ community visioning
- ✓ true cost accounting
- ✓ comprehensive land-use planning
- ✓ redevelopment of urban areas
- ✓ sustainable forestry
- ✓ community supported agriculture
- ✓ greenways and bike lanes
- ✓ urban growth boundaries
- ✓ transit-oriented development
- ✓ transfer and purchase of development rights



Maryland's Smart Growth Program Inspires Communities/Businesses

- ✓ Smart Growth Legislation
 - ▶ Rural Legacy Program
 - ▶ state grants to buy private development
 - ▶ up to 200,000 acres by 2011

- ✓ Center for Chesapeake Communities
 - ▶ Sustainable Site Planning Project
- ✓ *Toward A Sustainable Chesapeake Summit and Final Report*





Pennsylvania Shows Leadership in Sustainable Development

- ✓ Pennsylvania's Growing Greener Initiative
- ✓ High Performance Green Buildings Program, DEP
- ✓ York, PA - Pilot Green Community
- ✓ Pittsburgh's Green Neighborhood Initiative





Virginia Communities Applying Sustainable Development

- ✓ EcoVillage of Loudoun County
- ✓ Thomas Jefferson Planning District Commission's Sustainability project
- ✓ University of Virginia's School of Architecture and Institute for Sustainable Design
- ✓ VA Sustainable Businesses and Communities Conference



INSTITUTE *for*
SUSTAINABLE
DESIGN

UNIVERSITY *of* VIRGINIA



Delaware Shows Leadership in Sustainable Development

National Achievement Award for
Farmland Protection from
the American Farmland Trust



Rain Detention Gardens
Naamans Creek Watershed
Association Arden, DE



DE Estuary Program
Sustainable Delaware River
Governor's Summit

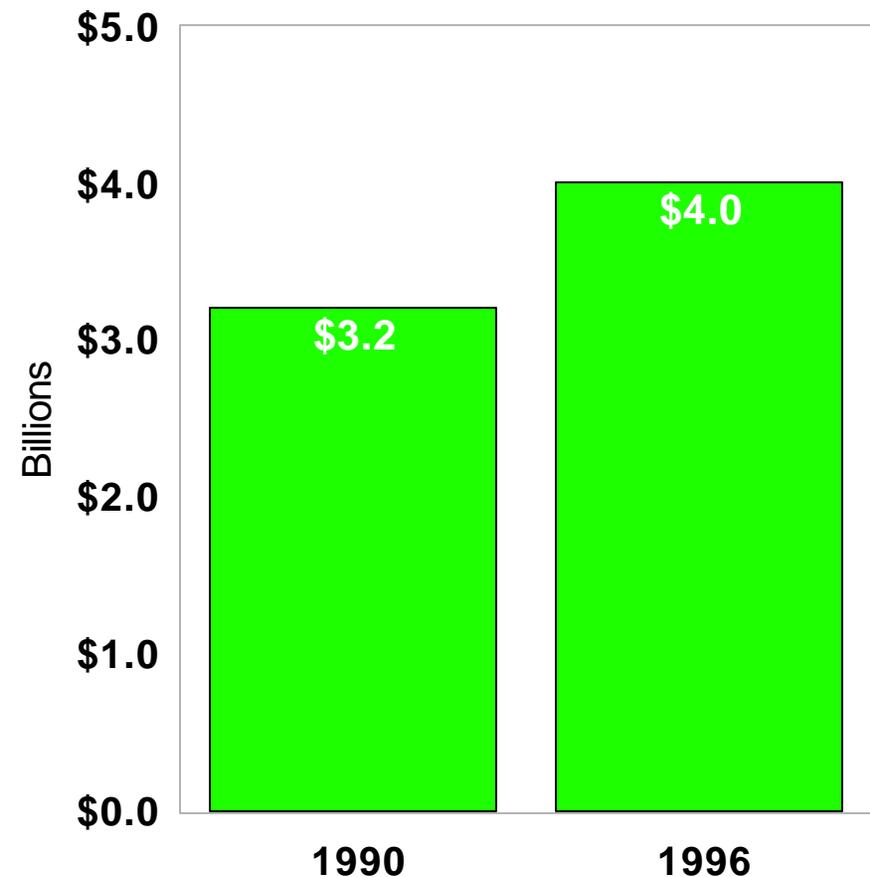


West Virginia Has...

Location, Location, Location

- ✓ WV has 1 million acres of recreation areas including 2 national parks, 36 state parks, nine state forests, 47 wildlife management areas and two national forests.
- ✓ In 1995, there were 960,535 resident hunting and fishing licenses sold; 243,141 non-resident.

Tourism's Contribution to the State's Economy



Source: West Virginia Tourism Commission



SD Challenge Grant Projects

- 1996**
- ★ Wilson College CSA's
 - ★ Friends of the Rappahannock
 - ★ Thomas Jefferson Planning Dist. Com.
- 1997**
- ★ Acid Mine Drainage and Art
 - ★ Nine Mile Run Site Redevelopment
 - ★ Naaman's Creek Rain Detention Gardens
 - ★ EcoVillage
 - ★ Center for Chesapeake Communities
- 1998**
- ★ Ivy City Deconstruction
 - ★ Regional Stewardship Center
 - ★ Greensgrow Farm
 - ★ Anacostia Eco-Garden



What you can do...

- ✓ depend less on automobile for short trips
- ✓ consider working on issues of safety in your community so that children can walk or ride a bike to school and other activities without fear
- ✓ prioritize actions that will improve the quality of your life
- ✓ Ask yourself, "Is it more important to have more time or more money"
- ✓ determine what you value in life