



THE OHIO STATE UNIVERSITY

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# The Urban-Suburban-Exurban- Rural Continuum: Definitions, Trends and Interdependences

Elena Irwin

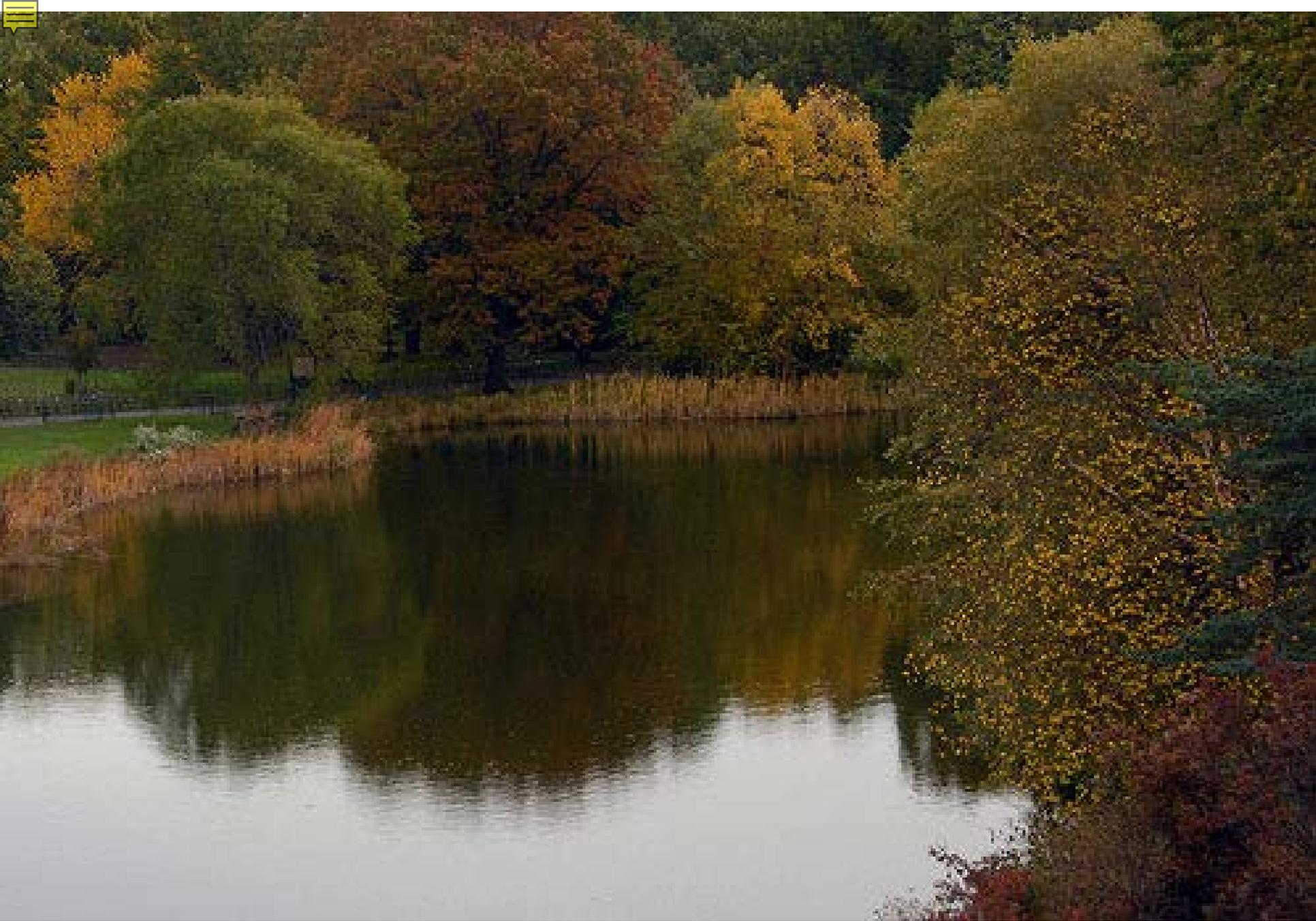
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Prepared for: OSU National Urban Extension Leaders Conference, The Ohio State  
University, Columbus OH May 24, 2016

Are the following images urban  
or rural?















s, & More  
udy · Antiques

FRANKLIN

OPEN

FRANKLIN





RE/MAX  
JACE GLICK  
HOME FOR SALE

CENTRO REALTY INC.  
JOAN COX  
HOME FOR SALE

HOME FOR SALE

COLDWELL BANKER 21







# Did you have difficulties deciding?

- Are cities devoid of open space and wildlife?
- Do all people in the countryside hunt, farm, fish and shoot?
- Is everyone living in towns and cities stressed and worried about crime?
- Can farming happen in the city?
- Is all rural land dedicated to agriculture or forests?
- Is all industry in the city?

***Increasingly difficult to distinguish between rural and urban, the transition is often gradual***



# Definitions of urban and rural

- **Physical:** population, density, land use
- **Legal:** government boundaries
- **Functional:** economic flows and interactions
- **Cultural:** ethnicity, diversity, degree of urbanity
- **Environmental:** impervious surface, industrial pollution, urban heat island
- There is no absolute or right definition—depends on your question and the purpose!

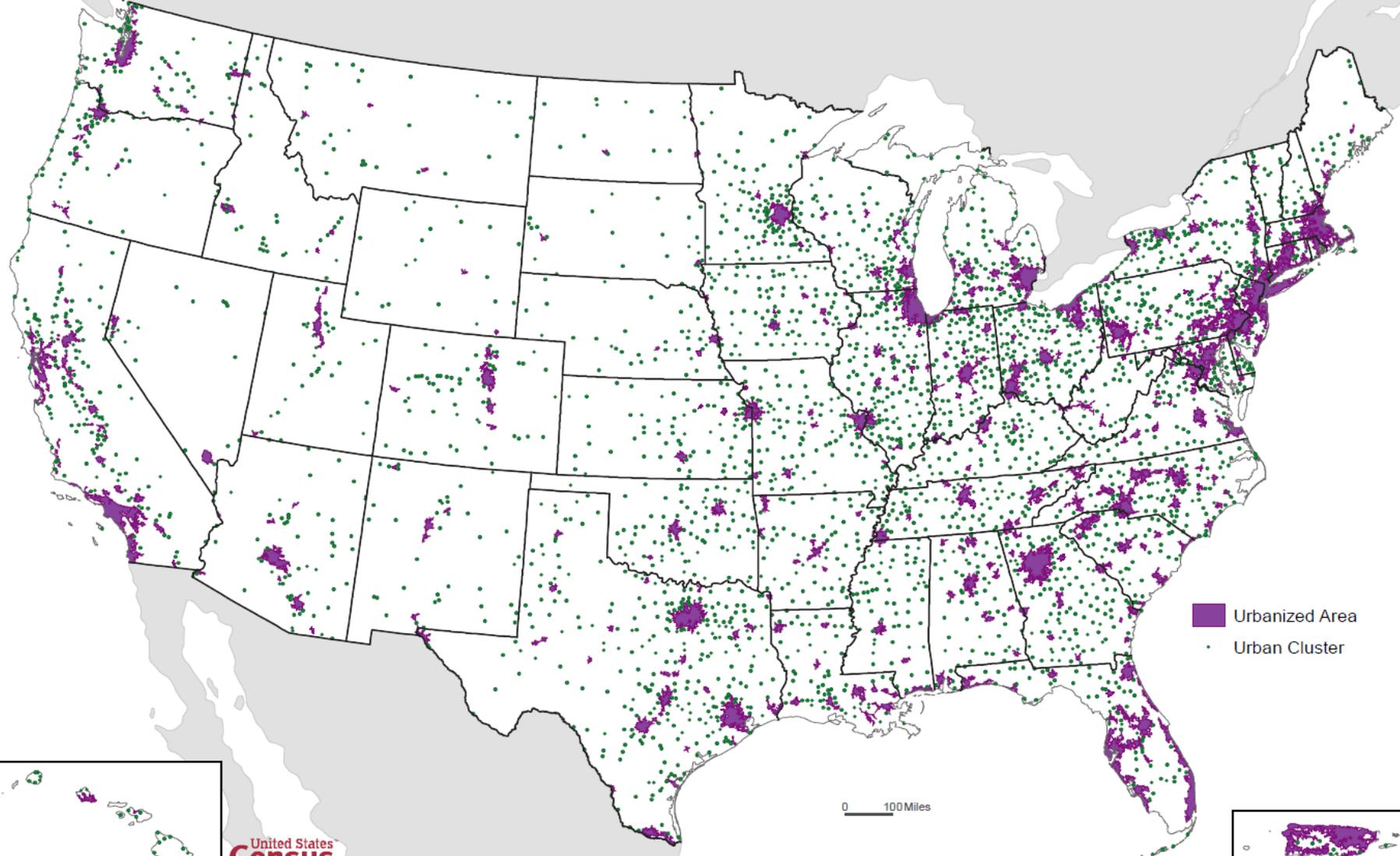
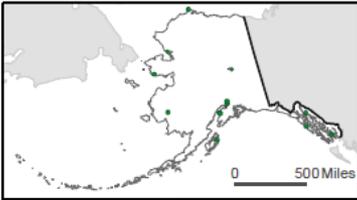


# Urban Areas

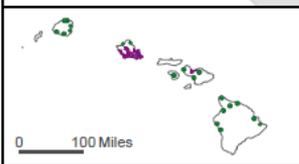
(Population-based definition of urban and rural)

- The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses.
- The Census Bureau identifies two types of urban areas:
  - **Urbanized Areas (UAs)** of 50,000 or more people
  - **Urban Clusters (UCs)** of at least 2,500 and less than 50,000 people
- "Rural" encompasses all population, housing, and territory not included within an urban area

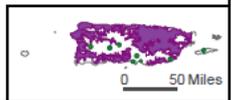
# Urbanized Areas and Urban Clusters: 2010



Urbanized Area  
Urban Cluster

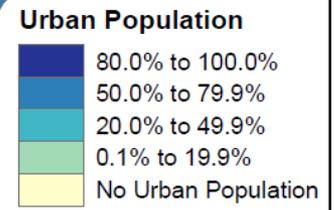
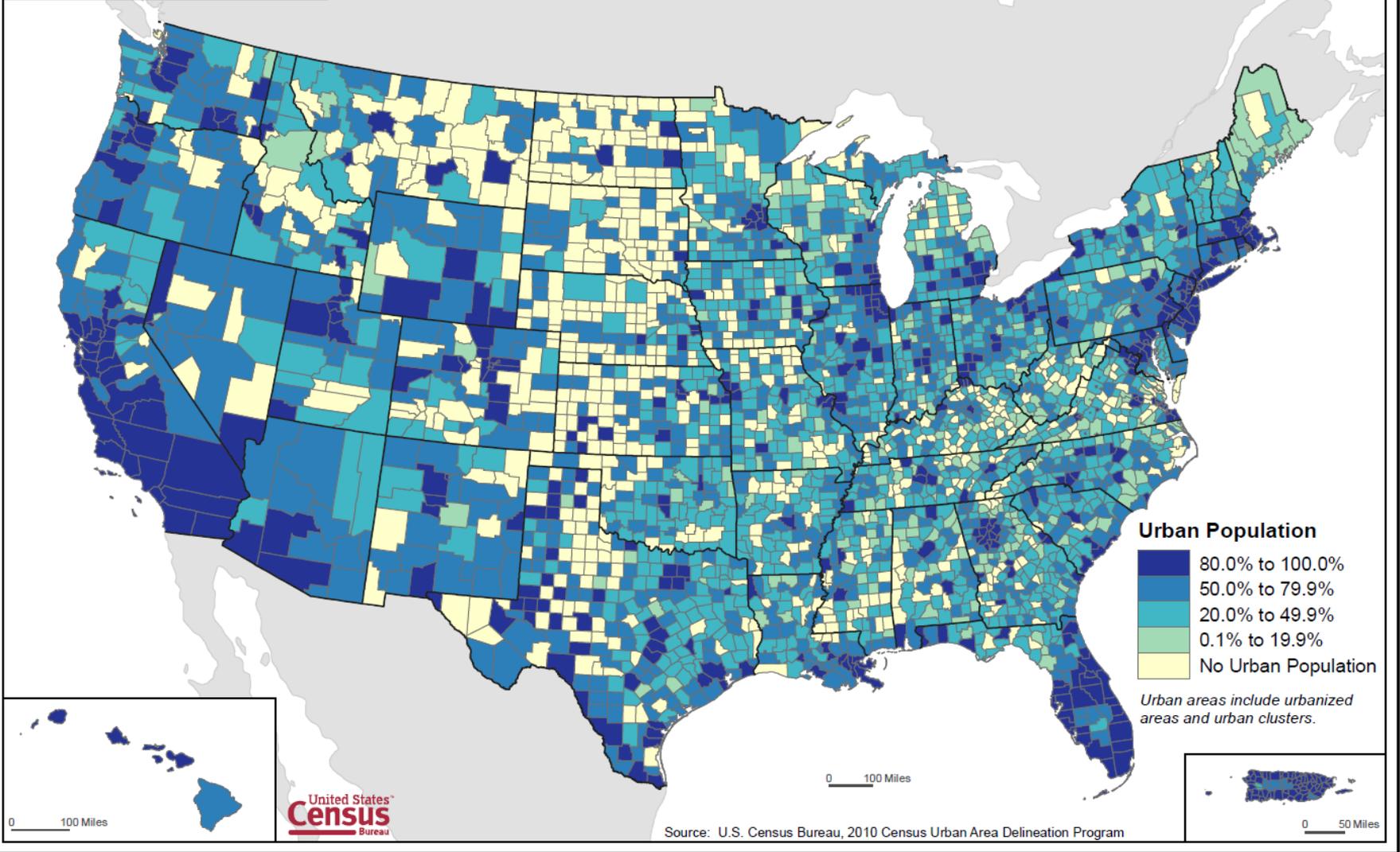
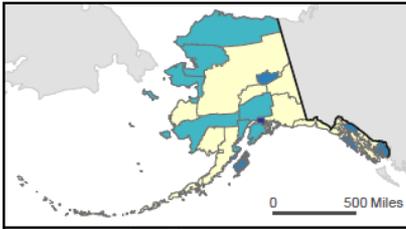


United States  
**Census**  
Bureau

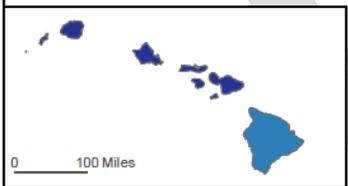


Source: U.S. Census Bureau, 2010 Census Urban Area Delineation Program

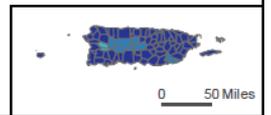
# Percent Population Residing in Urban Areas by County: 2010



*Urban areas include urbanized areas and urban clusters.*



Source: U.S. Census Bureau, 2010 Census Urban Area Delineation Program





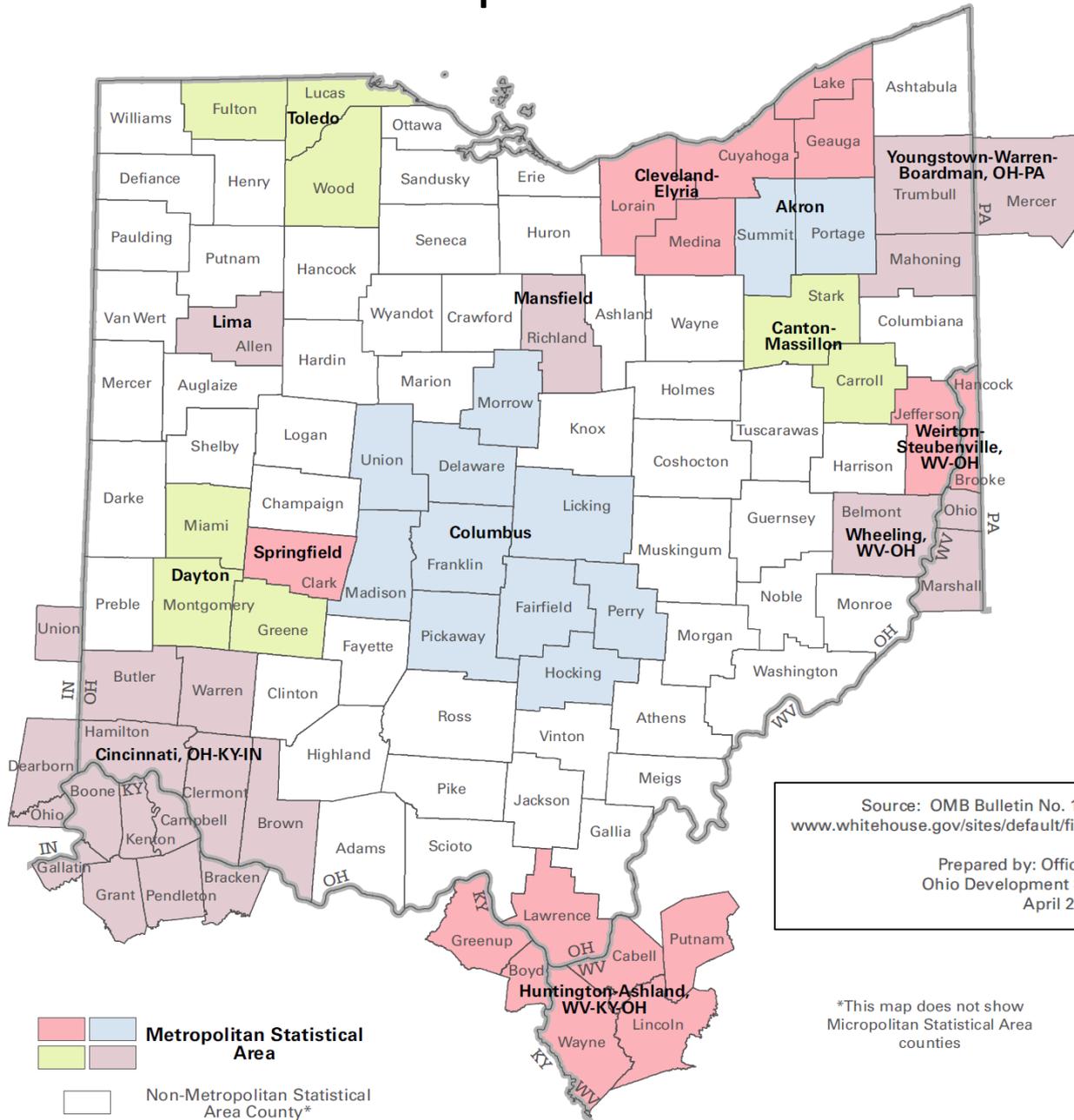
# Metropolitan Statistical Areas

(Functional-based definitions of urban and rural)

- **Metropolitan Statistical Areas:** A geographical region with a relatively high population density at its core and close economic ties throughout the area; contains a population of at least 50,000
- **Micropolitan Statistical Areas:** One or more counties that have an urban core area of at least 10,000 population but less than 50,000
- **Non-Metropolitan (or Non-Core):** Any county that is not part of a metropolitan or micropolitan area
- **Combined Statistical Areas:** a grouping of adjacent metropolitan and/or micropolitan statistical areas (MSAs) defined based on social and economic ties measured by commuting patterns between adjacent MSAs.



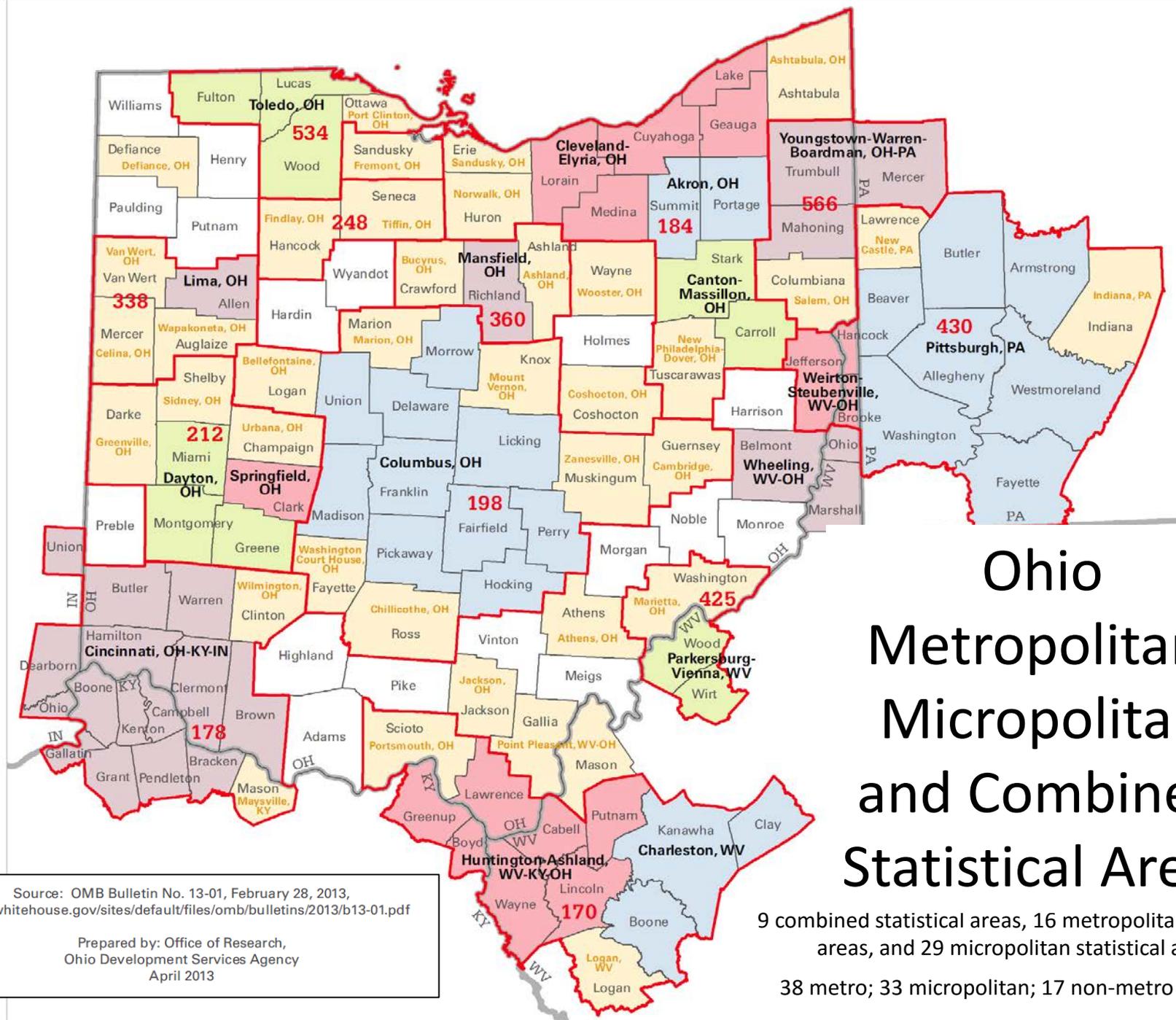
# Ohio Metropolitan Areas



Source: OMB Bulletin No. 13-01, February 28, 2013, [www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf](http://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf)

Prepared by: Office of Research,  
Ohio Development Services Agency  
April 2013

\*This map does not show Micropolitan Statistical Area counties



# Ohio Metropolitan, Micropolitan and Combined Statistical Areas

9 combined statistical areas, 16 metropolitan statistical areas, and 29 micropolitan statistical areas  
38 metro; 33 micropolitan; 17 non-metro counties

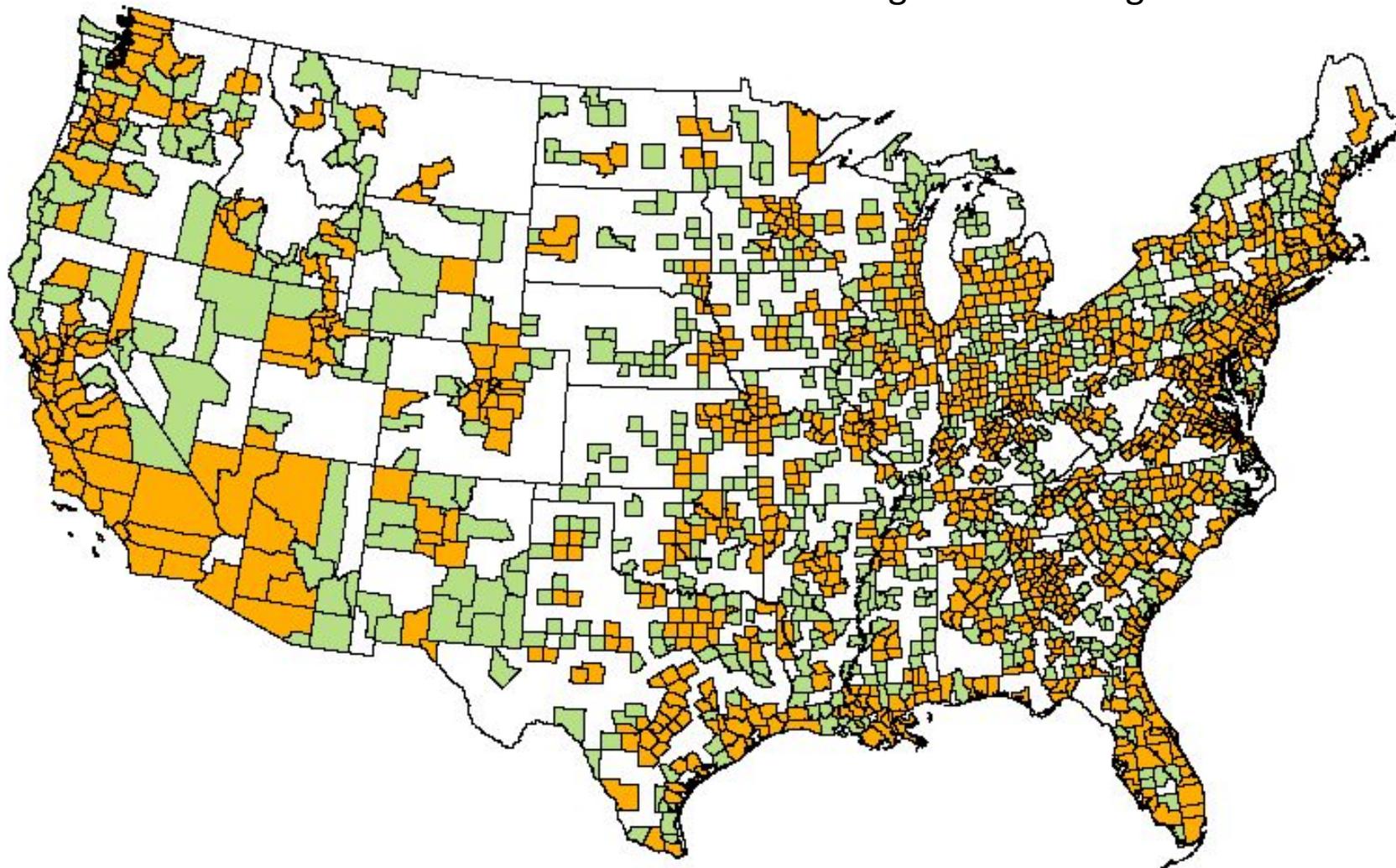
Source: OMB Bulletin No. 13-01, February 28, 2013, [www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf](http://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf)  
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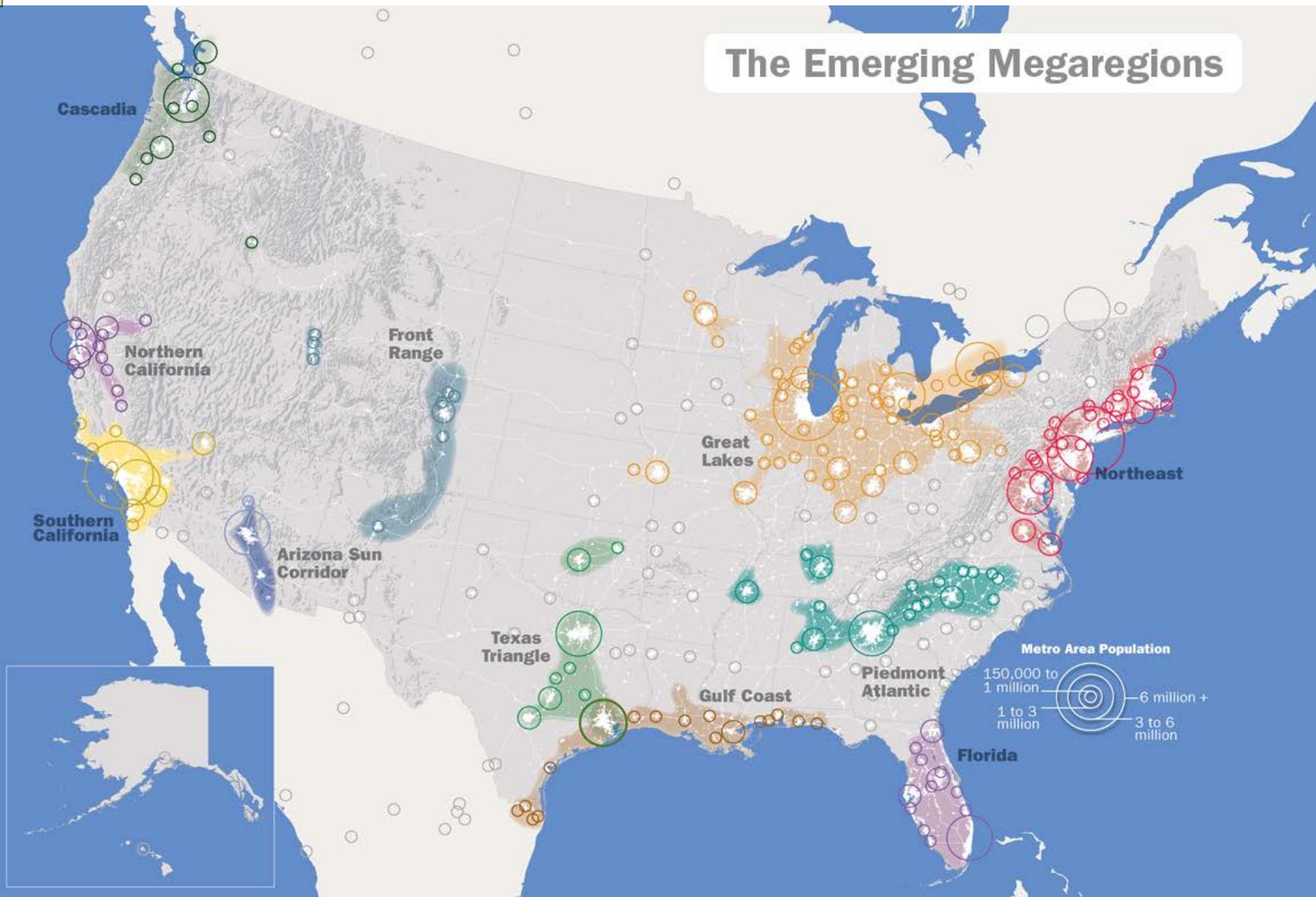
# Core Based Statistical Areas

Metropolitan    Micropolitan    Noncore

The official definition from the US Census Bureau and the Office of Management & Budget

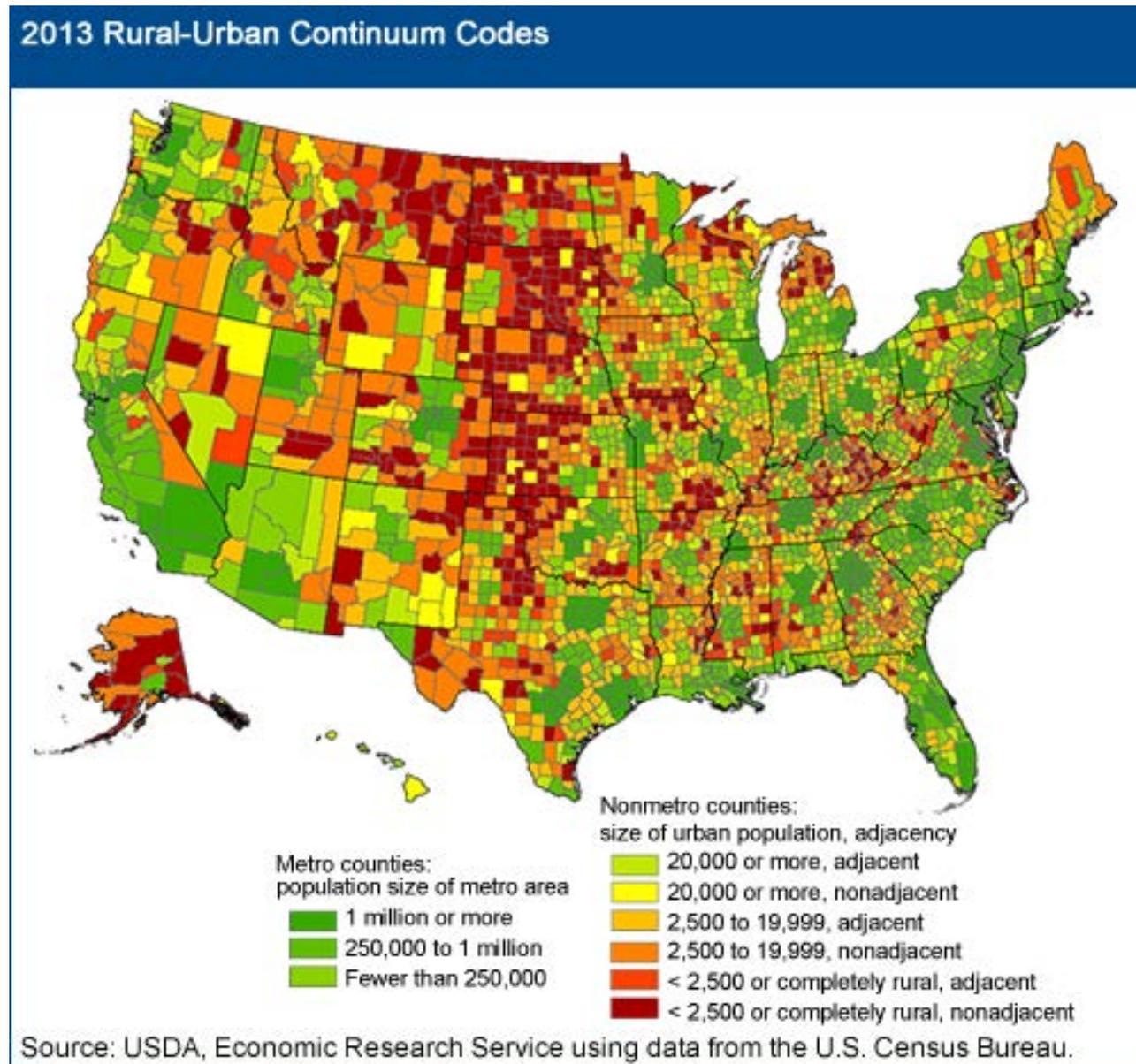


# The Emerging Megaregions



Source: Regional Plan Association <http://www.america2050.org/megaregions.html>

# Urban-suburban-exurban-rural continuum





# U.S. Distribution of Population and Counties by Rural-Urban Continuum Code

County type	Population (% of total)	Number of counties (% of total)
Metro: 1 million or more	55%	15%
Metro: 250k - 1 million	21%	12%
Metro: less than 250k	9%	11%
Non-metro: 20k+ adjacent to metro	4%	7%
Non-metro: 20k+ non-adjacent	2%	3%
Non-metro: 2.5k-20k adjacent	5%	19%
Non-metro: 2.5k-20k non-adjacent	3%	13%
Non-metro: less than 2.5k adjacent	1%	7%
Non-metro: less than 2.5k non-adjacent	1%	13%

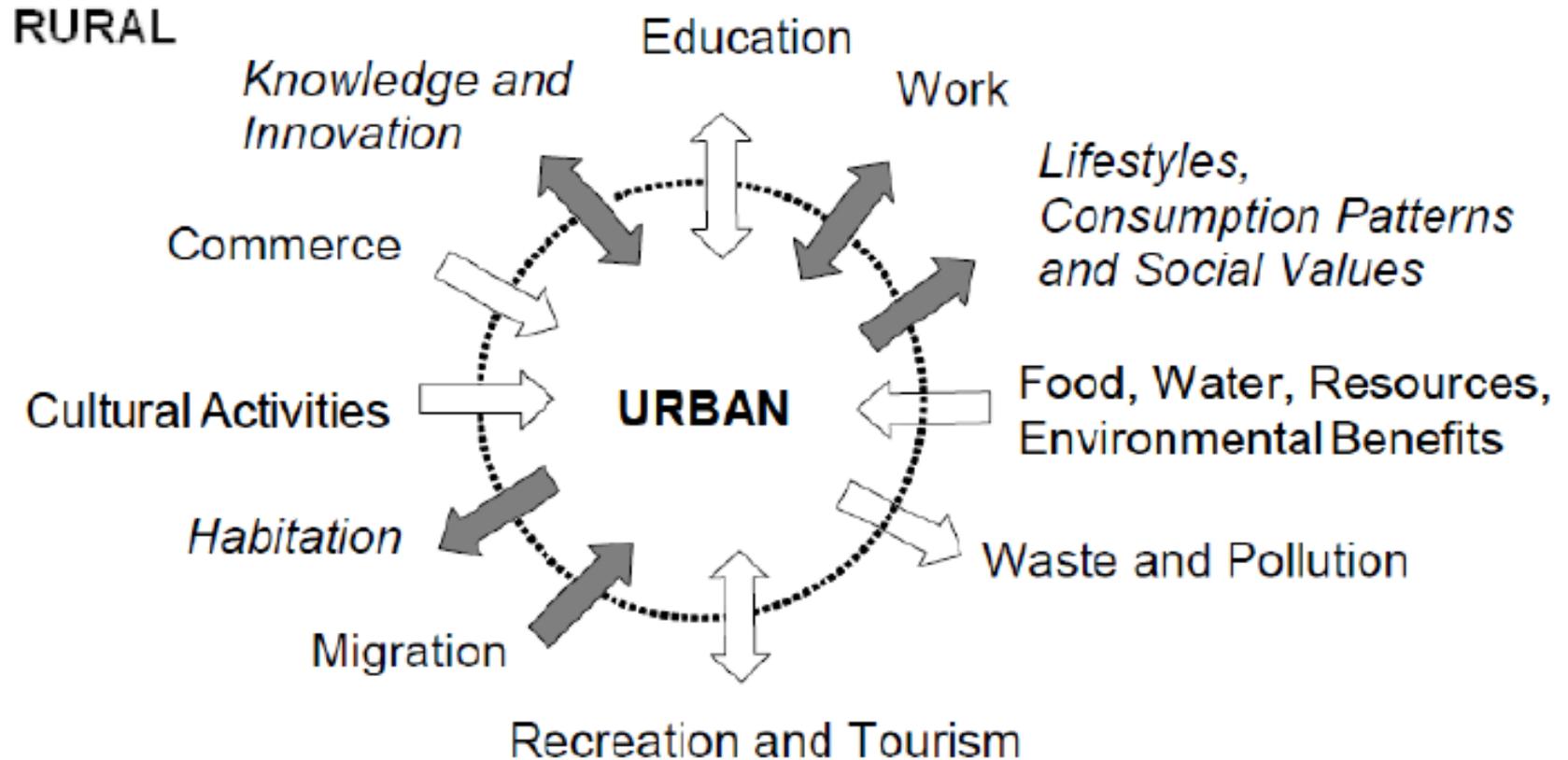
95% of U.S. population lives in metro or non-metro adjacent county

# Urban-rural interdependence:

Flows of economic activities across urban-rural continuum

- People (migrating, commuting, visiting)
- Financial (remittances, investments from urban-based institutions)
- Manufactured goods and services from urban to rural settlements
- Environmental resources from rural to urban
- Pollution and waste (two-way flows between urban and rural)
- Information (e.g., prices, consumer preferences, employment opportunities)

# Flows between urban and rural areas



Source based on Preston (1975), Stead (2002), adapted by Repp et al. (2012)

Source: IINAS (2015) *Urban-Rural Linkages and Global Sustainable Land Use*

# Two types of urban-rural linkages

- Globalized (non-local) linkages between cities and many rural areas

*“Mobile phones manufactured in the city of Shenzhen, China (...) will be shipped and used to facilitate trade and social relations in hundreds or thousands of villages in Africa and Asia. The food consumed in Lagos or in Abuja (...), or the immigrants flowing into them, come from all over Nigeria, the region and the world, and not just from the proximate rural areas” (Berdegué et al. 2014).*

- Local linkages between urban (city, suburbs) and the surrounding exurban-rural area

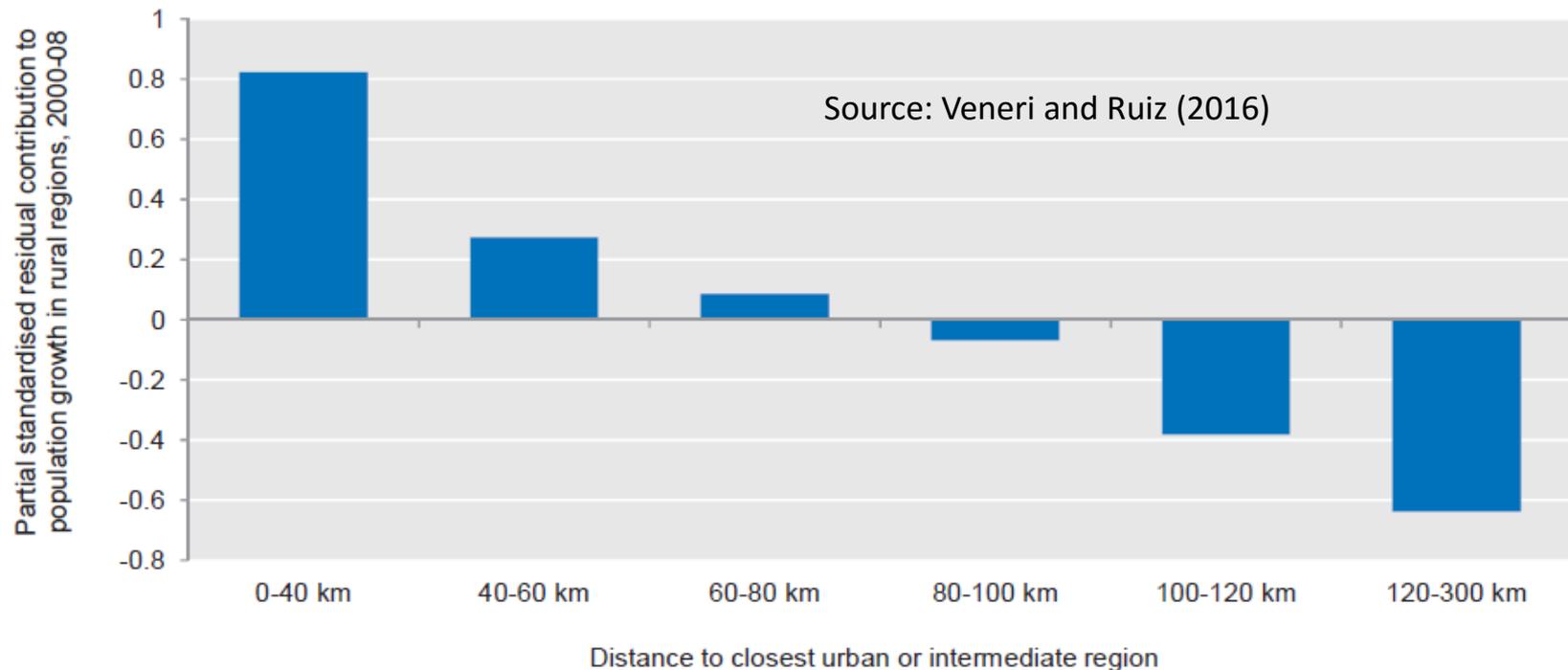


# Example #1: Urban Spillovers: Good or Bad for Rural Areas?

- **Urban spread** (positive spillovers for rural areas)
  - Attract businesses and people to nearby exurban/rural areas; urban residents or businesses that like rural amenities
- **Urban backwash** (negative spillovers for rural areas)
  - Cities act as vacuums for one-way flows of human capital and resources (“rural flight”)
- Research hypotheses
  - “Spread effect” dominates up to a certain distance at which people can easily commute in and out of the city
  - “Backwash effect” dominates as distance increases, which increases the probability that individuals relocate to the city instead of commuting

# Rural Population Growth and Proximity to Urban/Suburban Regions

- Partridge et al. (2007): Find that spread effect dominates up to 100 miles based on population growth study of Canadian regions
- Veneri and Ruiz (2016) find similar results for EU and US regions:

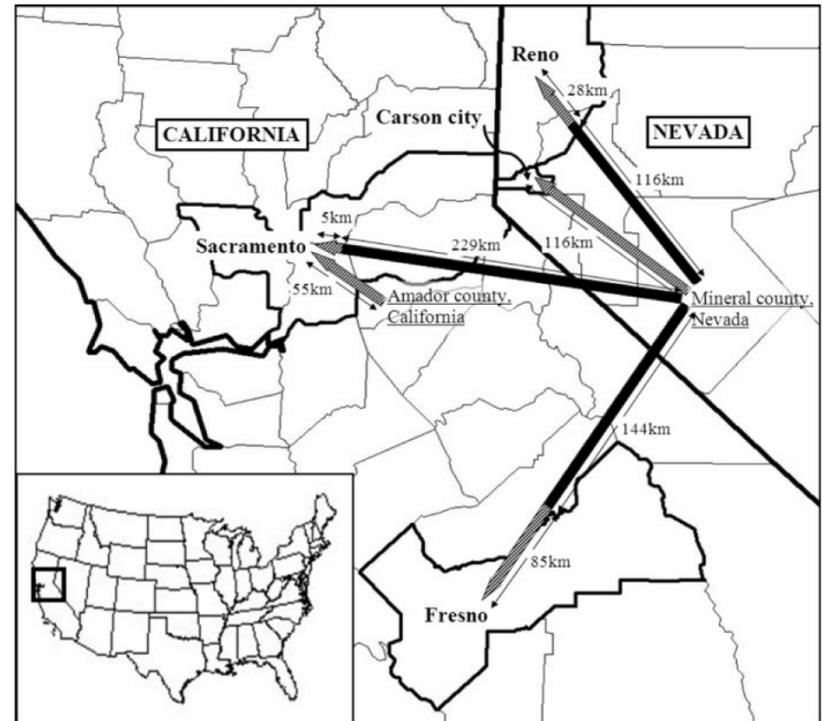


# Proximity to Large versus Small Cities

Partridge et al. (2008)

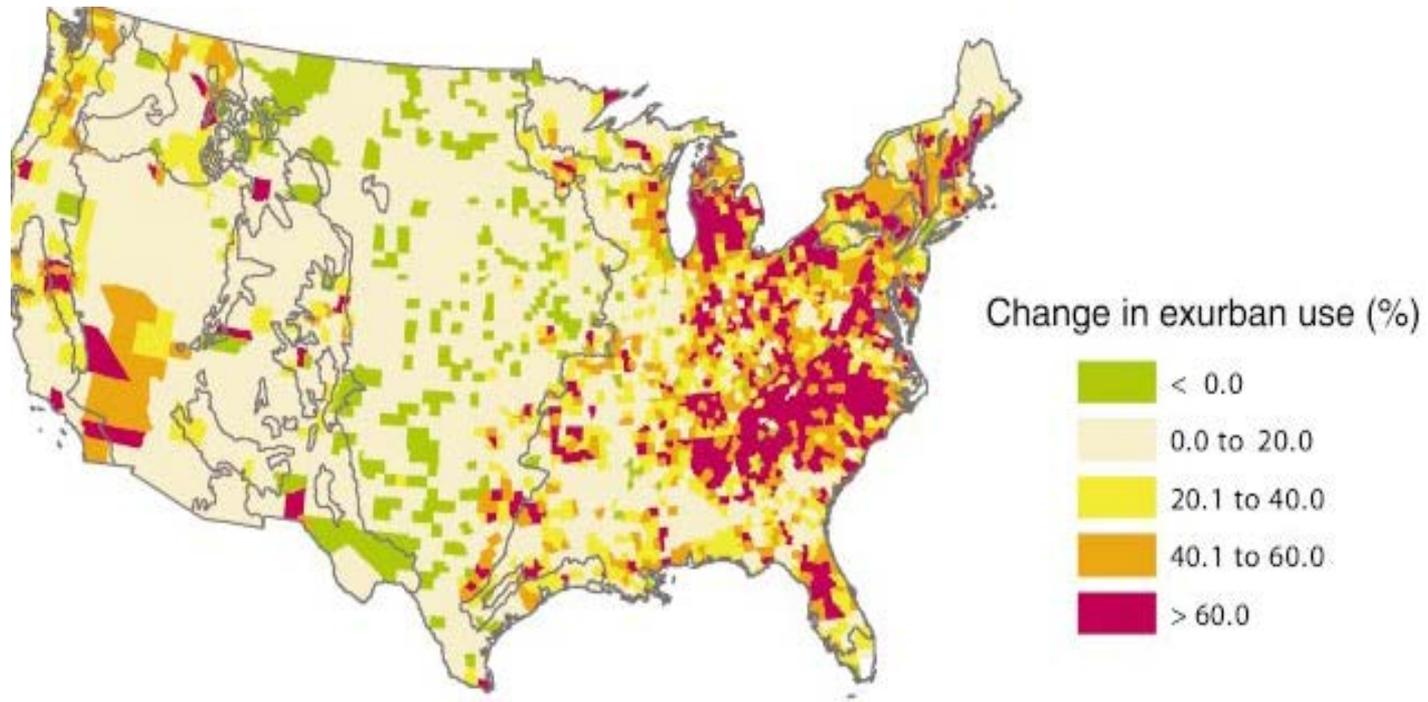
Do larger cities have a greater spillovers than smaller cities—due to greater diversity of retail and commercial services, urban amenities?

- Proximity to city of any size has positive effect on population growth of rural area
- Proximity to larger cities has a greater effect on population growth rates (compared to smaller cities)
- Further evidence of urban spread effects
- Also supports idea that larger urban areas offer “higher order” services that people desire to be near



# U.S. exurban growth 1950 – 2000

(Brown et al. 2005)

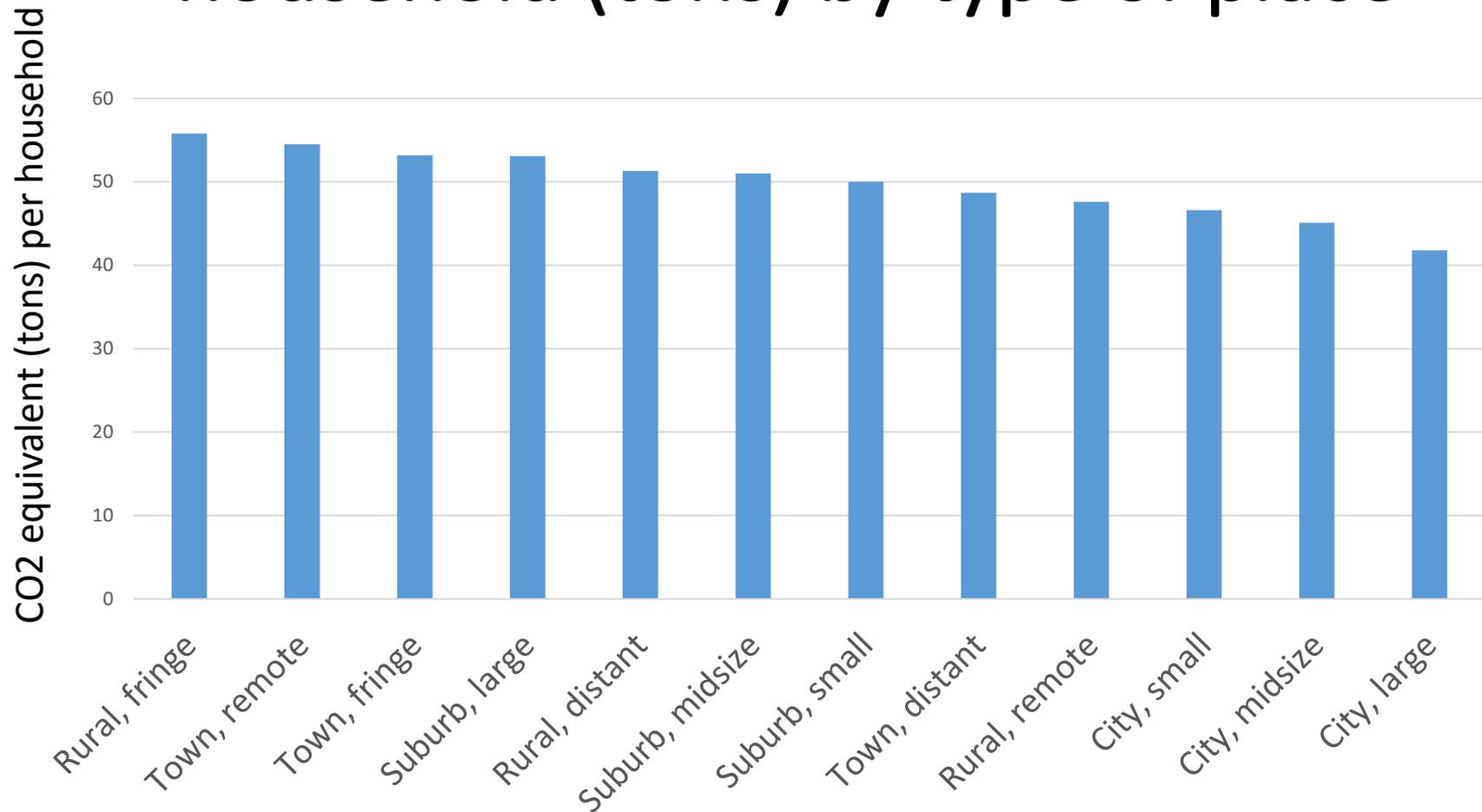


*Figure 2b from Brown et al. (2005): Change in exurban density (defined as 1 house per 1-40 acres)*

Between 1950-2000: The amount of land at urban densities (more than one house per acre) increased from less than 1% to nearly 2% whereas the amount of exurban land (between 1 and 40 acres per house) increased from about 5% to 25%.



# U.S. average carbon footprint per household (tons) by type of place



Source: Jones and Kammen (2014) *Environmental Science and Technology*

# Example #2: Intended and unintended effects of land use regulation

- Comprehensive land-use planning (CP) can help address issues of sprawl, fragmentation, and relieve environmental pressure
  - Ihlanfeldt (2009) found investments in CP lead to higher house prices (after controlling for effect of increased taxes to fund policies) in Florida; for every \$100 increase in per-capita funding for CP, house prices increased by 0.2%
- Open space preservation policies can lead to greater sprawl
  - Lichtenberg (2011) examined open space preservation policies and forest planting requirements in Maryland and found that both resulted in lower density development and increased sprawl
- Differences in regulations can foster more exurban development
  - Wrenn and Irwin (2015) examine differences in subdivision approval times and find that greater delays in more heavily regulated suburban areas increase the probability of less regulated, lower density exurban development

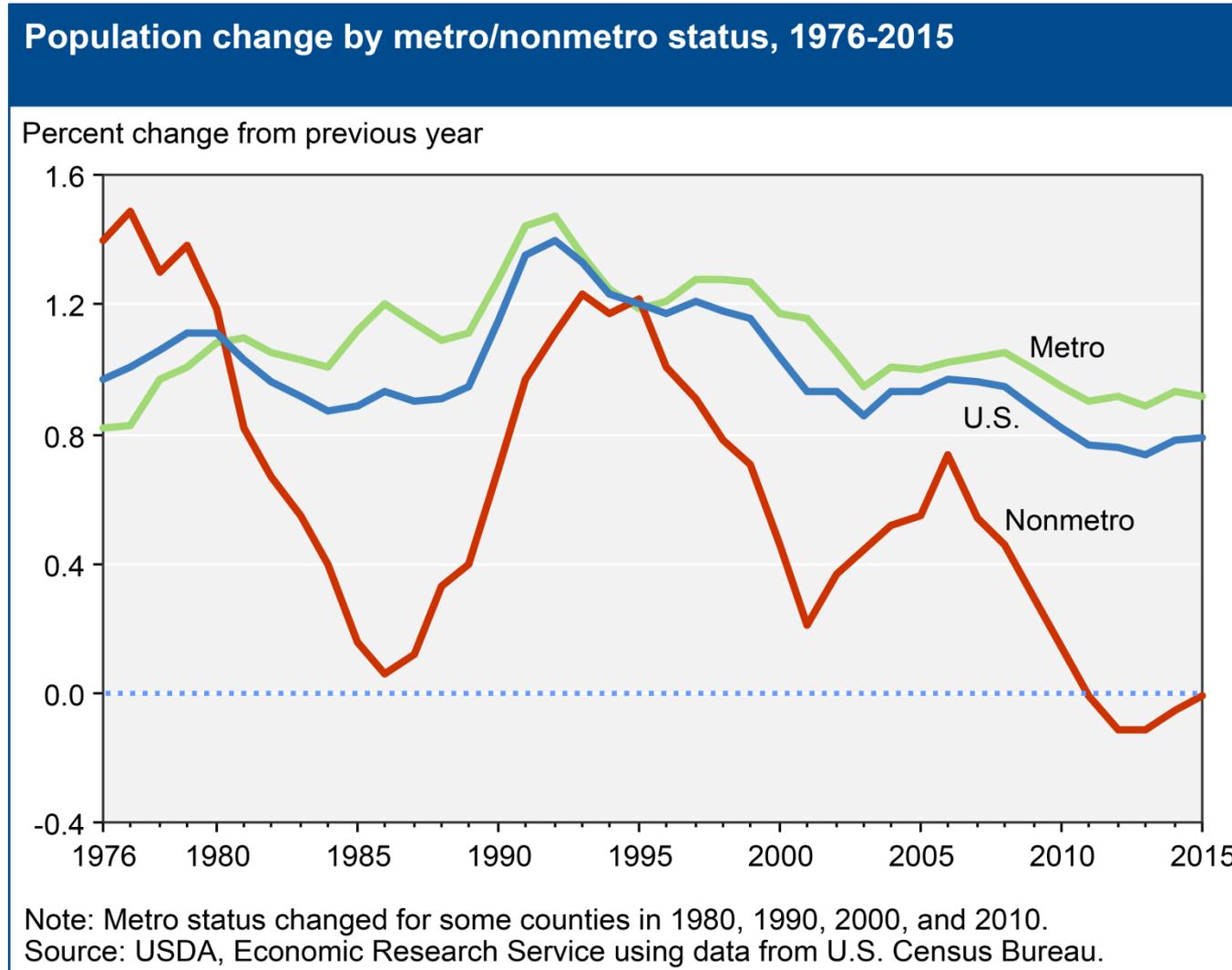
# Example #3: Regional food distribution and retail networks



- Good Natured Family Farms Alliance is a coalition of 150 independent family farms in the Kansas City region working together under a single marketing umbrella
- Urban partnership: Ball's Central Warehouse is key to solving the logistical problems of moving a large volume of local food from the family farms to the urban consumers

How have things  
changed since Great  
Recession?

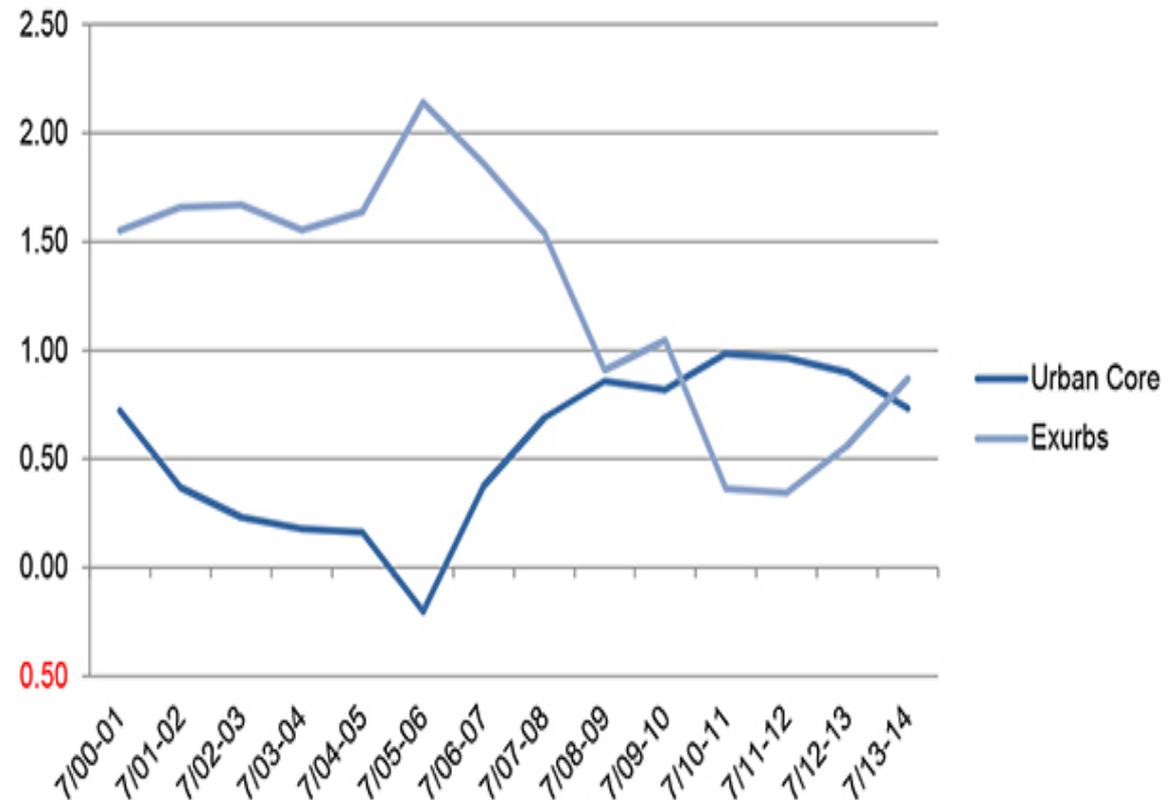
# Pre vs. Post Recession: Population Trends in Metro and Non-Metro Areas



# Pre vs. Post Recession: Urban Core vs. Exurban Population Trends

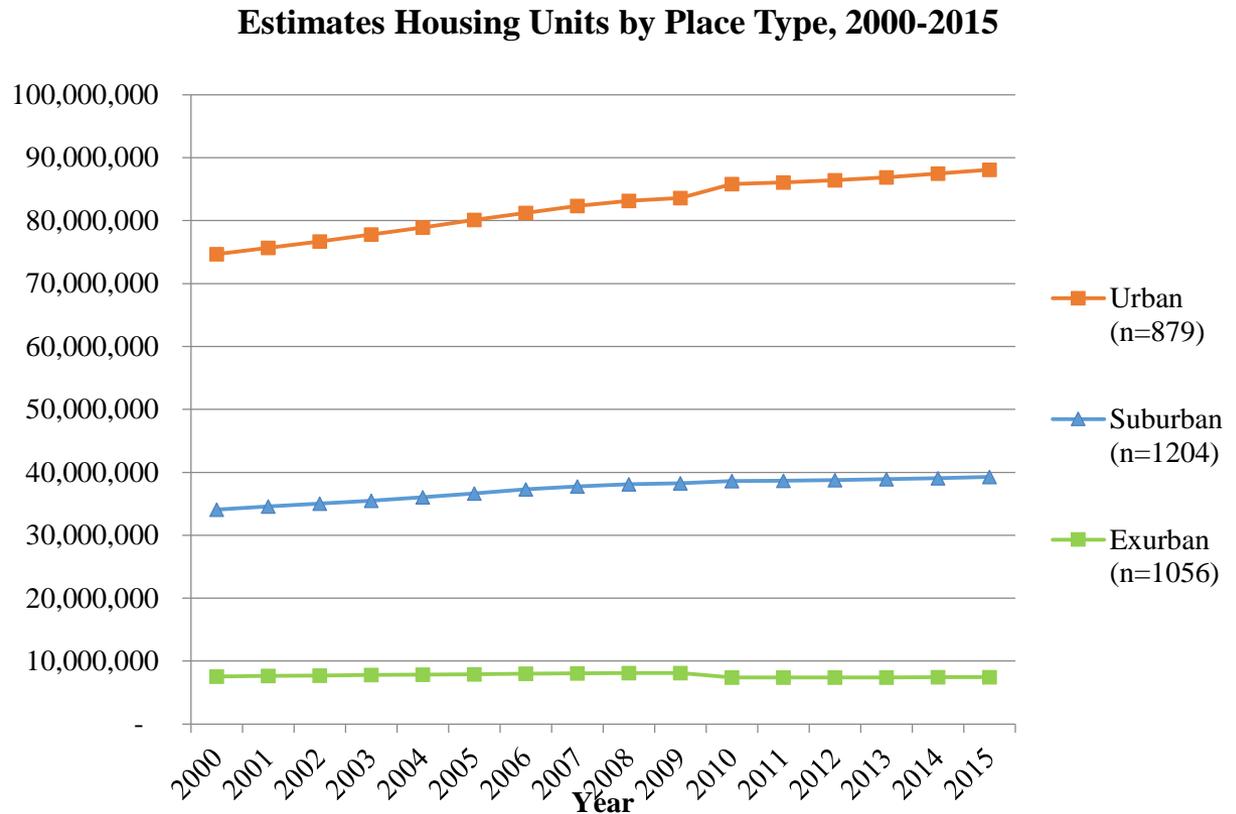
- Urban core population growth rates withstood the recession but have been falling as the economy recovers
- Exurban growth rates steeply declined during the recession, but have recovered

Figure 1: Population Growth Rates, Urban Core and Exurban Counties, 2000-2014



# Pre vs. Post Recession: Trends in Housing Units (2000-2015)

- Urban areas have highest rate of growth
- Suburbs show a smaller growth rate than urban
- Exurban areas declined
- Pre-recession growth rates (2000-2007)
  - Urban (10%)
  - Suburban (11%)
  - Exurban (6%)
- Post Recession growth rates (2010-2015)
  - Urban (3%)
  - Suburban (3%)
  - Exurban (-8%)



Source: US Census Housing Estimates based on USDA Rural-Urban Continuum Codes

# Implications for the future of urban-suburban-exurban-rural growth and interdependence?

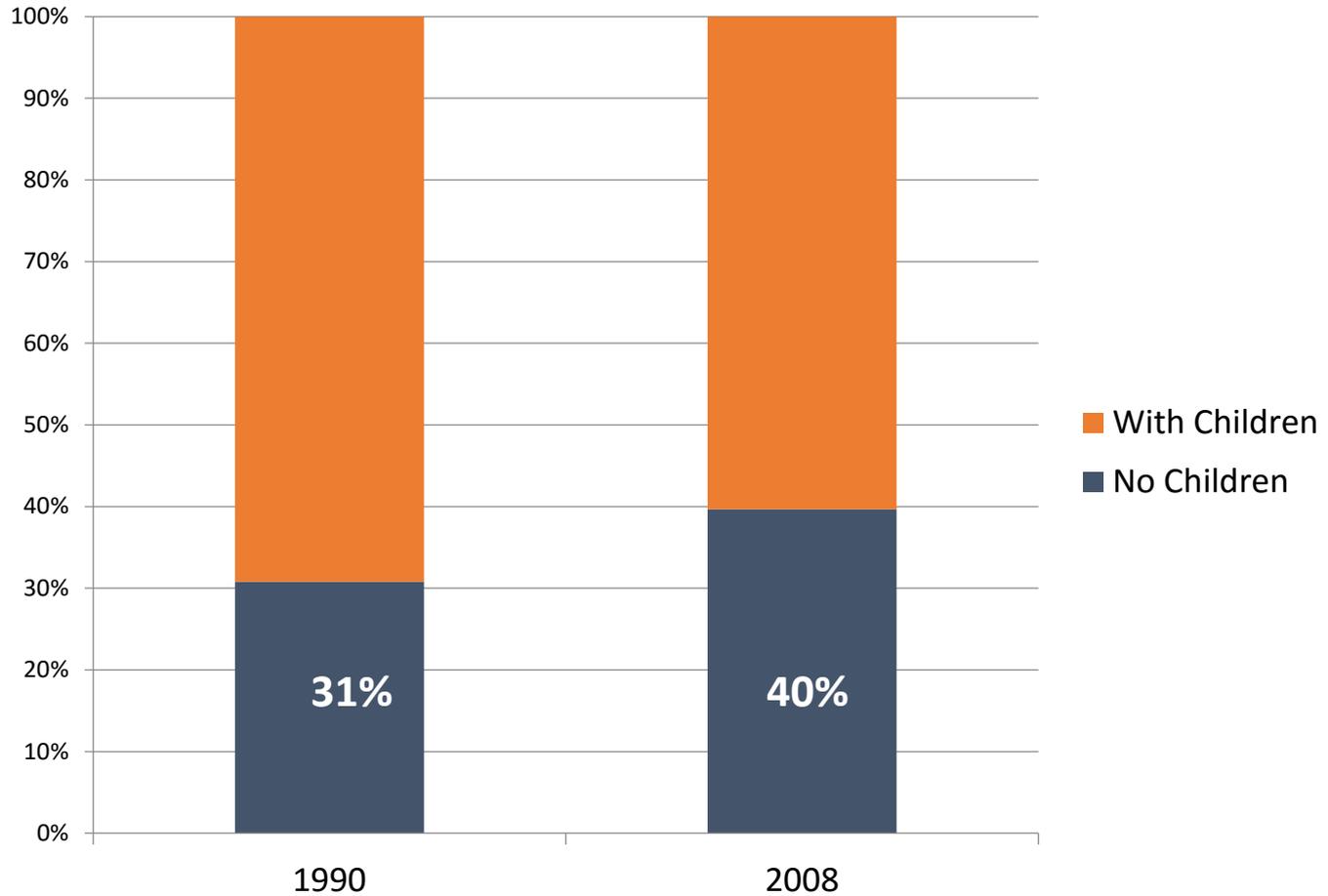
- For example, will growth once again fuel suburban and exurban growth → will “sprawl” return?
- It would be a mistake to base future predictions on past trends...

...we must look beyond trends to see how the causes of urban/suburban/exurban growth and sources of interdependencies are changing

# Fundamental forces

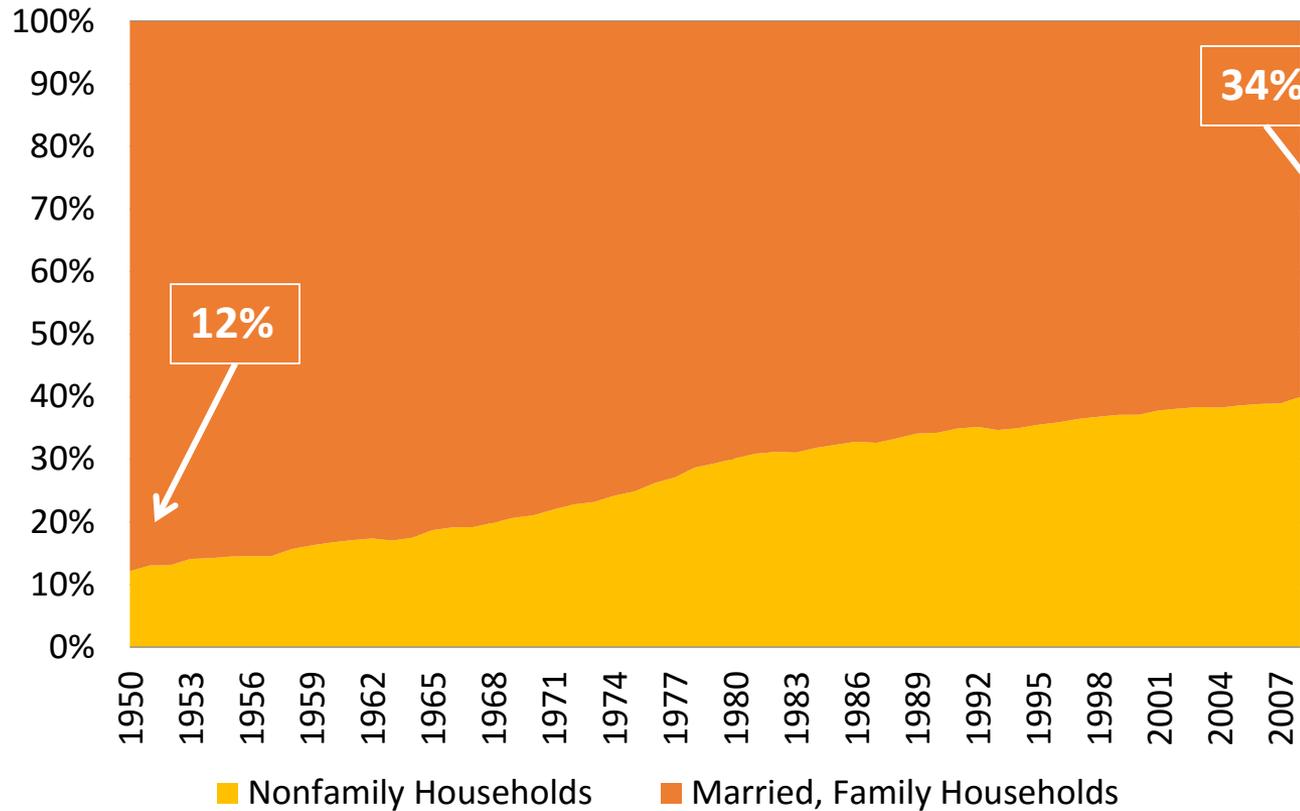
1. Demographic changes
2. Technological changes
3. Market changes
4. Policy changes

# Fewer households with children



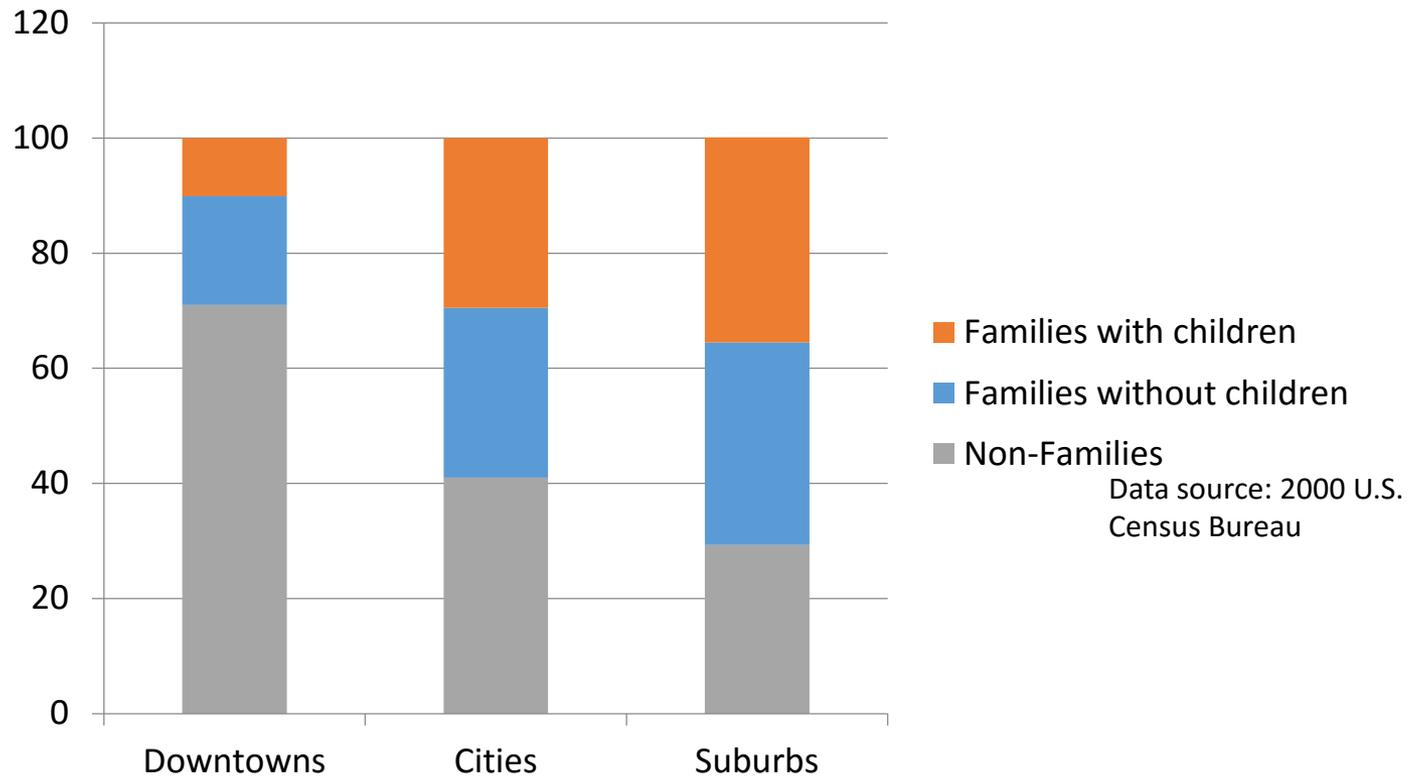
Source: U.S. Census Bureau, Current Population Survey, March 2009

# Greater proportion of non-family households



Source: U.S. Census Bureau, Current Population Survey, March 2009

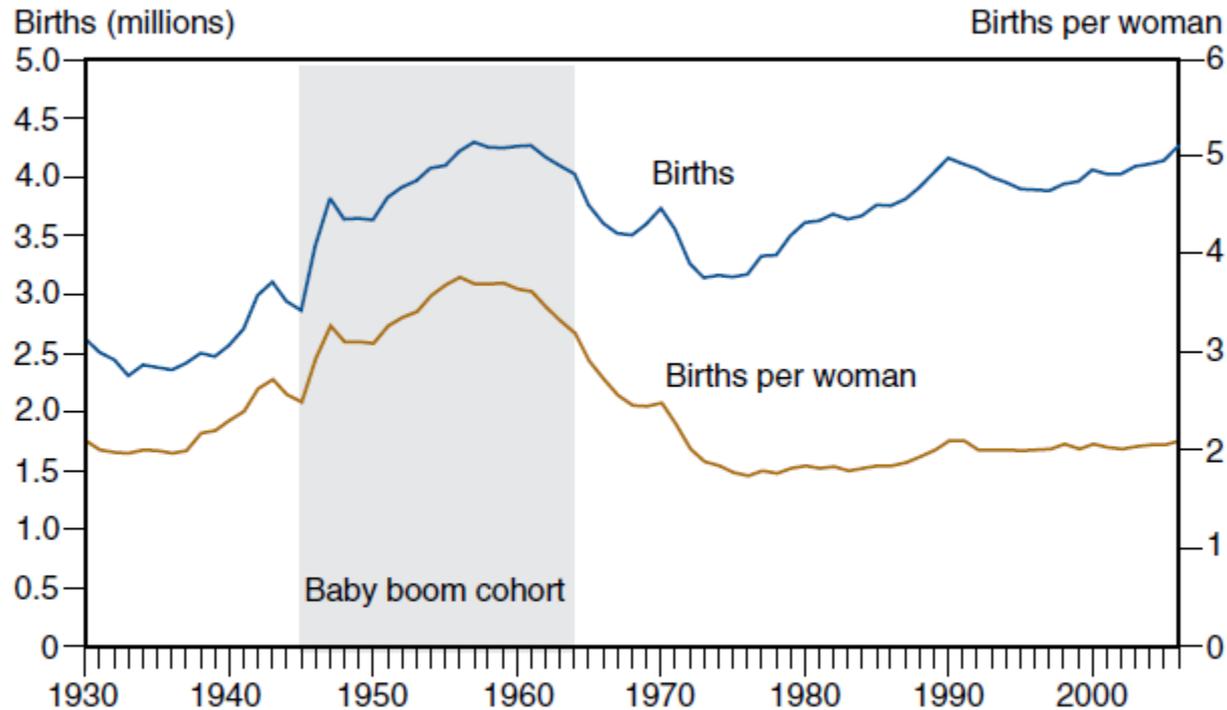
# Implication: Increased demand for urban living



Source: Birch "Who Lives Downtown" from Urban and Suburban America: Evidence from the 2000 Census, Berube, Katz and Lang, eds. (2006)

# Aging baby boomers

Figure 1  
U.S. live births and total fertility rate



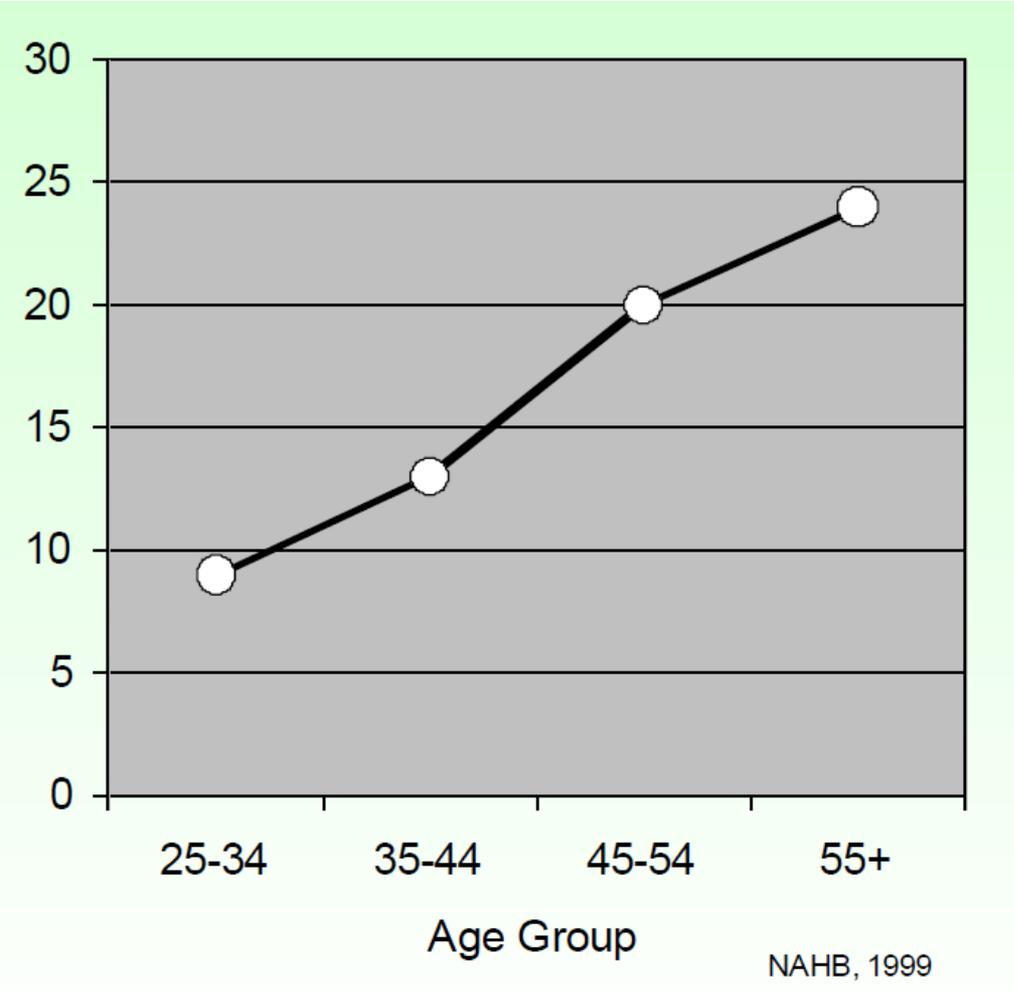
Note: Total fertility rate (births per woman) is the sum of age-specific birth rates for women ages 15-44.

Source: USDA, Economic Research Service, using data from the National Center for Health Statistics.

Source: Cromartie and Nelson (2009) USDA ERS report 79

Some aging baby boomers prefer urban living...

**Percent preferring a town house in the city**

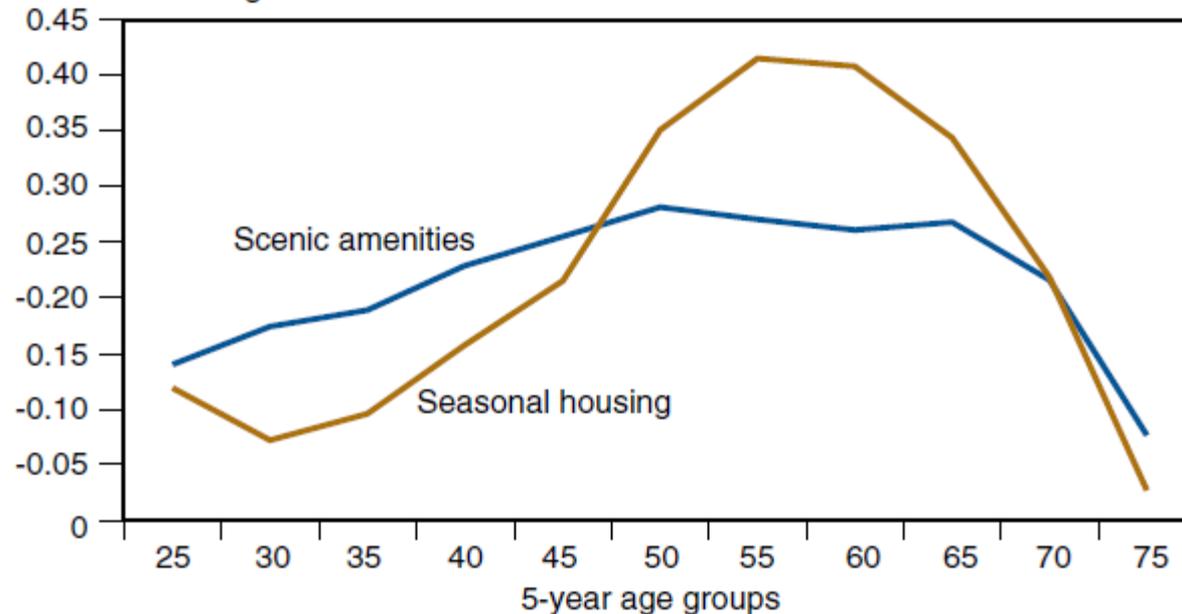


...but others attracted to high-amenity rural areas

Figure 5

**Effects of recreation (as measured by seasonal housing) and scenic amenity factors on net migration by age, 1990-2000**

Standardized regression coefficients



Source: USDA, Economic Research Service, using data from the U.S. Census Bureau.

“Baby boomer migration into rural America driven by natural amenities...”  
From Cromartie and Nelson (2009) USDA ERS report 79

# Fundamental forces

1. Demographic changes
- 2. Technological changes**
3. Market changes
4. Policy changes



Fuel efficiency increasing as manufacturers respond to:

- **Government policies**, ex: National Fuel Efficiency Policy (May 2009)
  - Standard for new cars and light trucks from 25 to 35.5 MPG
  - \$2.4 billion invested in electric/hybrid vehicle technology
- **Consumer demand** driven by long-term higher gas prices
  - EV and Hybrids: small but growing demand

# Implications for outer growth

- Higher gas prices in long run will lessen the demand for outer living...
- But this could be offset by increased fuel efficiency  
→ increased fuel efficiency could lead to increased sprawl



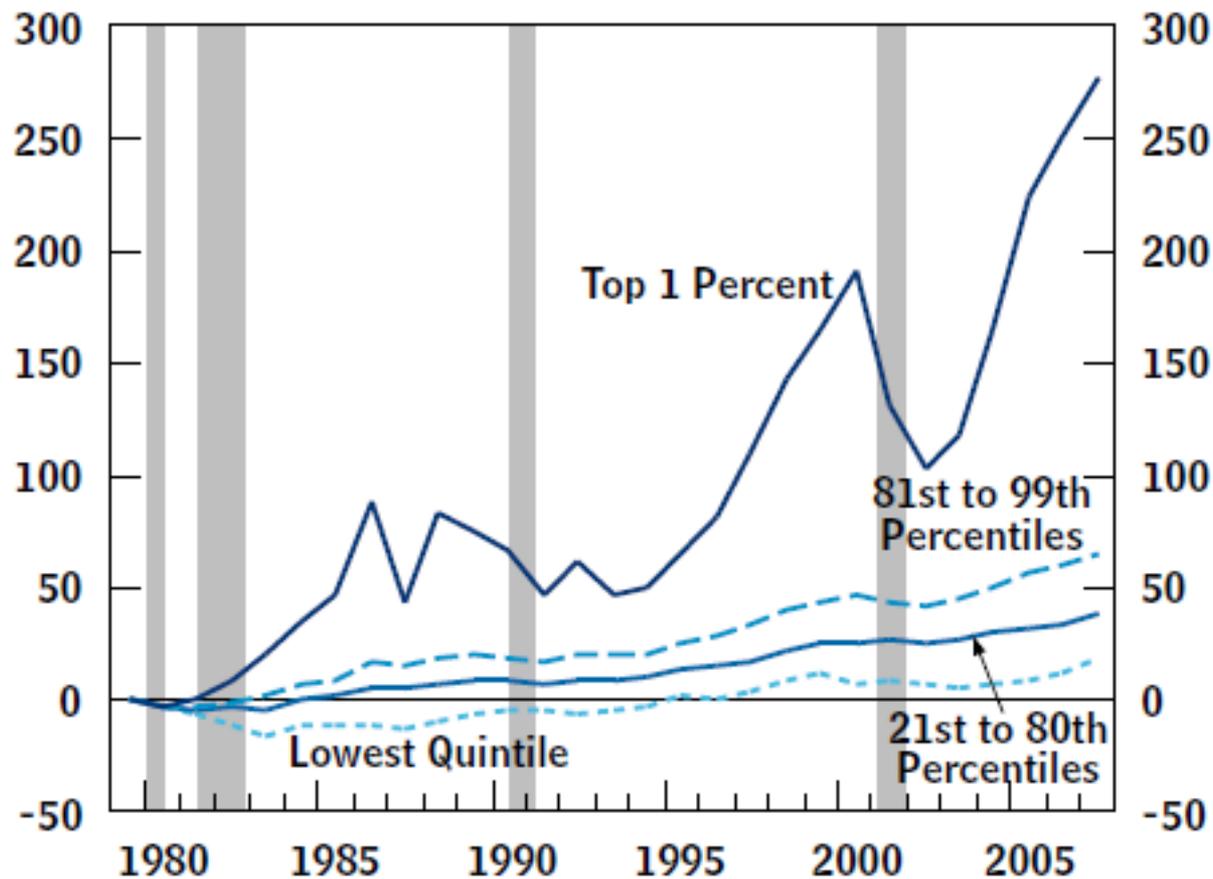
# Information technology (IT)

- Increasing use of IT **reduces the costs of living far away work** by allowing people to work remotely
- Increasing IT use among firms has **fueled globalization of manufacturing and services**
- On the other hand, increasing use of IT among firms appears to have **encouraged clustering of some firms**
- New innovations in IT are likely to do both: facilitate decentralization and encourage clustering → smaller urban clusters distributed across landscape

# Fundamental forces

1. Demographic changes
2. Technological changes
- 3. Market changes**
4. Policy changes

# Percentage Change in Income since 1979 by Income Group in U.S.

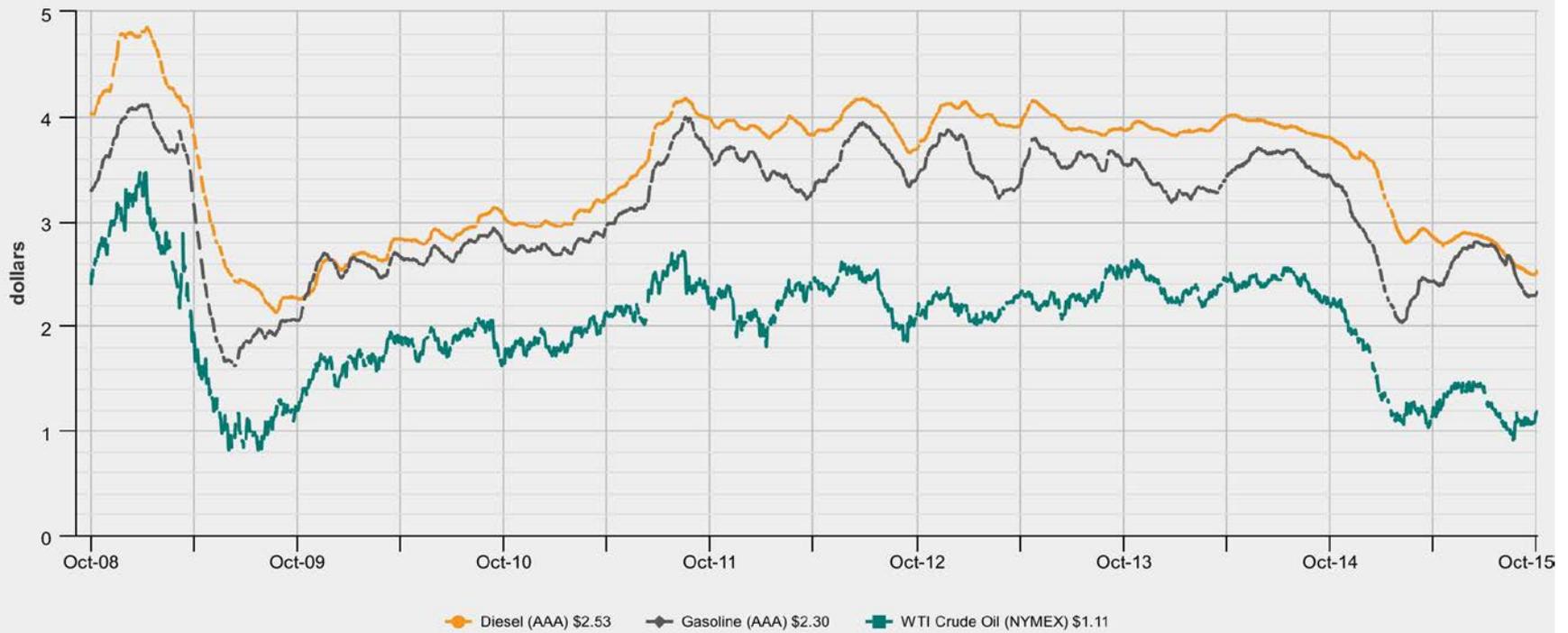


Source: Congressional Budget Office.

# Uncertain fuel costs

## Gasoline, Diesel and Crude Oil Prices

October 14, 2015



Source: NYMEX (WTI crude oil) and AAA (gasoline and diesel)

# Fundamental forces of sprawl

1. Demographic changes
2. Technological changes
3. Market changes
- 4. Policy changes**



# National: Emerging energy policies

- Energy policies
  - Creating markets for clean energy
  - More efficient homes and buildings
- National policy to reduce carbon emissions
  - Clean power plan (August 2015) – new standards for power plants
  - A national carbon market?? (regional markets in Northeast and Western U.S)
- National Fuel Efficiency Policy (2009)
  - Agreement to increase fuel economy to 54.5 miles per gallon for cars and light trucks by 2025

# Changing demands for undeveloped land: Alternative energy production

- Many alternative energy sources (biofuels, solar, wind) use land as a production input
- This will increase demand for undeveloped land and increase the opportunity cost of developing land → slow urban development
- However...
  - ...These affects depend on local and regional markets for undeveloped land and are will not affect all places equally

# Local and regional: Sustainable communities and balanced growth

- Example: NE Ohio Balanced Growth Program “best local land use practices” includes:
  - Identify priority development areas
  - Identify priority conservation areas
  - Plan for open space preservation
  - Plan for transfer of development rights
  - Plan for agricultural protection

# Implications of new policies

- Energy policy that targets carbon emissions will increase the cost of refining gasoline producing electricity with nonrenewables
  - Higher electricity and gas prices for consumers will reduce demand for large houses and car travel
  - However, advances in fuel efficiency may ameliorate the effects of rising gas prices
- More stringent land use controls may lower the supply of developable land in outer areas and slow growth
  - However this depends on how the policies are implemented , e.g., lack of coordination can result in more sprawl

# In conclusion: the future of urban-suburban-exurban-rural growth and interdependence?

	Promote outward growth	Promote urban densification
<b>Demographics</b>	For some households: growing pull of natural amenities in rural areas	Increasing diversity of households and demand for urban living
<b>Technology</b>	Continued IT advances and greater fuel efficiency	Some alternative forms of transportation
<b>Markets</b>	Renewed economic growth	Stagnate economy and tighter credit markets; oversupply of housing; long-term increases in gas prices; increasing demands for undeveloped land
<b>Policies</b>		Increased lending regulations; alternative energy policies; increased land use regulations