

URBAN PLANNING AND ENVIRONMENT



The Social Impacts of Urban Containment

Arthur C. Nelson, Casey J. Dawkins
and Thomas W. Sanchez

Megapolitan America

Defining and Applying a New Geography

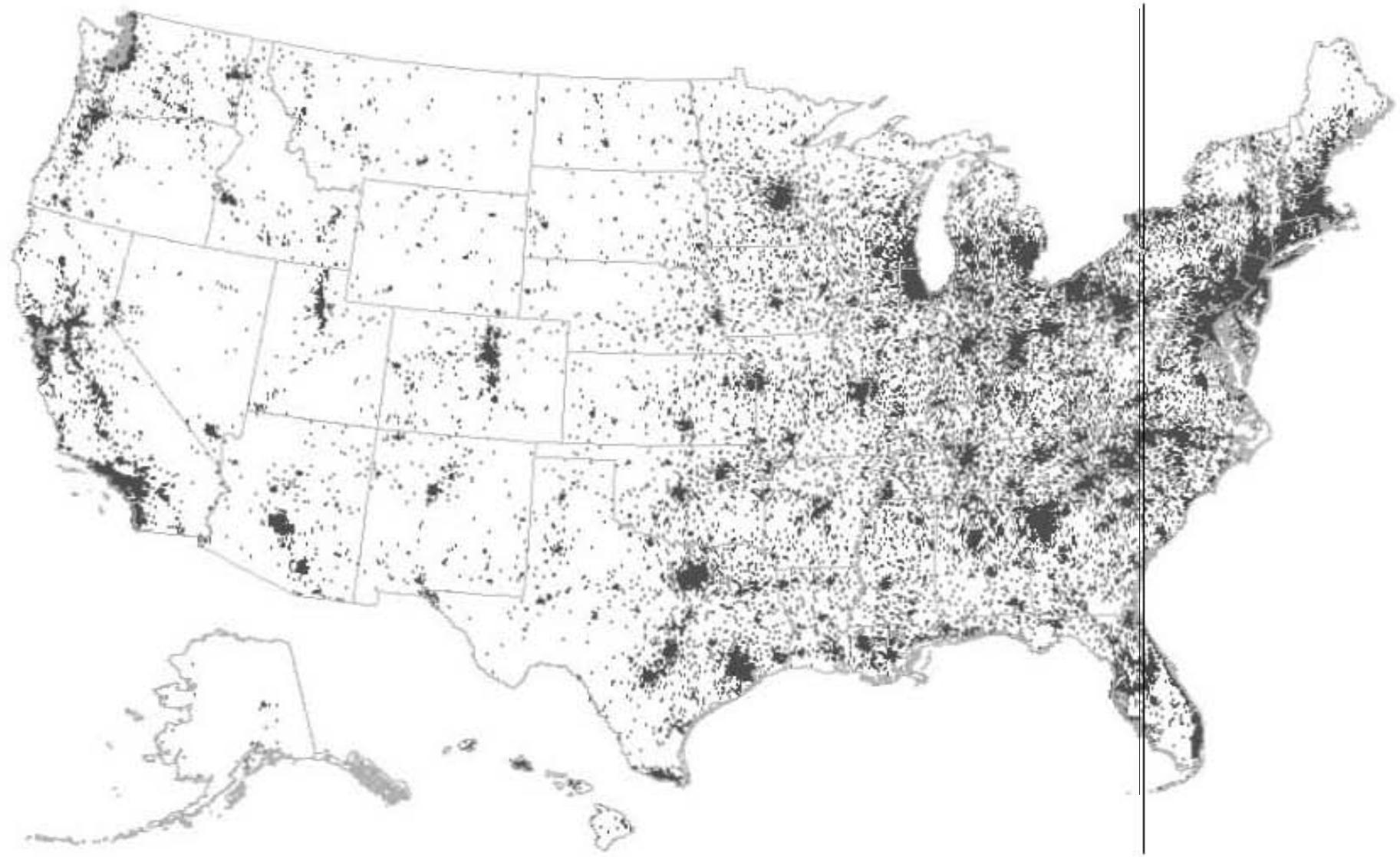
**Megacities, Megaregions
and Spatial Planning**

Georgia Tech – Atlanta, Georgia
June 28, 2007

**Arthur C. Nelson, Ph.D., FAICP
Robert Lang, Ph.D.**

Metropolitan Institute at Virginia Tech

US Population Settlement 2043



Source: USA Today, "Where will everybody live?", Cover story concept by Arthur C. Nelson, October 27-29, 2006

Jeann Gottmann's Legacy

Megalopolis 1961

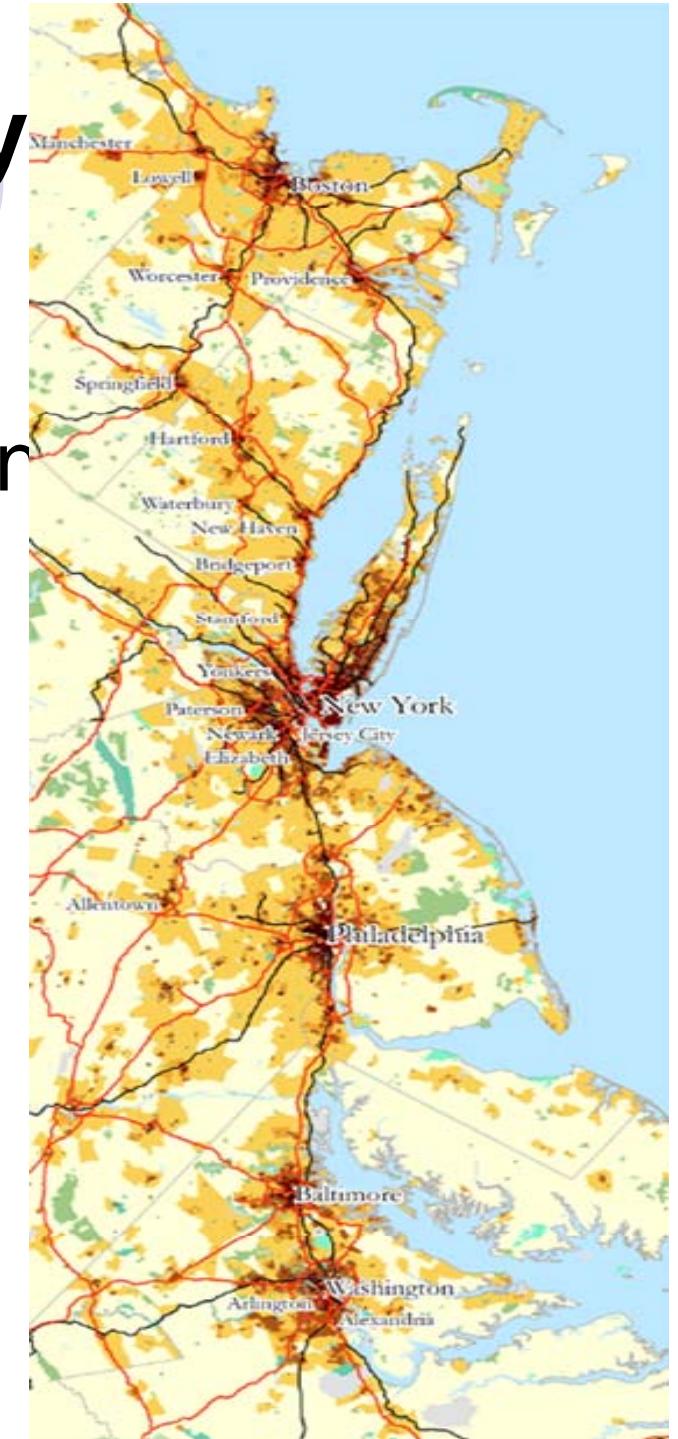
Presented new way of thinking on metropolitan conurbations.

Largely ignored conceptually for 40+ years.

Concept rekindled by Bob Yaro and Armando Carbonell.

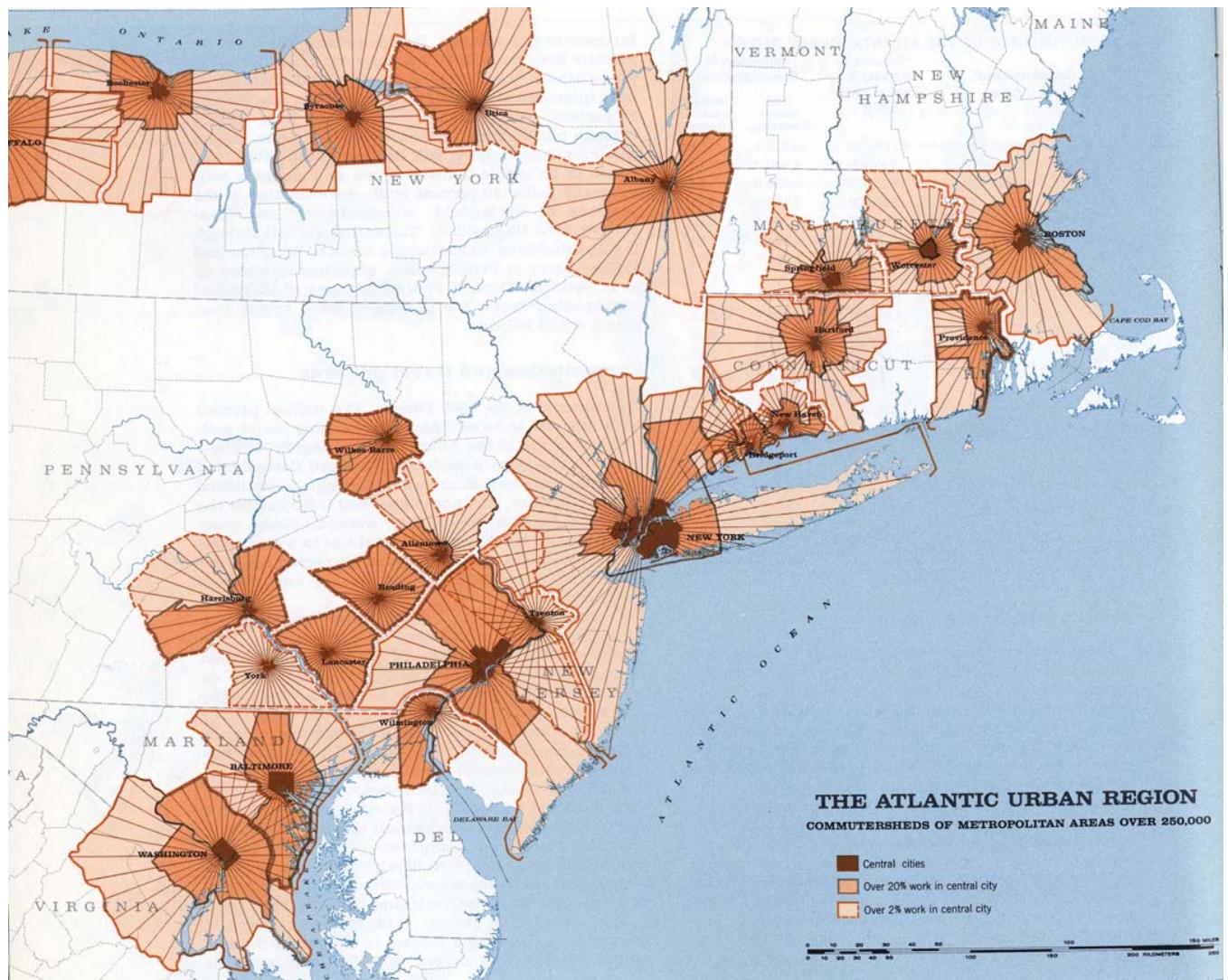
Leadership by Penn with academics across US.

New academic vigor, and rigor.

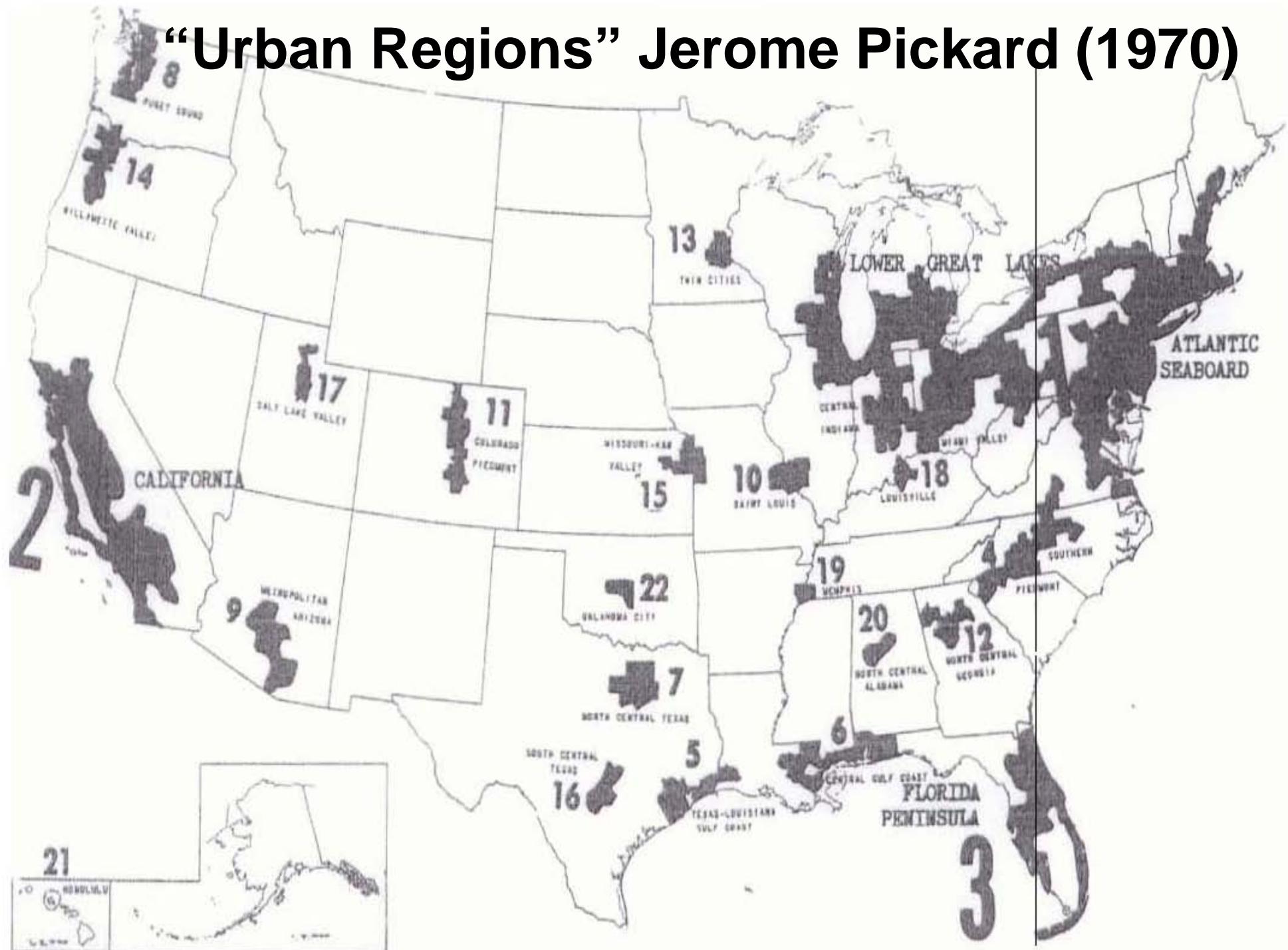




1960s' RPA Northeast Corridor



“Urban Regions” Jerome Pickard (1970)



Pickard's 1970 Urban Region Criteria

- At least 1 Million People Live in an Urban Region
- Urban Region's Maintained Three Times the Population Density of the 1970 US Average Density
- The Units are Minor Civil Divisions, Which Allows for Sub-County Analysis

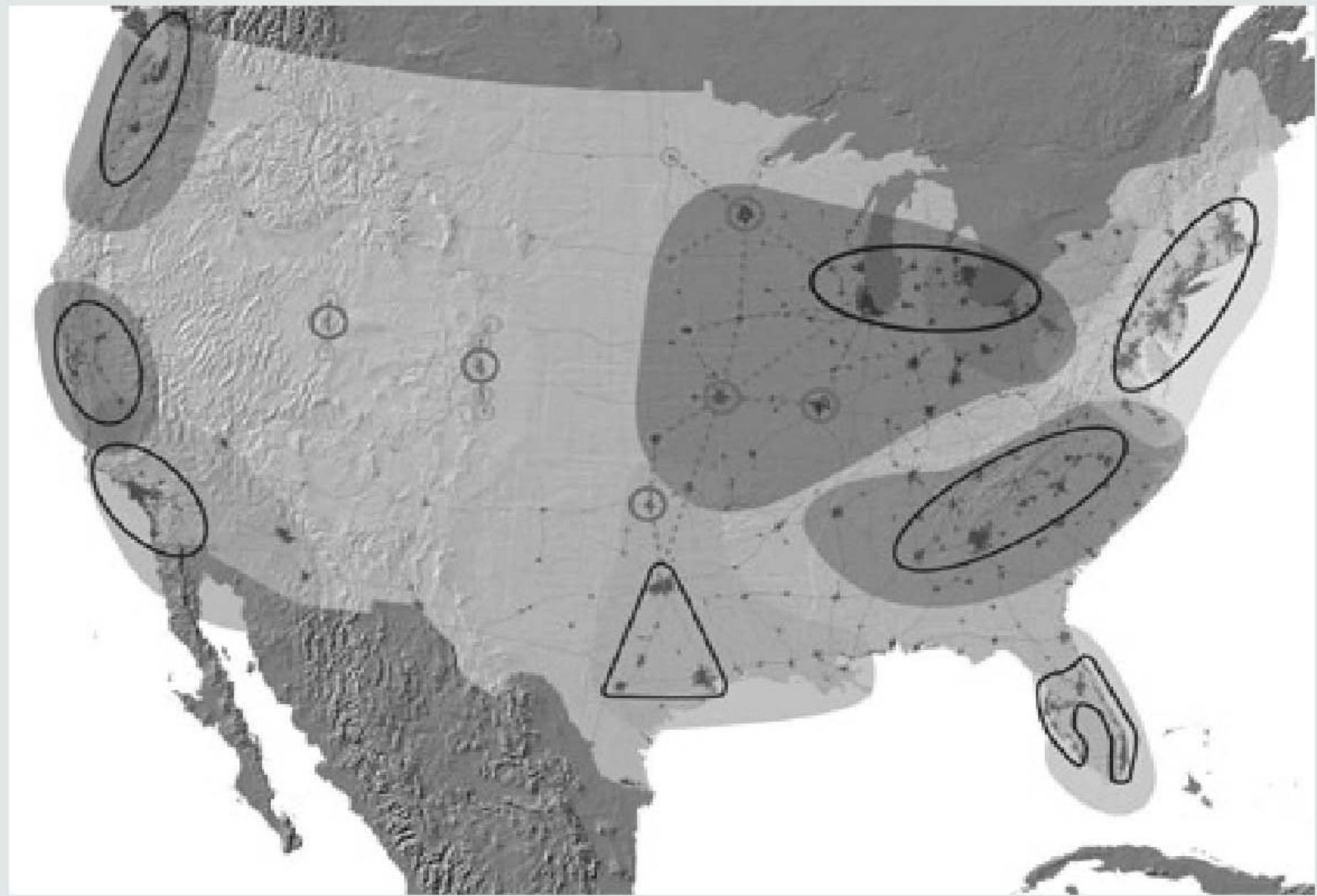
Population of Future Urban Regions of the United States

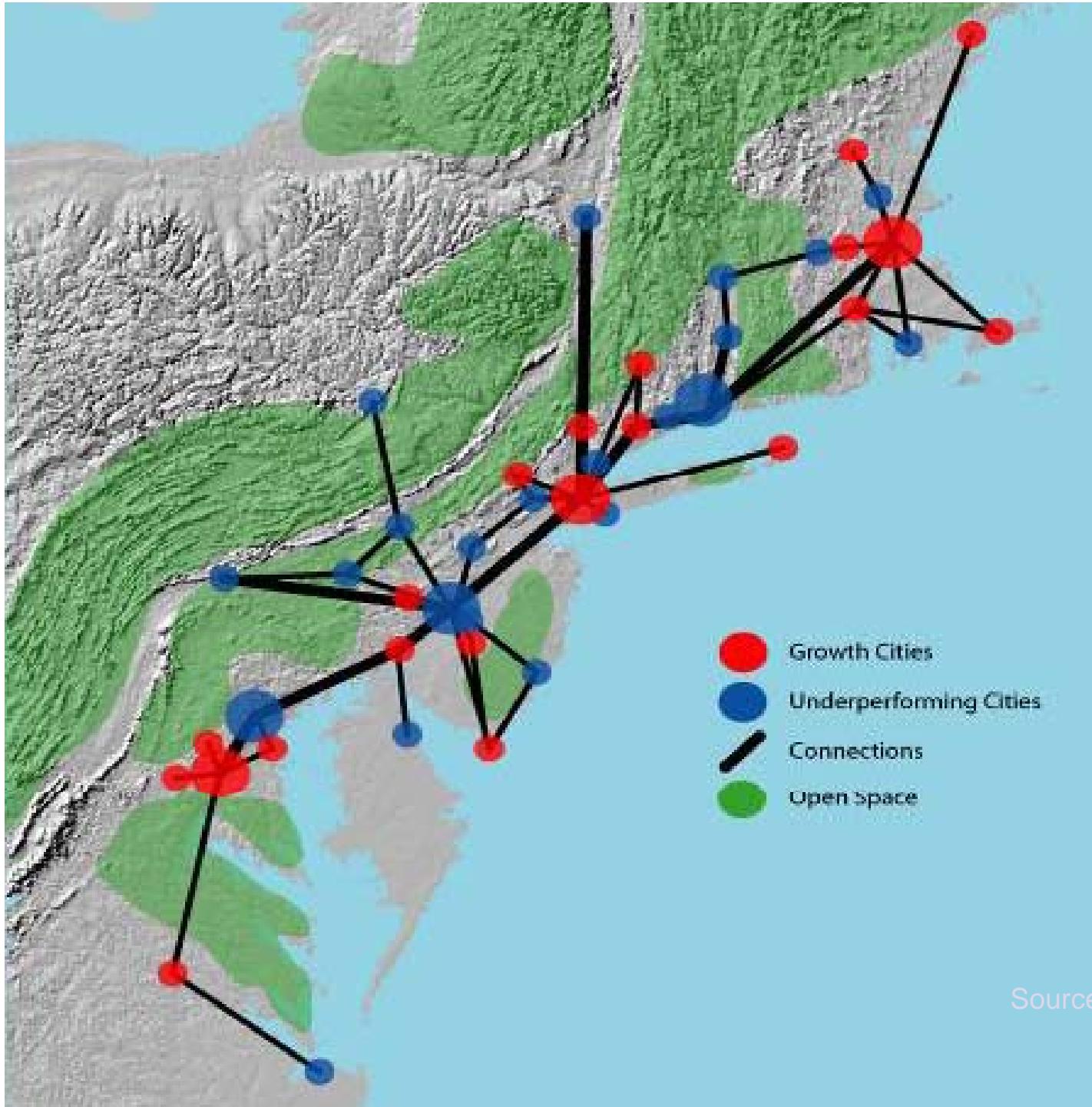
| Urban Region | Population in Millions | |
|--|------------------------|------------------|
| | 1970 (estimated) | 2000 (projected) |
| 1. Metropolitan Belt | 86.2 | 126.5 |
| Atlantic Seaboard | 45.8 | 67.4 |
| Lower Great Lakes | 40.4 | 59.1 |
| 2. California | 19.9 | 42.5 |
| 3. Peninsular Florida | 5.7 | 13.0 |
| 4. Southern Piedmont | 3.3 | 5.2 |
| 5. Texas-Louisiana Gulf Coast | 2.5 | 4.9 |
| 6. Central Gulf Coast | 2.7 | 4.7 |
| 7. North Central Texas | 2.2 | 4.2 |
| 8. Puget Sound | 2.1 | 3.8 |
| 9. Metropolitan Arizona | 1.3 | 3.5 |
| 10. Saint Louis | 2.4 | 3.5 |
| 11. Colorado Piedmont | 1.6 | 3.2 |
| 12. North Central Georgia | 1.8 | 3.1 |
| 13. Twin Cities | 1.8 | 2.5 |
| 14. Willamette Valley | 1.4 | 2.4 |
| 15. Missouri-Kaw Valley | 1.5 | 2.3 |
| 16. South Central Texas | 1.2 | 2.2 |
| 17. Salt Lake Valley | 0.8 | 1.6 |
| 18. Louisville | 0.9 | 1.5 |
| 19. Memphis | 0.8 | 1.4 |
| 20. North Central Alabama | 0.8 | 1.3 |
| 21. Honolulu (Oahu) | 0.7 | 1.2 |
| 22. Oklahoma City | 0.6 | 1.2 |
| Total (U.S.) | 142.2 | 235.7 |
| % of total U.S. population in urban regions | 69.3% | 76.8% |

Pickard's
2000
Population
Estimates

FIGURE 2

Emerging Megalopolitan Areas in the United States

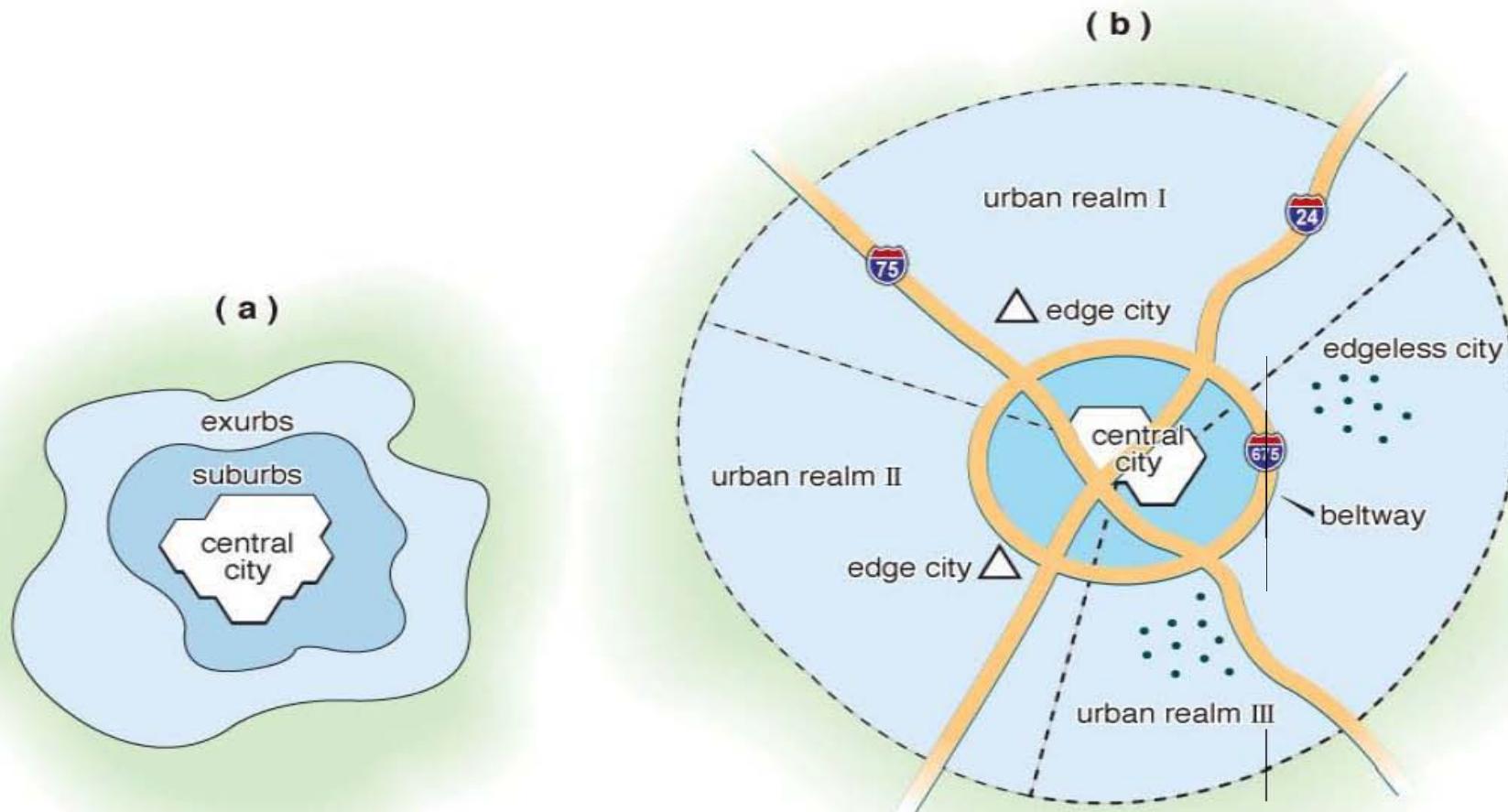




Hot and Cold Links Between Cities

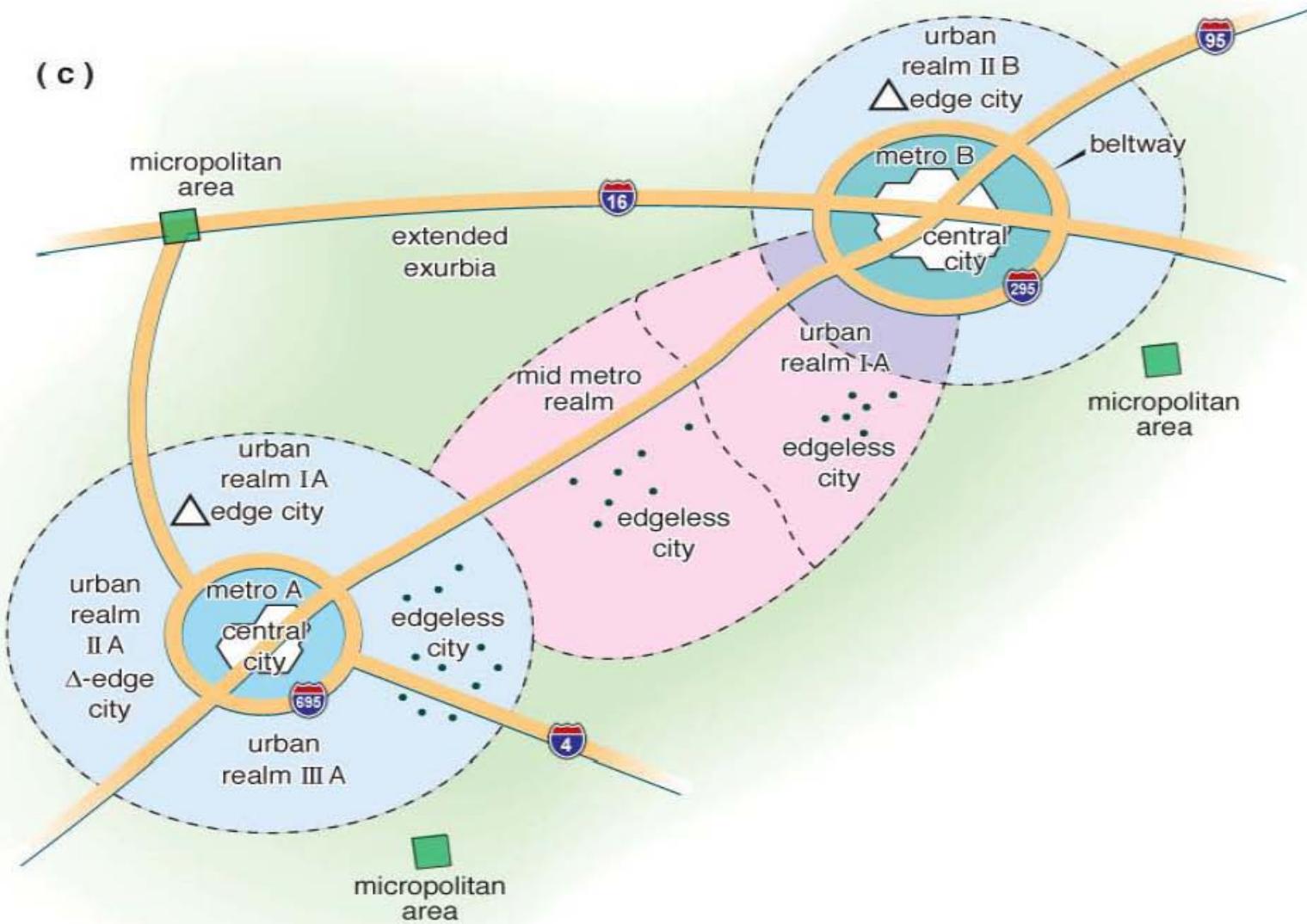
Source: University of Pennsylvania

20th Century Metropolitan Form

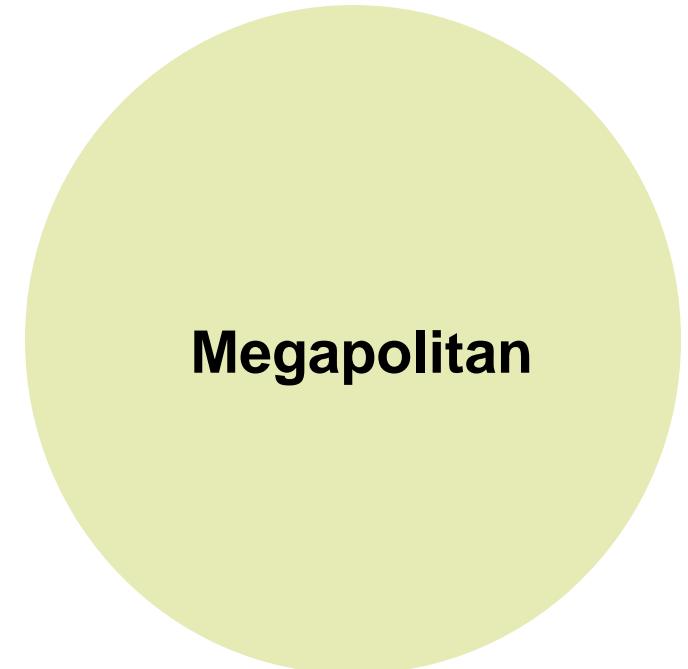
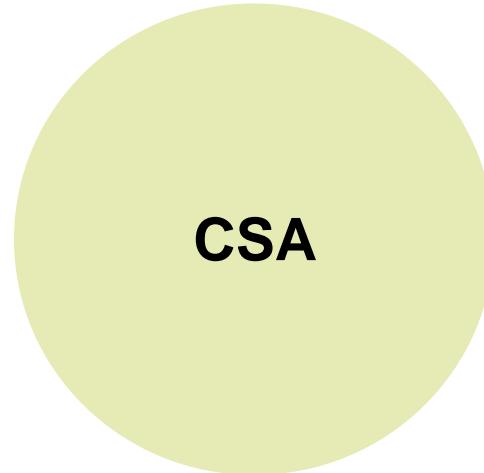
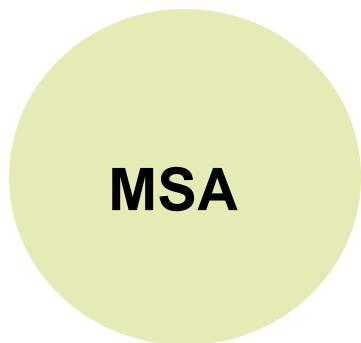


21st Century Megapolitan Form

(c)



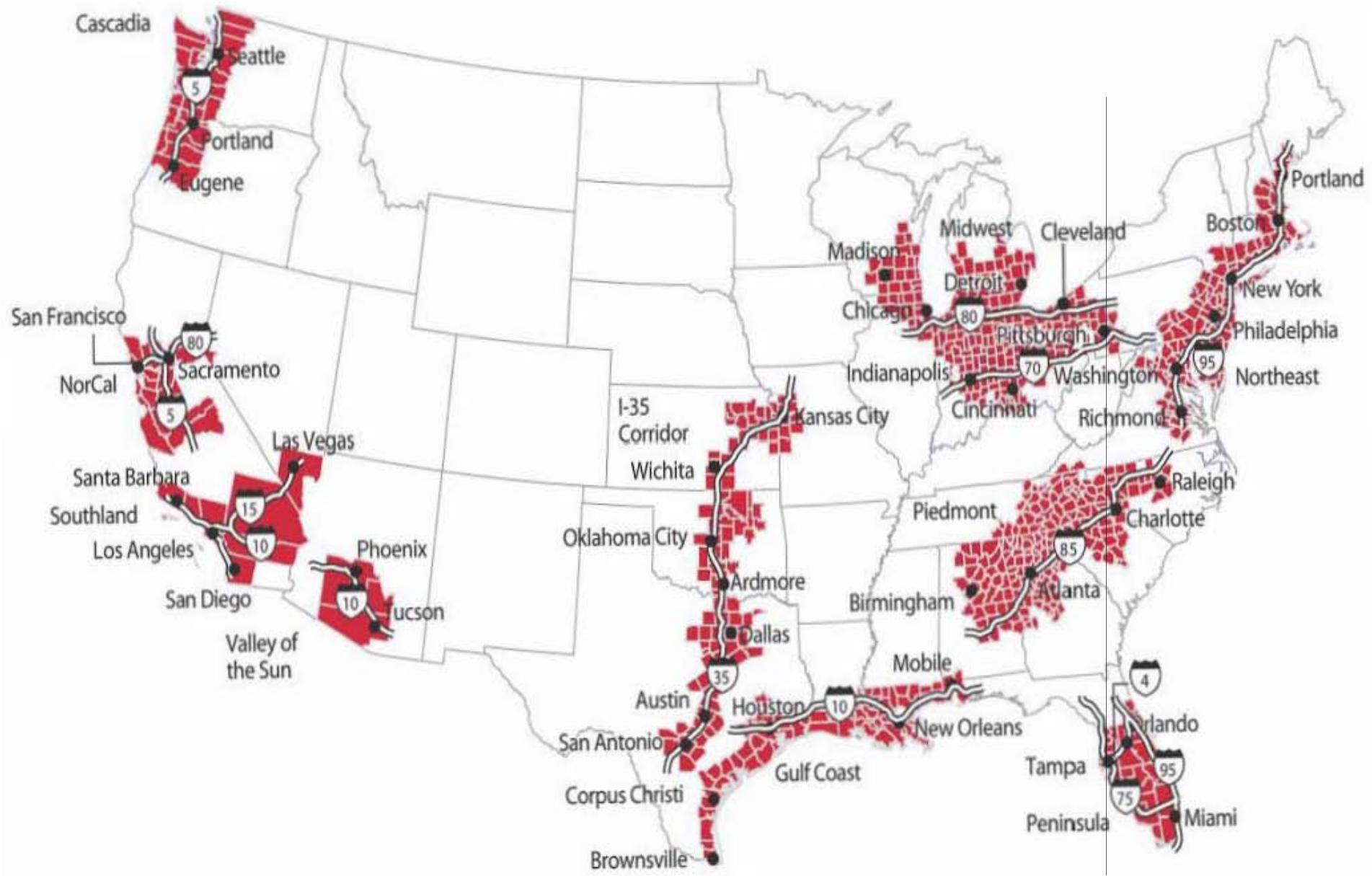
Lang-Nelson Metropolitan Hierarchy



Lang-Nelson Megapolitan Models

- Original 2005 Megapolitan Model Identifies Contiguous Metro and Micropolitan Areas that are Linked By Business Connectivity, Transportation, and Environment.
- New 2006 Model Works on a Modified Version on Census Methods that Track Commuting. It is Very Close to the Census's Combined Statistical Area Criteria. The Model Supplements the 2005 Geography.

Lang-Nelson Original 2005 Megapolitans



Megapolitans in The News

USA Today July 2005

6A · MONDAY JULY 11, 2005 · USA TODAY

Population boom spawns super cities

Megapolitan areas are on the march thanks to a global economy and sprawling development

ARDMORE, Okla. Football rivalries between Oklahoma and Texas are legendary. And Oklahomans joke that they're a lot like Texans — without the arrogance.

So why are Ardmore's promotional brochures and website proudly proclaiming: "Dallas is coming our way?"

Because in a nation where the population is booming, development is sprawling and the economy is globalizing, the most distant places are becoming the closest of neighbors.

Big cities are bumping into small towns, stretching into rural areas, gobbling up farmland and merging into big urban blobs: megapolitan areas.

Sports rivalries aside, the world is no longer about towns, cities, counties, metropolitan areas or even states. These traditional boundaries are being replaced more and more by a booming nation of 295 million brains for another 125 million people by 2050.

If current development patterns continue, millions more will settle around metropolitan areas, along interstate highways and near major airports, creating sprawling urban sprawl areas. Tinkered by common culture, economy, geography and ecology.

By Haya El Nasser
USA TODAY



Construction boom: Oklahoma developer William Meadham at the job site of one of the houses he's building in Ardmore.

Construction boom: Oklahoma developer William Meadham at the job site of one of the houses he's building in Ardmore.

Researchers at University of Pennsylvania's Department of City and Regional Planning predict

Metro areas growing into monster clusters

Metropolitan areas will have populations of at least 10 million.

| | 2000 Population | 2005 Population | Key qualities of each |
|----------------------|-----------------|-----------------|-----------------------|
| Metropolitan area | 25 | 75 | Canada |
| Signature metro area | Seattle | 110 | West Coast |
| Signature industry | High-tech | 125 | Valley of the Sun |
| Political leaning | Democratic | 140 | Midwest |
| | | 155 | East Coast |
| | | 175 | Pacific Northwest |
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Megapolitans in The News

Business 2.0
November '05

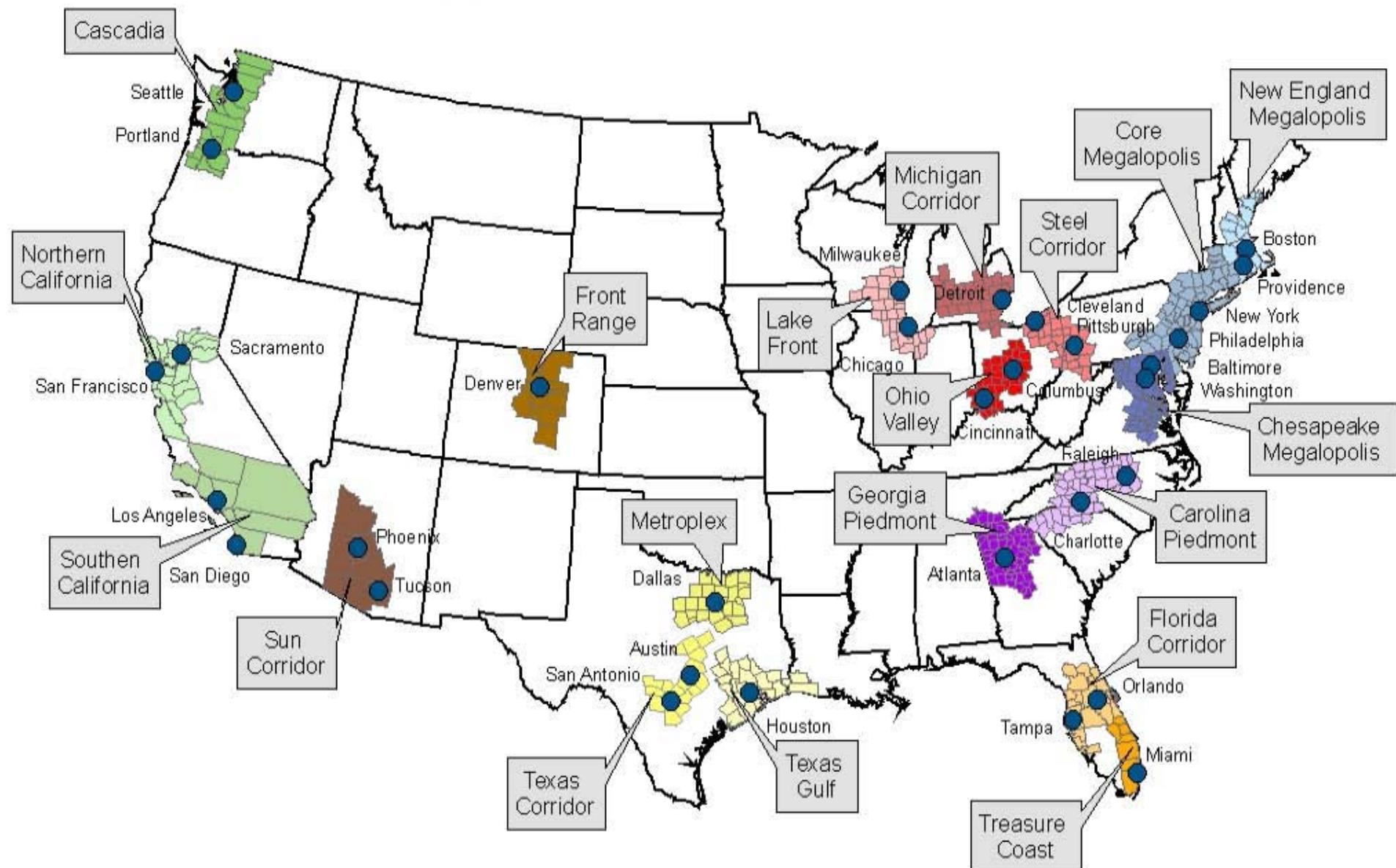


Business 2.0 November '05

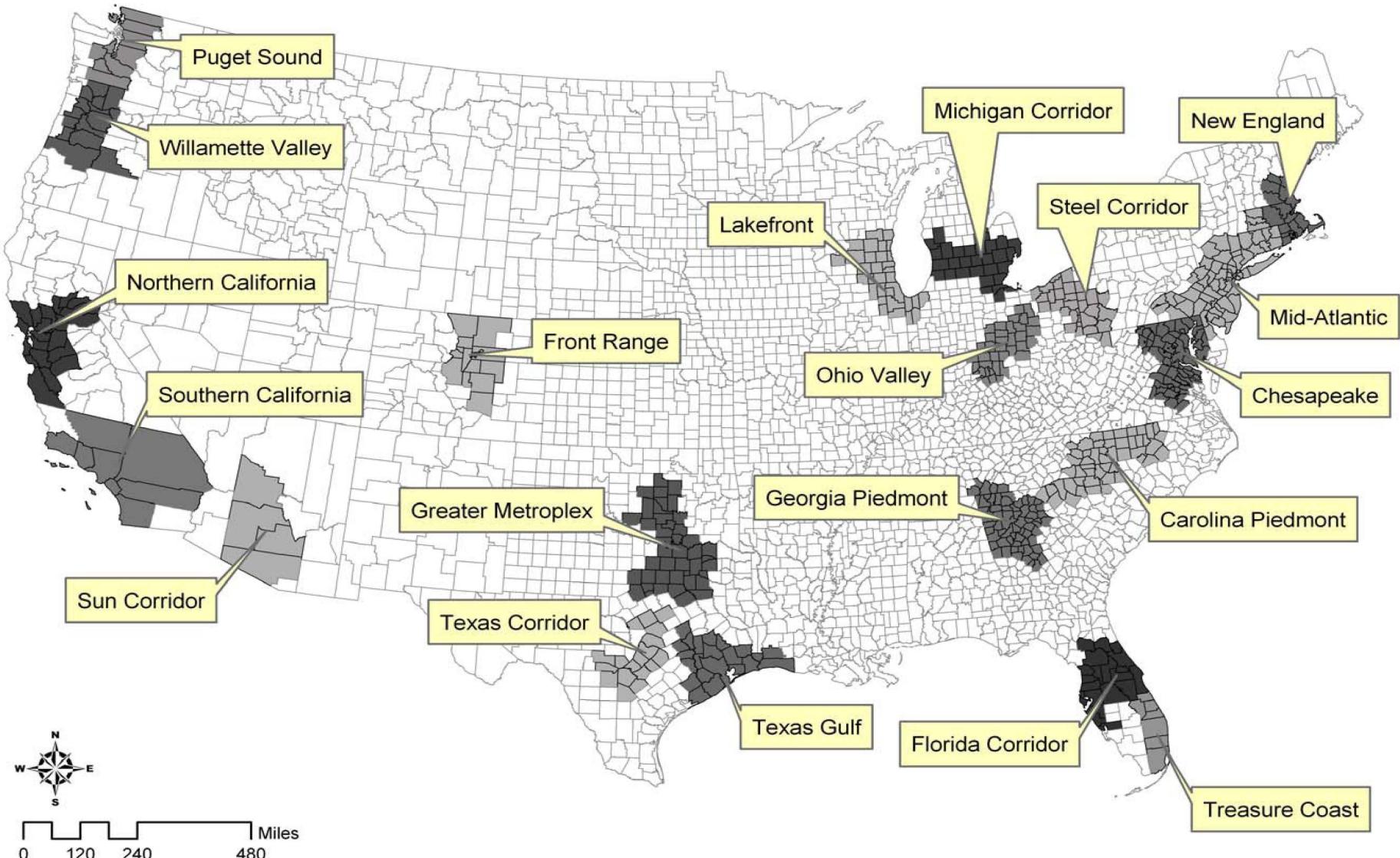
Megapolitan Centerfold



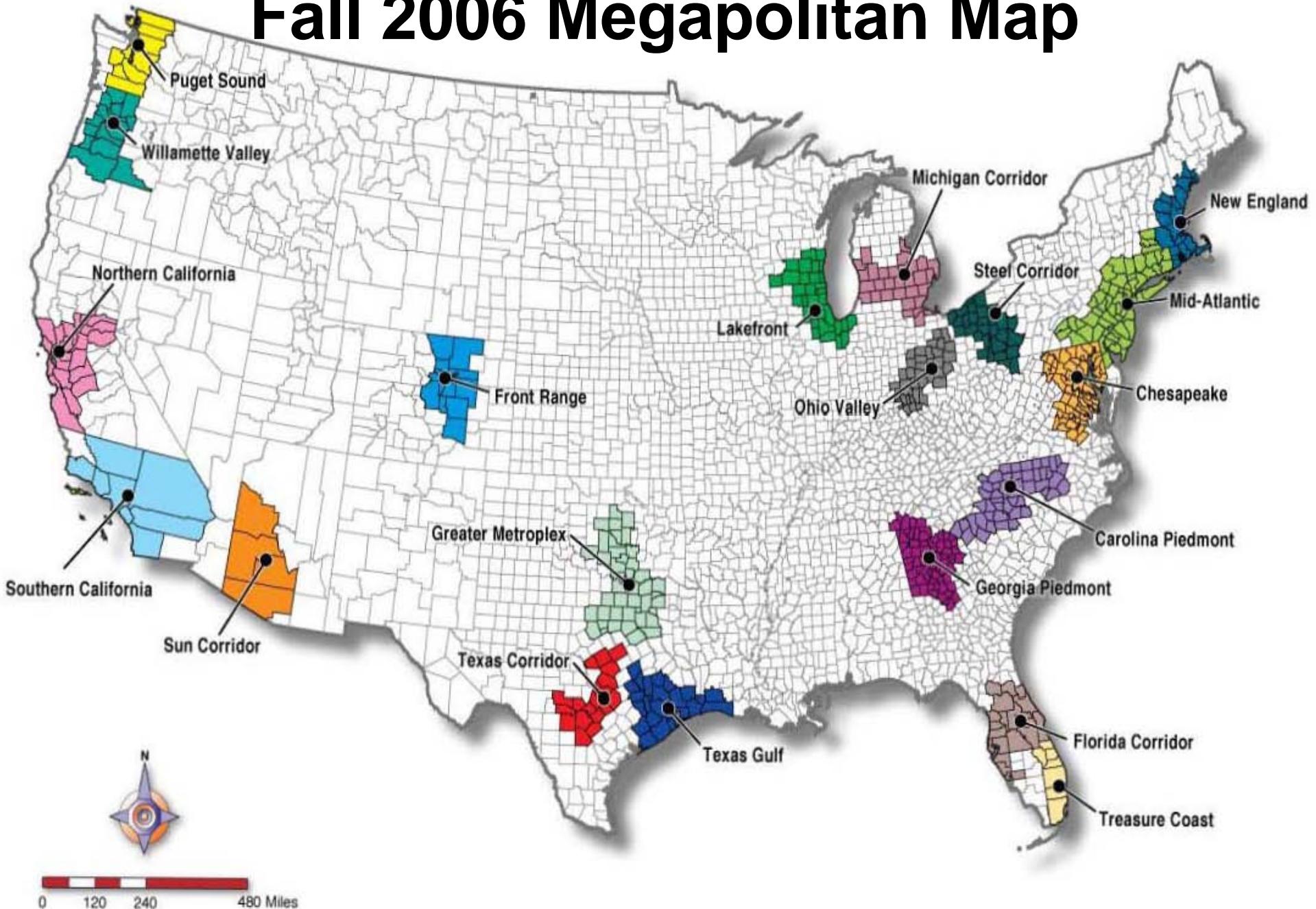
Megalopolitan America - September 2006



Megapolitan America



Fall 2006 Megapolitan Map



2006 Metropolitan Hierarchy

| Types | Descriptions | Examples |
|--|---|---|
| Metropolitan Statistical Area | An “urbanized area” or “principal city” with at least 50,000 people plus surrounding counties with a 25% “Employment Interchange Measure” (EIM) in 2000 | Pittsburgh, Denver |
| Combined Statistical Area | Two or more adjacent micro and metropolitan areas that have an EIM of at least 15% in 2000 | Washington/Baltimore, Cleveland/Akron |
| Megapolitan Area—Defined by Virginia Tech Metropolitan Institute | Two or more metropolitan areas with anchor principal cities between 50 and 200 miles apart that will have an EIM of 15% by 2040 based on projection | Sun Corridor (Phoenix/Tucson), Northern California (San Francisco/Sacramento) |
| Mega-Region Defined by RPA and Lincoln Institute | Large, connected networks of metropolitan areas that maintain environmental, cultural, and functional linkages | Piedmont, Texas Triangle |

U.S. and China Megapolitans

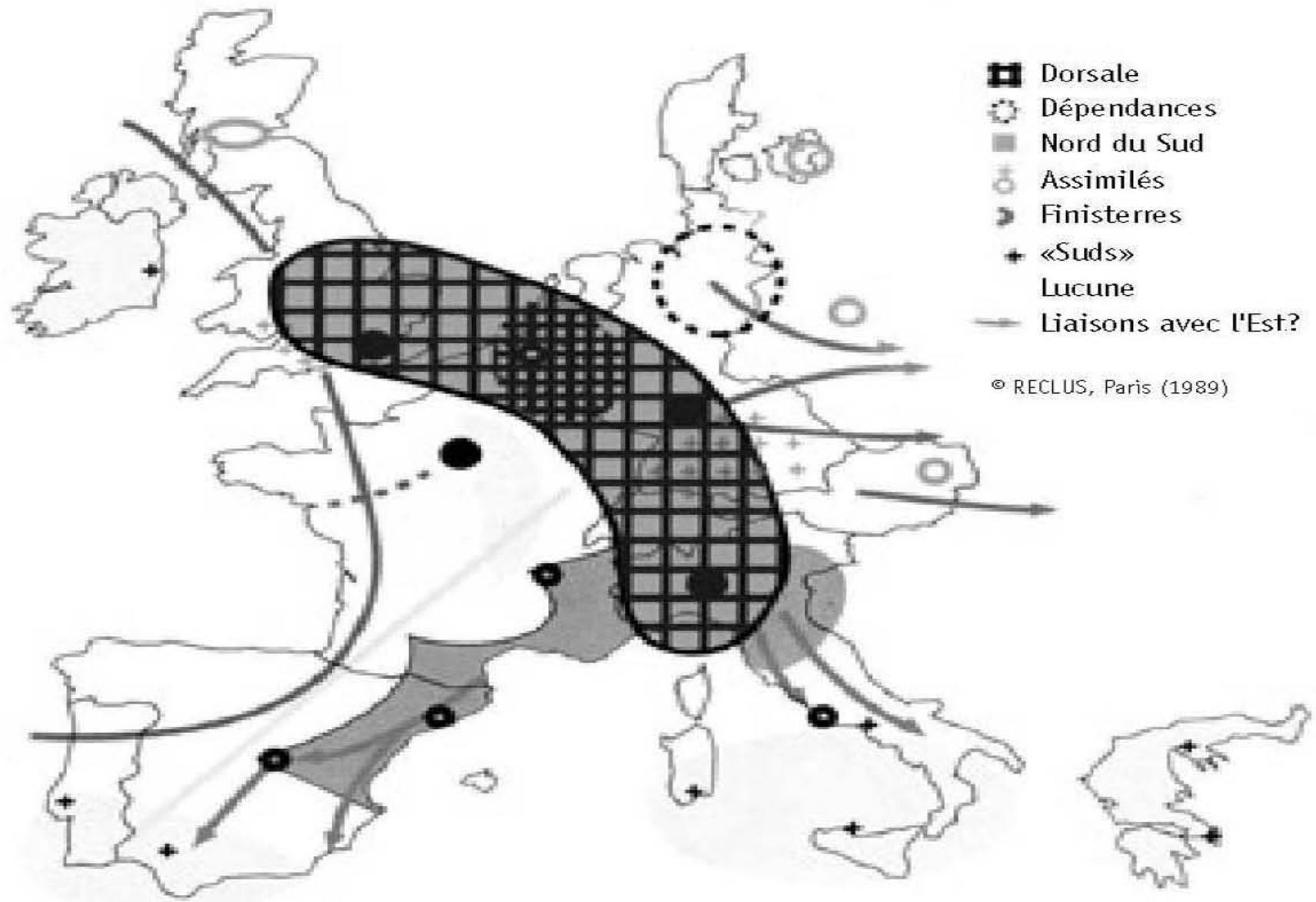


US and China Compared

| <u>Measure</u> | China Target | US Mega |
|-----------------------|---------------------|----------------|
| Land | 20% | 15% |
| Population | 50% | 60% |
| GDP | 80% - 90% | 70% |

FIGURE 1

The “Blue Banana,” depicting the economic core of the European Union from London to Milan



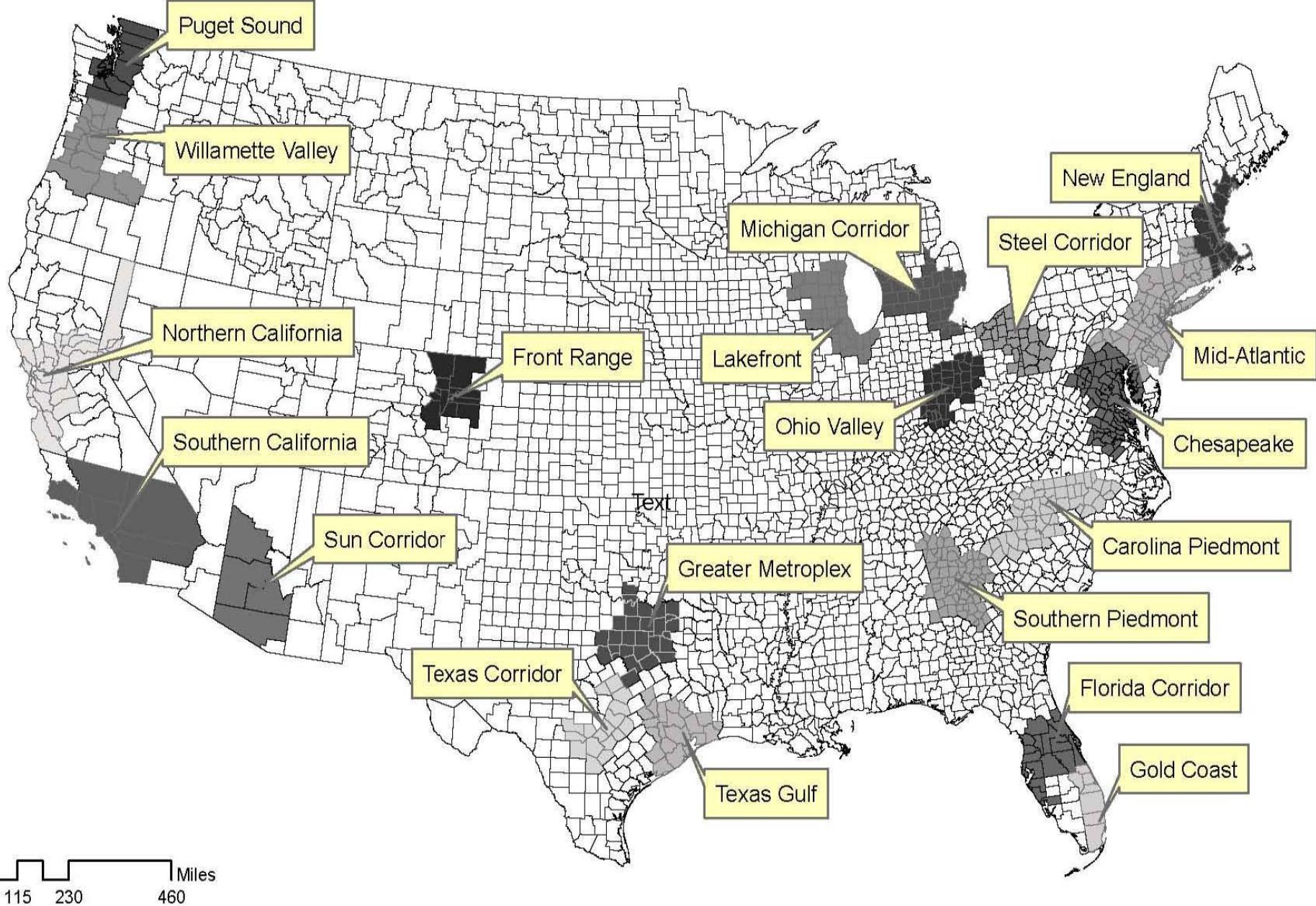
Sources: Lincoln Institute of Land Policy and Regional Plan Association (2004) and Faludi (2002)

Refining Megapolitan Definition

- Will Reach a Census-Defined Employment Interchange Measure (or EIM) of 15 Percent by 2040
- Have Two or More Metropolitan Areas with Anchor Principal Cities Between 50 and 200 miles apart
- Are Never More Than a Day's Drive from End to End
- Are Large-Scale, But Not Intergalactic

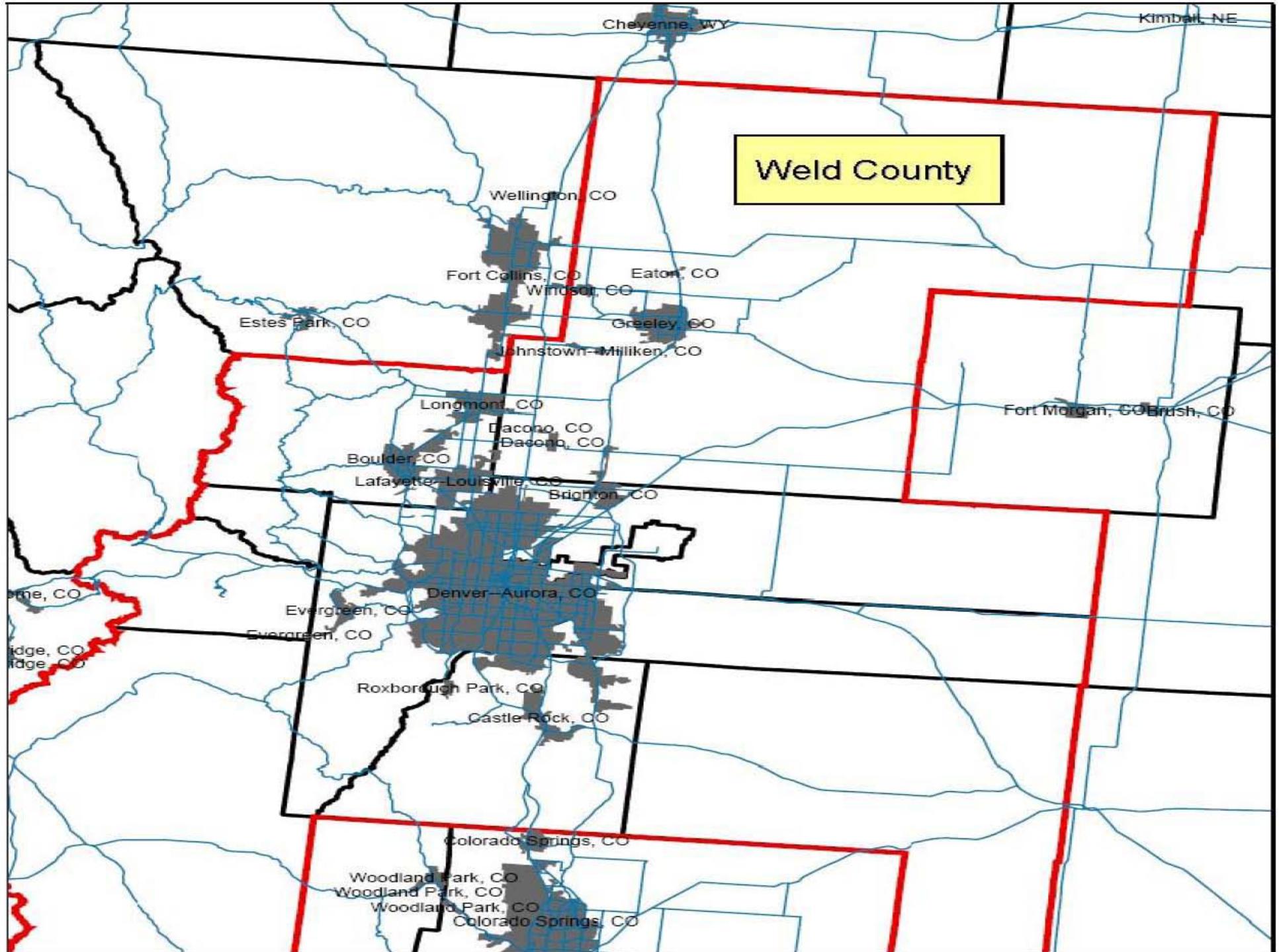
Lang-Nelson Megapolitan Model 2007

- Produces 20 Megapolitan Areas, Most of Which are Sub Units of the Original 2005 Megapolitan Areas
- The New Macropolitan Areas are More Methodologically Defensible and Can Easily Be Adopted by the US Census Bureau
- The New Population Threshold to Qualify as a Megapolitan Area will Be 5 Million People by 2040.

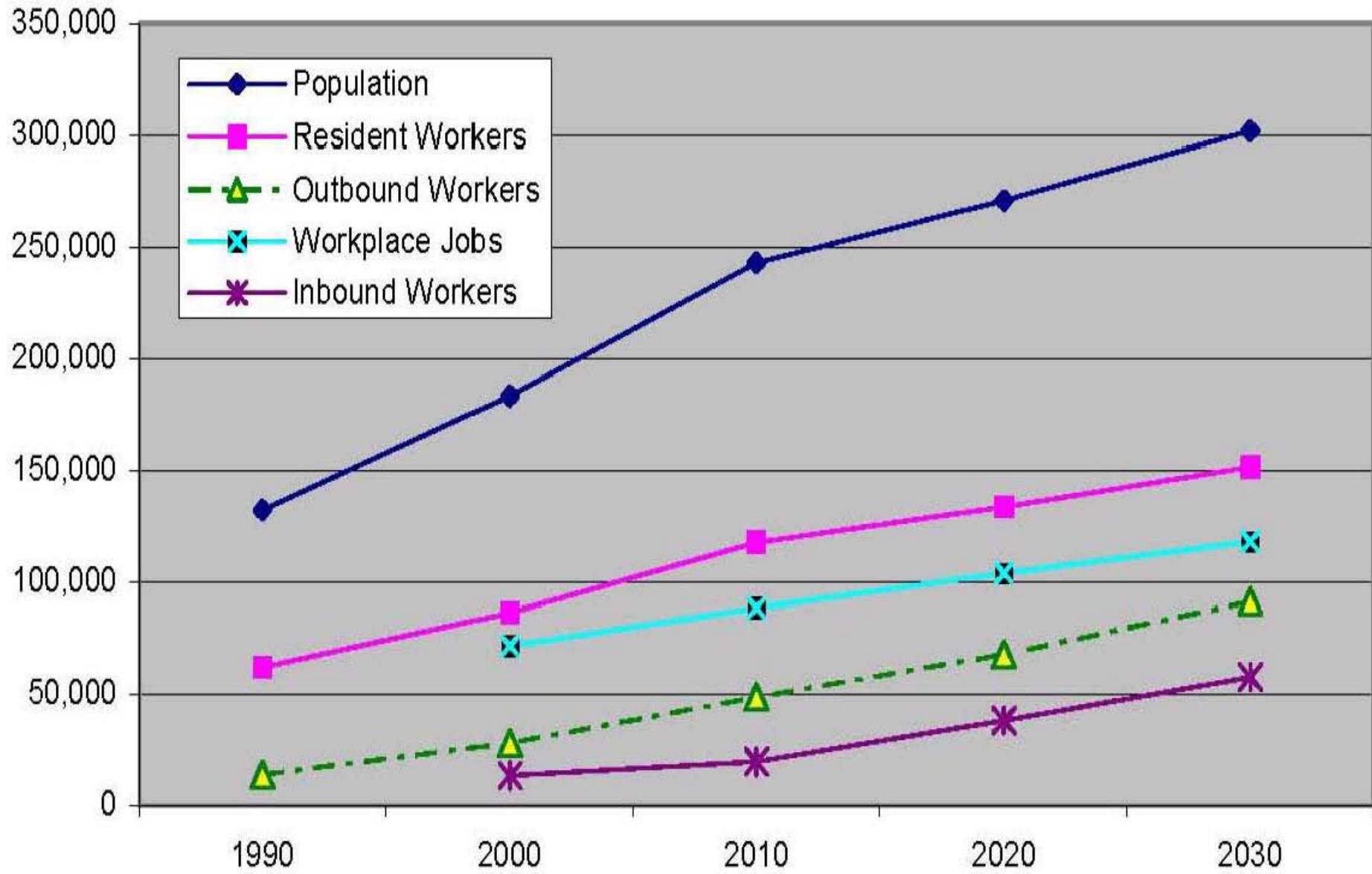


Emerging Census “Combined Statistical Areas” by 2010, and Earlier

- Model predicted Boston-Providence before Census merged them
- Phoenix-Tucson
- Los Angeles-San Diego
- San Francisco-Sacramento
- Washington-Baltimore-Richmond
- Tampa-Orlando
- San Antonio-Austin
- Chicago-Milwaukee

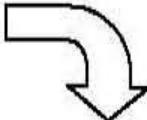


Weld County, Colorado



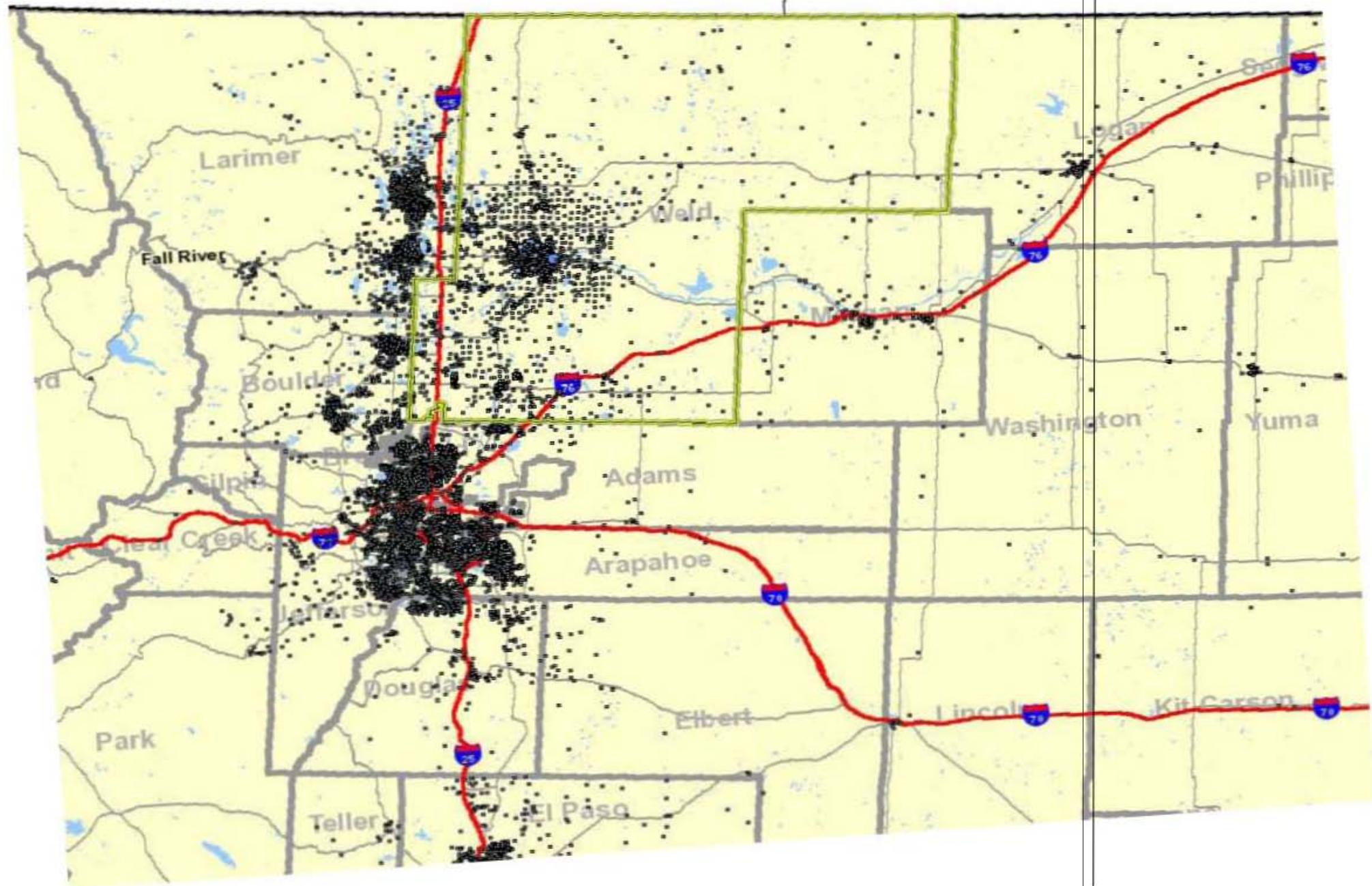
Migration into Weld County, 2004-2005

Returns (~ households)

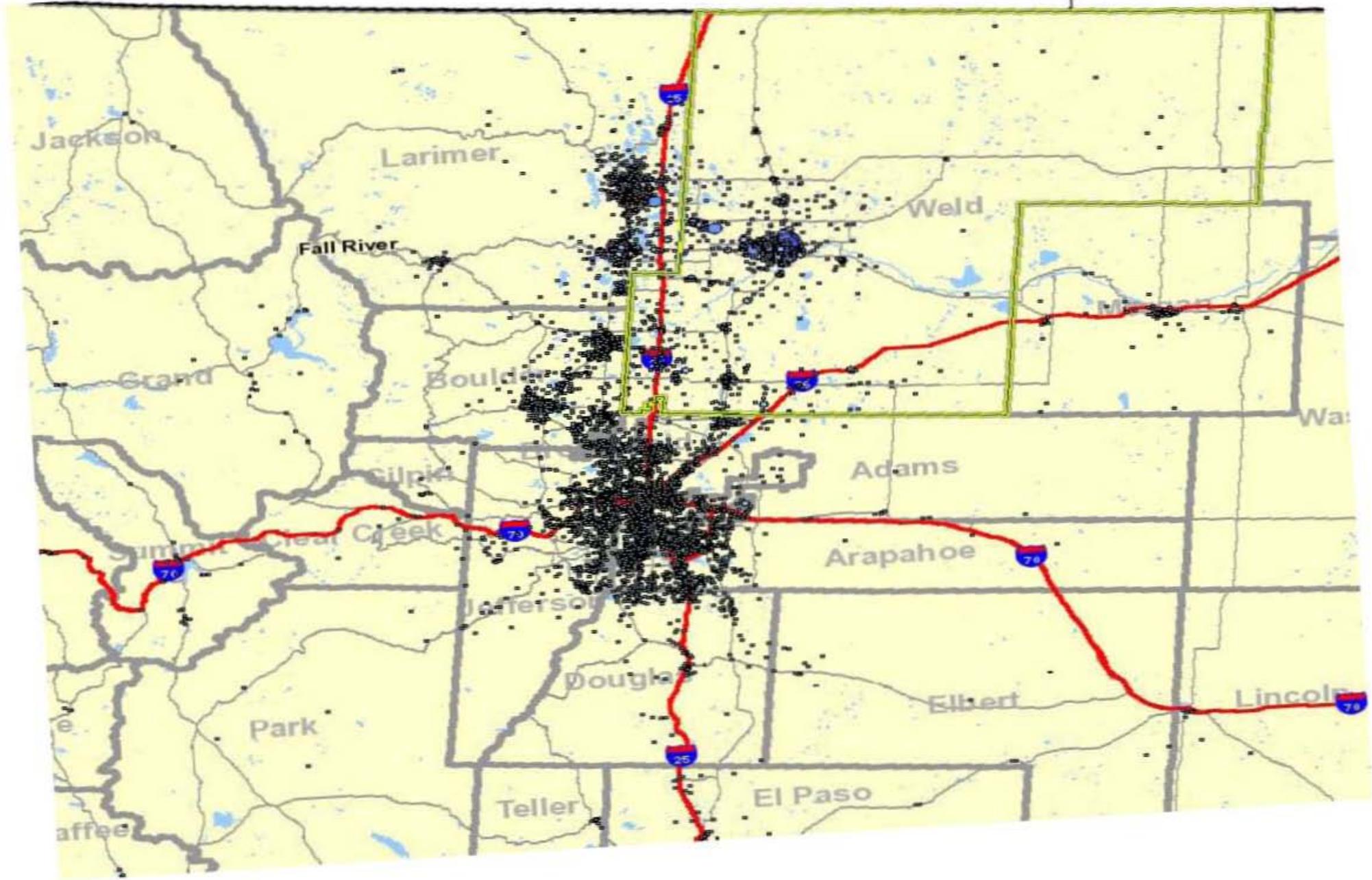
| | |
|---------------------------|---|
| Non-Migrants | 65,341 |
| Pct In-Migration | 10.4% |
| Total In-Migration | 7,603 |
| |  |
| Foreign Immigrants | 31 |
| From Different State | 2,111 |
| From Same State | 5,461 |
| From Front Range Mega* | 4,790 |
| Pct of Total In-Migration | 63.0% |

* Larimer, Boulder, Adams, Jefferson, Denver, Arapahoe,
Broomfield and Douglas Counties

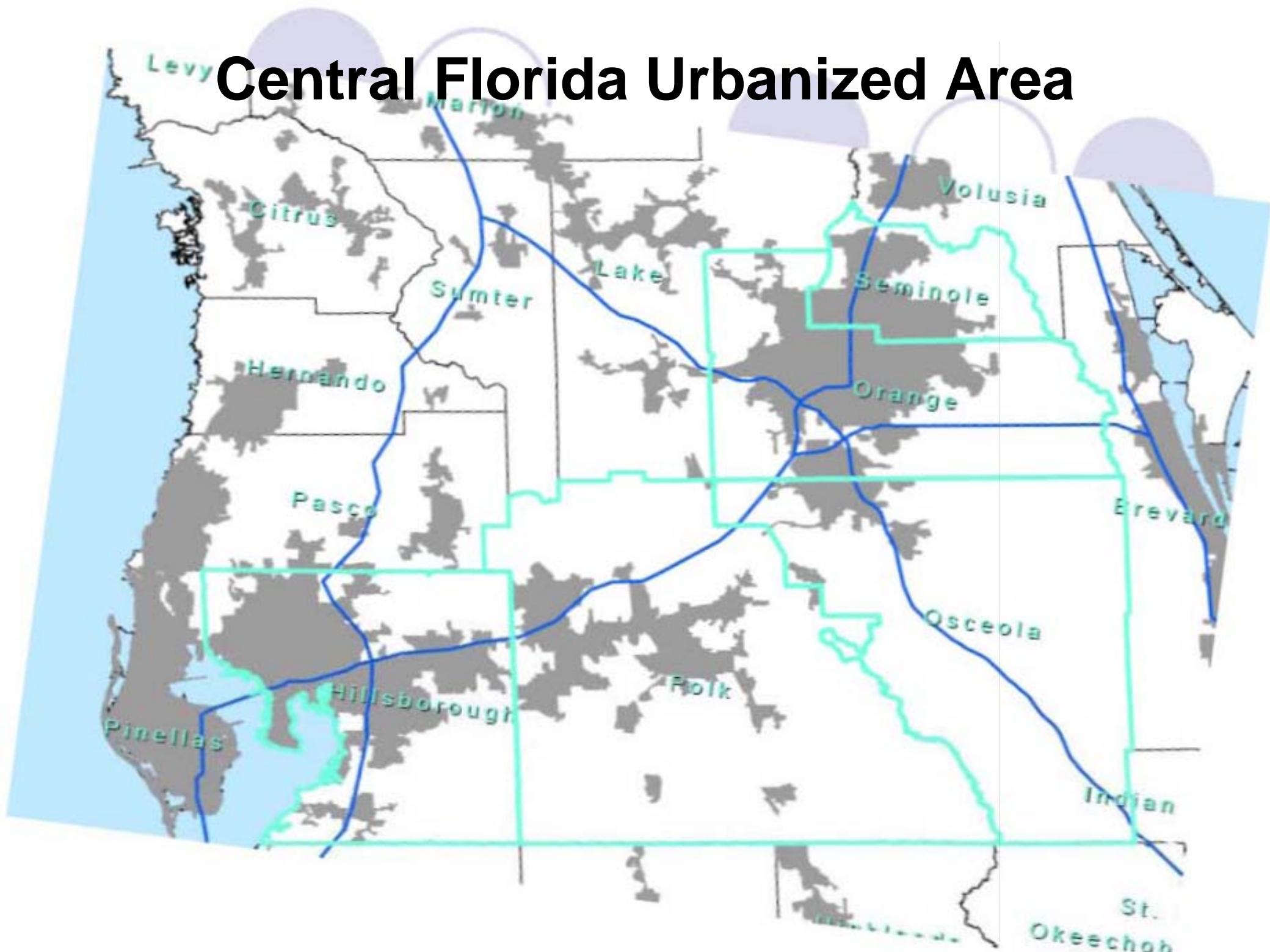
Labor Sheds (ss Data)



Commuter Sheds (ss Data)



Central Florida Urbanized Area



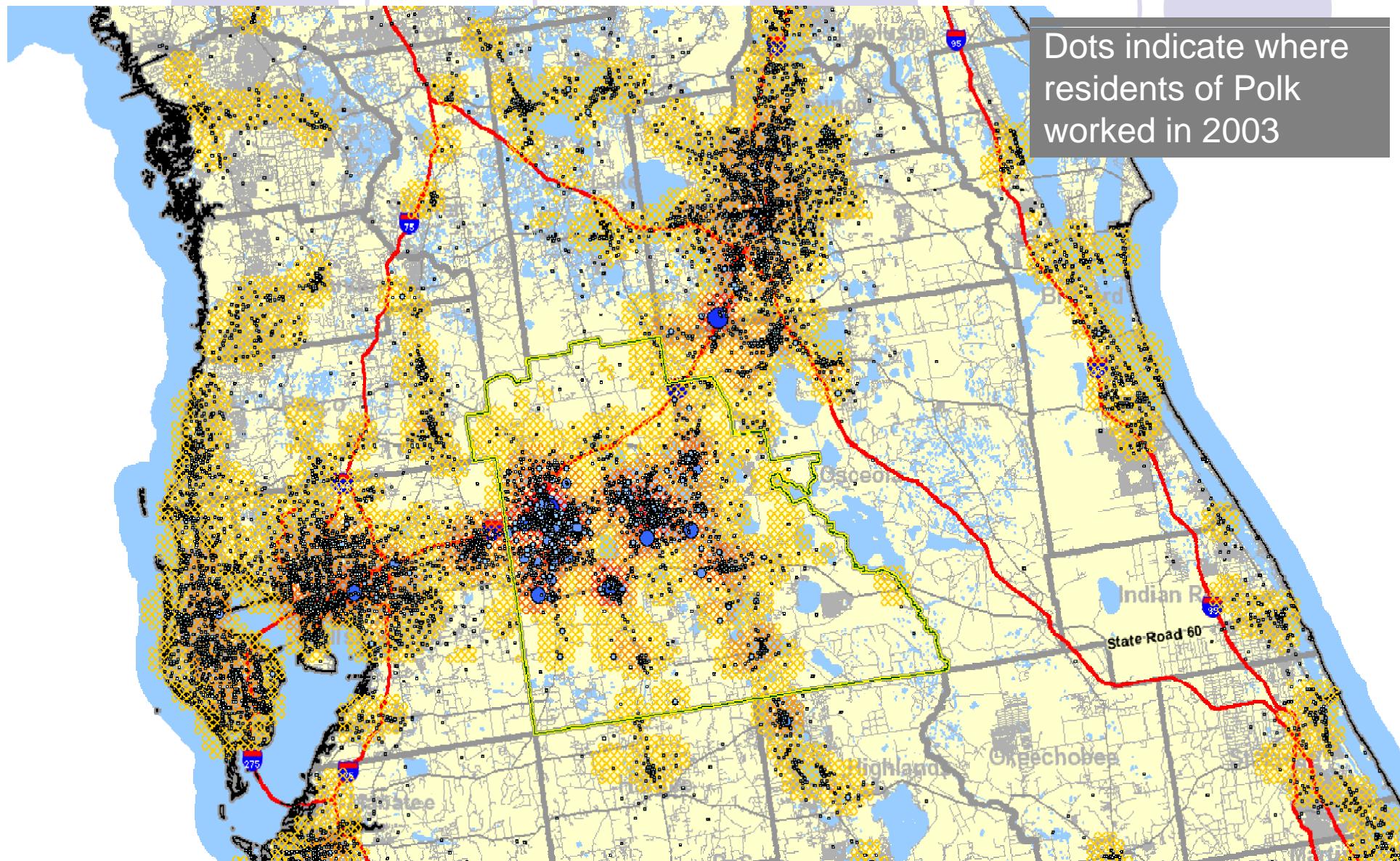
Migration Patterns into Polk

Migration into Polk County, 2004-2005

| Returns (~ households) | |
|------------------------------|--------|
| Total In-Migration | 16,698 |
| Foreign Immigrants | 182 |
| From Another State | 8,400 |
| From Florida | 8,116 |
| From Hillsborough | 1,611 |
| From Orange/Osceola/Seminole | 2,567 |
| From Remainder of Florida | 3,938 |

Source: Internal Revenue Service.

Polk County Commuter Shed



Source: *Longitudinal Employer-Household Dynamics, US Census Bureau.*

The 20 Megapolitan Areas

| Megapolitan Areas and Megaregions | Anchor Metro(s) | 2005 Population | Land Area Sq. Miles |
|-----------------------------------|-------------------------------|-----------------|---------------------|
| Northeast | | | |
| New England | Boston/Providence | 51,601,118 | 60,917 |
| Mid-Atlantic | New York/Philadelphia | 8,276,116 | 11,779 |
| Chesapeake | Washington/Baltimore/Richmond | 33,527,905 | 30,308 |
| | | 9,797,097 | 18,830 |
| Great Lakes | | | |
| Steel Corridor | Cleveland/Pittsburgh | 34,267,189 | 68,021 |
| Ohio Valley | Cincinnati/Columbus | 7,067,896 | 16,131 |
| Michigan Corridor | Detroit | 5,344,052 | 15,123 |
| Lakefront | Chicago/Milwaukee | 8,969,861 | 19,002 |
| | | 12,885,380 | 17,765 |
| Piedmont | | | |
| Carolina Piedmont | Charlotte/Raleigh | 13,953,787 | 46,494 |
| Georgia Piedmont | Atlanta | 7,012,769 | 25,735 |
| | | 6,941,018 | 20,759 |
| Florida | | | |
| Florida Corridor | Tampa/Orlando | 13,823,188 | 24,367 |
| Treasure Coast | Miami | 7,851,525 | 16,836 |
| | | 5,971,663 | 7,531 |
| Texas Triangle | | | |
| Texas Gulf | Houston | 18,187,772 | 68,959 |
| Texas Corridor | San Antonio/Austin | 6,247,170 | 19,967 |
| Greater Metroplex | Dallas-Ft Worth/Oklahoma City | 3,965,018 | 16,536 |
| | | 7,975,584 | 32,456 |
| Front Range | | | |
| | Denver | 3,880,126 | 20,766 |
| Sun Corridor | | | |
| | Phoenix/Tucson | 4,988,564 | 31,882 |
| Cascadia | | | |
| Puget Sound | Seattle | 7,350,438 | 35,226 |
| Willamette Valley | Portland | 4,106,956 | 14,415 |
| | | 3,243,482 | 20,811 |
| Northern California | | | |
| | Bay Area/Sacramento | 11,288,313 | 24,186 |
| Southern California | | | |
| | Los Angeles/San Diego | 21,720,656 | 49,033 |
| Megapolitan Totals | | 181,061,151 | 429,851 |
| US Total | | 296,410,404 | 2,959,064 |

Note: Megaregions are shown in bold; Anchor Metros rank in the top 50 US Metropolitan Areas

Source: Metropolitan Institute at Virginia Tech, US Bureau of the Census and

US Geological Survey.

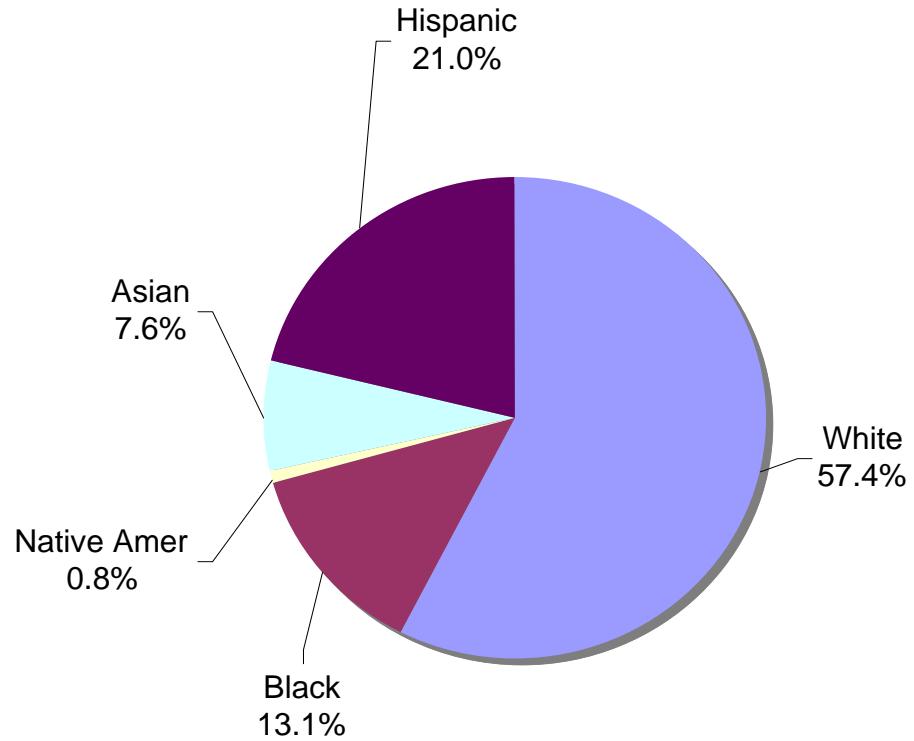
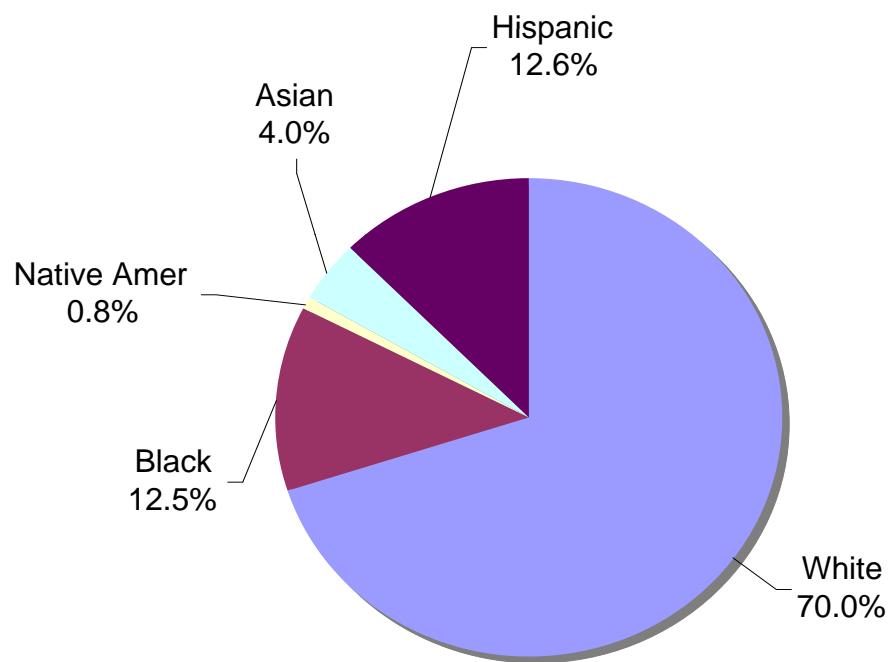
M e g a p o l i t a n P o p u l a t i o n G r o w t h , 2 0 0 0 - 2 0 3 0

| M e g a p o l i t a n A r e a s and M e g a r e g i o n s | 2 0 0 0 P o p u l a t i o n | 2 0 3 0 P o p u l a t i o n | In c r e a s e A b s o l u t e | In c r e a s e P c t . |
|--|--------------------------------|--------------------------------|-----------------------------------|---------------------------|
| M e g a l o p o l i s | 4 9 , 9 4 8 , 0 6 4 | 6 2 , 4 2 7 , 0 7 0 | 1 2 , 4 7 9 , 0 0 6 | 2 5 . 0 % |
| New England | 8 , 1 3 3 , 2 1 9 | 9 , 8 7 3 , 6 6 8 | 1 , 7 4 0 , 4 4 9 | 2 1 . 4 % |
| Mid-Atlantic | 3 2 , 6 5 6 , 3 0 9 | 3 9 , 0 7 2 , 1 9 6 | 6 , 4 1 5 , 8 8 7 | 1 9 . 6 % |
| Chesapeake | 9 , 1 5 8 , 5 3 6 | 1 3 , 4 8 1 , 2 0 6 | 4 , 3 2 2 , 6 7 0 | 4 7 . 2 % |
| G r e a t L a k e s | 3 3 , 6 4 1 , 2 2 0 | 3 9 , 5 3 6 , 7 7 5 | 5 , 8 9 5 , 5 5 5 | 1 7 . 5 % |
| Steel Corridor | 7 , 1 4 0 , 2 8 7 | 7 , 4 3 4 , 6 8 9 | 2 9 4 , 4 0 2 | 4 . 1 % |
| Ohio Valley | 5 , 1 9 8 , 1 0 0 | 6 , 3 7 4 , 7 7 6 | 1 , 1 7 6 , 6 7 6 | 2 2 . 6 % |
| Michigan Corridor | 8 , 8 3 5 , 7 4 2 | 1 0 , 0 7 0 , 1 4 2 | 1 , 2 3 4 , 4 0 0 | 1 4 . 0 % |
| Lake Front | 1 2 , 4 6 7 , 0 9 1 | 1 5 , 6 5 7 , 1 6 8 | 3 , 1 9 0 , 0 7 7 | 2 5 . 6 % |
| P i e d m o n t | 1 2 , 6 3 3 , 9 2 6 | 1 9 , 0 9 6 , 4 7 4 | 6 , 4 6 2 , 5 4 8 | 5 1 . 2 % |
| Carolina Piedmont | 6 , 4 6 0 , 3 3 8 | 9 , 4 3 1 , 8 0 9 | 2 , 9 7 1 , 4 7 1 | 4 6 . 0 % |
| Georgia Piedmont | 6 , 1 7 3 , 5 8 8 | 9 , 6 6 4 , 6 6 5 | 3 , 4 9 1 , 0 7 7 | 5 6 . 5 % |
| F l o r i d a | 1 2 , 4 7 4 , 4 2 3 | 2 0 , 3 1 2 , 5 5 4 | 7 , 8 3 8 , 1 3 1 | 6 2 . 8 % |
| Florida Corridor | 6 , 9 7 5 , 7 7 2 | 1 1 , 3 5 2 , 5 0 6 | 4 , 3 7 6 , 7 3 4 | 6 2 . 7 % |
| Treasure Coast | 5 , 4 9 8 , 6 5 1 | 8 , 9 6 0 , 0 4 8 | 3 , 4 6 1 , 3 9 7 | 6 2 . 9 % |
| T e x a s T r i a n g l e | 1 6 , 5 2 5 , 2 0 3 | 2 5 , 5 9 8 , 6 9 7 | 9 , 0 7 3 , 4 9 4 | 5 4 . 9 % |
| Texas Gulf | 5 , 6 9 9 , 7 0 4 | 8 , 5 3 5 , 9 6 1 | 2 , 8 3 6 , 2 5 7 | 4 9 . 8 % |
| Texas Corridor | 3 , 5 7 3 , 6 2 1 | 5 , 8 7 0 , 4 7 0 | 2 , 2 9 6 , 8 4 9 | 6 4 . 3 % |
| Greater Metroplex | 7 , 2 5 1 , 8 7 8 | 1 1 , 1 9 2 , 2 6 6 | 3 , 9 4 0 , 3 8 8 | 5 4 . 3 % |
| F r o n t R a n g e | 3 , 5 8 2 , 6 8 8 | 5 , 5 9 4 , 5 2 3 | 2 , 0 1 1 , 8 3 5 | 5 6 . 2 % |
| S u n C o r r i d o r | 4 , 2 9 5 , 5 1 6 | 7 , 8 3 9 , 8 7 3 | 3 , 5 4 4 , 3 5 7 | 8 2 . 5 % |
| C a s c a d i a | 6 , 9 0 1 , 1 6 0 | 9 , 9 2 7 , 2 1 7 | 3 , 0 2 6 , 0 5 7 | 4 3 . 8 % |
| Puget Sound | 3 , 8 9 2 , 0 1 6 | 5 , 5 5 6 , 1 5 4 | 1 , 6 6 4 , 1 3 8 | 4 2 . 8 % |
| Willamette Valley | 3 , 0 0 9 , 1 4 4 | 4 , 3 7 1 , 0 6 3 | 1 , 3 6 1 , 9 1 9 | 4 5 . 3 % |
| N o r t h e r n C a l i f o r n i a | 1 0 , 7 8 8 , 5 9 9 | 1 5 , 0 5 7 , 7 1 9 | 4 , 2 6 9 , 1 2 0 | 3 9 . 6 % |
| S o u t h e r n C a l i f o r n i a | 2 0 , 3 2 6 , 8 3 1 | 2 7 , 7 9 6 , 9 0 0 | 7 , 4 7 0 , 0 6 9 | 3 6 . 7 % |
| M e g a p o l i t a n T o t a l | 1 7 1 , 1 1 7 , 6 3 0 | 2 3 3 , 1 8 7 , 8 0 2 | 6 2 , 0 7 0 , 1 7 2 | 3 6 . 3 % |
| U S T o t a l | 2 8 2 , 1 9 3 , 4 7 7 | 3 7 8 , 3 0 2 , 7 3 6 | 9 6 , 1 0 9 , 2 5 9 | 3 4 . 1 % |

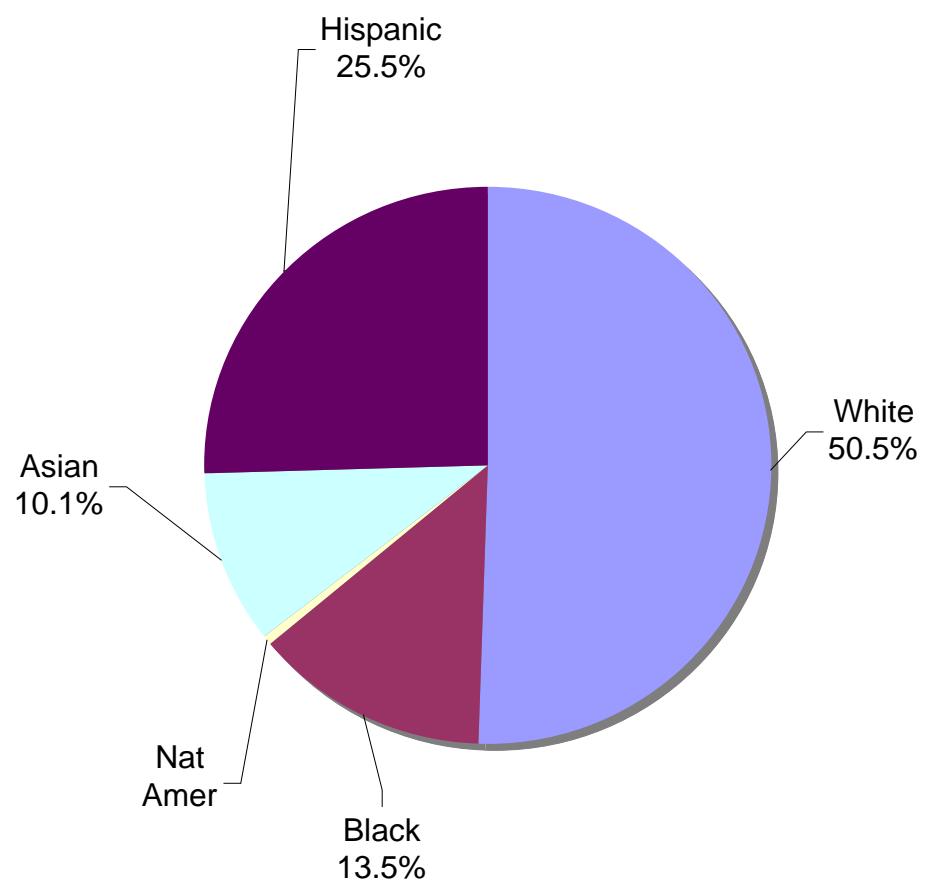
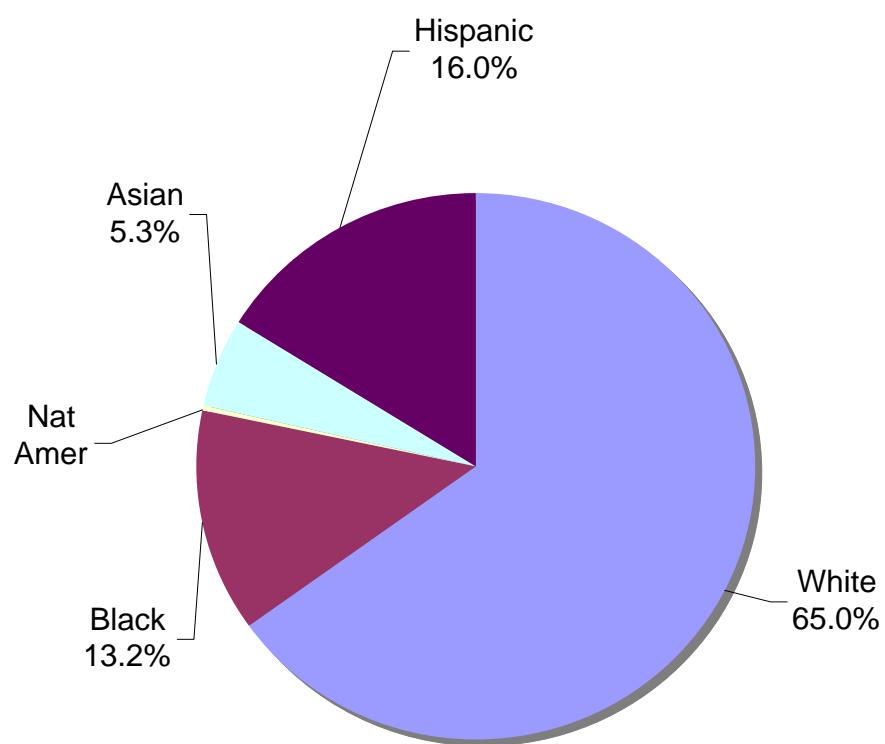
Note: Megaregions are shown in bold.

Source: Metropolitan Institute at Virginia Tech, 7/1/00 population from US Bureau of the Census and 7/1/30 projection based on data from Woods & Poole Economics, Inc.

Racial Composition 2000-2030, US



Racial Composition 2000-2030, Megas

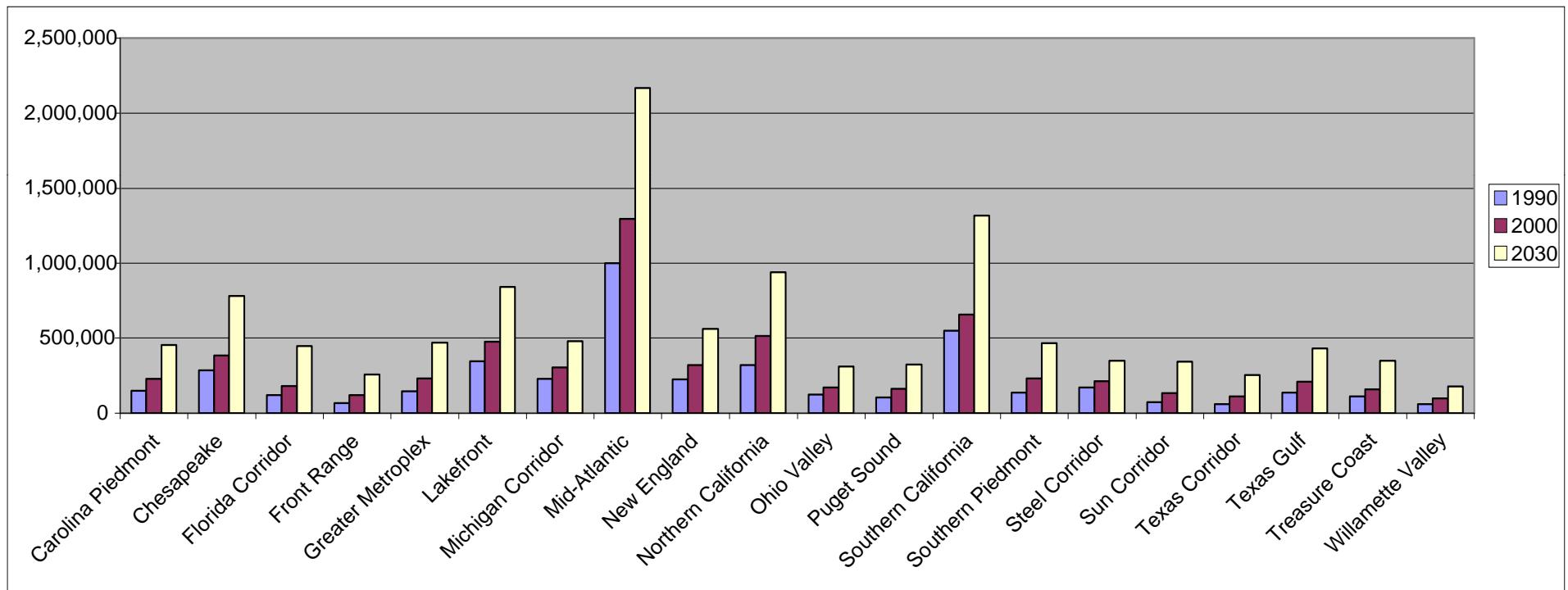


Share of Population Change by Race 2000-2030 by Geography

[Megas = 66% of Growth]

| <u>Geography</u> | <u>White</u> | <u>Black</u> | <u>Native Amer.</u> | <u>Asian</u> | <u>Hisp.</u> |
|------------------------|--------------|--------------|---------------------|--------------|--------------|
| Non-Mega | 13,150 | 2,577 | 678 | 2,883 | 12,090 |
| <i>Share of Change</i> | 41.9% | 8.2% | 2.2% | 9.2% | 38.5% |
| Metropolitan | 6,410 | 8,939 | 203 | 14,330 | 31,849 |
| <i>Share of Change</i> | 10.4% | 14.5% | 0.3% | 23.2% | 51.6% |

Gross Regional Product by Mega 2000-2030



Share of Change in Gross Regional Product by Geography, 2000-2030

(figures in trillions of 2006 dollars)

| <u>Geography</u> | <u>2000</u> | <u>2030</u> | <u>Change</u> | <u>Share</u> |
|--------------------|-------------|-------------|---------------|--------------|
| US | \$9,120 | \$17,254 | \$8,134 | |
| Megalopolitans | \$6,191 | \$11,717 | \$5,526 | 68% |
| Non-Megalopolitans | \$2,929 | \$5,537 | \$2,608 | 32% |

Why Study the Megapolitans

- Megapolitans are the New Geography of Mid-21st Century America
- Megapolitans Give a Physical Focus to the Projection of Numbers for American Population Growth
- Megapolitans Vividly Profile the Nation's Biggest Market Opportunities and Planning Challenges