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Robert E. Lang
Brookings Mountain West, robert.lang@unlv.edu

Dawn Dhavale

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Beyond Megalopolis: Exploring America's New "Megapolitan" Geography

Robert E. Lang
Metropolitan Institute at Virginia Tech

Dawn Dhavale
Metropolitan Institute at Virginia Tech

*"... the ten
Megapolitans
have a
population
equal to
France,
Germany, and
the United
Kingdom
combined,
or about
202 million
residents in
2005."*

Main Findings and Observations

- The Metropolitan Institute at Virginia Tech identifies ten US "Megapolitan Areas"—clustered networks of metropolitan areas that exceed 10 million total residents (or will pass that mark by 2040).
- Six Megapolitan Areas lie in the eastern half of the United States, while four more are found in the West.
- Megapolitan Areas extend into 35 states, including every state east of the Mississippi River except Vermont.
- Sixty percent of the Census Bureau's "Consolidated Statistical Areas" are found in Megapolitan Areas, as are 39 of the nation's 50 most populous metropolitan areas.
- As of 2003, Megapolitan Areas contained less than a fifth of all land area in the lower 48 states, but captured more than two-thirds of total US population with almost 200 million people.
- Megapolitan Areas are expected to add 83 million people (or the current population of Germany) by 2040, accounting for seven in every ten new Americans.
- By 2040, a projected 33 trillion dollars will be spent on Megapolitan building construction. The figure represents over three quarters of all the capital that will be expended nationally on private real estate development.
- In 2004, Democratic candidate John Kerry won the Megapolitan Area popular vote by 51.6 percent to 48.4 for President George W. Bush—or almost the exact reverse of the nation as a whole. Kerry received 46.4 million Megapolitan votes, while Bush won 43.5 million.
- Megapolitan geography reframes many planning and public policy debates, touching on such issues as environmental impact, transportation, and urban sprawl.

Introduction: From Megalopolis to Megapolitan

...the Megapolitan concept seems to have popularized the idea that the modern cities are better reviewed not in isolation, as centers of a restricted area only, but rather as parts of "city-systems," as participants in urban networks revolving in widening orbits.

Jean Gottmann (1987, p. 52)

Geographer Jean Gottmann, writing over two decades after publishing his influential book *Megalopolis* (1961),¹ understood the impact that his thinking had on urban theory. Now, two decades later still, a new trans-metropolitan geography is emerging that advances many of Gottmann's ideas. Researchers in the United States and Europe are proposing new methods for classifying and tracking the megalopolis (Faludi 2002 Yaro et al. 2004, Yaro and Carbonell 2004, Carbonell and Yaro 2005). And while Gottmann was specifically referring to the northeastern United States, the latest round of research extends the concept to clusters of networked metropolitan areas around the world. For example, European researchers argue that large-scale urbanized areas are the primary geographic unit for integration into the world economy (Faludi 2002). The European Union [EU] currently has one well-defined "global integration zone"—the area inside the so-called "Pentagon" that runs from London to Hamburg to Munich to Milan to Paris and back to London (Schon 2002).

This Census Report updates Gottmann's megalopolis to current trends in American trans-metropolitan development.² Gottmann's original study of the Northeast's megalopolis (1961) held that the region was unique in several ways, including its large size and commercial

inventiveness. By the time Gottmann "revisited" the megalopolis in the late 1980s (Gottmann 1987, Gottmann and Harper 1990), he acknowledged that several other US regions could qualify as Megapolitan. He noted especially the cases of the Midwest and West Coast, but also saw a nascent megalopolis forming in the South around Atlanta (1987). This study identifies ten "Megapolitan Areas," found in all regions of the country, not just in the Northeast.

Gottmann's work influenced academics but had no impact on the way the US Census Bureau defines space, probably in part because at the time his work discussed a single, unique region. But the idea of a functional trans-metropolitan geography is one that warrants the Census Bureau's attention. Regional economies now clearly extend beyond an individual metro area. The Megapolitan concept recognizes this fact and suggests a new geography to show which regional economies are linked.

When the Census Bureau does formalize a geographic concept, it gains power. Consider a recent example. Rural development advocates lobbied the Census Bureau for years to redefine more heavily settled rural areas as quasi-metropolitan places (Lang and Dhavale 2004). In 2003, the US Office of Management and Budget (OMB), which oversees the Census Bureau, responded with the designation "Micropolitan Area." Now micropolitans are literally on the map. Businesses, government agencies, and planners have new geography to work with. Publications took notice—*Site Selection Magazine*, for example, started a list of "Top Micropolitans" in which to locate businesses (Starner 2005).

Megapolitan Areas (or "Megas") have a similar potential. Once they are officially recognized, private industries and government agencies

would embrace this new geography.³ And there are clearly cases where the Megapolitan scale is the most logical one at which to address problems. Consider the recent debate over the fate of Amtrak—America's National Railroad Passenger Corporation. The Bush administration wants to eliminate all Amtrak funding in the 2006 federal budget. Defending this action, the US Secretary of Transportation, Norman Mineta, wrote in the *New York Times* that "The problem is not that Americans don't use trains; it is that Amtrak has failed to keep up with the times, stubbornly sticking to routes and services, even as they lose money and attract few users" (2005, p. A19). Amtrak is a national rail system with a profitable line connecting big Northeastern cities that offsets losses on service to remote rural locals. As illustrated below, Megapolitan Areas have two qualities—concentrated populations and often corridor form—that make them excellent geographic units around which Amtrak could be reorganized.

The Evolving Megapolitan Idea

The concept of a large-scale, trans-metropolitan urban structure has been debated among planners since the early 20th century. The idea can be traced to a famous exchange in the pages of the *New Republic* during the summer of 1932 between noted theorist and critic Lewis Mumford and Thomas Adams, director of the *Region Plan of New York and Environs* (now the Regional Plan Association, or RPA).⁴ The debate pitted what Fishman (2000) calls "regionalists" (such as Mumford) against "metropolitanists" (such as Adams). Metropolitanists believed that 20th century cities would maintain their 19th century form even as they grew to 10 or 20 million residents and extended 50 or more miles from the center (Thomas 2000). They also argued by

extension that most investment should go to fixing the metropolitan core.

Regionalists saw a radical shift in metropolitan structure, away from a monocentric metropolis and toward a more dispersed network of cities and villages arrayed across a vast—although integrated—space they called the "urban region" (Fishman 2000). After the mid 20th century, most new urban growth occurred outside the regional core, which fueled the development of sprawling and often connected metropolitan areas. The proposed "urban region" concept is thus the progenitor of the Megapolitan Area.

In the year following the Mumford-Adams debate, urban sociologist R.D. McKenzie (1933) published *The Metropolitan Community*. This book formally laid out the regionalist's thinking. McKenzie argued that American metropolitan development:

...is tending to concentrate more and more in large regional aggregates. In every such aggregate, the population tends to subdivide and become multinucleated in a complex of centers that are economically integrated into a larger unity (p. 1).

According to Thomas (2000), Gottmann's Megalopolis: "effectively completed the analysis of metropolitan regionalism undertaken by R.D. McKenzie three decades earlier" (p. 50). Like McKenzie, Gottmann emphasized economic integration.

RPA's Second Regional Plan in the 1960s (the first appeared in the 1920s under Adams) produced a series of reports on growth patterns in the New York metropolitan area. One document titled *The Region's Growth* (1967) contained a section on what it called "The Atlantic Urban Region" (RPA

1967).⁵ This region stretched from Virginia to Maine and covered essentially the same area as the Gottmann's megalopolis.⁶ The RPA report extended Gottmann's work by including new data analysis to show regional integration. It also projected the spread of urbanization to the year 2000 (which looks very similar to current patterns).⁷ The RPA report featured an aerial photo portrait that documented variation in growth patterns from the cores to the edges of the region.

Interestingly, *The Region's Growth* appeared just before the explosion of suburban office development occurred in the early 1970s (Garreau 1991, Lang 2003, Lang et al 2005). For example, Dulles airport and its accompanying access road through Fairfax County, VA are shown as the "metropolitan fringe" in the photo essay. Today, the "Dulles Corridor" anchors one of the nation's biggest and most important high tech concentrations.⁸

The Region's Growth raised an important point: is the Atlantic Urban Region a "super-city or a chain of cities?" The report finds that:

The main difference between an urban area at the scale of the Atlantic Urban Region and the traditional metropolitan scale is that the emerging larger form has a multitude of major nodes whose areas are likely to be largely autonomous. Nevertheless, the individual urban centers benefit from mutual proximity, and there is bound to be increased integration (RPA, p. 35).

As this Census Report shows, the continuing spread and growing integration of large-scale urban space since 1967 now confirms the Northeast as a super city.

While Gottmann's and RPA's work was influential in the 1960s, and Gottmann's definition "continues to dominate dictionaries in geography," the Megalopolis concept had little lasting impact outside academic geography (Baigent 2004, p 687). But that is now starting to change. The current RPA president Robert Yaro has kept the idea of the megalopolis alive in recent years. Yaro argues that Americans should do large-scale European-style "spatial planning" (Yaro et al 2004, Yaro and Carbonell 2004). To that end, Yaro organized a meeting at the Rockefeller Brothers Foundation headquarters in Tarrytown, NY to begin a coordinated effort at advancing this idea. RPA's role in promoting the Megalopolis makes sense. Greater New York is the nation's most populous metropolitan area and it lies in the center of the oldest and largest megalopolis. RPA also has the deepest history with the concept, which dates to the Adams/Mumford exchanges of the 1930s.

This Census Report represents the first pass at establishing a new Megapolitan geography. The RPA and Lincoln Institute of Land Policy (this study's funder) are working with several other academic institutions, including the University of Pennsylvania and Georgia Tech, to support similar research. Together with these partners, the Metropolitan Institute at Virginia Tech will produce future refinements of this new geography. One hope is that a standard megapolitan definition can emerge from this collaborative effort that ultimately facilitates an official census designation.

Megapolitan Areas Defined

Megapolitan Areas are defined in this report using multiple methods. The definition builds on prior attempts to determine trans-metropolitan clusters by adding new data, and theory (Faludi 2002; Yaro and Carbonell 2004, Yaro et al 2004, Carbonell

and Yaro 2005). The current work on Megapolitan development relies mostly on an analysis of spatial connectivity, which can be shown with tools such as satellite imagery. Such work focuses on the "space of places," or the physical distribution of the built environment. But there is also a "space of flows," or sets of connections that link places via transportation systems and business networks (Castells 1996). According to theory, the most complete geographic understanding emerges by looking at both the "place" and "flow" of space (Taylor 2004). To their credit, the Census Bureau's metropolitan area definition combines both, making the definitions useful and meaningful. Here, we expand this work to create an even larger unit of analysis, which is becoming increasingly necessary in today's global economy. The methods detailed below show how place and flow determine Megapolitan locations and boundaries.

The name Megapolitan plays off of the megalopolis label by using the same prefix—"mega." Interestingly, the name Megapolitan was under consideration during the Census Bureau's last review of metropolitan area standards just prior to the 2000 census (*Federal Register* 1999, PRB 2000). As part of a redefinition proposal to categorize metropolitan areas by size, the catch-all "metropolitan" category was to be scrapped. In its place would be "Megapolitan" areas, where the central cities had more than one million residents, and "Macropolitan" areas, or regions with central cities ranging from 50,000 to 999,999 residents.⁹ Although this hierarchical system was not approved by OMB, the Census Bureau clearly sees that American development patterns vary by scale.

The Census seeks simple but definitive methods for defining and organizing space. Metropolitan areas were first officially designated in 1949 to show functional economic relationships (Anderson

1988). Commuting, which at that time mostly tied the edge to the core, was an easy proxy for this linkage. For instance, job losses in central cities would impact suburbs by lowering retail sales and depressing their housing markets. Thus the center and periphery existed as a single integrated unit as shown by employment dependency. Census wanted an easily measured and universal proxy for this relationship—commuting best fit the model.

A direct functional relationship as indicated by commuting does not exist at the Megapolitan scale (RPA 1967). The area is simply too big to make daily trips possible between distant sections. But commuting is just one—albeit key—way to show regional cohesion. Other integrating forces exist such as goods movement, business linkages, cultural commonality, and physical environment. A Megapolitan Area could represent a sales district for a branch office. Or, in the case of the Northeast or Florida, it can be a zone of fully integrated toll roads where a single "E-Z Pass" or "SunPass" works across multiple metropolitan areas.

Circulating this Census Report among policy makers and researchers will help establish even more large-scale structuring forces. Yet the Census does not need an exhaustive list of such linkages—just one or two may do. The trick is in finding the best ones. The wrong strategy would be to overwhelm the Census with an endless array of idiosyncratic and hard to gather statistics. Metropolitan and micropolitan definitions can be explained in a sentence to two using just a few descriptive statistics. We are not quite there yet with Megapolitan Areas, but that is the ultimate goal.

A Megapolitan Area as defined here:

- Combines at least two, but may include

dozens of existing metropolitan areas.

- Totals more than 10,000,000 projected residents by 2040.¹⁰
 - Derives from contiguous metropolitan and micropolitan areas.
 - Constitutes an “organic” cultural region with a distinct history and identity.
 - Occupies a roughly similar physical environment.
 - Links large centers through major transportation infrastructure.
 - Forms a functional urban network via goods and service flows.
 - Creates a usable geography that is suitable for large-scale regional planning.
 - Lies within the United States.¹¹
- Consists of counties as the most basic unit.

Note that Megapolitan—like metropolitan—space is not synonymous with the Census Bureau’s “urbanized area.” Urbanized areas indicate settlement at 1,000 people per square mile or more, which the Census Bureau uses to chart.¹² But all Megapolitan and metropolitan areas include considerable space that falls below this density threshold. The reason is that urbanized areas indicate a physical space, while Megas and metros also factor in functional relationships at the county level. There are many counties in both Megas and micros that are fully urbanized based on the census definition, but there are other less urbanized (sometimes barely urbanized) counties that link to metropolitan areas via commuting patterns. Similarly, counties in Megapolitan Areas maintain both physical and functional links, as shown.

Using counties as building blocks allows for a detailed statistical analysis. County data extends back decades and is available in easy-to-read electronic formats (Katz and Lang 2003). The Census Bureau reports “long-form”¹³ data at the

county level, which provides multiple demographic variables including information on race, income, mobility, housing, and education. All micropolitan and metropolitan area designations are based on counties. In fact, the Census Bureau established the metro and micro categories as a classification system in which to place counties. The Census determines where all 3,141 US counties fit in the typology. There are three basic classes of counties: metropolitan, micropolitan, and non-“core based” (meaning neither metropolitan nor micropolitan).

Counties are also the most consistent unit of local governance in the US. According to the National Association of Counties (2005), 48 of the 50 states have operational county governments (Connecticut and Rhode Island are divided into geographic units called counties, but lack governments.). Counties are charged by states to run both national and local elections. By using counties as the most elemental unit, data on how Megapolitan Areas vote are available, including how they vote in presidential elections.

Megapolitan Areas constitute an overlay category. A Megapolitan Area would not replace metropolitan or micropolitan areas. Instead it adds a larger unit of analysis by rolling the metros and micros into a larger defined space. The Census Bureau already has such an overlay in its newly designated Combined Statistical Areas (CSAs).¹⁴ Once a county is determined to be either metropolitan or micropolitan, it is eligible to be in a CSA. Not all US counties fall into CSAs, and likewise not are labeled as Megapolitan.

CSAs are the Census Bureau’s first true trans-metropolitan category.¹⁵ Metropolitan areas can combine with micropolitan areas to form larger-scale CSAs. Metros can also link with other metros, as micros can connect with other micros to

make CSAs. Note that geography is not the sole determinant for the connection. Not all contiguous metros and micros are part of CSAs; there must be an economic, or a functional, relationship. Currently, there are 120 CSAs. CSAs are important to the Megapolitan definition because they show that the Census Bureau already grasps trans-metropolitan geography. They are also vital because CSAs serve as building blocks for the Megas. Most of the Megapolitan Areas defined in this study begin with CSA-to-CSA links. With CSAs, the Census Bureau has moved along the path of defining Megapolitan Areas. We are now extending this work.

Methods: Redefining American Space

The key methods questions in this study are: where are the Megapolitan Areas, what are their boundaries, how are the metro and micro areas that comprise them connected, and what are the best names to label these places? Because Megapolitan Areas are primarily defined by physical space, the process of their creation begins with basic geography. Like the Census Bureau does, this analysis essentially "tests" all US counties to see if they qualify as Megapolitan based on the definition. After selecting the possible counties that meet the geographic criteria, other filters of cultural geography, environment, transportation networks, and future growth projections are overlaid to help delineate the final Megapolitan boundaries. The population and demographic data used in this study comes from the US Bureau of the Census (2001, 2003). The geographic analysis was performed with ESRI's ArcGIS 8.3 software. Outlined below are the steps we took to identify the ten Megapolitan Areas in the US.

Mapping the Megapolitans

The first step in creating Megapolitan areas

involved producing a map of the micropolitan and metropolitan counties. To be considered as a candidate for Megapolitan inclusion, an area must be a string of contiguous metropolitan and micropolitan counties, uninterrupted by non-metropolitan counties. Non-metropolitan counties can only be defined as Megapolitan if metropolitan and micropolitan counties completely encircle them, or if their borders are more than 60 percent contiguous with a metro or micro county.¹⁶

Second, all counties were evaluated by their type of connectedness—micropolitan or metropolitan—to determine their eligibility as Megapolitan. Potential Megapolitan connections were assigned a priority, based on their Census Bureau definitions: The highest priority was given to the CSA-to-CSA connection, followed by a metro-to-CSA, a metro-to-metro, metro-to-micro, and lastly a micro-to-micro link.¹⁷ For example, if two adjoining counties touch, both belonging to different CSAs, then according to our definition their connection has the most strength and so would be included in the same Megapolitan Area. Conversely, two adjoining micropolitan counties represent a relatively weak link and may not have enough gravitational pull to hold a Megapolitan Area together.

As the connections diminished in strength, Megapolitan areas were terminated. The same was true if two counties were contiguous, but did not reflect a connection in real space. Like the Census, rules can be broken in order to more accurately reflect the situation on the ground. For instance, the boundary for what we named the "Cascadia Megapolitan Area" in the Pacific Northwest divides two adjacent CSAs. We determined the Albany–Corvallis–Lebanon, Oregon CSA to be part of Cascadia, whereas the Bend–Prineville, Oregon CSA is not. This split results from the

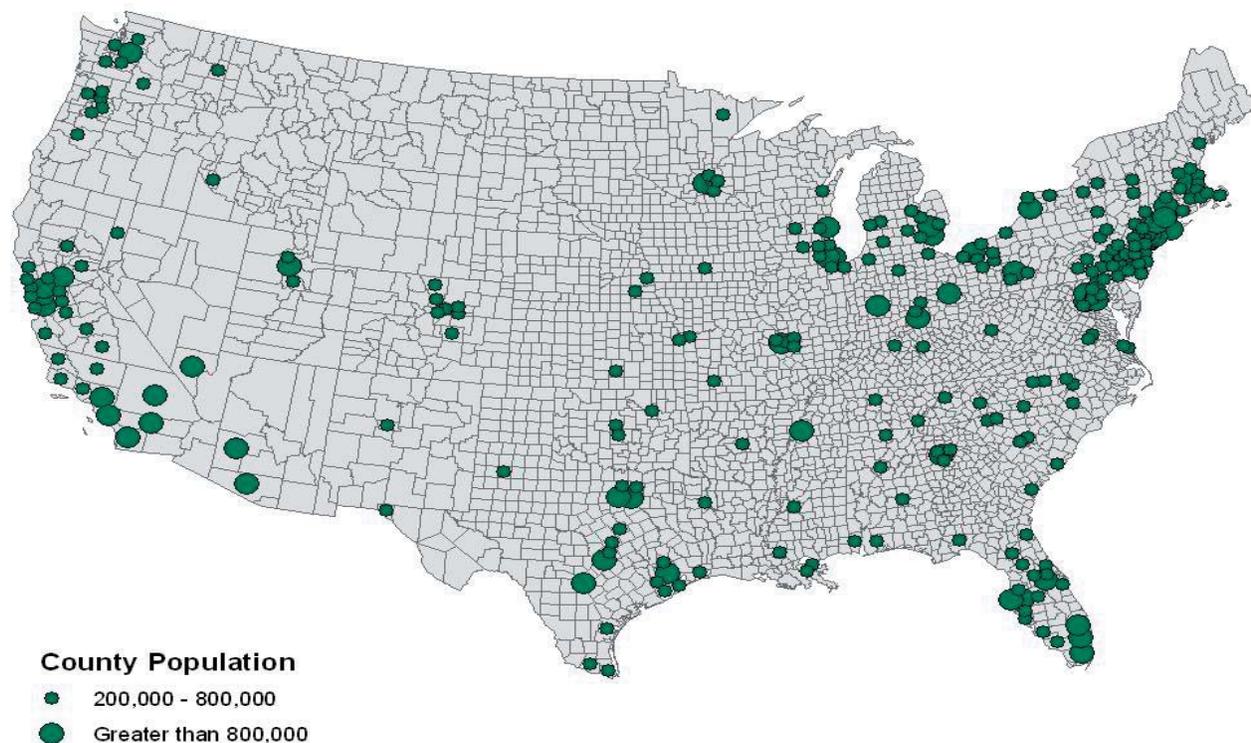
ecological and cultural differences between the Pacific Coast/Willamette Valley and inland Oregon that lies east of the Cascade Mountains. Our methods indicate that Cascadia lies from the west slope of the Cascades to the Pacific Coast and from the Canadian border on the north to the southern end of Oregon's Willamette Valley.

In just one case, a CSA itself was split and only part was included in the Megapolitan area. The "Southland Megapolitan Area" (in Southern California and Nevada) divides the Las Vegas–Paradise–Pahrump CSA because only metropolitan Clark County, NV (which contains metro Las Vegas) is economically tied to Southern California. Micropolitan Pahrump, NV is a separate world. Nye County (home to Pahrump) is one of the largest counties in the United States and reaches into the heart of central Nevada's Great Basin—a

vast open space of mountains and deserts. This area was deemed too spatially and functionally removed from the Southland to be included in the Megapolitan Area.

At this stage, we "tested" the Megapolitan Areas using a series of current population maps. Map 1 is an example of the maps in this series. It shows all of the counties in the United States that have between 200,000 and 800,000 residents, and those that have more than 800,000 residents.¹⁸ The map indicates the basic outlines of major population concentrations. Maps were also produced showing such variables as urbanized areas and population density across the United States to test whether or not the way we had defined each proposed Megapolitan area lined up with actual urban development patterns.

Map 1: Mid-sized and Large US Counties



After the initial census base map was created, the Mega boundaries were drawn, and the current population maps were tested against Megapolitan geography, each Megapolitan Area was examined using several non-census criteria. These measures included cultural geography, transportation, ecology, future growth projections, and economic linkages.

We developed a series of maps to show major transportation networks and city locations for each Megapolitan Area, along with information on historical geography (Zelinsky 1973) and development trends (Yaro et al. 2004; Nelson 2004, 2005). Megapolitan edges were also determined by topographic elements that might constrain or redirect growth, as well as the boundaries of large-scale ecosystems (Meinig 2004). These additional considerations, or screens, smoothed the boundaries and helped to determine the fate of conflicted areas. At this point, the previous work by Gottmann (1961) and Yaro et al. (2004) was compared to the preliminary Megapolitan Areas. Adding these other filters ensured that the space that was defined initially by census-based criteria was not a statistical artifact, but was instead a vibrant and real place. The data section that follows provides more insight into the local nature of Megapolitan Areas, and how this information factored into determining boundaries.

As this project deals with actual space, methodological rules are not the only basis for inclusion in a Megapolitan Area—although they are certainly the primary one. Just as the Census Bureau relies on local opinion and preference when determining geography, judgment calls reflecting the ground information are an essential component of the definition process. A county may meet the criteria to be included in a Mega, but may not actually be a part of the area. Local knowledge

is essential to determining compatibility. As this work continues, refinement to the Megapolitan boundaries will be based partly on local input. Again, this mimics the vetting process that the Census Bureau itself uses in placing counties in metros, micros, and CSAs.

Finally, we did not carve the United States into spheres of influence based on a core/hinterland relationship. There are geographies that account for every inch of American space by showing various types of connections, including market areas, or even which Federal Reserve Bank district a place belongs to. Drawing such geographic boundaries is often a useful exercise, but does not apply to our Megapolitan Area analysis. In our view, Megapolitan Areas should have discrete boundaries, as do metropolitan and micropolitan areas. The point is to show which counties belong to large-scale urban clusters and which ones do not. However, other researchers at Regional Planning Association, Lincoln Institute of Land Policy, University of Pennsylvania, and Georgia Tech are considering larger extended areas, which might be thought of as "Mega-Regions." These analyses find a core and periphery to each Mega, which may mean that most of the US would fall within the sphere of influence for a Mega-Region. At some point, the work on Megapolitans and Mega-Regions may combine to produce a single system that shows both trans-metropolitan clusters and their larger network of rural and resource areas.

Methods Challenges

This analysis produced several methodological challenges. Interestingly, the nature of these challenges in many cases varied by region of the country. The big divide was the East versus West. This is not a surprise given that the two

halves of the United States have very dissimilar settlement histories. Lang, Popper, and Popper (1995, 1997) determined the main character of this difference to be driven by physical forces, which produced mostly contiguous settlement of the eastern United States and an "urban archipelago" development pattern in the West (Lang 2002). The big US settlement divide, in turn, shaped county geography, which therefore influenced how Megapolitan Areas were constructed.

The Big Western Counties. The West, especially the Southwest, has enormous counties that often rival or surpass eastern states in square mileage. Big western counties can distort urban analysis, including determining where Megapolitan Areas begin and end. As noted above, Nye County, NV, which forms a CSA with Clark County, NV (Las Vegas), is mostly filled with open desert. However, the Pahrump Valley at the southern end of Nye County, which is more than double the size of New Jersey, contains workers who commute to the Las Vegas strip. But adding all of Nye County into a Megapolitan Area on the basis of a single commuter colony makes no sense. To get around this potential distortion in the data, all western counties were carefully examined to see how they were urbanized. There were cases such as Nye County where a place was dropped because its inclusion would provide a false impression of an overly expansive Megapolitan geography even though it connected to another Mega county.

The East: Too Much Connection? In the East, there are so many contiguous metros and micros that half the nation seems to be one extended urban space. One reason the East appears filled up is that it contains hundreds of micropolitan areas (for example, Ohio alone has 26 micros; see Frey et al. 2004). There are so many micropolitan areas in the East, and they spread so widely that a

trip down I-95 from Maine to Miami now passes through just five counties that are non-core based (Lang and Dhavale 2004). Additionally, less than half the land area of the lower 48 states lies in non-core based (or non-metro and non-micro) counties (Lang and Dhavale 2004).

Thus the main methods problem in the East was too much apparent connectivity, making it hard to determine where one Mega started and another ended. The Midwest and South were especially prone to appearing as an unbroken string of metros and micros. However, cultural geography offered some guidance on how this space is actually structured. For example, geographers place Pittsburgh, PA squarely in the Midwest, and show a clear cultural region in the Piedmont South (Zelinsky 1973; Meinig 2004). Another key element in delineating the Southern and Midwestern Megapolitans was the "flow data," which found networks of connected cities in both regions.

Flow Data. The Census Bureau, the nation's main creator of geographic statistics, does not provide data on flows between American cities.¹⁹ Therefore, this data must be generated. This study uses a flow method pioneered by Taylor (2004) and developed for American cities by Taylor and Lang (2005). Taylor devised the "hinterworld" concept (as opposed to physical hinterland) to illustrate a virtual geography of business networks.²⁰ Taylor's (2004) network model measures how "networked" a city is to another on the basis of business contacts. It looks at how headquarters and branches of large producer service firms in six sectors link cities. The six sectors tracked are law, accounting, management consulting, insurance, media, and advertising.

Taylor and Lang (2005) found that many US cities maintain dense local connections—both within the United States and their respective regions. For example, midwestern cities such as Chicago, IL and Cleveland, OH had strong business links and are thus connected by more than proximity. The Taylor method helped determine the placement of marginal cases. For example, it shows that Richmond, VA is more integrated into the Northeast Megapolitan Area than the southern “Piedmont” one. Richmond, the former capital of the confederacy, may be southern in culture, but it is increasingly northern in business networks. Furthermore, it connects via contiguous metropolitan space to the Washington, DC region.

With a combination of flow and place information, Richmond was determined to be the southern terminus of the Northeast Megapolitan Area.

For now, the flow data was only used to tweak the edges of Megapolitan Areas by helping determine if a metropolitan area belongs in a Mega or not. As the flow data is further developed (including such measures as goods movement and airline travel), it will help further refine future iterations of the Megapolitan boundary analysis and may factor more heavily in the definition of place.

Naming the Megapolitans

A criterion for defining Megapolitan Areas was their “organic” nature. Megas are not just a collection of counties but real places, with long histories and distinct regional identities. Therefore, we carefully selected Megapolitan names that captured a vernacular reference to place. The importance of place name is noted in the cultural geography literature (Meinig 2004). Geographers such as Zelinsky (1973) used phone books and other place-based documents to establish how an area refers to itself.²¹ He looked, for example, at business listings and checked the number of references made to identifiers such as Piedmont or Northeastern.

To replicate this method we used Google (www.google.com). The number of “hits” a place name generates in part reflects its

Table 1. Megapolitan Area Name Google Search Ranked by Hits		
Megapolitan Area	Google Search	Google Hits
Northeast	Northeast US	9,380,000
Midwest	Midwest US	6,970,000
Gulf Coast	"Gulf Coast" US	3,030,000
Piedmont	Piedmont US	1,500,000
NorCal	NorCal	575,000
Southland	Southland California	280,000
Valley of the Sun	"Valley of the Sun" Arizona	97,300
Cascadia	Cascadia Northwest	80,800
Peninsula	"Florida Peninsula"	44,000
I-35 Corridor	"I-35 Corridor"	6,030
Megalopolis	Megalopolis US	96,700
Megapolitan	Megapolitan	2,660

Source: www.google.com
 Note: Accessed on March 10, 2005

common use. There are multiple ways to refer to the ten Megapolitan Areas identified in this study. We used Google to help establish which of them registered the most hits, with the assumption being that hits indicate actual use. Table 1 shows the results of this analysis.²²

We decided that combined place names seemed contrived and offered little chance for eventual adoption. Therefore, labels such as "BosWash" to refer to the Northeast or "SanSac" in reference to the combined San Francisco and Sacramento metropolitan areas were not considered. We did allow one contraction of place name, NorCal for Northern California, because the reference is so common in the region that it generates 575,000 Google hits.

Four of the Mega names—the Northeast, Midwest, Gulf Coast, and Piedmont—also refer to broad regions. As expected, all four of the labels generated thousands of Google hits (see Table 1). Note, however, that the names used here refer just to the Megapolitan section of these regions. For instance, the label "Northeast" does not apply to non-Mega places such as rural Vermont, but only to counties that lie within the Northeast Megapolitan Area.

Two of the terms in Table 1—Southland (for Southern California) and Valley of the Sun (for Central Arizona)—commonly identify the Los Angeles and Phoenix metro areas. Even though the Megapolitan Areas in both cases extend beyond the core metros (to grab places such as Las Vegas and Tucson), Los Angeles and Phoenix comprise so large a share of their Megas that the name can apply to the entire area. Also, the labels make no direct reference to either Los Angeles or Phoenix and generate large numbers of hits.

Cascadia (as in the Cascade Mountains) was a clear label for the Pacific Northwest because the physical environment looms so large in the identity of this region—even among urban dwellers (Abbott 1993, Findlay 1993). But the area that we ultimately labeled "I-35 Corridor," which refers to a string of metro areas running from San Antonio, TX in the South to Kansas, City, MO in the North, presented a challenge. This region has a history of being connected dating back to the Chisholm Trail.²³ Still, there was no longstanding local reference to the area. However, because of increased trade and goods handling due to the North American Free Trade Agreement (NAFTA),²⁴ The interstate highway linking these places is now one of the busiest roads in the country (Federal Highway Administration 2003).²⁵ The highway is such a major conduit of people and commerce that it has taken on an identity all its own. The label "I-35 Corridor" now registers over 6,000 Google hits, and that number should grow substantially in the future.

It is important to note that I-35 is not the only interstate highway that defines space. Within the larger Megapolitan Areas of the Piedmont and the Peninsular lie the "I-85 Corridor," running from Raleigh, NC to Atlanta, GA (with 4,390 Google hits), and the "I-4 Corridor" from Daytona Beach, FL to Tampa, FL (with 7,470 Google hits). These corridors were not used to label these respective regions because they form only part of their Megas. One other "Corridor" was considered as a name—the Northeast Corridor (with 84,100 Google hits). While this registered high as a place name, it nonetheless fell short in terms of recognition compared with the more general label "Northeast." In addition, we decided that there would be only one Megapolitan Area named for a corridor and that label was reserved for an area that was the most corridor-like. That description best fit the I-35 Corridor.

As Megapolitan research proceeds, the names suggested here will be tested with locals in the respective regions. This process matches the Census Bureau's efforts to attach locally accepted names to metropolitan areas. The Census Bureau will even change a metro label if a region raises objections. Frey et al. (2004) cite the case where: "Consultations with local officials resulted in OMB changing the name of the New York–Newark–Edison, NY–NJ–PA MetroSA to New York, Northern New Jersey–Long Island, NY–NJ–PA MetroSA..." (p. 21). Similarly, Megapolitan labels first and foremost must meet with approval from citizens.

Findings

Applying the definition and methods detailed above produced ten US Megapolitan Areas (see Map 2). A significant majority of Americans live in these ten locations, which by 2003 accounted for more than two in three US residents. The top 15 most populous metropolitan areas are found in Megas.²⁶ In addition, 39 of the nation's 50 most populous metros lie within the ten Megapolitan Areas,²⁷ as do 72 of its 120 CSAs. Map 2 shows that six Megapolitan Areas appear in the East while four more are found in the West. Despite capturing over two-thirds of the population, US Megas make up less than 20 percent of the land area in the Lower-48 states.

Map 2: The Megapolitans



Megapolitan Areas extend into 35 states, including every one east of the Mississippi River except Vermont. Four states—Connecticut, Delaware, New Jersey, and Rhode Island—are completely Megapolitan. Eight states have parts of two Megapolitan Areas within their borders: Alabama, California, Florida, Nevada, Pennsylvania, Texas, Virginia, and West Virginia. Only two Megapolitan Areas lie completely in one state: Florida's Peninsula and Arizona's Valley of the Sun. California and Nevada link up via two Megapolitan Areas—NorCal (From San Francisco, CA to Reno, NV), and the Southland (from Los Angeles, CA to Las Vegas, NV). Oregon and Washington share the Cascadia Megapolitan Area. The I-35 Corridor reaches into four states, while the Gulf Coast, Piedmont, and Midwest Megas include parts of five, six, and seven states

respectively. The Northeast Megapolitan Area spreads from the Mid-Atlantic to New England, touching a dozen states and the District of Columbia. The region is thus represented by almost a quarter of the US Senate—or 24 Senators.

Map 3 highlights the key interstate highways linking major metros within Megapolitan Areas. Interstate 95 plays a big role in Megapolitan mobility from Maine to Florida. Because of the big population centers in the Northeast and Peninsula, the number of people living within 50 miles on either side of this interstate exceed all others in the nation. The West's bookend to I-95 is I-5, which runs through three separate Megapolitan areas. An analysis by the Metropolitan Institute at Virginia Tech (2005) shows that in 2000, over 64 million people lived within just 50 miles of I-95,

Map 3: Interstates and Megapolitans



and over 37 million lived within the same distance of I-5. Most of this population is found in the two Megapolitans along I-95 and the three straddling I-5. Interstate 10 also links three Megas—the Southland, Valley of the Sun, and Gulf Coast. Other places where key interstates help define Megapolitan growth include the I-35 Corridor, which goes from Kansas City, MO to San Antonio, TX, and I-85 in the Piedmont linking Atlanta, GA to Raleigh, NC.

Current Population and Growth Rates

Table 2 shows the 2003 population and current growth rates in the ten Megapolitan Areas. As a group, Megapolitans outpaced the national growth rate for the first three years of the decade. The United States gained 3.3 percent more people from 2000 to 2003, while the Megas added 3.9 percent. The Megapolitan Areas gained 7.5 million new residents over the period. Just two Megapolitan Areas trailed the nation as a whole in growth. The

Table 2: Megapolitan Population and Growth Ranked by Size

Megapolitan Areas	2000 Population	2000 Population Rank	2003 Population	2000-2003 Growth Rate	2000-2003 Growth Rank	Percent of 2000 US Population*	Percent of 2003 US Population*
Northeast	49,182,941	1	50,427,921	2.5	9	17.5	17.3
Midwest	39,489,865	2	40,082,288	1.5	10	14.0	13.8
Southland	20,962,590	3	22,173,291	5.8	4	7.4	7.6
Piedmont	18,391,495	4	19,318,992	5.0	5	6.5	6.6
I-35 Corridor	14,465,638	5	15,315,317	5.9	3	5.1	5.3
Peninsula	12,837,903	6	13,708,165	6.8	2	4.6	4.7
NorCal	11,568,172	7	12,024,173	3.9	8	4.1	4.1
Gulf Coast	11,533,241	8	12,064,600	4.6	6	3.7	3.7
Cascadia	7,115,710	9	7,412,248	4.2	7	2.5	2.6
Valley of the Sun	4,095,622	10	4,486,206	9.5	1	1.5	1.5
Megapolitan Total	189,643,177		197,013,201	3.9		67.4	67.8
United States*	281,421,906		290,788,976	3.3			

Source: US Census Data

*2000 and 2003 population data are from all 50 states

Gulf Coast grew faster than NorCal since 2000, and by 2003 surpassed it by about 40,000 people.

The Northeast and Midwest are by far the most populous Megas, with more than 50 and 40 million residents by 2003. Together, at 90.5 million people, they surpass Germany, the most European nation, with 82.5 million residents in 2004. And unlike Germany, the Northeast and Midwest are still growing, albeit slower than the other Megapolitan areas. The Midwest and Northeast form the old core industrial heart of the nation (Zelinsky 1973, Meinig 2004) and still represent the largest-scale trans-metropolitan development in the United States, even with their relative population decline compared to the Sunbelt.

The fastest growing Megapolitan Areas lie in the Sunbelt. Several of them experienced gains above five percent for the period 2000 to 2003. The fast-growth Megas, ranked by their development pace, are: Valley of the Sun, Peninsula, I-35 Corridor, Southland, and Piedmont. Two Megapolitans fall below the 10 million resident mark, but based on an extrapolation of current growth rates, Cascadia will pass this size in 2025, while the booming Valley of the Sun gets there by 2029.²⁸

Just 35 years ago, the Valley of the Sun was a modestly settled region,²⁹ but rapid growth has moved the area within striking distance of Megapolitan status. A similarly fast expanding region is the Front Range of the Rockies in Colorado. The Front Range extends from Fort Collins, CO in the North to Colorado Springs, CO in the South. Denver's sprawling metropolitan area dominates this region. Front Range cities are linked by I-25, which helps shape it into a corridor. The Front Range was not included in this analysis because it is projected to have just 7 million residents by 2040. However, feedback on this

study may prompt a reconsideration of methods and result in the Front Range being added as the 11th Megapolitan Area.

Land Area

Megapolitan Areas vary by size (see Table 3). The Midwest is the largest with 119,822 square miles, or an area slightly smaller than the state of New Mexico. The Piedmont is almost equally expansive with 91,093 square miles. The more populous Northeast by contrast comes in at just 70,062 square miles. By this calculation, the Northeast would appear to be the densest Megapolitan Area. However, the square mileage figure for the Southland is significantly distorted by the inclusion of Riverside and San Bernardino Counties in California. As noted above, big western counties may feature vast open space. This is certainly true in the case of Riverside and San Bernardino, the latter of which is physically the largest county in the United States.

Megapolitan Composition: By Counties

Table 4 shows the number and type of counties found in each Megapolitan Area. In total, the Megapolitans account for just over a quarter of the 3,141 US counties, but include more than 43 percent of all metro/micro counties. The Midwest and Piedmont Megas have the most counties over all, and by far the most rural counties. The metropolitan areas in these expansive regions sweep around and encircle patches of rural space. In time, we believe that much of the enclosed rural counties will become either metro or micro ones. The only other Megapolitan Area to have a significant percentage of rural counties is Cascadia. The rural counties here lie along the Pacific Coast, which is still lightly settled while remaining very much a part of Cascadia.

**Table 3: Megapolitan Land Area
Ranked by Square Milage**

Megapolitan Areas	Total (sq. miles)	Water (sq. miles)	Land (sq. miles)	Size Rank	Percent Total of US*
Midwest	119,822.2	15,365.0	104,457.4	1	3.8
Piedmont	91,093.1	1,783.7	89,309.4	2	2.9
I-35 Corridor	75,125.7	1,388.4	73,737.3	3	2.4
Northeast	70,061.6	11,011.6	59,049.9	4	2.2
Gulf Coast	68,540.4	14,035.1	54,505.3	5	2.2
Southland	51,722.2	2,919.5	48,802.7	6	1.7
Cascadia	46,532.0	5,061.1	41,470.8	7	1.5
Peninsula	37,644.3	8,397.3	29,246.9	8	1.2
NorCal	34,065.5	2,304.7	31,760.8	9	1.1
Valley of the Sun	23,787.2	28.2	23,759.0	10	0.8
Megapolitan Total	618,394.1	62,294.7	556,099.4		19.8
United States*	3,119,884.8	160,820.2	2,959,064.6		

Source: US Census Data

*Land totals are for the Lower-48 states

It is interesting that the Southland, which is the third most populous Megapolitan Area, has just eight counties. Likewise, the Valley of the Sun is comprised of only three counties. This is evidence again of the big western counties. Also note that no rural (or non-core based) counties lie in these Megas. However, vast open space is found within their metropolitan counties.

Megapolitan Composition: By Metropolitan and Micropolitan Area

The basic building blocks for the Megas are metros, micros, and CSAs. Table 5 lists the number of these elements by Megapolitan Area. The Midwest and Piedmont Megas are chock full of all three building blocks. The Midwest alone accounts for over 107 metropolitan and micropolitan areas. It also contains 24 CSAs, which is one of five in the United States. In total, 39 of the 50 metropolitan areas with more than

1 million residents lie in Megapolitan Areas. Table 5 also shows that six in ten of the nation's CSAs and half of all metros are found in Megas.

The Northeast and Midwest Megas lead the nation in the number of metropolitan areas containing more than 1 million residents, with eight of these big metros each. The real surprise is that the I-35 Corridor has five metropolitan areas with populations over 1 million, which accounts for almost half of the metros in the region. The big metros in the I-35 Corridor help push its population past the better known Peninsula.

Megapolitan vs. National Growth by 2040

Table 6 shows that Megapolitans will account most new population and job growth in the United States from 2005 to 2040. The Megas will capture an even bigger share of money spent on construction. Using Woods & Poole Economics³⁰ county data forecasts, Nelson (2004, 2005) estimates that half the built environment of 2030 will have been constructed in just the previous 30 years, and by 2040 the figure could reach nearly two thirds.

The Megapolitan Areas are projected to add 83 million people by 2040, which will nearly match the current population of the US. The new residents will require an additional 32 million new housing units. The figure includes both new construction and replacement. The Megapolitan Areas should also generate 64 million new jobs in the next 35 years. The money spent on providing the residential and commercial structures to

Table 4: Megapolitan Composition Ranked by Number of Counties

Megapolitan Areas	Number of Total Counties	Number of Metro/Micro Counties	Number of "Rural" Counties	Percent of all US Counties*
Midwest	218	198	20	6.9
Piedmont	198	172	26	6.3
Northeast	145	143	2	4.6
I-35 Corridor	97	92	5	3.1
Gulf Coast	73	70	3	2.3
Cascadia	32	26	6	1.0
Peninsula	32	31	1	1.0
NorCal	23	23	0	0.7
Southland	8	8	0	0.3
Valley of the Sun	3	3	0	0.1
Megapolitan Total	829	766	63	26.4
United States*	3141	1780	1361	

Source: US Census Data

"Rural" counties in the table are what the Census Bureau officially labels "non-Metropolitan Counties"

Metro/Micro counties combine the figures for Metropolitan and Micropolitan counties

*County totals are for all 50 states

**Table 5: Megapolitan Metro/Micro Composition
Ranked by Number of Metros**

Megapolitan Areas	Number of Metros	Percent of Metros*	Number of Micros	Percent of Micros*	Number of CSAs	Percent of CSAs*	Metros Above 1 Million*
Midwest	50	14.0	57	10.1	24	20.0	8
Piedmont	33	9.2	40	7.1	16	13.3	3
Northeast	31	8.7	11	1.9	9	7.5	8
Gulf Coast	16	4.4	18	3.1	9	7.5	2
NorCal	13	3.6	2	0.4	3	2.5	3
I-35 Corridor	12	3.4	18	3.2	4	3.3	5
Peninsula	12	3.4	9	1.6	2	1.7	3
Cascadia	10	2.8	7	1.2	3	2.5	2
Southland	6	1.7	0	0.0	2	1.7	4
Valley of the Sun	2	0.6	0	0.0	0	0.0	1
Megapolitan Total	185	51.2	162	28.3	72	60.0	39
United States*	361		573		120		50

Source: US Census Data

*Statistical areas total are from all 50 states

accommodate this growth are staggering, running in the trillions of dollars. It will take an estimated 10 trillion dollars to fund Megapolitan residential construction, and an additional 23 trillion dollars for non-residential structures.

US Megapolitans Compared to Western Europe

Since the late 19th century American geographers have looked for a US urban space to compare with the densely settled parts of Europe (Popper et al 2001). In fact, the first Census geographer Henry Gannett proposed that Europeans consider

the urban parts of the East and Midwest as their equivalents (Gannett 1893). The American "census frontier" was invented in part to isolate the unsettled land from built up places, so that the densely populated places could be compared to Europe (Popper et al 2001).

Today, the ten Megapolitans have a population equal to France, Germany, and the United Kingdom combined, or about 202 million residents in 2005. The US Megapolitan density at over 325 people per square mile now easily surpasses the big three nations of Western Europe. Adding

**Table 6. Megapolitan vs National Growth, 2005 to 2040
Demographics and Construction**

	2005-2040 Megapolitan Growth	2005-2040 National Growth	Megapolitan Percent Share of Growth
Demographics			
Population	83 Million	118 Million	70.3
Housing Units	32 Million	45 Million	71.1
Jobs	64 Million	93 Million	68.8
Construction			
Residential Expenditures	10 Trillion	14 Trillion	71.4
Non-Residential Expenditures	23 Trillion	29 Trillion	79.3
Total	33 Trillion	43 Trillion	76.7

Source: Nelson 2005 based in part on Woods & Poole County Data Projections

region, and the “mixed beads” describe downtown and various-sized suburban office clusters. Sternlieb and Hughes (1988) find that most suburban development occurs in what they call “growth corridors.”

Some literature also describes Megapolitan spatial character. Pressman (1985) offers examples of both corridors and galaxies. The leading cases of corridors are the Northeastern US and central Spain’s Ciudad Lineal that runs through Madrid.³¹

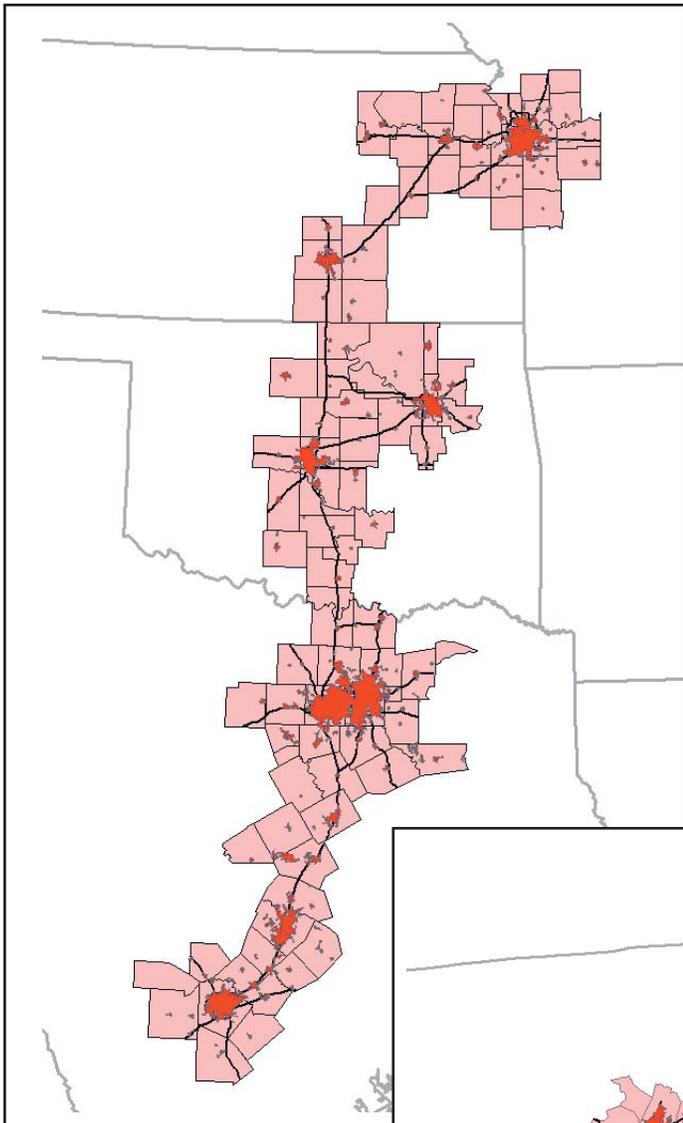
According to Pressman (1985), a good example of a Megapolitan galaxy is northern Germany, which he argues forms “a series of linked ‘cores’ appropriated in the landscape at functional distances from each other” (p. 356).

another 83 million residents to this space by 2040—even assuming some enlarging of current boundaries—will lift this figure past 450 people per square mile.

Megapolitan Form: Galactic vs. Corridor

Megapolitan Areas vary in spatial form. Some Megas show a clear corridor (or linear) form, while others spread out into vast urban galaxies. Many Megas exhibit both spatial patterns. Urban geographers have long referred to “galaxies” (Lewis 1983, 1995) or “corridors” (Baerwald 1982) at the individual metro scale. Pivo (1990) describes such galaxies as a “net of mixed beads,” where a mix of large and small centers extend over a wide area. The “net” here refers to an individual

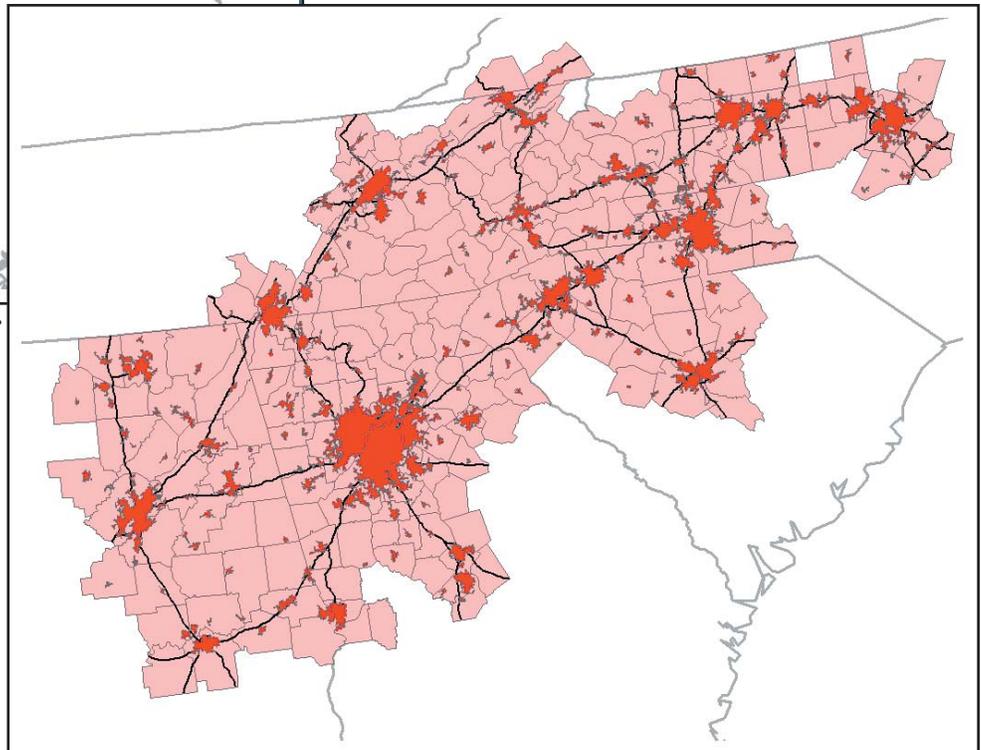
Extending Pivo’s (1990) metropolitan-based metaphor to the Megas, the net would now encompass up to 100,000 square miles—such as in the Midwest or Piedmont—and the beads would be individual metros within these regions. The big beads could refer to Chicago and Atlanta, while little ones indicate the dozens of micropolitan centers. Likewise, Megapolitans such as I-35, the Northeast, and the Gulf Coast are the ultimate large-scale manifestations of growth corridors.



Map 4: The I-35 Corridor Megapolitan

Maps 4 and 5 illustrate corridor and galactic Megapolitan Areas. The I-35 Corridor appears in Map 4. The light pink shaded area shows the region's Megapolitan counties, while the darker red shared zones indicate the urbanized areas. The dark black lines are the interstate highways, and the light ones are the county boundaries. The urbanized space lines up as beads along a string. The biggest single node is Dallas, TX. The only major metro area that lies away from I-35 is Tulsa, OK.

Map 5 profiles the galactic form of the Piedmont Megapolitan Areas. Note that while interstate highway corridors lace the Piedmont, the region maintains a web of metros that spread over a broad region of networked space. The single biggest bead in this net is metropolitan Atlanta, GA.

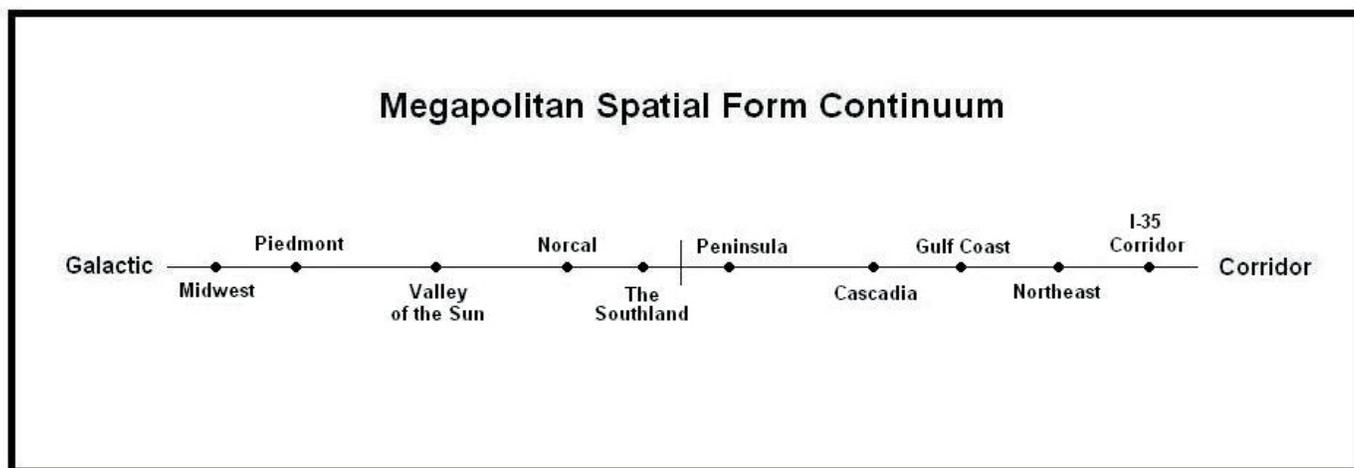


Map 5: The Piedmont Galactic Megapolitan

The illustration below shows the spectrum of Megapolitan spatial form, ranging from “galactic” to “corridor.” At one pole is the galactic Midwest, while on the other end of the continuum is the I-35 Corridor. All other Megas lie between these two, with the Piedmont region the next most galactic, and the Northeast nearest in form to the I-35 Corridor. It is too early to speculate what these variable forms mean in terms of Megapolitan function, but the spectrum does indicate that US trans-metropolitan development produces a wide range of spatial structure. The spatial analysis combined with compositional data also strongly suggests that the Midwest and Piedmont Megapolitans are related regions in terms of basic form. This observation certainly warrants further study.

largest industry in the region, but they are key sectors that play to each Megapolitan’s current competitive advantages. Thus, “high tech” is to NorCal what “finance” is to the Northeast or “aerospace” is to Cascadia—the sector in which the Megapolitan dominates either US or even world markets.

Table 7 also shows Megapolitan Area political trends based on a county-level analysis of the 2000 and 2004 presidential elections.³² There are five Megas that lean Republican and five Democratic. The most Democratic Megapolitan Area is NorCal, while the I-35 Corridor is Republican. The Midwestern and Peninsula are the most swing Megapolitans, with the former tilted to the Democrats and the latter toward the Republicans.



The Megapolitans at a Glance

Future research will explore each Megapolitan Area in greater detail than is possible in this Census Report. For now, however, Table 7 provides a quick summary of selected Megapolitan features. The “signature industry” label refers to the businesses that are popularly associated with each Megapolitan Area. These may not be the

In 2004, Democratic candidate John Kerry won the Megapolitan Area popular vote by 51.6 percent to 48.4 for President George W. Bush—or almost the exact reverse of the nation as a whole. Kerry received 46.4 million Megapolitan votes, while Bush won 43.5 million. The 90 million total Megapolitan ballots accounted for three quarters of all cast in the US. The quarter of the votes cast outside the Megapolitan Areas went heavily

for Bush. The President’s margin of victory in non-Megapolitan America was 60/40, which approximates his 2004 vote share in rural America

(Lang et al 2004).

Policy Implications and Impact

Table 7. The Megapolitans at a Glance

Megapolitan Area	Megapolitan States	Biggest Metro	Signature Industry*	Rep. vs Dem. Politics**
Cascadia	OR, WA	Seattle	Aerospace	Dem.
Gulf Coast	AL, FL, LA, MS, TX	Houston	Energy	Rep.
I-35 Corridor	KS, MO, OK, TX	Dallas	High Tech	Rep.
Midwest	IL, IN, KY, MI, OH, WI	Chicago	Manufacturing	Dem.
NorCal	CA, NV	San Francisco	High Tech	Dem.
Northeast	CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, WV	New York	Finance	Dem.
Peninsula	FL	Miami	Tourism	Rep.
Piedmont	AL, GA, NC, TN, VA	Atlanta	Logistics/Trade	Rep.
Southland	CA, NV	Los Angeles	Entertainment	Dem.
Valley of the Sun	AZ	Phoenix	Home Building	Rep.

* The industry most easily identified with leading metros in the Megapolitan Area.
 ** How a Megapolitan Area leans politically based on the 2000 and 2004 elections.

Any new geographic category can reshape public policy. Given that Megapolitan Areas label as proposed here redefine the space where two in three Americans reside, its impact could prove significant. There are countless ways that Megas may alter the policy landscape. The discussion below focuses on two of these issues—urban sprawl and transportation planning. The section starts with a brief consideration of what “audiences” exist for Megapolitan studies and ends with a note about future research.

Audiences

The key audience for Megapolitan research is the US Census Bureau, which through OMB authorizes new standards

for defining places. The Census Bureau seeks input on better ways to label and measure urban development. It was, for example, quite responsive in redefining much of non-metropolitan America as micropolitan. The Megapolitan research can spur the Census Bureau to rethink its geographic definitions. This effort would be helped by developing broad constituencies that advocate for a Megapolitan label.

There are several other audiences that Megapolitan research can reach. These include elected officials and policy makers whose localities would be impacted by a Megapolitan designation. This audience can also help promote the Megapolitan concept by using it in practice and asking for its formal adoption by the Census Bureau.

Another important audience is the research community whose work focuses on planning and metropolitan development. Their feedback to the preliminary analysis presented in this study will improve the social science of Megapolitan Areas. The academic fields that connect most directly to Megapolitan studies are urban geography, planning, and sociology.

Finally, the Megapolitan concept is media friendly. In fact, *USA Today* has already reported on what it calls a "string city," as in: "Unrelenting sprawl along Interstates 85 and 20 is creating a 'string city' that stretches 600 miles between Raleigh, NC, and Birmingham, AL" (El Nasser and Overberg 2001, p. A3). A search on Google News for recent references to the term "megalopolis" shows that there are 111 media citations for just the period February 11 to March 17, 2005.

From a review of current media, it appears that the public has an intuitive sense that Megapolitans are real. Making this concept official will coalesce

this belief and channel it into a new working geography.

Megapolitan Sprawl

The emergence of Megapolitan Areas comes not just from rapid growth in the US population over the past several decades—it also reflects how the nation is developing. Since 1950, the most significant growth pattern has been urban decentralization. Even by the time Gottmann first observed the megalopolis, the emergence of the "spread city" (a term coined by the Regional Plan Association of New York in the 1960s) was apparent. Suburbs from Boston to Washington were racing toward one another. When they joined, which many have, they would make the Northeast a single extended Megapolitan space.

What began with the original Northeast megalopolis now extends to nine other places. The combination of rapid growth and massive decentralization transformed once distant cities into galaxies and corridors of linked urban space. Ever-expanding exurbs will continue to strengthen and add to these linkages. Thus the physical connectivity that provides much of the basis for Megapolitan Areas should strengthen over the next few decades.

Not only are Megapolitans one consequence of sprawl, the different ways these regions develop also provides insight into how urban decentralization varies around the nation. More importantly, this knowledge can improve the way regions respond to the consequences of sprawl. Galster et al. (2001), Fulton et al. (2001), and Lang (2002) show that urbanization patterns vary considerably and produce distinct regional metropolitan built forms. This research also finds that sprawl, as measured by built density,

differs in character by region. All three studies identify a "dense sprawl" in places such as Los Angeles, where even the edge of the region may have subdivisions with small lots. By contrast, the edges of southern metropolitan areas feature lower density development and constitute a quasi-rural environment.

Lang (2002, 2003) measured the percent of metropolitan residents living in Census Bureau-defined "urbanized areas" to show variation in regional development patterns. Recall that these areas have densities at or exceeding 1,000 residents per square mile. Downs (1999) argues

that a metropolitan area with a substantial number of residents below this threshold indicates a low-density urban fringe.

Table 8 shows the percent of urbanized area population for each Megapolitan. Virtually all (98.17 percent) Southland residents live in urbanized areas. By contrast, almost a third of Piedmont citizens live outside these places. The edge of Megapolitan development in the Southland is sharp and well-defined as indicated by the very small share of people living in the non-urbanized fringe. Conversely, the Piedmont edge is amorphous given that one in three people

live outside its urbanized areas.

Even the intensely built Northeast—the place that inspired Gottmann—has over 5.2 million residents living in places with less than 1,000 people per square mile. The Piedmont has just over 6 million in these same places, while the Midwest has almost 6.7 million. Nationally, nearly 25.8 million Megapolitan residents live in low-density non-urbanized areas, with the

Table 8. Megapolitan Urbanized Area, 2000
Ranked by Percent of Urbanized Area

Megapolitan Area	2000 Megapolitan Population	2000 Urbanized Population	2000 Non-Urbanized Population	Percent of Urbanized Population
Southland	20,962,590	20,579,606	382,984	98.2
Valley of the Sun	4,095,622	3,853,392	242,230	94.1
NorCal	11,568,172	10,788,790	779,382	93.3
Peninsula	12,837,903	11,805,629	1,032,274	92.0
Northeast	49,182,941	43,924,756	5,258,185	89.3
Cascadia	7,115,710	6,009,614	1,106,096	84.5
Gulf Coast	11,533,241	9,650,988	1,882,253	83.7
I-35 Corridor	14,465,638	12,074,583	2,391,055	83.5
Midwest	39,489,865	32,791,908	6,697,957	83.0
Piedmont	18,391,495	12,377,286	6,014,209	67.3
Megapolitan Total	189,643,177	163,856,552	25,786,625	86.4

Note: Urbanized Areas exceed 1,000 people per square mile.

bulk coming from the Northeast, Piedmont, and Midwest—or East of the Mississippi.

From the urbanized area analysis, it appears that there is a Southland versus Piedmont style of sprawl. Knowing this, the Megapolitan Areas could develop regionwide strategies for addressing sprawl. For example, given that the region is already densely built, altering the pattern of Southland-style sprawl could mean better mixing land uses to facilitate pedestrian or transit-oriented development. But the same strategy would not work in the Piedmont where densities are low.

Some Megapolitans also face the prospect of “build out,” or the point at which large-scale Greenfield opportunities disappear. Large sections of the Southland and Peninsula are near build out. The Los Angeles and Miami metropolitan areas in particular face this prospect. For example, less than ten percent of developable land remains in Broward County, FL (home to Fort Lauderdale) because of environmental concern for the Everglades (Lang et al. 2005). In much of the Southland and the Peninsula, sprawl has simply no where to go. These two Megapolitan Areas will have to shift their growth models if they are to accommodate even a portion of their projected population gains.

The New MPOs: Megapolitan Planning Organizations

If officially designated, Megapolitan Areas would be the US Census Bureau's largest geographic unit. Their rise could spark a discussion of what types of planning needs to be done on this scale. In Europe, Megapolitan-like spatial planning now guides new infrastructure investment such as high-speed trains between networked city centers. The United States should do the same. The interstate highways that

run through Megapolitan Areas, such as I-95 from Boston, MA to Washington, DC; I-35 from San Antonio, TX to Kansas City, MO; and I-85 from Raleigh, NC to Atlanta, GA, would greatly benefit from unified planning. A new Census Bureau Megapolitan definition would legitimize large-scale transportation planning and trigger similar efforts in such areas as economic development and environmental impact.

Federal transportation aid could be tied to Megapolitan planning much the way it has recently been linked to metropolitan areas. The Intermodal Surface Transit Efficiency Act of 1991 required regions to form Metropolitan Planning Organizations (MPOs) in order to receive federal money for transportation projects (Gertz 2003). In a similar vein, new super MPOs could result from future legislation that directs Megapolitan Areas to plan on a vast scale. It is then that tangible impacts would begin to occur. For example, an analysis of traffic flow along the Northeast Megapolitan Area from Boston to Washington would show that a key pressure point is the Delaware tolls on the Delaware Turnpike. The state uses these tolls to raise revenue, but the resulting traffic on busy weekends and holidays creates a major inefficiency in the Northeast Megapolitan Area's transportation system. Also, the resulting pollution lowers the air quality in places such as southern New Jersey. The super MPO that would be charged with transportation planning throughout the Northeast Megapolitan Area may be in a position to negotiate an end to these tolls.

Future Research

The research presented in this study is only a start. We offer this work to begin the discussion. Feedback from those out in the Megapolitan Areas and other researchers will greatly facilitate

adjustments to our definitions, methods, and geography. The purpose in formally presenting this research in its preliminary stage is to solicit input from experts and others who may use Megapolitan geography.

Future versions of this work will add more detailed examination of the ten Megapolitan Areas. This will include a demographic analysis using census long-form data. The Megas are composed of counties. This means they can be examined as fully as any metropolitan or micropolitan area. Other sources of data that are also collected at the county level will further clarify conditions in these places.

Finally, some methods used to define Megapolitan Areas may shift. One possibility considered in this preliminary research phase was to split the types of Megapolitan Areas based on their total population. The biggest four or five Megas could be designated as "Principal Megapolitan Areas." The Megapolitans below these could be called "Secondary Megapolitan Areas," to indicate a second tier of scale. The secondary Megas may also include the Front Range of the Rockies, which in many respects is a peer area to Cascadia and the Valley of the Sun. There may also be another secondary Megapolitan Area that runs along the old Erie Canal from Albany to Buffalo, NY. But does it make sense from a planning perspective to have two Megapolitan types based on size? The answer to that question will come from the field.

Authors

Robert E. Lang is Director of the Metropolitan Institute at Virginia Tech and an Associate Professor of Urban Affairs and Planning. The author is currently working on a book (with Jennifer LeFurgy) titled *Boomburbs: The Rise of America's Accidental Cities* for the Brookings Institution Press. Dawn Dhavale is a doctoral candidate in Urban Affairs and Planning and a Research Associate at the Metropolitan Institute. The authors thank Jared Lang for his help in preparing the GIS Maps of the Megapolitan Areas and Chris Nelson for his projection data. They also thank Jessica Hanff for editing and formatting this Census Report, Carol Bell for her editing, and Rebecca Sohmer for her editing and useful comments.

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Notes

1. According to Baigent (2004) the term megalopolis "meaning a large city, was in general press by the 1820s" (p. 687). The first scholarly use of megalopolis was by the English urban planner Patrick Geddes in 1927 (Thomas 2000). The word was originally a pejorative term for overgrown cities.

2. Gottmann used the term "megapolitan" as an adjectival form of megalopolis, as he does in the epigraph at the start of this note.

3. Even if the Census Bureau does not designate Megas in the short term, using existing census categories as basic building blocks creates a census-compatible geography that planning agencies could adopt.

4. The authors thank Robert Yaro the current RPA president for suggesting a history of Megapolitan thinking and for providing guidance on the recent evolution of the idea.

5. Boris Pushkarev, RPA's Chief Planner in 1967 was the principal author of the Atlantic Urban Region section.

6. It covered a 150 county area that closely approximates the Northeast Megapolitan Area that we identify in this report.

7. The RPA report significantly overestimated population growth in the Atlantic Urban Region. This was due in part to the fact that the base it used for extrapolating growth trends included the peak of the Baby Boom. Yet despite their being less people, the amount of current settled area looks similar to what RPA predicted. This indicates that the Atlantic Urban Region has thinned out due to fast growth at the low density fringe.

8. The Corridor, sometimes referred to as the "Silicon Dominion," played a vital role in starting the Internet.

9. At the bottom of the scaling were Micropolitan Areas, a concept that was adopted.

10. The Megapolitan threshold requirement of greater than 10 million residents by 2040 indicates a critical mass of people. The figure exceeds New York City's 2000 population by two million people. The date 2040 was selected to show a three decade-plus growth in Megapolitan development. Thirty five years ago in 1970 a shift to more urbanized suburbs

began in earnest. Lang et al (2005) calls this post-1970 style development a "new metropolis," of which Megapolitans are one consequence. By 1880, the "Atlantic Urban Region," or the Northeast Megapolitan Area had almost 11 million residents (RPA 1967).

11. We stop at national borders for statistical purposes, but clearly some Megapolitan Areas extend into Mexico and Canada.

12. The Census Bureau also uses this statistic to identify core counties in a metropolitan area.

13. For a more detailed explanation of long-form data, see Berube et al 2005.

14. According to Frey et al. (2004), just over half of all metropolitan areas are found in CSAs.

15. There were some earlier quasi versions of trans-metropolitan areas. One such example is the Census Bureau's old Consolidated Metropolitan Statistical Areas (CMSA), which occasionally captured two big regions, such as the Baltimore-Washington CMSA. But there were only 18 CMSAs, of which just a handful made big metro linkages.

16. For example, Jackson County, TX is the only non-metropolitan coastal county to be included in the "Gulf Coast Megapolitan Area." The county met the 60 percent contiguous boundary rule, and it has a CSA, metropolitan, and micropolitan area along its border.

17. We are not the first researchers to use this method to identify Megapolitan Areas. Chute (1956) used contiguous Census-defined metropolitan areas as the basis for "urban regions."

18. The 200,000 and 800,000 population thresholds were selected based on a recent county-level analysis by Lang and Gough (2005). See this publication for a methods statement on the significance of these break points.

19. The Census Bureau does keep such data internally. It does not release this information because it cannot gather flow data for all of the United States.

20. The hinterworld maps are available online at www.lboro.ac.uk/gawc/visual/hwatlas.html

21. Cultural geographers also use names to help identify where a cultural region begins and ends. For example, Zelinsky (1973) looked at local phone books to see how many times a region's label is used in a business name. He would then go to the neighboring

community, look at the phone book, and do the same thing. At some point the regional name is not used which therefore demarcates the edge of the region. The 21st century equivalent of this type of analysis would use superpages.com (a local e-phone book). This will be performed in subsequent revisions of the Megapolitan research.

22. Other popular names were also checked as a benchmark for the ones selected as Megapolitan labels. For example, "Dallas Metroplex" generated 251,000 hits in Google. That ranked it just below Southland as a place reference.

23. The Chisholm Trail was a late 19th-century cattle route that connected rail heads in Kansas and Missouri to range lands in central Texas.

24. We also considered "the NAFTA Corridor" as a label for this Megapolitan Area, but the Google hits for that label only registered in the hundreds.

25. The traffic flow along I-35 is now so heavy that Texas is proposing to build a new super highway to roughly parallel the existing Interstate. According to USA Today, "The Trans-Texas Corridor, almost a quarter-mile wide, would carry cars, trucks, trains and pipelines for water, oil, natural gas, electricity and fiber optics. The roads would be built over the next 50 years at a cost of up to \$185 billion, mostly with private money" (Copeland 2005, p. A3). If built, the Trans-Texas Corridor would significantly strengthen Megapolitan connectivity in the I-35 Corridor.

26. These are the top 15 and 50 most populous metropolitan areas as of the June 2003 Census Bureau estimates.

27. The 11 metropolitan areas not included (ranked by size) are: Minneapolis, MN-WI; St. Louis, MO-IL; Denver, CO; Virginia Beach, VA-NC; Nashville, TN; Memphis, TN-MS-AR; Buffalo, NY; Louisville, KY; Jacksonville, FL; Rochester, NY; and Salt Lake City, UT.

28. The projection is based on population growth from 2000 to 2003.

29. In 1970, the Valley of the Sun had just 847,236 residents.

30. Woods & Poole Economics, Inc. is a Washington, DC-based consulting firm that produces long-term county-level economic and demographic projections.

It maintains a database that projects over 900 variables through 2030. Nelson (2005) extends this data to 2040 by extrapolation.

31. The Ciudad Lineal was part of a planned effort to build a linear metropolis around rail (Collins 1959).

32. The county data comes from votes tabulated by CNN and available at: <http://www.cnn.com/ELECTION/2004/>

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