Defining U.S. Megaregions

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Abstract
This paper explores recent and historical scholarly research on the identification of U.S. megaregions and the different methodology used to define them. The author, now a staff member at Regional Plan Association (RPA), discusses in detail RPA's methodology for defining 11 U.S. megaregions and its strengths and weaknesses.

Why Megaregions?

As metropolitan regions continued to expand throughout the second half of the 20th century their boundaries began to blur, creating a new scale of geography now known as the megaregion. Interlocking economic systems, shared natural resources and ecosystems, and common transportation systems link these population centers together. As continued population growth and low density settlement patterns place increasing pressure on these systems, there is greater impetus to coordinate policy at this expanded scale.

Historically, new geographic scales evolved as a result of the movement of population outward from the city center in increasing numbers and at decreasing densities. To critics, the megaregion is simply the latest scale at which to recognize this pattern and connotes amorphous sprawl, unbroken and continuous across the landscape. However, the identification of the megaregion does not imply the acceptance of this phenomenon and the recognition of the inevitability of this continued pattern. It can be used to stress connections between centers within the megaregion. It can incorporate population centers as well as natural landscapes worthy of protection, and which are integral to the functioning of the megaregion. It can be used to transcend metropolitan and state boundaries to coordinate mutually beneficial policies, such as intercity travel or freight movement. These megaregions, which began to agglomerate in the last century, present planners with a scale that possesses both challenges and immense opportunities for regional planning in this century.

The challenge of identifying these emerging regions has been undertaken on several fronts. The most recent iteration of these regions has been developed by Regional Plan Association (RPA) in partnership with the Lincoln Institute of Land Policy. Eleven such megaregions have been identified as possessing qualities that would make cooperative integrated planning advantageous at this scale. These regions were chosen based upon location of existing population centers, population and employment growth projections, and connectivity between centers. This paper is an evaluation of the method RPA used to identify these eleven megaregions.

History

From the earliest towns incorporating the land beyond the extent of their city walls to the codification of the metropolitan area in the middle of the 20th century, the concept of expanding the boundaries of the metropolitan landscape to address changing demands on urban systems is not new. This tradition of geographers and planners attempting to enhance the value of geographic definitions to meet the needs of new generations continued with the first identification of a scale larger than the metro regions by French geographer Jean Gottmann in his 1961 book *Megalopolis*. This "Megalopolis" referred specifically to the Northeastern United States stretching from New Hampshire to Virginia. Gottman referred to this new spatial order as "the dawn of a new stage in human civilization," and predicted that Megalopolis was a prototype that would evolve in other parts of the country by the end of the 20th century (Gottman 1961).

Senator Claiborne Pell picked up on Gottman's idea in the 1960s and began promoting transportation planning at this scale. He decried that Megalopolis was becoming "entangled in ribbons of concrete," too crowded for efficient travel, and that airplanes wasted hours each day waiting for a place to land, while at the same time there existed underutilized railroad track within the region (Pell 1966). He used this new concept of the megapolitan scale to advocate for the creation of a new public authority, to be administered through an eight state compact, charged with operating intercity passenger rail service in the Northeast corridor.

Regional Plan Association also identified this emerging Northeast Megaregion in the 1960s. In *The Region's Growth,* part of its Second Regional Plan, RPA describes the "Atlantic Urban Region" as "an urban chain which extends for 460 miles from Maine to Virginia" (RPA 1967). This

region was nearly identical to Gottman's Megalopolis. James Pickard, writing in the 1960s and 70s for the Urban Land Institute began the process of nationalizing this concept when he identified 21 urban areas with population of over one million and a population density over 205 people per square mile. He predicted that these 21 regions would merge into 10-15 by 1980 (Pell 1966).

Expanding the conceptions of the megaregion to the national scale is more complicated than identifying the original Northeastern Megalopolis. In the past decade attempts have been made on several fronts to systematize the process for defining these. Two notable efforts emanate from the Department of City and Regional Planning at the University of Pennsylvania and the Metropolitan Institute at Virginia Tech. These early attempts to identify emerging megaregions outside the Northeast began to create metrics for what criteria to include and where the boundaries should be drawn.

Led by Bob Yaro, Jonathon Barnett, and Armando Carbonell, a planning studio at the University of Pennsylvania School of Design initiated the most recent round of interest in American megaregions in 2004. This initial interest in nationalizing the megaregion concept that had been up until that point confined to the Northeast was heavily influenced by the European Spatial Development Perspective (ESDP). The primary motivation for this attempt was the SuperCities of Europe and Asia that were being identified and seen as the new competitive unit of the global economy (Penn 2004). These European SuperCities were identified as part of the ESDP. Investments were being made in infrastructure that would make these regions more competitive in the global market place. These regions, consisting of "networked cities" span national borders within the EU, and were being used as a framework to plan for growth, environmental protection, and economic development.

The University of Pennsylvania effort was an attempt to create a similar scale at which to conceive these agglomerations in the United States. It focused on population growth, the building out of suburban America, inequitable growth patterns, and constrained infrastructure as the impetus for identifying these megaregions. This effort identified eight "SuperCities" or regions that could benefit from increased economic and political cooperation. Although the research on historical trends and problems faced by population growth was rigorous, the identification of these regions was not undertaken in a systematic process. Population projections were displayed graphically on a map and regions that appeared to be growing together were identified as "SuperCities."

This work sparked renewed interest in megaregions and was picked up by the Metropolitan Institute at Virginia Tech. The Metropolitan Institute's approach is based primarily on spatial connectivity. It attempts to define the geographic unit by looking at "place and flow" (Lang and Dhavale 2005). The Census Bureau's definition of metropolitan area combines criteria for both place and flow in the form of population and commuting patterns. The Metropolitan Institute's conception of the megaregion attempts to apply this notion of connectivity to an expanded scale. However, commuting patterns used in the formulation of the metropolitan area do not suffice at this scale because the distances are too great, and therefore, other measures of connectedness must be conceived.

Virginia Tech's method began with counties in a metropolitan or micropolitan region and ranked them based on strength of connectedness. This method is similar to the process used by Chute in the 1950s who looked at the Northeast as a string of metropolitan areas. These areas were further refined through a business flow analysis measuring how cities are networked together. These were then further "tested" against non-Census criteria – including cultural geography, transportation, ecology, future growth projections, and economic linkages.

The current RPA process attempts to build on these methodologies and further systematize the process for the identification of these regions.

RPA Methodology for Indentifying Megaregions

The process by which megaregions were identified began by creating a scoring system to rank counties on the basis of existing population and employment levels, population and employment growth, and connectivity. This criteria-based system resulted in an index that was used to rank potential counties for inclusion in megaregions. This index consisted of five equally weighted variables. Counties were assigned one point for each criterion met. A map was then created on which the counties were displayed based on a one-to-five scale. RPA then engaged its staff in a workshop, drawing on their personal and professional experiences to move towards defining final boundaries for the megaregions.

Quantitive Methodologies

The index consisted of five equally weighted criteria. A county was assigned one point for each of the following conditions met:

- **It was part of a core based statistical area;**
- **Its population density exceeded 200 people per square mile in the 2000 census;**
- **The projected population growth rate was expected to be greater than 15 percent and total increased population was expected to exceed 1,000 people by 2025;**
- **The population density was expected to increase by 50 or more people per square mile between 2000 -2025; and**
- **The projected employment growth rate was expected to be greater than 15 percent and total growth in jobs was expected to exceed 20,000 by 2025.**

Regional Plan Association staff and interns refined the preliminary analysis of megaregion boundaries in a workshop on June 16, 2006.

Core Based Statistical Areas

The first criterion was whether the county was part a Core Based Statistical Area (CBSA) as defined by the Office of Management and Budget (Either Metropolitan Statistical Area or Micropolitan Statistical Area, collectively called Core Based Statistical Area). This distinction does not delineate an urban/rural divide. Counties within a CBSA may contain both urban and rural areas and populations. Instead, these categories recognize a "population nucleus and adjacent communities that have a high degree of integration with that nucleus." (OMB 2000)

For the purposes of defining the megaregion, several factors of CBSA's definition are important. Each CBSA is defined based on population and connectivity. To be included in a CBSA, a county must have an urbanized area, or urban cluster with a population of at least 10,000. Further, counties within a CBSA are related to each other based on commuting patterns. This connection is what ties these counties together and is the reason for inclusion in the CBSA. Counties within each CBSA are defined as either central or outlying counties. Central counties are defined for the purpose of measuring commuting patterns to and from potential outlying counties. A central county has at least 50 percent of its population living in urban areas of at least 10,000. An outlying county has at least 25 percent of its employed residents commuting to other counties within the CBSA or at least 25 percent of the county's workforce comes from other counties within the CBSA.

This emphasis on connectivity within the definition of CBSAs was the primary reason it was included as a criterion for megaregion definition. Each county that was designated as part of a CBSA was assigned one point. There were 1,743 counties assigned one point for being part of a CBSA out of the total 3,077 counties included in the study.

Population Density

The second criterion that went into the megaregion model was current population density by county. A county was assigned one point if its population density was greater than 200 people per square mile as of the 2000 census. Population density was included in this model to account for existing population centers. In order to be included in a megaregion, counties needed to be either a center of population or employment, or connected to these centers. Thus, identifying these population centers is a critical input to building the definition of a megaregion.

In setting thresholds for inclusion, cutoffs need to be determined in a somewhat subjective manner as there is no standard density level at which rural environments becomes exurban or suburban. 200 people per square mile was determined to be an appropriate threshold because it includes counties generally accepted to be urban, suburban, and exurban but excludes primarily rural counties. This is similar to the cutoff Pickard used to describe his metropolitan aglomerations in the 1960s of 205 people per square mile. It is however, a departure from the exurban/rural cutoff used by RPA in the Second Regional Plan, which was 100 people per square mile. This higher threshold was deemed more appropriate for this exercise because the intent of this specific criterion was to locate existing population centers, not all counties, for consideration of inclusion in megaregions. Counties with lower density that will experience rapid growth will be accounted for by other criteria in the study.

This calculation resulted in 454 of the total 3077 counties included in the study being assigned 1 point. Although this only includes 15 percent of the total counties, it accounts for 68 percent of the U.S. population. Of these 454 counties 451 were part of a Core Based Statistical Area. There is obviously a large overlap between these two criteria; however, this does not diminish their value as individual critera. CBSA's were included to account for chains of population on the landscape, connectivity between population centers, as well as to identify the population centers themselves. By including a stand alone measure of current density, this weights this factor in the ultimate score for inclusion and differentiates the population centers from the outlying counties that connect to them.

For example, an urban or suburban county with high connectivity to its neighbors will have a score of 2 after calculating the CBSA and population density categories. The low density (less than 200 persons per square mile) outlying counties, however, that are included in a CBSA because of their connectivity to an urban center will only have a score of 1. This unequal weighting ensures that higher density counties are counted more for inclusion in megaregions then the outlying counties that connect to them producing a gradient emanating from the urban center out toward the rural fringe. As will be discussed later, this differentiation became useful when the process moved to a more subjective phase, and visual cartographic representation was used to determine the boundaries of the megaregions. Three hundred fifty-three of these 454 counties were ultimately included in a megaregion

Forward Looking Criteria

Ultimately, the reason for creating a new level at which to collect data and analyze spatial patterns is to meet challenges associated with anticipated growth. As such, the next three criteria rely on projections of future growth; the first two deal with population growth, the final with employment growth. The source of data is the 2002 Complete Economic and Data Source from Woods and Poole, a commercial data provider, which provides employment and population data by county from 1969 to 2025.

Population Growth

The first forward looking criterion to be calculated was the expected population growth rate. Counties were assigned one point if the expected growth rate was expected to be greater than 15 percent with a minimum total growth of 1,000 people. This accounts for counties with substantial growth rates, but excludes counties with very small populations that could potentially skew the results.

There were 1,543 counties that were assigned one point for meeting these conditions. Of the four calculated variables that went into building the megaregion definition, the population growth rate variable encompassed the most total counties, representing 50 percent of all the counties in the nation. These 1,543 counties accounted for 64 percent of the current population but were expected to accommodate 93 percent of the expected growth, bringing the share of total population in these counties up to 70 percent by 2025.

Although a broad category accounting for much of the nation's expected growth, the population growth variable is an important input in defining the megaregions. This category accounts for counties that will experience rapid growth that may be just outside a CBSA with relatively low current population density. These counties would not be accounted for by the two variables discussed above but would meet the requirements for this category. Counties that fit this description, as well as the two variables discussed below (increasing population density, and high rates of employment growth) would result in an overall score of three and possibly be included within a megaregion boundary. In fact, counties such as these are what link the metro regions together, creating the megaregions, and are, thus, crucial to the definition. Six hundred ninety-eight of these counties were included in one of the final megaregions, accounting for 73 percent of the total megaregion counties.

Population Density Change

The next criterion evaluated was projected change in population density. The megaregion definition needed to account for population clustering as well as total population growth. This is because increased clustering leads to potential opportunities for increased connections in employment, transportation systems, and recreation. As such, population density change was included in the definition to account for this potential increased clustering of population. One point was assigned to each county that was projected to experience an increase in density of 50 people per square mile from 2000 - 2025. The threshold of 50 was determined to be the minimum rate of change at which a rural community will become exurban and connected to neighboring a metropolitan region. Counties growing at less than this rate will either remain rural or not have the exurban density to from substantive links with surrounding metropolitan regions.

The results of this calculation include 459 counties or roughly 15 percent of the counties included in the study. Not surprisingly, the counties in which density is projected to increase over this threshold will account for a disproportionate amount of the expected population growth. These 459 counties currently account for 63 percent of the nation's total population. This is expected to increase to 66 percent by 2025 as these counties will accommodate 77 percent of the anticipated growth. Three hundred forty-seven of these counties were ultimately included in a megaregion.

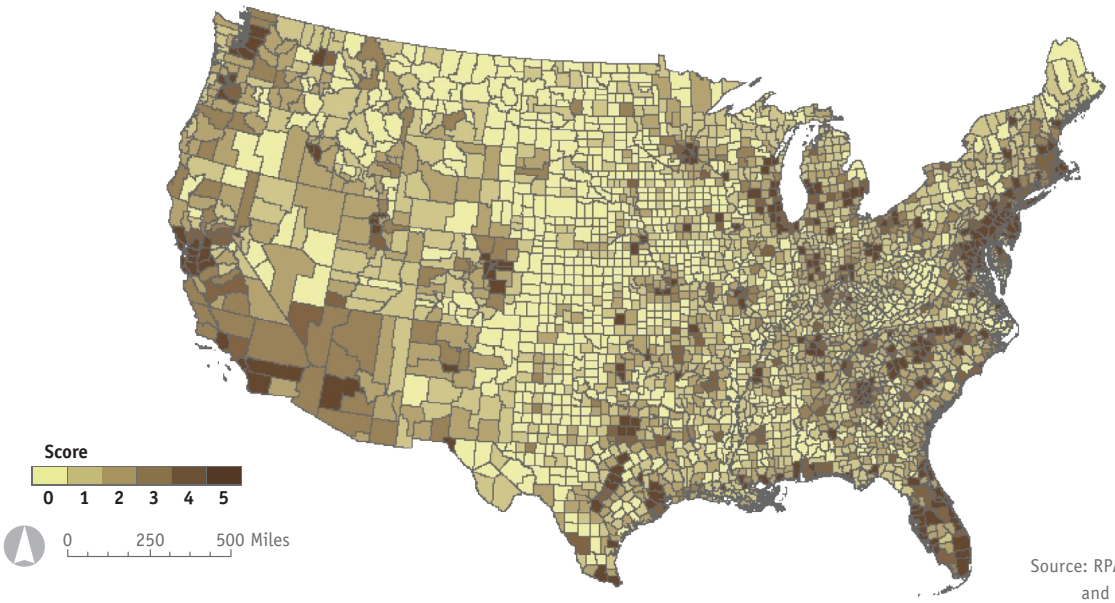
Employment Growth

The final calculated variable that went into building the megaregion definition was projected employment growth rate. Counties were assigned one point if the expected employment growth rate was greater than 15 percent with a minimum total growth of 20,000 jobs. A 15 percent growth rate was chosen as a cut off because counties experiencing employment growth at this minimum were deemed to have rapidly growing economies. However, as this was the only variable related to employment, a high threshold needed to be set for total employment growth to account only for counties that will add a substantial amount of jobs. Counties that are growing their employment at this minimum percentage, while adding a minimum of 20,000 jobs, will be significant contributors to the future economy and will likely form (if they do not already possess) strong connections with surrounding counties.

There were a total of 503 counties that met these conditions. These accounted for 16 percent of the total counties but 71 percent of the nation's total employment in 2000. This is expected to increase to 74 percent by 2025 as these counties add 47,000,000 jobs or 81 percent of the expected growth in employment for the nation. Only 11,000,000 jobs are expected to be added in the remaining 2,574 counties. This is an average of 4,300 jobs per county in these 2,574 counties, as compared to 93,000 in the selected 503 counties.

This criterion is integral to the identification of the megaregions. These megaregion designations attempt to account for areas that will receive disproportionate increases in population and employment, as well as the growing interconnectedness between the population centers that result from these increases. Projected growth in employment, in both percentage and absolute terms, is a key indicator of this growing interdependence within regions. Three hundred fifty-nine of the 503 counties identified by this criterion were included in the final megaregions. Of these 359, 61 were not counted in the population growth rate categories. These counties primarily represent employment

FIGURE 1: U.S. Counties by Score



Source: RPA Analysis of Census and Woods & Poole Data

centers within megaregions that are not experiencing rapid population growth, but are nonetheless integral to regional integration. They are primarily located in the Northeast and Midwest megaregions.

Final Megaregion Counties

The five criteria described above were added together to compile an overall score per county. This score ranged from 0-5 for all counties. Table 1 details the results of the ranking system. The table includes the total number of counties in each score category, the number of counties with this score included in a megaregion, as well as two percentages. The first is the percent of the given score that is in a megaregion; the second is the percent of the total counties in megaregions that are of this score. As can be expected, the percentage for inclusion in a megaregion increases as the score for the county increases. That is, a county is more likely to be a part of a megaregion if it is currently dense, with high expected population and employment growth. There is less of a trend seen in the column on the far right, the percentage of counties with a given score in a megaregion. This primarily results in the uneven overall distribution of scores throughout the nation, heavily weighted toward lower scores.

Table 1

Score	Total Counties	Counties In Megaregion with this score	Percent of counties with this score in Megaregions	Percent of counties in Megaregions with this score
0	905	42	5%	4%
1	908	208	23%	22%
2	680	293	43%	30%
3	176	107	61%	11%
4	134	91	68%	9%
5	274	221	81%	23%

Source: RPA

Nearly a third of all counties did not meet any of the criteria for determining megaregions. However, 42 (5 percent) of these counties, found their way into a megaregion. Twenty-four of these counties can be found in the Great Lakes Megaregion and are included because they are located between city pairs within the megaregion and are surrounded on all sides by megaregion counties. The remaining 18 are scattered throughout the other 10 megaregions and are included for similar reasons. In the case of the three included in the Front Range, they are three contiguous counties along the I-25 corridor between Denver and Albuquerque.

On the other end of the scale, 274, or roughly 9 percent, of the counties met all the criteria outlined above and had the maximum score of 5. Of these, 81 percent were included in a megaregion. The 53 counties that scored a 5 that were not included in a megaregion were primarily located in the Midwest and South and were medium sized, growing metropolitan or micropolitan regions that were isolated from other similar population centers. These include Oklahoma City, Tulsa, Memphis, Nashville, Kansas City, Salt Lake City, Boise, and Spokane. The remainder of the megaregions was made up of a mixture of scores.

Table 2

Megaregion	Number of Counties	Area in sq miles	Population 2000	Estimated Percent Growth to 2025	Average Score
Southern California	10	61,986	21,858,662	31%	3.90
Southern Florida	42	38,356	14,686,285	45%	3.89
Northern California	31	47,928	12,724,861	36%	3.71
Northeast	142	61,942	49,563,296	17%	3.55
Piedmont	121	59,525	14,855,052	38%	2.96
Arizona Sun Corridor	8	48,803	4,535,049	62%	2.88
Cascadia	34	47,226	7,400,532	38%	2.79
Front Range	30	56,810	4,733,679	44%	2.79
Gulf Coast	75	59,519	11,747,587	35%	2.35
Texas Triangle	101	85,312	16,131,347	46%	2.27
Great Lakes	388	205,452	53,768,125	17%	2.22
Megaregions	962	772,860	206,780,494	28%	2.69
Rest of Country	2115	2,245,370	73,508,817	24%	1.00
Total	3077	3,018,230	280,289,311	27%	
Megaregion Percent	31%	26%	74%		

Source: RPA Analysis of Census and Woods & Poole Data

Qualitative Methodology

Once this index was complied, it was printed out on a large national map for the interactive process. This process consisted of two separate methods. The first was a group exercise relying on personal and professional knowledge of the RPA staff to interpret the agglomerations displayed on the map. The second used aerial photography and satellite imagery to refine the boundaries identified during the group process. These two processes resulted in the identification of 11 megaregions.

The first of these two methods was a group exercise based on the Delphi Method. The Delphi Method employs a panel of experts that through a multi-staged process refines estimates and converges on consensus. For this modification, RPA staff was asked to use personal knowledge of the various regions of the country and using tracing paper trace what they thought would be appropriate boundaries for the megaregions. In addition to a large printout of the map displayed in Figure 1, several maps were also made available for consultation that displayed watersheds and bioregions. The staff was asked to draw on their personal and professional knowledge of the geography of the United States and their professional experience visiting and studying metropolitan regions around the country to determine expanded catchment areas for this new geography. The cumulative overlap of many individual attempts resulted in distinct patterns and the emergence of stable megaregion boundaries. This trial and error process is similar to the design workshops used for community visioning lead by RPA on a significantly larger scale.

The consensus boundaries were then evaluated against aerial photographs and satellite imagery to more accurately determine the edges of the potential megaregions. This allowed the final boundaries to be informed by locating the extent of urbanization within the regions. This portion of the process was especially useful to account for natural features such as mountain ranges, water features, and open space that create natural barriers between the regions. These images influenced in particular the identification of the boundaries the Piedmont and Florida megaregions.

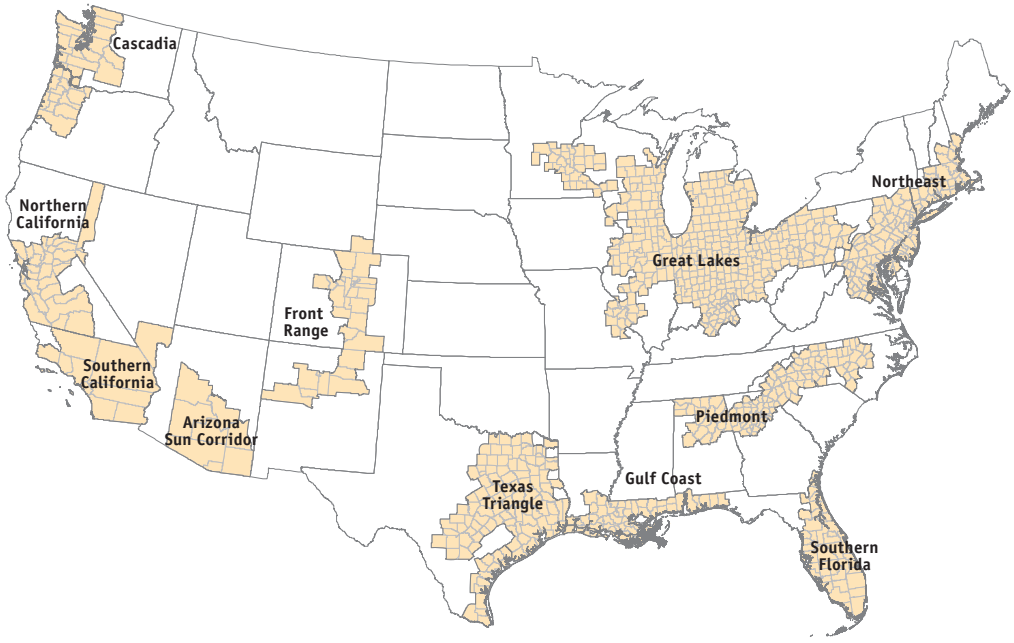
Identified Megaregions

Eleven megaregions were identified. These 11 megaregions differ in size, shape, population, density, growth, and employment. They all however, consist of interrelated population and employment centers that share common transportation networks, cultures, and environmental features.

The megaregions fall into three categories. The first is the smaller, faster growing regions of the West. These include the Arizona Sun Corridor (8 counties), Cascadia (34 counties), and Front Range (30 counties). These three megaregions are comparatively small (between 8 and 34 counties), have current populations less than 10 million, are exhibiting rapid regional growth, and have emerging internal connections. These three all have approximately the same overall score of approximately 2.8. This score represents counties with generally high rates of population and employment growth that are part of a CBSA but lack the density to meet the thresholds for either the current or future density categories.

The second group consists of large, slow growth, well established regions with strong internal connections and deep-rooted historical ties. These megaregions include the Northeast (142 counties) and the Great Lakes (388 counties). Although both anticipate slow population growth at 17 percent over the 25 year period, these two megaregions account for nearly half of the current population of the 11 megaregions and more than a third of the total population of the country. These two regions share many of the same attributes and challenges. They have well established population centers, contain older industrial cities, and have experienced a thinning of their population since the middle of the twentieth century. Despite this, these regions

FIGURE 2: Megaregion Counties as Identified by RPA Method



Source: RPA

are integral to the nation's current and future culture and economy. The regional focal cities of Chicago, New York, and Washington, D.C. are world centers of finance, culture, and politics.

The Great Lakes megaregion had the lowest overall score of the 11 megaregions with 2.2. This is primarily a result of the relatively slow growth in population and employment in of its 388 counties as well as the fact that many rural counties are included in this megaregion and lie in between the population centers. The Northeast, as a result of its high density, has a score of 3.6, placing it fourth out of the 11 regions, despite its relatively slow growth.

The final category of megaregions is a hybrid of the first two. These consist of larger, more established regions than the first, but smaller, faster growing regions than the second. These regions are expected to accommodate a major portion of the nation's anticipated growth. These megaregions include Southern California (10 counties) Southern Florida (42 counties), Northern California (31 counties), Piedmont (121 counties), Gulf Coast (75 counties) and Texas Triangle (101 counties).

There were a range of scores among these megaregions. Southern California, Southern Florida, and Northern California had the three highest overall scores. This is due to their established centers, fast growing peripheral regions, and relatively compact size. There were a range of scores among the other megaregions in this category, although all shared a growth rate of over 30 percent. Thirteen of the counties in this class were included in two megaregions. These include the counties of metro Houston that are part of both the Texas Triangle and the Gulf Coast.

The average score for the 962 counties in megaregions is 2.69 compared to an average of 1.00 for counties outside a megaregion. Table 2 summaries selected statistics for all 11 megaregions, including number of counties, total area, population, expected growth, and total average score of included counties.

Analysis

Attempts, both current and historic, to create an expanded geographic scale are undertaken to address challenges not adequately addressed by existing geographies. As metropolitan regions continued to expand throughout the last half of the 20th century their boundaries began to blur. Interlocking economic systems, shared natural resources and ecosystems, and common transportation systems create an impetus to coordinate policy on this expanded megaregional scale. By identifying these shared relationships that help define the megaregions, planners and policy makers gain the ability to coordinate mutually beneficial policies within the megaregions.

The method used by RPA to define megaregions could be expanded, however. The index created by RPA did a good job at identifying fast-growing regions with existing metropolitan centers, such as megaregions in Florida and California, and the consistently dense Northeast, but it provided less guidance for identifying the more sparsely-populated, slower-growth megaregions, such as the Great Lakes or Gulf Coast. We lacked a true variable to account for connectedness between cities. A mechanism is needed to answer questions such as: are there stronger ties between Pittsburgh and cities in the Great Lakes Megaregion or between Pittsburgh and Philadelphia? Are Nashville and Memphis integrated

into the Piedmont economy? Is Salt Lake City as isolated as it appears geographically, or does it share critical links with the economies of the Front Range or Northern California? These questions were largely left unanswered.

The ranking system focused exclusively on population and employment factors, failing to incorporate the importance of natural systems, transportation systems, and cultural and economic connections in the quantitive analysis. Although, during the second phase of the process these natural systems and transportation infrastructure were on the maps and were considered by staff members as they drew their boundaries. As population and employment growth are the primary drivers for recognizing this new geography, they are critical inputs to the definition, and the method does a good job of accounting for them. However, since the goal is to create strategies for economic development, natural systems management, and transportation planning, refining the definition to match these challenges is crucial. Although more difficult to quantify, variables that could capture these concepts would result in a richer more meaningful definition of the megaregions.

The method employed by Taylor and Lang (2005) of business flow analysis as a measure of how cities are connected could greatly enhance the understanding of the megaregions. This method however, also has significant drawbacks in this context. The results of the business flow analysis shows that New York is more connected with Tokyo, Chicago, and Hong Kong, than with Philadelphia, a city 100 miles to the south, within the Northeast Corridor, and with which it shares environmental and built infrastructure. This is not just an anomaly due to New York's position as a world capital. This analysis shows Los Angeles more closely connected to Washington, D.C. than with San Diego. Miami's strongest connection is with Dallas; Houston's is with San Francisco. This analysis is appropriate to assess the international flow of intellectual capital but does little to address the particular spatial challenges that face the megaregions.

A more appropriate means to assess the spatial connectivity within these regions is intercity passenger and freight movement. These passenger and goods flows have clear relationships to land use patterns, environmental impacts, and economic vitality. These transportation networks are what hold the megaregions together, making them distinct units rather than amorphous collections of population. Thus, incorporating data on intercity travel will move toward answering many of the unanswered questions on connectivity that were not answered in the RPA process.

Conclusion

All of the modern conceptions of megaregions rely to varying degrees on future projections. Scholars studying world population half a century ago foresaw continuous acceleration of growth well into the 21st century. One notable forecaster, an architect and planner named Constatinos Doxiadis, predicted that world population growth would level off at 50 billion by the middle of the 21st century. He predicted that the megacities of the world would be replaced by "Ecumenopolis", a vast world city made up of interlocking megapolitans (Pell, 1966). World population growth has, in fact, begun to level off well short of this prediction, and future population predictions have been scaled down considerably in the past 30 years.

This is offered as a note of caution, as it is important to take into account that projections can fail to materialize. Although sound predictions about future growth based on past trends are key in any attempt to plan for the future, these plans should also be rooted in present conditions. As this relates to the megaregions, creating geographies that are intended to transcend current borders and integrate policy among interrelated centers should be heavily rooted in the current connections between these centers. Although future population and employment growth are integral inputs to address the challenges that will face the megaregions in the future, the current transportation networks and passenger flows that tie these regions together cannot be ignored in building their definition.

The current iteration of the megaregions follows a long tradition of expanding geography intended to meet new challenges. In spite of its limitations, the method used by RPA to define these megaregions attempted to systematize the process for identifying "SuperCities". The five criteria used in this analysis incorporated both current population data and future projections for population and employment growth. These data adequately identified fast-growing regions with existing major population centers as well as the densely populated northeast, but failed to identify slower growing, less dense regions that may or may not contain strong existing connections. The identification of these areas relied on more subjective methods. Although relevant data is difficult to obtain, by including some measure of connectivity into the index itself, the identification process can more accurately and systematically identify megaregions.

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