

The Patchwork Metropolis:

The Morphology of Crosscutting Urban-Suburban Class Divides

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Abstract

This research examines the new divides and changing structure of the modern city and metropolis. Ever since the classic Chicago School models of urban form, the metropolis has been conceived as divided by affluent suburbs surrounding a less advantaged core. More recently, the concept of a great inversion has been advanced to capture the return of more advantaged groups to the urban center and the outward shift of poverty and disadvantage to the suburbs. To gain insight into the actual changes in urban and metropolitan form, we map the locations of three major classes — the growing ranks of knowledge workers and professionals who make up the creative class, the declining blue collar working class and the rapidly rising low-wage class of service workers in routine jobs like food preparation, and clerical work — across a dozen of America's largest metro areas and their core cities. We find a new pattern of class division and urban form that we refer to as the patchwork metropolis, where class divides cut across city and suburb alike. These divides are conditioned by the location of the advantaged creative class which occupies and clusters around the most functional and desirable areas of the metropolis — close to the urban core, around transit, near knowledge institutions and along areas of natural amenities. The less advantaged classes are shunted into the spaces left over or in between — either traditionally disadvantaged areas of the inner city or the far fringes of the suburban and ex-urban periphery.

Keywords: Patchwork Metropolis, Divided City, Inequality, Segregation, Class Divides.

Introduction

The form and structure of cities and metropolitan areas is a central, if not *the* central, organizing construct of modern urbanism and urban studies. The basic models of our urban world that inform much of the conventional wisdom and academic thinking to this day were handed down from the pioneering studies of the so-called Chicago School of urbanism. In their most basic and simplified form, those models portray an urban core occupied by commerce, industry and the residential locations of the disadvantaged and the working classes surrounded by more affluent middle and upper class suburbs. For more than a century then, the geographical division between city and suburb was also America's overarching class divide. The upper and the middle classes lived in the suburbs; the poor lived in less advantaged cities or in undeveloped rural places. With deindustrialization (Bluestone and Harrison 1982), post-industrialism (Bell 1976; Piore and Sabel 1984; Storper and Scott 1989; Drucker 1994) and the recent back-to-the-city movement (Smith 1979; Long et al. 1980; Frey 2000; Cortright and Mayer, 2002), the concept of a great inversion (Ehrenhalt 2012) has been advanced whereby the urban core has been re-occupied by advantaged groups with the less advantaged pushed outward into the suburbs.

Our research aims to shed empirical insight into the new divides and changes in urban and metropolitan form occurring today. To do so, we map the locations of three major classes across a dozen of America's largest metro areas and their core cities. Class remains an inescapable presence in America, crosscutting almost every aspect of the social structure from education and employment to income, politics, and health. We define class based on the work people do and the occupations they are engaged in (Florida 2002, 2014). About a third of the U.S. workforce belongs to the growing knowledge-based creative class, which includes researchers, scientists, academics, designers, entrepreneurs, entertainers, artists and others who work with their minds. Just twenty percent are members of the blue-collar working class, which includes factory workers, tradespeople, and other skilled, often unionized workers, down from almost forty percent of the workforce at the mid-point of the last century. The largest and fastest-growing class, which accounts for about half of the work force, is the service class, whose members toil in routine, low-skill, low-pay jobs like food preparation, janitorial work, health aides, and retail trade. Class, of course, is more than a socio-economic construct. It is shaped and structured by location and geography. We map the residential locations and clustering of these three major classes in twelve of America's largest metros and their center cities.

The patterns we identify differ from traditional models and are more complex than a great inversion. Instead, we find class divides that span both city and suburb. We refer to this continuous juxtaposition of concentrated advantage and concentrated disadvantage as the patchwork metropolis. We further find that the evolving class divides of the patchwork metropolis are shaped and structured by the locational choices of the advantaged class. In city after city, metro after metro, the affluent have colonized the most economically functional and desirable places — in and around the urban core, along transit routes, close to universities and knowledge-based institutions,

and along waterfronts and other natural amenities. The less advantaged classes are shunted into the spaces left over or in between — either traditionally disadvantaged areas of the inner city or the far fringes of the suburban and ex-urban periphery. Just as the rise of the knowledge economy has created a job market that is split between high wage knowledge jobs and lower wage service jobs, middle class neighborhoods have been hollowed out as the geography of cities and metropolitan areas have become increasingly divided between high and low income neighborhoods.

The remainder of this paper proceeds as follows. The next section outlines the key constructs and theories that shape our understanding of urban form and structure. The following one discusses our data and methodology. The body of the paper presents our maps of urban form and structure and summarizes our key findings. In the concluding section, we summarize our key results and their implications for the way we conceptualize and think about cities and metropolitan areas.

Theory and Concepts

Classic Models of Urban Form

Our basic understanding of the form and structure of cities comes from the work of the Chicago School of urban sociologists. Beginning in the 1920s and 1930s and using Chicago as their laboratory, Park, Burgess, and their associates in the Department of Sociology at the University of Chicago developed a basic model of the city based on concentric zones (Park and Burgess 1925). Economic activity and land uses were sorted as they radiated out from the central business district in the core: first the factory district, then zone in transition with the warehousing and logistics functions; and then working class, middle class, and finally higher-income residential uses.

Subsequent models refined these basic insights. Hoyt, also from the Chicago School, developed an alternative sector model (Hoyt 1939). Instead of radiating outward in neat concentric circles, major economic and residential activities take shape as irregular sectors or segments along main transportation arteries. Populations and economic activities are sorted and organized by access to transportation as well as by their distance from the urban core.

A third model is that of the multiple nuclei introduced by Harris and Ullman (Harris and Ullman 1945). This model envisioned the city as a set of nuclei for different productive activities. The centers of commerce and business are separated from the centers of manufacturing, warehousing, and transportation; each economic function forms a distinct cluster. But here again, the residential users with the most means seek to avoid the dis-amenities of industry, forming residential hubs as far away from the manufacturing centers as possible. Once a hub is established, it tends to persist. Urban geography and location is thus path dependent (David 2001) — shaped and structured by previous development patterns and trajectories.

From Suburbanization to Post-Industrialism

These models provide a fairly accurate picture of cities and urban development through the era of mass suburbanization following World War II when, prompted by shifts in federal housing and transportation policy, people and jobs began flowing out of urban centers in unprecedented numbers. In their landmark 1959 study of the New York metropolitan area, the economists Hoover and Vernon documented this flight to lower density (1959). Vernon's product cycle model of industrial location later showed how the rise of standardized manufacturing technologies allowed factories to be relocated to outlying areas where land and labor were cheaper (1966).

This outward-oriented suburban pattern reached its pinnacle in the 1980s and was idealized in Garreau's (2011) edge city model, a great confluence of office parks and malls in which the key commercial functions of the central business district follow the population out to the suburbs. By then, suburbs were not just overtaking cities as population centers, but supplanting them as innovation centers as well. High-tech industry, which arose in parallel with the post-war suburban boom, was concentrated in suburban clusters like Silicon Valley, the Route 128 beltway around Boston, the Research Triangle in North Carolina, and suburban Seattle and Austin (Kotkin 1997; Kotkin 2000).

Reflecting upon these changes in the post-industrial metropolis, researchers associated with the LA School questioned whether the classic models still had relevance (Dear 2002). Using greater Los Angeles as their case study, they argued that growth in the modern metropolis no longer proceeded outward from the core but in a sprawling, disintegrative manner, as a multiplicity of industrial, commercial, and residential zones spread across the city and metropolis without any predictable pattern.

Beveridge (2011) compares contemporary Chicago, LA, and New York City to the models associated with the Chicago and LA schools and also to a New York school of urban development associated with Jane Jacobs. Utilizing census tract data, he examines the processes and patterns of population growth in all three metro areas since 1910. With the movement of people and firms back to the urban core and the suburbanization of poverty over the past couple of decades, Beveridge finds that patterns of urban development have become considerably more complicated than they were. The overall process of urban development now reflects aspects of all the major schools. Many cities have vigorously growing downtowns, as the New York model would suggest, but outlying areas that are developing without any obvious pattern, as in the LA model. In some cases, these patterns are so amorphous that they call into doubt the very constructs of city and suburb.

The Great Inversion

The past decade or so has witnessed a phenomenon that Ehrenhalt (2012) has dubbed the great inversion, where center cities are luring back businesses and affluent populations, while the suburbs become poorer and their rate of growth slowing. Even as some urban centers have come back, not all cities are reviving; and a considerable wealth and human capital still remain in the suburbs. Furthermore, while it is true that

more poor people live in suburbs than cities, the nation's suburban population is also much larger than its urban population. Cities have greater shares of poor residents than suburbs do overall.

Still, the once considerable divides between cities and suburbs are less hard and fast than they were. Many urban neighborhoods have taken on characteristics that are more commonly associated with the suburbs, such as high-end, mall-like retail shopping centers, housing with more square footage, and greater economic homogeneity. At the same time, some suburban neighborhoods have come to look more like cities, with higher densities, better transit connectivity, more mixed-use development, and greater walkability.

Numerous explanations for this back-to-the-city shift have been proposed. Drawing from Jacobs, Lucas (1988) identifies human capital externalities as the primary force for overall economic growth. Glaeser et al suggest that the efficiencies and amenities that urban locations provide are desirable to those with higher skills and knowledge, noting that the rise of this consumer city represents a significant change from the older industrial producer city (Glaeser, Kolko, and Saiz 2001). Clark and Lloyd (2004) herald the advent of the city as entertainment machine. Albouy (2009) documents the powerful combination of productivity and amenity growth responsible for accelerated income and housing price growth America's metro regions.

Inequality, Segregation, and the Divided City

Much of this research focuses on the clustering and sorting of people and economic activity across metros (Florida 2002). Glaeser and his colleagues have also noted the divergence of educated people or human capital across regions (Berry and Glaeser 2005) as they cluster and concentrate in some cities and metro regions as opposed to others. This process is something of a winner-take-all, zero-sum game. If clustering enriches some places, others are left behind.

Socio-economic inequality is a subject of growing concern and academic study (Piketty and Saez 2001; Stiglitz 2013). Economists tend to focus on the decline of lower-skill middle class factory jobs and the widening wage gap between highly skilled knowledge work and lower skilled service work as the primary cause of socio-economic inequality (Acemoglu and Autor 2012; Autor, Levy, and Murnane 2003; Card and DiNardo 2002).

Inequality also has a geographic dimension, according to recent studies (Glaeser et al. 2009). A 2011 study that tracked the income gap across U.S. metros from 1979 and 2004 finds that city size alone accounted for roughly 25 to 35 percent of the total increase in economic inequality over this period, over and above the role of effects of skills, industry composition, and other factors. The role of city size is shown to be even more pronounced among lower wage earners, explaining more than half of the increase in inequality (Baum-Snow and Pavan 2011).

Florida and Mellander (2014) examined the factors that shape income inequality across metro areas. Skill-based technical change accounted for part but not all of the cause for income inequality across metros. Inequality was more closely associated with endemic poverty, levels of unionization, and tax rates. While all classes of workers receive higher wages in knowledge metros, housing prices are higher too — and the wage premiums that the service class and the blue-collar working class receive are not large enough to make up for the difference (Florida 2013a).

A 2012 study found inequality to be compounded by differentials in access to city services and amenities. Skilled knowledge workers derive distinct advantages from living in safer neighborhoods with better schools, better healthcare, and a wide range of other services and amenities — a gap in well-being that is 20 percent higher than can be accounted for by the simple wage gap between skilled and unskilled workers (Diamond 2012).

There is also long-running interest in the gentrification of urban neighborhoods (DeGiovanni 1983; Freeman 2005; Lees 2000). A detailed analysis by the Cleveland Federal Reserve (Federal Reserve Bank of Cleveland 2013) examined the extent of gentrification across America's 55 largest cities over the past decade. Defining gentrification as a neighborhood (more precisely, a census tract) that moved from the bottom half to the top half of the distribution of home prices, it found substantial levels of gentrification in several cities — Boston, Seattle, New York City, San Francisco, and Washington, D.C., most notably — but much more modest levels in most. In nearly three quarters of cities, less than ten percent of all neighborhoods experienced gentrification, and in 22 cities, including San Diego, Charlotte, Buffalo, Pittsburgh, and Detroit (40 percent of the sample), gentrification affected 5 percent or less of all neighborhoods. Florida used this data to examine the kinds of metros that are more likely to see high levels of gentrification. They find gentrification to be more likely in larger, denser, more affluent metros with higher levels of human capital and technology-based industries. Interestingly, they found gentrification to be associated with wage inequality but not with income inequality across metros (Florida 2013d).

A number of studies have examined economic segregation within cities and metro areas. Detailed studies by researchers at the University of Toronto's Cities Centre document the erosion of once-stable middle-income neighborhoods, the dramatic growth of lower-income areas, and the increased segregation of the rich and poor in their own separate enclaves in Toronto and Vancouver (Hulchanski 2010; Ley and Lynch 2012). A 2009 study found a close and growing connection between inequality and economic segregation in American neighborhoods between 1970 and 2000. According to this study, areas that are more economically segregated in 2000 than they were in 1970 house more than 85 percent of the entire metropolitan population of the United States (Watson 2009). The segregation of the rich and poor rose in all but three of America's 30 largest metros between 1980 and 2010 (Fry and Taylor 2012). According to the same study. This rise in economic segregation is closely related to the long-term rise in income inequality. According to an even more recent study, the share

of families living in middle class neighborhoods declined from nearly two thirds (65 percent) in 1970 to less than half (44 percent) by 2007 (Bischoff and Reardon 2013).

Still more recent research has examined the effects of inequality and segregation on mobility. Chetty et al (2014) traced the intergenerational mobility of some 40 million children born between 1980 and 1991 and their parents, using two key measures of mobility. The study found upward mobility to be shaped by several key factors including family structure, school quality, social capital, racial and economic segregation and income inequality. The study also found economic mobility to vary widely by location. Mobility was highest in the Northeast, California, the Great Plains, and Rocky Mountain states and lowest in the Sunbelt and Rustbelt. Rothwell and Massey (2015) found the differences in lifetime earnings between those who grow up in the richest 20 percent of neighborhoods versus those who grow up in the bottom 20 percent end up being about the same as the difference between just completing high school and having a college degree. This neighborhood effect grew even larger when they took geographic differences in cost of living into account, ending up at nearly a million dollars — \$910,000 to be exact.

A wide body of research documents the geography of persistent poverty and concentrated disadvantage. In his book *Great American City*, Sampson shows how residential segregation exacerbates the disadvantages of the poor (2012). Sharkey further documents the role that neighborhoods play in the perpetuation of poverty (2013).

This large and growing body of literature documents the re-entry of the more affluent and skilled workers and households back to the urban core, the growing inequality and segmentation of space by class, and the cascading spatial effects of a more segmented American metropolis that accompany this back-to-the-city movement. What the literature on urban inequality and segregation has yet to do is establish whether a new urban form has emerged — whether a distinct urban ecology and morphology accompanies the advent of the more unequal and divided city. This is the core focus of our study.

Methodology and Data Sources

Our research aims to better understand the form and structure of the divided metropolis. Our inquiry is structured around detailed maps of the class geography of America's largest metro areas and the core cities. These maps chart the residential location of three main classes defined by the kinds of work people do (see Florida 2002; Florida 2012b; Florida 2014). The creative class spans those employed in science and technology, business and management, and arts, culture, design and entertainment. It encompasses roughly a third of the workforce but varies substantially by location. The service class is the largest class, encompassing 45 percent of the workforce. Its members are dominated by those who are paid to provide routine services, such as food preparation, clerical and administrative support, retail and office work. The

working class that makes up roughly 20 percent of the workforce includes those engaged in traditional blue-collar work spanning factory production, transport, and construction.

Our analysis maps the residential locations of these three main classes for 12 of America's largest metros areas and their primary cities: New York, Los Angeles, Chicago, Washington, D.C., Atlanta, Miami, Dallas, Houston, Philadelphia, Boston, San Francisco and Detroit. These metros account for nearly 30 percent of the total U.S. population and 37 percent of U.S. economic output (see Table 1). These metros vary considerably by age and timing of development, region of the country, and other key factors. They also vary considerably by class or occupational structure. The creative class makes up almost half of the workforce in Washington, DC (46.8 percent) and just slightly more than 30 percent (30.4 percent) in Miami. The service class ranges from a high of more than 50 percent in Miami to a low of just slightly more than 40 percent in Washington, DC. The working class ranges from a low of 12.8 percent in Washington, DC to a nearly a quarter of the workforce (24.4 percent) in Houston. (See Appendix 1 and 2 for more detail).

The maps designate four key factors that we hypothesize to act as attractors for the advantaged knowledge and professional workers that make up the creative class.

Urban Core

The first factor we consider in our analytical maps is proximity to the urban core. We operationalize this as the area within two miles of the center city's city hall as per the Census Bureau (Wilson et al. 2012). We believe this is a conservative designation of the scope of the urban core area.

Knowledge-Based Institutions

The second factor is proximity to knowledge-based institutions, including university, government laboratories, and think tanks. Knowledge based institutions employ large numbers of science and technology, creative and professional workers and also act as magnets to attract these individuals. We identify universities as research universities based on the Times Higher Education World University Rankings (2014), membership in the Association of American Universities (Association of American Universities 2014), and membership in the Annapolis Group (Annapolis Group 2014). We include all 41 federally funded research and development centers (NSF 2014). Our listing of think tanks is based on the most comprehensive think tank rankings available from the University of Pennsylvania (McGann 2013). Again, we believe this listing is a conservative one, compared to say identifying all colleges, all labs and think tanks, regardless of quality.

Transit Routes

The third factor is proximity to transit. A number of studies have shown the increasing preference of knowledge workers for locations close to transit (Duncan 2010). We map all light-rail and subway lines, but do not map the location of rapid bus service (e.g.

Metro LA's Silver Line) or of tram or funicular railways. Transit route files were sourced from local municipalities or states' open data warehouses.

Natural Amenities

The fourth factor is natural amenities. Here again, research has shown the clustering of highly educated and creative workers around natural amenities as well as the higher prices of housing around these amenities (Duncan 2010; Bartholomew and Ewing 2012). We map major parks and green spaces including national parks, forests, and monuments, state designated parks and forests as well as county and local parks. The park designation may also include beach and waterfront preservation areas as well as wildlife management or conservation areas. Water boundaries for coastlines, lakes, and major rivers are also included, as designated by their urban boundaries.

Table 1: Summary Statistics Grouped by Population

| Metro | Metro Pattern | Population | Number of Census Tracts | Sample Resident Size |
|-----------------------|-----------------------|------------|-------------------------|----------------------|
| New York | Core-Oriented | 18,897,109 | 4,365 | 8,875,297 |
| Los Angeles | Fractal | 12,828,837 | 2,849 | 5,951,071 |
| Chicago | Core-Oriented | 9,461,105 | 2,113 | 4,460,071 |
| Dallas | Class Bloc | 6,371,773 | 1,294 | 3,005,011 |
| Philadelphia | Class Bloc | 5,965,343 | 1,435 | 2,816,055 |
| Houston | Fractal | 5,946,800 | 1,058 | 2,710,209 |
| Washington, DC | Core-Oriented (Top 3) | 5,582,170 | 1,340 | 2,889,207 |
| Miami | Fractal | 5,564,635 | 1,149 | 2,549,898 |
| Atlanta | Class Bloc | 5,268,860 | 923 | 2,446,431 |
| Boston | Core-Oriented (Top 3) | 4,552,402 | 985 | 2,324,665 |
| San Francisco | Core-Oriented (Top 3) | 4,335,391 | 959 | 2,127,340 |
| Detroit | Class Bloc | 4,296,250 | 1,198 | 1,863,262 |

This method of mapping allows us to establish the broad patterns for where different occupational classes might concentrate in space. A weakness of this approach is that it treats all census tracts similarly, regardless of whether or not they are primarily residential. At the same time, layering firm employment on to these maps (e.g. through

a cartogram where the size of each tract corresponds with its share of all residents) distorts the maps considerably. Fortunately, each census tract is highly likely to have similar residential occupancy to adjoining tracts. *Table 2* shows that average tract sizes do not vary so much that they vary across regions. It also shows that the standard deviation for average tract population is less than 60 percent of the average for all metros and closer to 45 percent for most.

Table 2: Size of Census Tracts by Metro (Average and Standard Deviation)

| Metro | Average Residents Per Tract | Standard Deviation Residents Per Tract |
|----------------|-----------------------------|--|
| Atlanta | 2,651 | 1,174 |
| Boston | 2,360 | 855 |
| Chicago | 2,111 | 985 |
| Dallas | 2,322 | 1,046 |
| Washington, DC | 2,156 | 875 |
| Detroit | 1,555 | 678 |
| Houston | 2,562 | 1,397 |
| Los Angeles | 2,089 | 789 |
| Miami | 2,219 | 962 |
| New York | 2,033 | 998 |
| Philadelphia | 1,962 | 842 |
| San Francisco | 2,218 | 839 |

In our maps, the color purple identifies neighborhoods where the largest share of residents are members of the creative class, the color taupe service class neighborhoods, and blue for working class neighborhoods. Green is used to identify space that is predominantly agricultural. We also identify the four key factors discussed above. A white circle designates the urban core. A red diamond is for research universities and knowledge-based institutions. Black lines indicate subway and rapid transit lines. Parks and green spaces are identified as striped green areas. In addition, we use an airplane icon to identify the location of major commercial airports.

Findings

Our key findings are as follows. Our analysis finds that for all 12 metro areas and their core cities, occupational class divides cut across both city and suburbs. We also find that the class patterning is determined by the location decisions of the most advantage class, which occupies the most functional and desirable areas. This advantaged class has the most bidding power in urban property markets and their locational decisions will tend to condition the social geography of the city the most. In this respect, our approach to the socio-economic cartography of the city is similar to that used by the Chicago School.

Ultimately, we identify three broad patterns or types of the evolving patchwork metropolis.

Core-Oriented: In the first type, the creative class occupies the core and radiates outward from it into the suburbs. This pattern is most evident in large metros like New York City and Chicago, and also in post-industrial metros like San Francisco, Boston, and Washington, D.C.

Class Bloc: In the second type, we find the three major classes split into separate well-defined blocs that span large areas. This Class Bloc pattern can be seen in Dallas, Atlanta, Philadelphia, and Detroit. In this type, the advantaged class is more heavily weighted to the suburbs though it does in some cases crossover into the city.

Fractal: In the third type, the pattern of class segmentation is less well-organized and structured. The advantaged class is clustered in a repeating pattern of islands, archipelagos or even tessellations. This pattern is spread across the suburbs and to some extent the city as well. Three metros conform to this pattern: Los Angeles and Miami, where the advantaged class is strung out along the waterfront, and Houston.

Type 1: Core-Oriented

Figure 1 shows the pattern for these four metros that generally conform to the Core-Oriented pattern: Boston, Chicago, New York City, San Francisco, and Washington, DC. In Core-Oriented metros, we find a large concentration of the creative class at or around the core. Still, this pattern does not completely correspond to an inverted pattern, as the advantaged creative class extends considerably into the suburbs as well. This set of metros include two of three of America's largest metros and two that are substantially post-industrial knowledge and tech hubs with large concentrations of human capital — San Francisco and Boston.

In addition to the creative class, Core-Oriented metros also have greater concentrations of the advantaged class at and around their core. To gain insight into the distribution of the advantaged creative class across the core city and suburbs, we calculate location quotients (LQs) for each class in the county or counties associated with the metro's primary city (as per the Census definition). An LQ of over 1 suggests

that the creative class is relatively more concentrated in the primary city. The creative class in primary city LQ for Core-Oriented metros is 1.03 compared to 9.6 for Fractal and 0.9 for Class Bloc metros.

Table 3: Class Concentration in Core County

| Class in Core County | All Core-Oriented | Class Bloc | Fractal |
|-----------------------|-------------------|------------|---------|
| Creative Class | 1.03 | 0.90 | 0.96 |
| Service Class | 1.05 | 1.05 | 1.13 |
| Working Class | 0.93 | 1.06 | 0.96 |

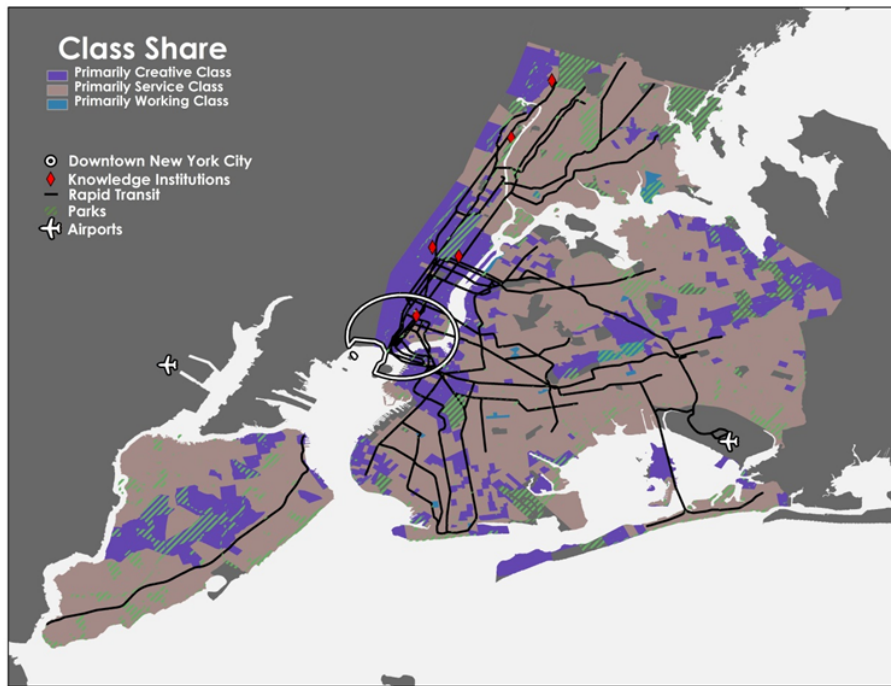
Source: Analysis by Martin Prosperity Institute based on data from the Bureau of Labor Statistics, Occupational Employment Statistics, 2010.

There are several other key factors that characterize Core-Oriented metros. Population density is one. As a group these five metros are considerably denser at the regional level than other types — or indeed most metropolitan areas (United States Census Bureau 2012b). New York’s population-weighted density of 31,251 people per square mile is first among all metros. San Francisco is second with 12,145. Chicago is sixth across all metros and fourth in the sample, after only LA. Boston is seventh and fifth respectively. While Washington, D.C. is less dense than the other four Core-Oriented metros, ranking eighth among the twelve metros in our sample, it is 55 percent denser than Houston, the ninth ranked metro, and three times denser than Atlanta.

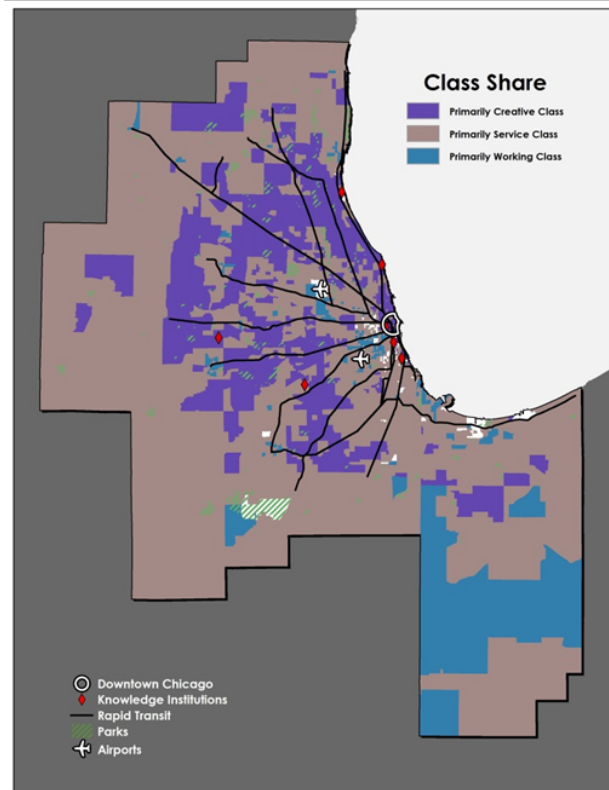
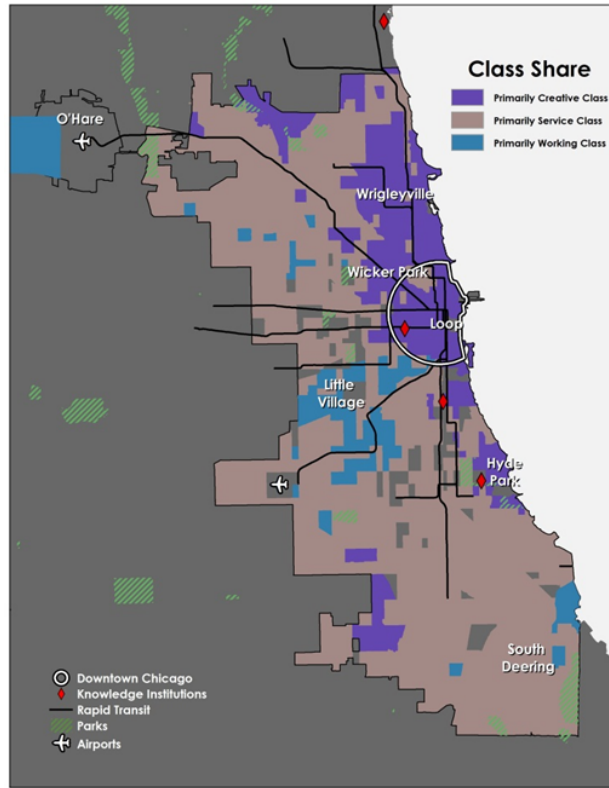
Core-Oriented metros are also more transit-oriented (U. S. Census Bureau 2011b). These four metros are the most transit intensive metros in the country, with mass transit commuting shares that are well above the 5 percent average for all metro areas. New York’s mass transit share was 30.5 percent in 2009, San Francisco’s was 14.6 percent, Washington, D.C. 14.1 percent, Boston 12.2 percent, and Chicago 11.5 percent.

Figure 1: Core-Oriented Type

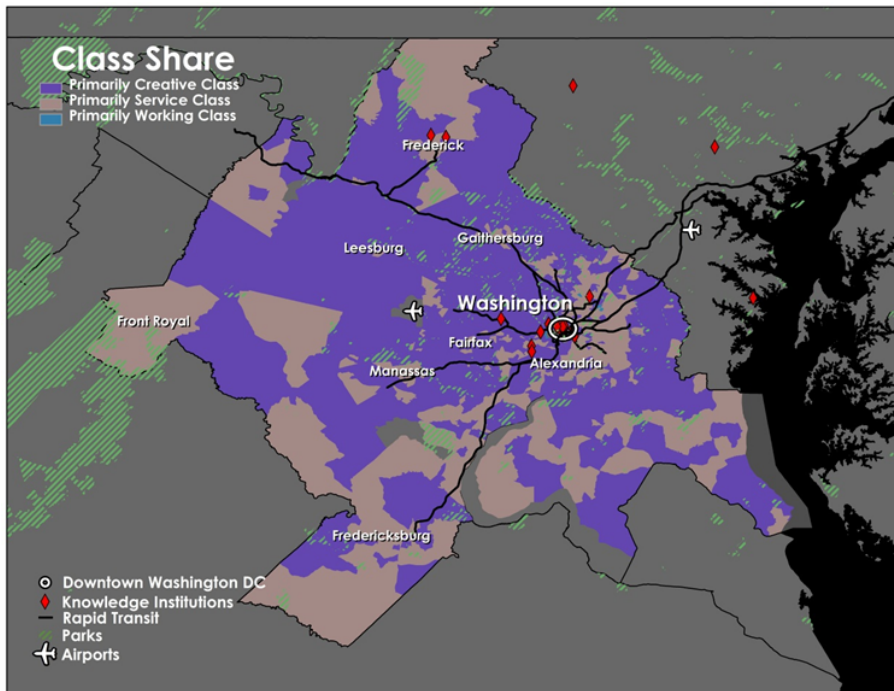
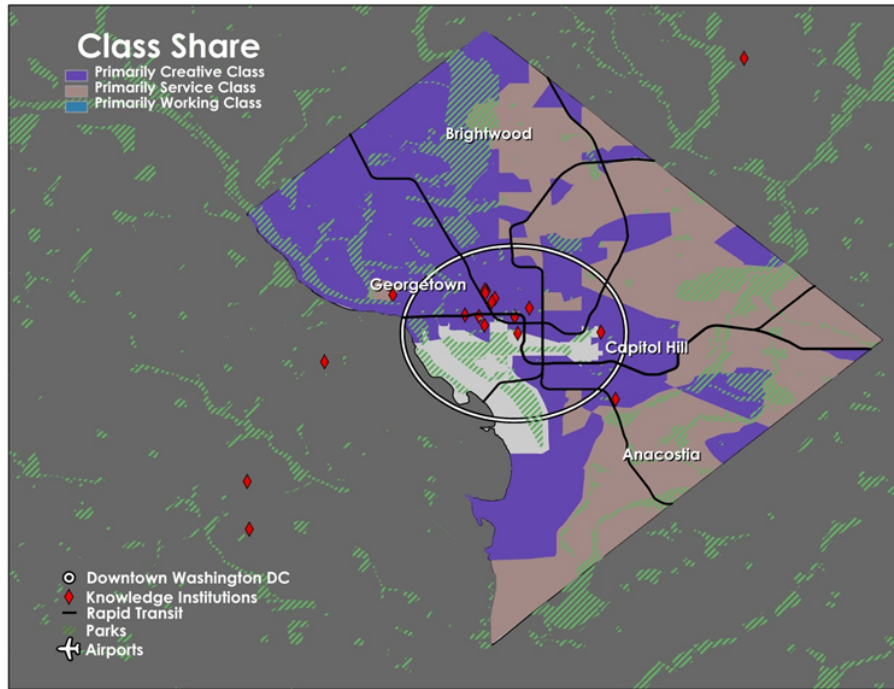
New York City



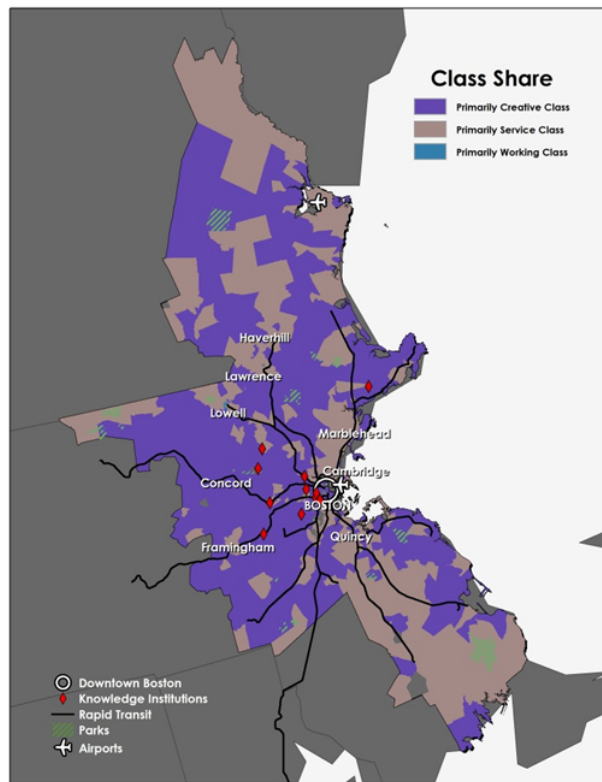
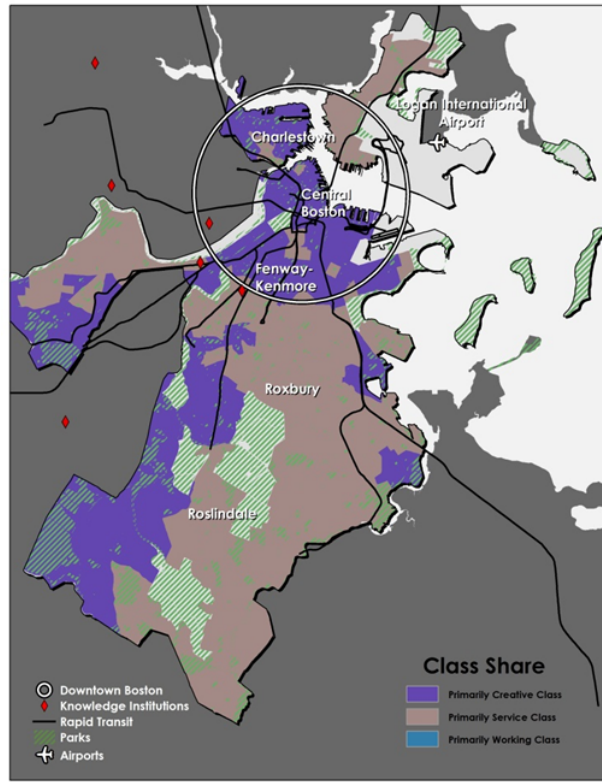
Chicago



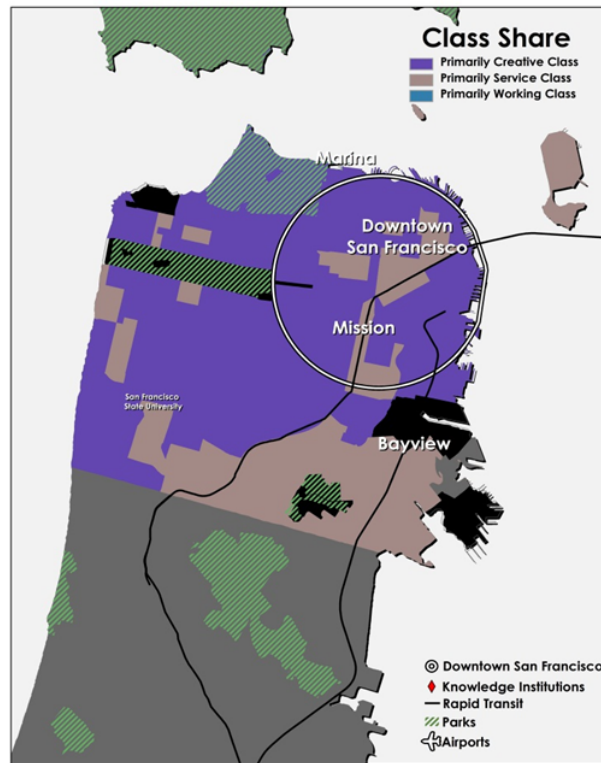
Washington, D.C.



Boston



San Francisco Bay Area



Core-Oriented metros are also distinguished by comparatively higher concentrations of the advantaged creative class. On average, 40 percent of residents belong to the creative class, compared to 35 percent for Class Bloc metros, and 33 percent for Fractal metros. The share of creative class ranges from 47 percent in Washington, D.C., and 42 percent in Boston to 39 percent in San Francisco, 36 percent in New York and 35 percent in Chicago.

This reminds us that while core-oriented cities all have the same basic pattern of urban form, they actually divide into two groups: large cities like New York and Chicago and more post-industrial knowledge based metros like San Francisco, Boston and Washington, DC.

The postindustrial character of Core-Oriented regions is further reflected in the lack of blue areas on the maps. Only 6 percent of all workers in these areas live where blue collar workers predominate. The disappearance of working class districts especially from metros like Boston, New York, and Chicago, places that defined America's Industrial Revolution, is striking. Even one generation ago, these places had decidedly more blue collar jobs.

Core-oriented regions are further distinguished by their large neighborhood-level concentrations of the creative class. As Table 5 shows, 43 percent of residents live in tracts that are predominantly creative class, compared to 36 percent for Class Blocs and 32 percent for Fractal metros. As Table 6 shows, 60.4 percent of creative class residents live in areas where their class predominates, compared to 52.1 percent for

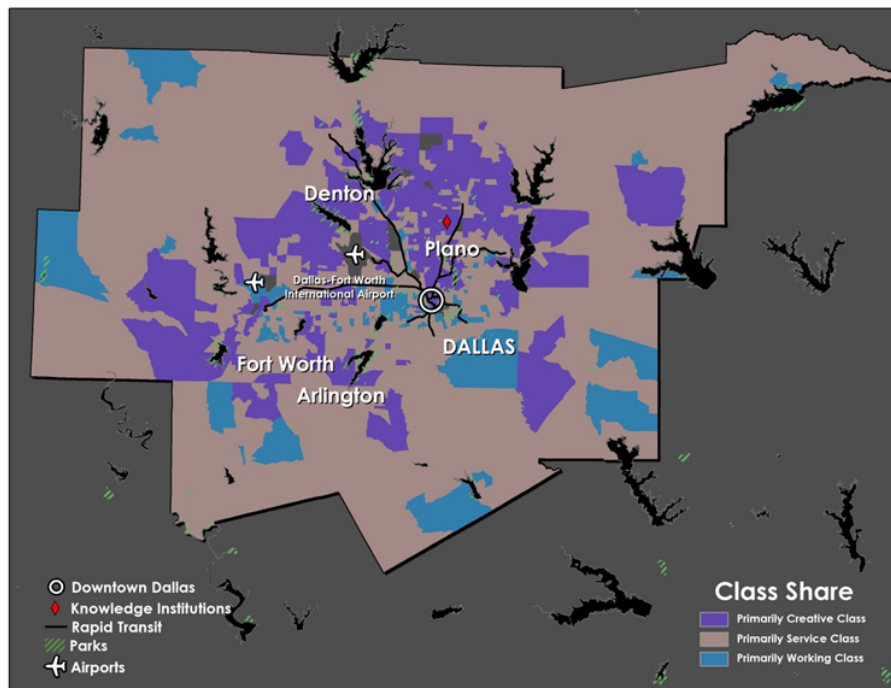
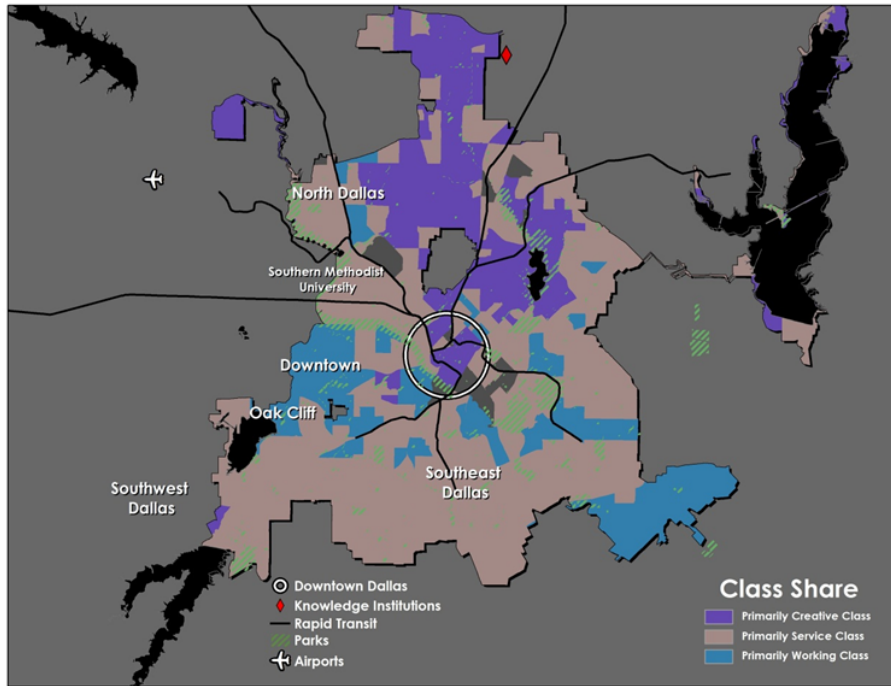
Class Bloc, and 49.3 percent of fractal metros. Similarly, in Core-Oriented metros, 66 percent of service class residents live in neighborhoods where the service class predominates. Our maps show that class is as much a fulcrum for the new urban morphology as income is. The tendency for people with similar incomes to cluster together (Sampson, 2012; Bischoff and Reardon, 2013) is at the same time a tendency to associate by class. These tendencies are more pronounced in Core-Oriented metros.

Type 2: Class Bloc

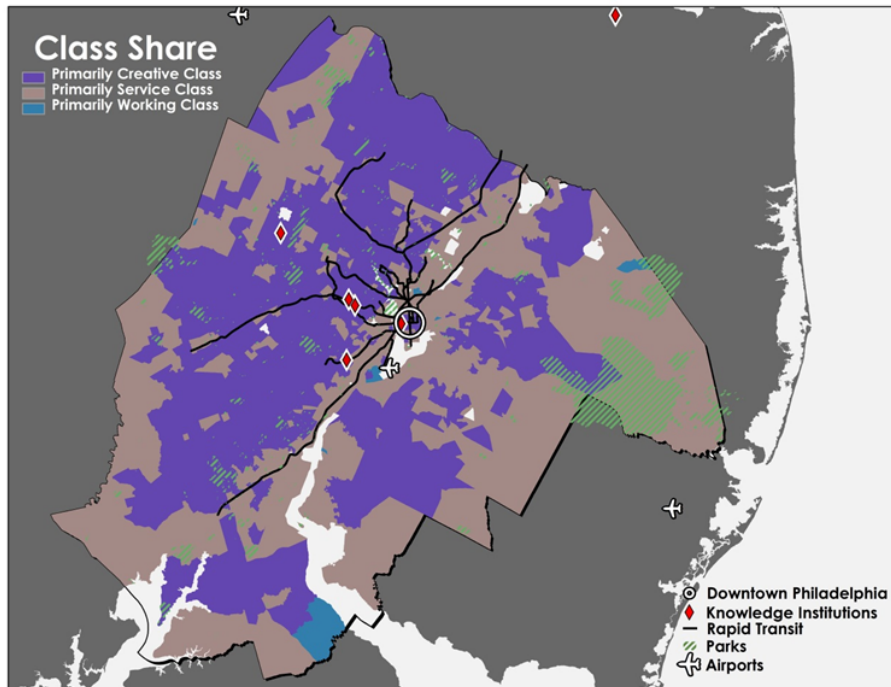
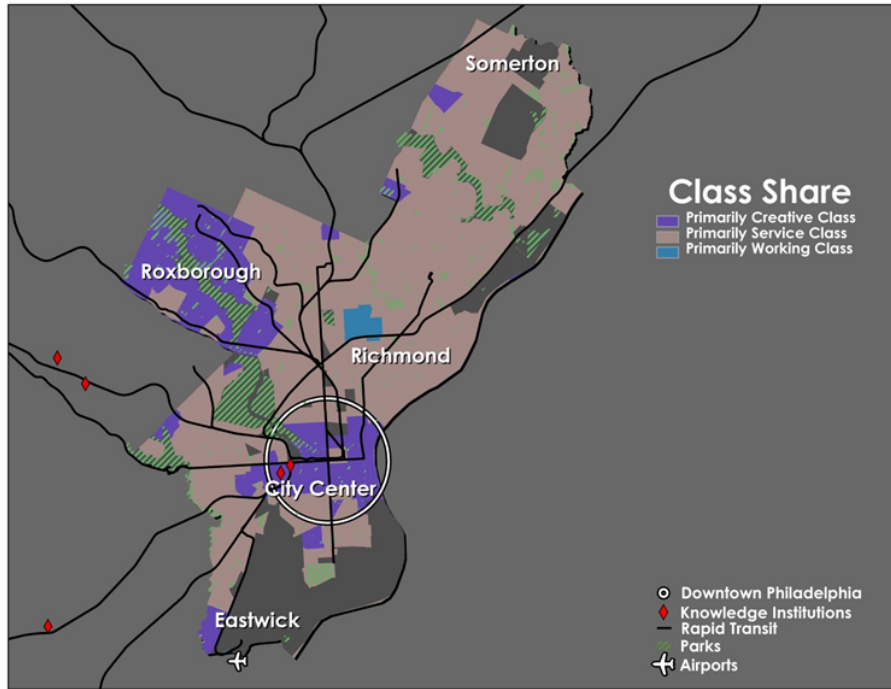
Figure 2 shows the pattern for the four metros to conform to the Class Bloc pattern. In this type, the metro is essentially split into separate locations for creative class and the service class. The advantaged class is weighted more heavily to the suburbs than the core.

Figure 2: Class Bloc Type

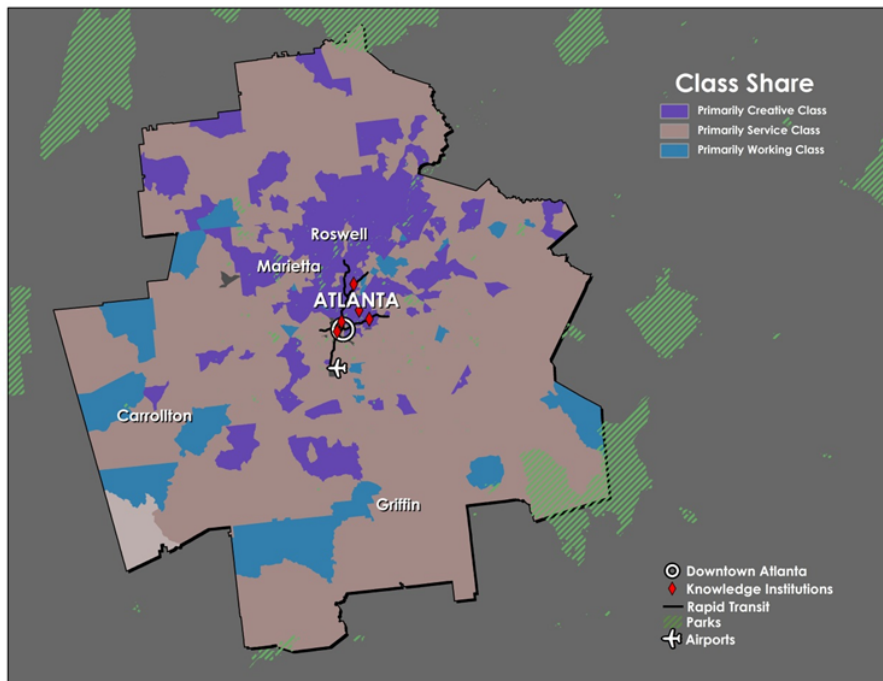
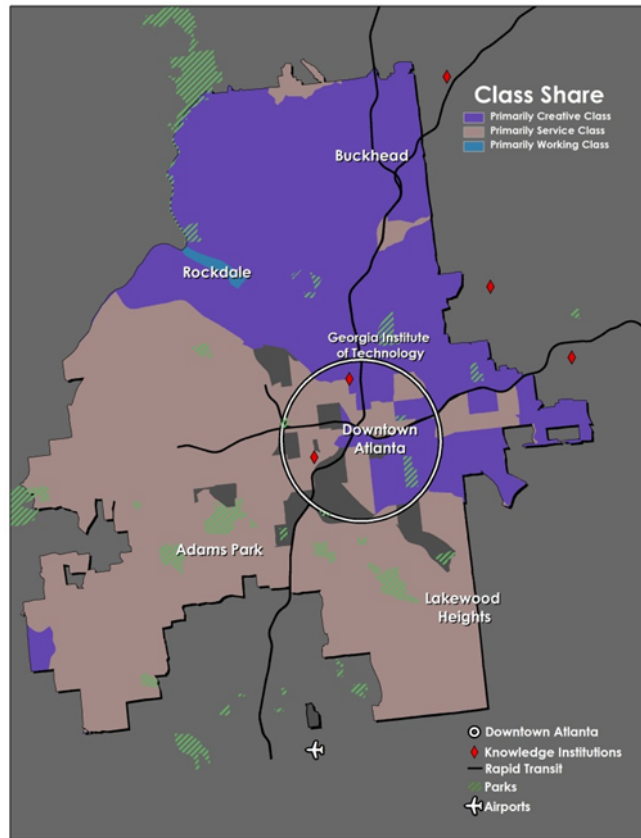
Dallas



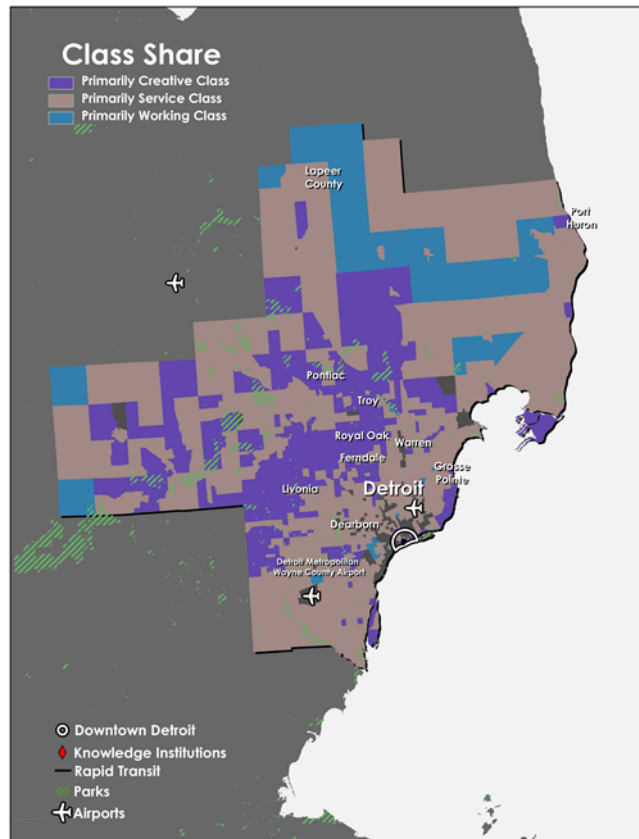
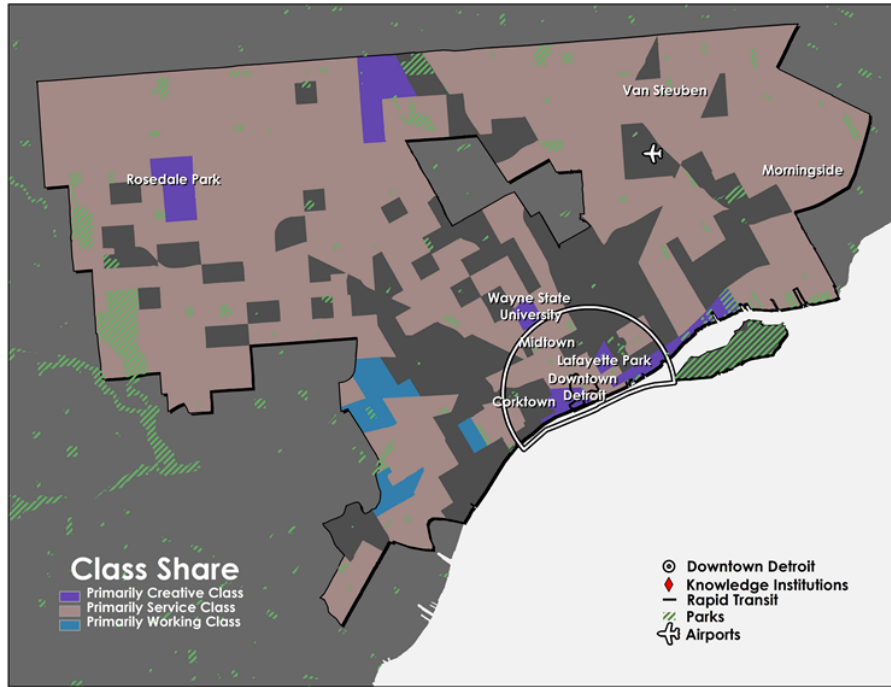
Philadelphia



Atlanta



Detroit



Greater Atlanta's line of class demarcation in the city cuts across a sharply defined east-west axis, with the Eastern side being dominated by creative neighborhoods and the western side by service ones. The creative class dominates the entire northeast of the city, from the inner to the outer ring suburbs of that community.

Dallas' divide follows a similar, but north-south axis, demarcated by Interstate 30 and the central business district. There is also a less pronounced east-west divide along the Trinity River just south of downtown, separating the working and service class neighborhoods to the west of the river from the creative class enclaves to the east.

Greater Detroit shows a creative class bloc in the central suburbs of the region near Birmingham, Bloomfield Hills, and Grosse Pointe. This complex is located along the old street-rail route that ran along Woodward Avenue and formed the metro's main commercial and development corridor. Creative dominated tracts are virtually absent from the city of Detroit.

Philadelphia's City Center features pockets of creative neighborhoods, but the city's creative-class bloc starts in the streetcar suburb of Roxborough and extends to adjacent suburbs that are not in the City of Philadelphia itself.

The Class Bloc pattern tends to anchor in the suburbs as opposed to the core. The core may have creative class enclaves, but the advantaged class does not predominate there or even in close-in suburbs. The creative class is relatively more concentrated in suburban counties than in the county of the core city. As Table 3 shows, the LQ for the creative class in the core county is 0.92. Metros of this type have relatively greater concentrations of the advantaged creative class in suburbs.

The Class Bloc pattern appears to be at least in part shaped by the location of knowledge institutions. In three of these metros, colleges or universities help to anchor well defined creative class blocs: Emory and Georgia Tech in Atlanta; Rice and SMU in Dallas; Penn, Drexel, Bryn Mawr, Haverford, and Villanova in Philadelphia. Furthermore, in Detroit, Wayne State University anchors one of the few creative districts near the urban core.

Class Bloc metros are considerably less dense than Core-Oriented ones. Philadelphia is the densest of the group, with weighted density of 7,773 people per square mile, well ahead of Dallas (3,909), Detroit (3,800) or Atlanta (2,173). Each of these metros, except for Dallas, has a mass transit system, and Philadelphia's commuting share is the highest at 9.3 percent. Atlanta's transit usage rate is 3.6 percent, Detroit is 1.7 percent, and Dallas is 1.6 percent - all considerably lower than for Core-Oriented metros.

Class Bloc metros have smaller neighborhood-level concentrations of the advantaged creative class. As Table 5 shows, 36 percent of residents live in tracts which are predominantly creative class versus 43 percent for Core-Oriented metros.

Conversely, 60 percent of residents live in predominantly service class tracts compare to 52 percent for Core-oriented Metros. The advantaged creative class however is less segregated than in Core-Oriented metros as Table 6 shows. In Class Bloc metros, 52.1

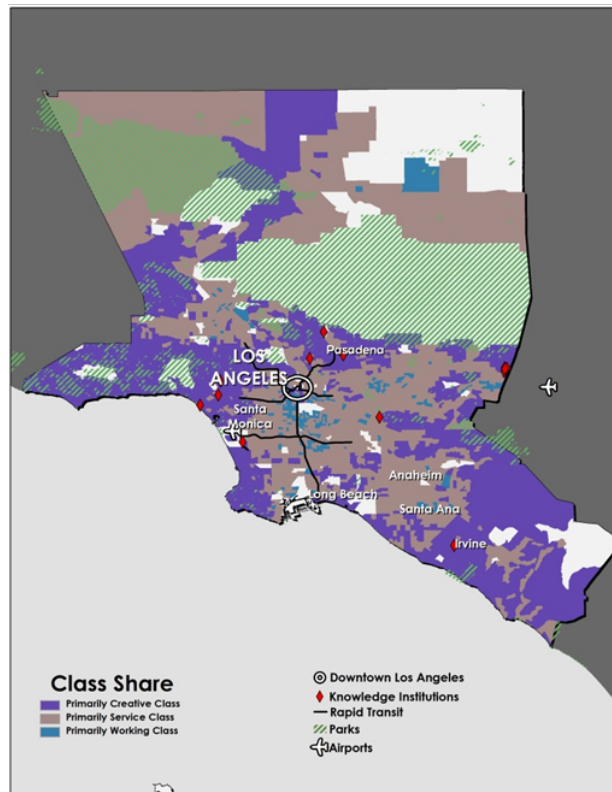
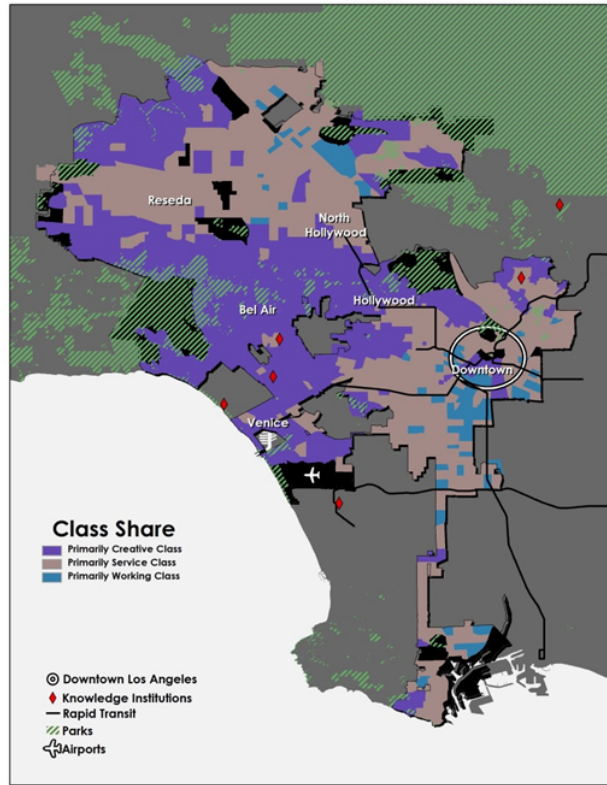
percent of the creative class resides in neighborhoods where the creative class predominates, compared to 60.4 percent in Core-Oriented metros). Service class residents in each type have roughly the same likelihood of living in neighborhoods which are predominantly service class (66 percent).

Type 3: Fractal

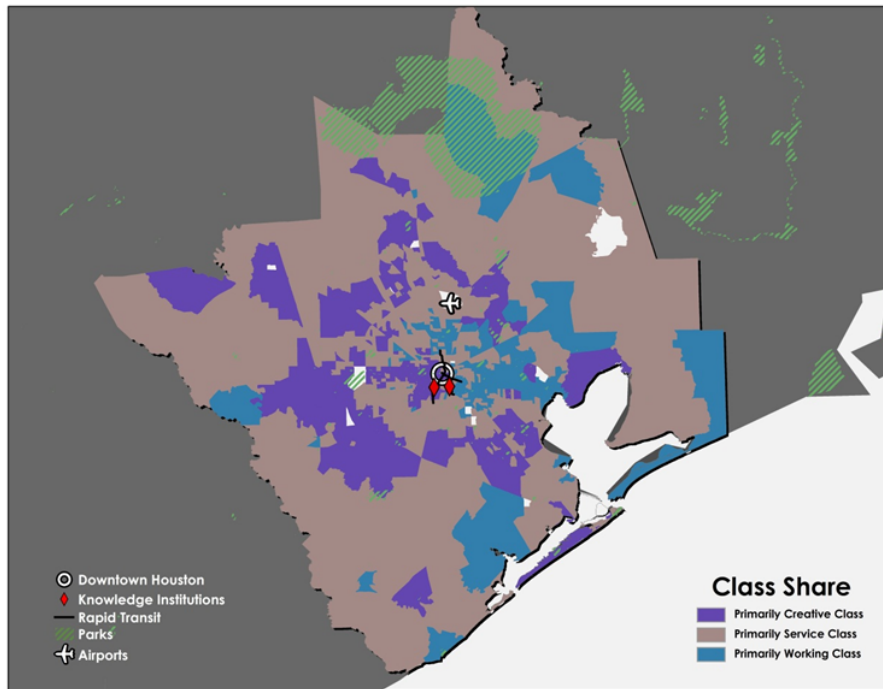
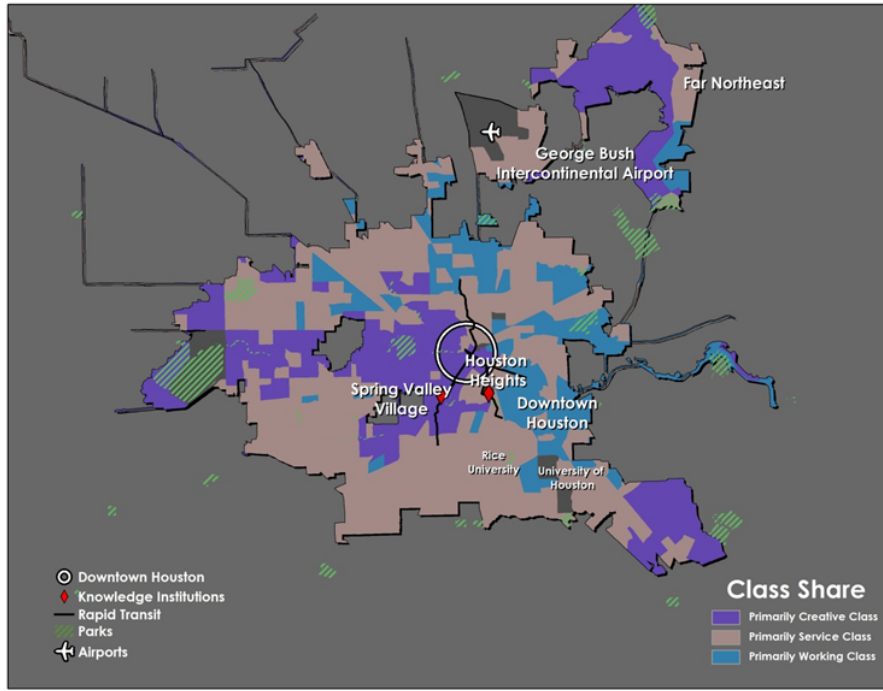
Figure 3 maps the pattern for the three metros that conform to the Fractal pattern: Los Angeles, Miami, and Houston. The Fractal pattern is less well-organized than the other two types. The advantaged class occupies islands that are spread throughout the metro.

Figure 3: Fractal Type

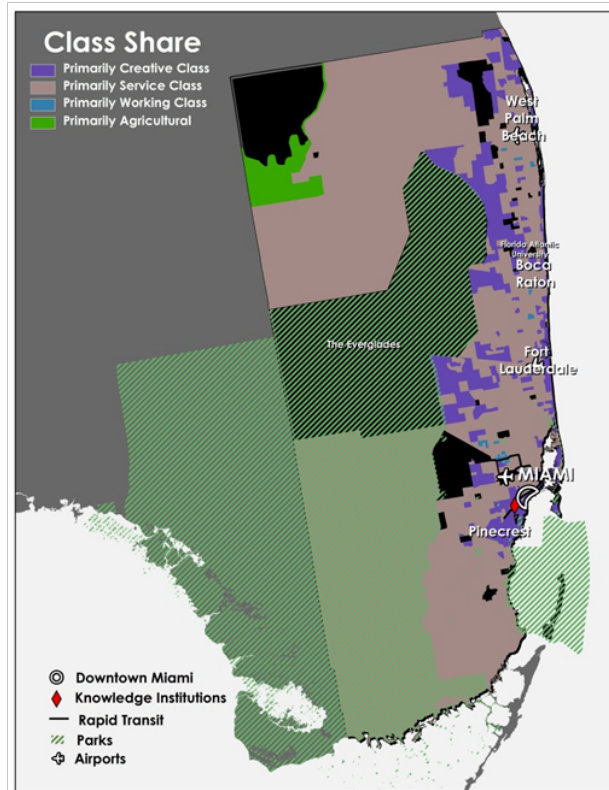
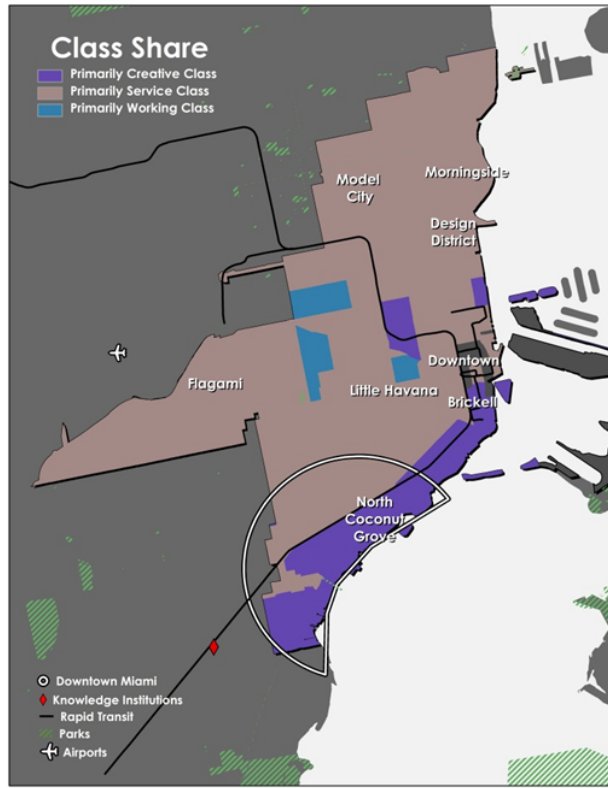
Los Angeles



Houston



Miami



In LA and Miami, this pattern appears to be structured at least in part by proximity to the waterfront. Most of L.A.'s creative class is spread out along the natural amenity of the Pacific Ocean. For the metro broadly, the creative class follows the coast from Malibu in the north to Irvine, Laguna Beach, and Dana Point in the south. A major creative class cluster stretches from LA County's Hollywood, Bel Air, and Westwood, where UCLA is located, to the beach community of Venice. There are additional clusters in Pasadena in the east, home to Caltech and the Jet Propulsion Laboratory, and near Downtown LA, where USC is located. L.A.'s service class tends to reside on the periphery of the major creative class clusters in North Hollywood, further out in Reseda, and in the neighborhoods between Hollywood and downtown.

Miami's creative class is likewise spread along the water. Six of the top ten creative class tracts in the metro are along the waterfront. Two of these tracts include or are close to universities — the University of Miami in Coral Gables and Florida Atlantic University in Boca Raton — a pattern which is common across the other cities and metros in this series.

In Houston, the creative class occupies an archipelago of clusters that spread from downtown Houston and Montrose in the city to Sugar Land in the southeast and the Woodlands to the north, as well as other neighborhoods sprouting north and south. Knowledge institutions play a substantial role in the location of the advantaged creative class. Seven of the metro's top ten creative class neighborhoods are located in the upscale area around Texas Medical Center. And Rice University, one of only three tier-one research universities in Texas,

The Fractal type is distinguished by several key features. All three metros that conform to this type are car-oriented metros that reached their current population rank after the Second World War. Their reliance on freeways and their sprawling geographic scope helps to structure their disorganized, fractal pattern. They also have relatively low proportions of transit usage — 6.2 percent of all commuters for LA, 3.5 percent for Miami, and 2.2 percent for Houston.

Fractal metros feature a range of densities. LA's is the third densest region in the sample, Miami ranks near the middle of the pack in seventh place, while Houston is closer to the bottom ranking at tenth of the twelve sample metros.

Fractal metros are the only ones of the three types where service workers are relatively more concentrated at the urban center, with an LQ for service workers in the primary city of 1.13 the highest of the three types.

Fractal metros have the smallest concentrations of the creative class at the neighborhood level. As Table 5 shows, 32 percent of residents live in neighborhoods where the creative class predominates compared to 36 percent in Class Bloc and 43 percent in Core-Oriented metros. Fractal metros have a more even split of classes across neighborhoods — 32 percent live in predominantly creative class neighborhoods, 35 percent in predominantly service class neighborhoods, and 32 percent in predominantly working class tracts.

Furthermore, as Table 6 shows, less than half (49 percent) of creative class residents live in neighborhoods that are predominantly creative class — the smallest share of the three types. Service class residents are as likely to live in neighborhoods which are predominantly service class as in neighborhoods concentrated with the other two class types. However, working class residents are much more concentrated than in the other two types: 57 percent of working class residents live in predominantly working class neighborhoods compared to 14.8 percent for Core-Oriented and 8.9 percent for Class Bloc. This likely reflects the distinctive industrial geography of these metros. All three have large ports, with working class populations still engaged in port activities. Our maps show substantial blue-collar clustering around the ports of Los Angeles and Houston, and to a lesser extent Miami which in effect anchor these working class residential clusters.

Factors that Shape the Patchwork Metropolis

The three types of urban form we have identified are ideal types. Characteristics of one or the other can be seen across types. Ultimately, comparing across these ideal types and across the twelve metros we have examined, our research identifies four key underlying factors that shape these class divisions and the urban morphology of the patchwork metropolis.

Clustering in and around the Urban Core

The urban core acts as either a magnet for creative workers in its own right or an anchor for a region's creative workers. The transformation of the core as a locational center for the creative class is a striking reversal from its former role as a center for industry, commerce, and shopping — and its abandonment in the 1960s and 1970s.

Our maps and analysis reflect the colonization of the urban core by the creative class. Dense metros like New York City and Chicago and post-industrial ones like Boston, San Francisco, and Washington, D.C. not only have larger creative class clusters than more sprawling ones like Houston and Atlanta, but their formations extend like wedges across the city and into the surrounding suburbs. This pattern has emerged in tandem with the de-industrialization of urban centers that has been underway for the past half century. Though its initial effect on cities was economic devastation, the exodus of industry established the broad context for the reclamation of devalued neighborhoods.

That said, it is important to recall that large creative class clusters and complexes still exist in the suburbs and exurbs. We also find pockets of low-income service worker and large swaths of poverty in and around the cores and the suburbs alike. Even though clustering at the core is a general trend, the pattern of class division in the contemporary metropolis is more complex than a simple 're-inversion', where the gentry have fully returned to the urban core.

Clustering around Knowledge Institutions

Knowledge institutions comprise a second key factor in the structure of the patchwork metropolis. Across every city and metro we examine, we find substantial clusters of the creative class around major universities and research facilities, for example, NYU and Columbia in New York City; USC, UCLA, the Jet Propulsion Laboratory, and the Rand Corporation in LA; the University of Chicago and Northwestern in Chicago; Rice and the Texas Medical Center in Houston; Georgetown and George Washington universities in Washington, D.C.; Emory and Georgia Tech in Atlanta; Harvard, MIT, Boston University, and Boston College in Boston and Cambridge; University of Pennsylvania in Philadelphia; UC-Berkley, UC-San Francisco, and Stanford in the Bay Area; the University of Miami, Florida International University and Florida Atlantic in greater Miami; Southern Methodist University in Dallas, and even Wayne State in Detroit.

This is something of a shift from the past, when universities functioned as more transitory stopping points for students to gain knowledge and degrees en route to their professional lives and careers. Many of the universities that were located in the downtowns of big cities (USC in Los Angeles; the University of Chicago; New York City's Columbia; Georgia Tech in Atlanta; MIT and Harvard in Cambridge) were surrounded by devalored neighborhoods, though some of these areas did retain higher and middle income residents, mainly professors and health care workers employed at universities and medical centers.

Proximity to Transit

Proximity to transit is a third factor that structures the divides and morphology of the patchwork metropolis. In many of the metros examined here, we find evidence of creative class clustering around major mass transit arteries. This is especially true in denser metros like New York City, Boston, Chicago, San Francisco, Philadelphia, and Washington, D.C., where mass transit, especially subways and light rail, reliably connects commuters to central business districts. However, in other cities and metros we see a mixed pattern with both the advantaged and disadvantaged classes located around transit.

Transit structures the location of the advantaged class in both direct and indirect ways. Transit itself provides a way for knowledge and professional workers to access the core without having to bear the opportunity costs of commuting by car, while enhancing their productivity by allowing them to work and interact on the subway or train. Transit also tends to act as a proxy for commercial and retail density meaning that even without subways themselves, residents already have better access to employment and services.

Clustering around Natural Amenities

Natural amenities are the fourth factor which helps to structure the form of the patchwork metropolis. Of particular importance is location along waterfronts. This pattern can be seen most clearly in Los Angeles along the Pacific coast, Miami along the Atlantic coastline and Biscayne Bay, and Chicago along the shores of Lake

Michigan. It can also be seen in Detroit along the Detroit River, Lake Michigan, and the smaller lakes. Recent efforts to open up Manhattan and Brooklyn riverfronts have resulted in new creative class clusters in those neighborhoods. In many cases, waterfronts have been reclaimed from industrial uses and provide the additional advantages of close proximity to the urban core and an abundance of warehouse buildings that can be repurposed as loft offices and housing.

These four features – proximity to the urban core, clustering around knowledge institutions, proximity to transit, and access to natural amenities are frequently interrelated and overlap with one another geographically. The urban cores of many cities and metros developed beside natural harbors and navigable lakes and rivers. Many older universities and colleges originally matured in city centers as well.

Conclusion and Discussion

Our research supports the idea that America's urban form has been reorganized across broad and predictable lines, as a patchwork metropolis in which class divides cut across city and suburb alike. In place of the previous class division between city and suburb, class now cuts across both, creating a patchwork *metropolis*.

The class divides we observe in the patchwork metropolis appear to be shaped and structured by the locational choices of the advantaged class. In city after city, metro after metro, the affluent have colonized the most economically functional and desirable places — in and around the urban core, along transit routes, close to universities and knowledge-based institutions, and along waterfronts and other natural amenities. The less advantaged classes are shunted into the spaces left over or in between — either traditionally disadvantaged areas of the inner city or the far fringes of the suburban and ex-urban periphery.

The rise of the patchwork metropolis reflects a basic change in the underlying economics of urban locations. Consider this in light of the basic model of urban bid rent curves outlined long ago by Alonso (1960), where land decreases in value with distance from the city center, with the land at the very center being most valuable. When he was writing in the 1960s, offices, shops, and industry would bid or pay the most for land in and around the center. In line with the basic Chicago school model, less affluent working classes would occupy the lower rent districts around factories, while higher income groups would purchase more space in the suburbs in part to avoid the congestion, noise, and pollution generated by industry. But now it is talent, not industry, which has become the top bidder for the best and most central locations.

This is part and parcel of the post-industrial transformation. As industry abandoned the urban core, central locations became more attractive for people to live in. The catalysts, of course, were artists and musicians, who turned those abandoned industrial spaces, often in transitional high-crime neighborhoods, into their lofts and studios. Their very presence started a cycle. As the neighborhood improved and crime fell, more new residents flooded in, driving property values and rents higher and higher. Those

reclaimed neighborhoods are not just “nice” places to live, they are productive ones as well. Over time, all manner of companies and startups began to infiltrate their lofts and commercial spaces. Their coffee shops and restaurants were just the sorts of third places favored by knowledge workers (Oldenburg and Brissett, 1982). With their density, walkability and 24/7 character, they were a perfect fit for creative class and knowledge-based production, which increasingly blurs the once hard and fast distinctions between the spaces of work and play and of production and consumption. As both the productivity and demand for these neighborhoods increased, their rents escalated still further, pricing out all but the very rich and driving out the very types of commercial and industrial activities that were once their economic backbones.

This shift is shaped by several key factors in the evolution of cities. The first is deindustrialization. As industry moved out of the urban core, central locations became more attractive for residential and retail uses. In the early days of post-industrialism, bohemians and artists took advantage of the availability of cheap, abandoned industrial spaces in transitional higher crime urban districts for their lofts and studios. But as the ranks of knowledge workers grew, talent has come to replace capital as the leading bidder for central locations.

The second is the intense clustering of creative class workers and the firms they create and work for. This is a function of the basic clustering force and human capital externalities long ago identified by Jacobs and Lucas (Jacobs 1969; Lucas 1988). Location around universities and other knowledge-based institutions reflect and reinforce this basic effect. Location around transit routes reduces the time costs of commuting and travel within the region and improves the productivity of knowledge workers, while providing access for service workers as well.

While these human capital and productivity effects predominate, amenities or consumption effects also play a role. If productivity effects alone were responsible for shaping the class divides of the modern metropolis, we would not see such substantial concentrations of affluent workers and households around natural amenities. But as these clusters of human capital attract firms, additional productivity effects are also created, as in the case of Santa Monica, which has emerged as a center for high-tech startups and industries.

When all is said and done, the once hard and fast distinctions between spaces of work and play and of production and consumption have blurred in the modern city and metropolis, compounding the key axes of class division. With their flexible yet intense work schedules, knowledge and creative workers demand services and amenities on an around-the-clock basis, the ability to walk and bike around their neighborhoods, and a social milieu that reflects and promotes their cosmopolitan values. These neighborhood-level features tend to be found more at higher densities, and higher densities tend to be found in the metropolitan core.

All of these processes evolve in mutually reinforcing ways over time. The influx of creative workers leads to higher levels of amenities and better public services, from

safety to schools to regular street cleaning, which in turn help attract still more creative class workers, driving property values and rents ever higher. As this process goes on, creative class districts expand in the urban center and begin to blur together with similar locations in older, mixed-use suburbs along transit lines. As service and working classes are pushed to the less attractive, non-colonized edges and peripheries, a geography of concentrated disadvantage emerges, juxtaposed to and shaped by the geography of concentrated advantage. The new patchwork metropolis transcends the old constructs of city and suburb, and is more fragmented, fractured and tessellated along class lines.

The old, stark divide between city and suburbs has given way to a new pattern of class division and isolation that spans them both. At the same time that the advantaged creative class has reclaimed parts of the urban center, the suburbs have been beset by growing poverty, heightened class division, and a mounting crisis of their own.

The maps and data we have provided above are descriptive and exploratory, rather than confirmatory in nature — our attempt to outline the basic contours and construct a basic typology of the divided city and metropolis. More research is needed on many dimensions of these geographic class divisions. For one, more research is needed to on the pattern of class division across a larger set of smaller and medium-size cities and metros as well as across other countries outside the United States. More systematic empirical research is required to fully probe the extent of these class divides and to examine the underlying factors such as income, education, occupation, race, neighborhood conditions and others which underpin them. More research is also required on the factors that shape these constellations of concentrated advantage versus concentrated disadvantaged. Despite these and other caveats, we hope our provisional research has helped to identify some key trends, patterns and processes and opened up this important area of inquiry for future research.

The past decade or so has seen great progress in identifying the key factors that shape the economic growth and development of cities and metropolitan areas. The next big frontier of urban research is to dig deep inside the black box of cities and metro areas to better understand their internal structure and differentiation - how the clustering of class and economic activity at the neighborhood level simultaneously shapes and divides them.

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