

# Job Sprawl Revisited: The Changing Geography of Metropolitan Employment

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“Understanding the changing location of jobs within U.S. regions represents a necessary step toward implementing policies for high-performing and prosperous metropolitan areas.”

## Findings

An analysis of the spatial location of private-sector jobs in 98 of the largest metropolitan areas by employment reveals that:

- **Only 21 percent of employees in the top 98 metro areas work within three miles of downtown, while over twice that share (45 percent) work more than 10 miles away from the city center.** The larger the metro area, the more likely people are to work more than 10 miles away from downtown; almost 50 percent of jobs in larger metros like Detroit, Chicago, and Dallas locate more than 10 miles away on average compared to just 27 percent of jobs in smaller metros like Lexington-Fayette, Boise, and Syracuse.
- **Job location within metropolitan areas varies widely across industries.** More than 30 percent of jobs in utilities, finance and insurance, and educational services industries locate within three miles of downtowns, while at least half of the jobs in manufacturing, construction, and retail are more than 10 miles away from central business districts.
- **Employment steadily decentralized between 1998 and 2006: 95 out of 98 metro areas saw a decrease in the share of jobs located within three miles of downtown.** The number of jobs in the top 98 metro areas increased overall during this time period, but the outer-most parts of these metro areas saw employment increase by 17 percent, compared to a gain of less than one percent in the urban core. Southern metro areas were particularly emblematic of the outward shift of job share with a 2.6 percentage-point decline in urban core job share and a 4.8 point gain in the outermost ring, outpacing the 98 metro average (a 2.1 point decline and a 2.6 point gain, respectively).
- **In almost every major industry, jobs shifted away from the city center between 1998 and 2006.** Of 18 industries analyzed, 17 experienced employment decentralization. Transportation and warehousing, finance and insurance, utilities, and real estate and rental and leasing showed the greatest increases in the share of jobs located more than 10 miles away from downtown.

Amid changing economic conditions—expansion, contraction, and recovery—during the late 1990s and early 2000s, employment in metropolitan America steadily decentralized. The spatial distribution of jobs has implications for a range of policy issues—from housing to transportation to economic development—and should be taken into account as metro areas work to achieve more productive, inclusive, and sustainable growth and, in the near term, economic recovery.

## Introduction

The movement of people and jobs away from city centers into increasingly distant suburbs represents a long-standing trend in metropolitan America.<sup>1</sup> The ongoing decentralization of population and employment has implications for the overall health and productivity of metro areas across the country. While “people sprawl” has been well-recognized and documented, this paper focuses specifically on “job sprawl,” exploring recent trends in the spatial distribution of employment in 98 of the nation’s largest metropolitan areas and how those trends differ across major industries.

Jobs may decentralize within a metro area for a variety of reasons, and can signal very different development patterns. But whether decentralization occurs due to the emergence of secondary downtowns in a booming region or because of diffuse, low-density sprawl in distressed metro areas, the changing location of employment is inextricably linked to a range of policy issues critical to a metro area’s success.<sup>2</sup> From transportation to workforce development to regional innovation and the provision of social services, the spatial distribution of a metro area’s jobs can ultimately influence its economic productivity, environmental sustainability, and social inclusion and equity.

To help frame the analysis presented in this paper, the following section provides a brief overview of the research literature that explores the potential implications of job sprawl.

### Infrastructure

In metro areas experiencing diffuse, low-density development, costs for building and maintaining infrastructure to support that development can be high. For residential development, Burchell and colleagues find that the costs of providing water and sewer infrastructure to new low-density development exceed the costs of servicing the same number of people in more compact development by 20 to 40 percent. Meanwhile, as people and firms move away from the urban core to the metropolitan fringe, they often leave behind a depleted tax base insufficient to maintain existing infrastructure and services.<sup>3</sup>

### Transportation

If new residential development keeps pace with commercial and industrial development, then employment decentralization need not mean that people become further geographically separated from their jobs. However, as Lang demonstrates, a predominant form of new development in major metro areas is “edgeless,” where new offices spread out along interstates and other commercial corridors, and not in “edge cities” that can truly integrate residential and business uses.<sup>4</sup> The resulting separation may exact costs by raising commuting times and congestion, and by limiting the range of transportation options that can serve low-density job development.

### Spatial Mismatch

When overlaid onto existing patterns of residential segregation, employment decentralization can result in different levels of geographic access to employment opportunities for different demographic groups. Stoll finds that metro areas with higher rates of employment decentralization exhibit greater rates of “spatial mismatch” between the relative locations of jobs and black residents.<sup>5</sup> In a study of selected large metro areas, Holzer and Stoll find that even as low-income and minority populations suburbanize, job growth is fastest in higher-income suburbs, perpetuating patterns of spatial mismatch within suburbia.<sup>6</sup> High levels of employment decentralization may thus impede efforts to connect historically under-employed workers to job opportunities.

### Innovation

The decentralization of employment, by lowering density and interaction among proximate firms and workers, may also lower the rate of innovation. Carlino and colleagues find that across metro areas patenting rates are strongly associated with employment densities in the urbanized portion of those metro areas.<sup>7</sup> Highly dispersed job growth may reduce the likelihood for the sort of inter-firm interactions that have proven valuable for creating knowledge spillovers and high-value innovative activity.

## Energy Consumption

The density of development and employment location also impact the amount of Vehicle Miles Traveled (VMT) in a region, in turn affecting the consumption of energy and amount of emissions produced. Researchers have found that the “carbon footprint” of metropolitan areas can be related to the density and concentration of development, with lower-density regions consuming higher amounts of carbon per capita.<sup>8</sup> Though research in this area has been limited, Ewing and his colleagues estimate that shifting 60 to 90 percent of new growth to more compact forms of development would reduce VMT by 30 percent and decrease carbon dioxide emissions from transportation by 7 to 10 percent over the next 40 years.<sup>9</sup>

Each of these issues affects individual metro areas differently, depending on their mix of employment and the extent to which they have addressed these challenges through policy and planning. Nevertheless, these findings underline the importance of understanding the changing dynamics of employment location within regions. Clearly, job loss or gain is not the only indicator of a metro area’s economic wellbeing. Where jobs locate, where job growth or decline occurs within a metro area, and how these patterns vary across industries also affects metropolitan performance and prosperity, these questions form the focus of the remainder of the paper.

## Methodology

**B**eginning near the peak of an economic cycle in the late 1990s (1998 and 2000), continuing through the brief recession that followed, and ending during the relative recovery of middle part of this decade (2004 and 2006), this analysis tracks the geographic development of urban employment trends in the major economic hubs of the country. It builds on the work of Glaeser, Khan, and Chu who documented the extent of employment decentralization in major metropolitan areas using 1996 ZIP code employment data.<sup>10</sup> This report offers a descriptive analysis based on the summary indicators of job decentralization used by Glaeser and his colleagues. It refines their original methods for allocating jobs across regions, brings forward the analysis to 2006, and looks at trends over time. It assesses patterns and trends in the location of jobs within 98 of the largest metropolitan areas in the country based on employment. These 98 metro areas contained 68 percent of U.S. jobs in 2005.<sup>11</sup>

## About the Data

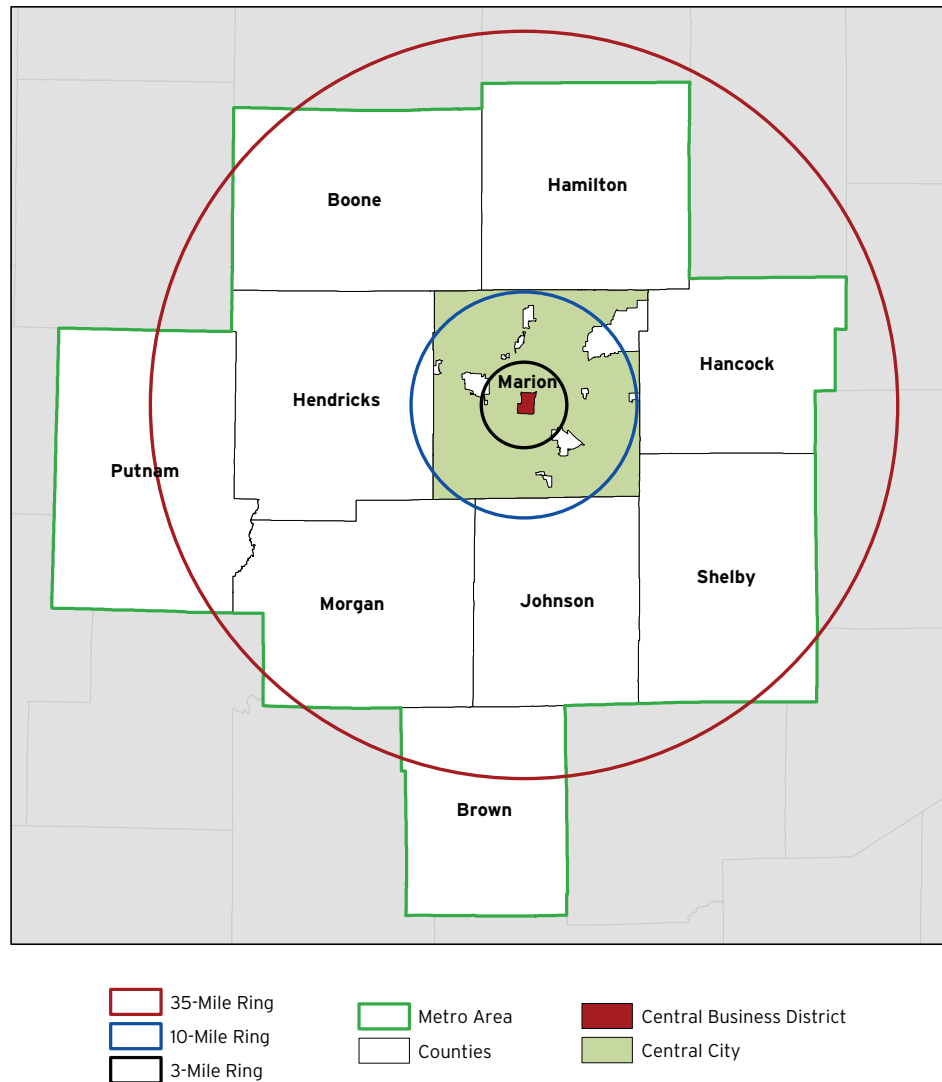
This analysis uses ZIP Business Patterns (ZBP) data for 1998, 2000, 2002, 2004, and 2006. These data are derived from the U.S. Census Bureau’s Business Register, a file of all known single and multi-establishment companies.<sup>12</sup> ZBP data include business counts by employment size and industry as well as employment totals at the ZIP code level. The data exclude information on the self-employed population, employees of private households, railroad employees, agricultural production workers, and most government employees.<sup>13</sup> Because government jobs tend to be more centralized, excluding most government employees from the analysis may lead to an incomplete picture of job location patterns in metro areas with high shares of jobs in the government sector.<sup>14</sup> Additional techniques are employed to account for employment totals that are suppressed in the public ZBP data.<sup>15</sup> Similar methods permit the estimation of ZIP code employment totals for each major industry.<sup>16</sup>

## Identifying Central Business Districts

This analysis uses the 2003 Office of Management and Budget definitions of metropolitan statistical areas as the standard geographic unit of measurement across years. Within each metro area, the central business district (CBD) anchors analysis of the spatial distribution of employment across the region.

The CBD(s) in each metro area is determined by the 1982 Census of Retail Trade, a survey of local leaders that designated the geographic business center of cities across the country.<sup>17</sup> Though dated, the 1982 designations represent the most recent and systematic definitions of CBDs across metro areas. Moreover, the 1982 CBDs still largely correspond to the densest job centers in these metro

Map 1. Indianapolis, IN Metro Area Employment Rings

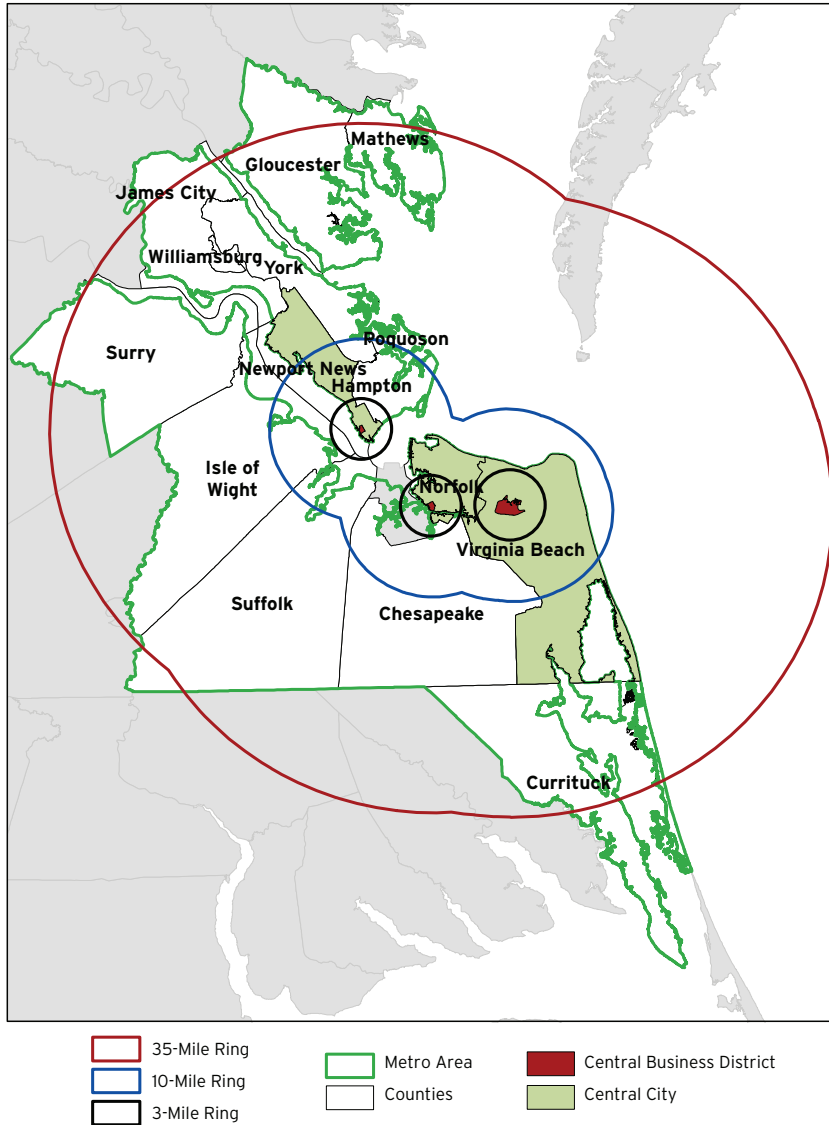


Source: Brookings Institution analysis of U.S. Census Bureau layer files

areas. In 75 of the 98 metros, the CBD overlaps the ZIP code with the highest job density in the metro area (as measured by employees per square mile), while 14 other metros have CBDs that overlap with the second most job-dense ZIP codes. Thus the 1982 designations remain relevant for identifying dense employment centers in these regions.

Some metro areas have more than one major employment center, often located in the second or third city listed in the official metro area name, after the primary city in the region. To account for all significant regional business hubs, this analysis identifies as CBDs those in all primary cities (i.e., those listed first in the official metro area name), as well those in any other city listed in the metro area name that meets three conditions: The city must have a population over 100,000, contain a CBD identified in the 1982 Census of Retail Trade, and the ZIP code(s) that overlap the CBD must contain at least half the number of jobs found in the primary central city's downtown ZIP code(s).<sup>18</sup> Using these criteria, this paper identifies 105 "downtowns" within the 98 metro areas analyzed.<sup>19</sup>

**Map 2. Virginia Beach-Norfolk-Newport News, VA-NC Metro Area Employment Rings**



Source: Brookings Institution analysis of U.S. Census Bureau layer files

### Spatial Location of Employment

To identify the geographic distribution of jobs throughout each metro area, this assessment uses Geographic Information Systems (GIS) software to map the CBDs.<sup>20</sup> Three rings are drawn around each CBD: one at a distance of three miles, the second at ten miles, and the third at 35 miles from the CBD (**Maps 1 and 2**).<sup>21</sup> The three-mile ring typically represents the central city “core,” including the downtown and surrounding neighborhoods, while the 10-mile ring generally captures activity out to the “beltway” of larger metro areas, including much if not all of the central city as well as portions of the inner suburbs. As noted by Glaeser, Khan, and Chu, the three-mile ring characterizes the extent to which the metro area has a well-defined employment center, while the share of employment between the 10- and 35-mile rings demarcates the extent of job sprawl in the metro area.<sup>22</sup> Given the wide variation in the land area covered by different metro areas, the 35-mile ring serves to bound the analysis for metros that extend beyond 35 miles from the CBD.<sup>23</sup> Thus, a metro area’s measure of job

centralization (or decentralization) is based on job location within the 35-mile radius, and not a function of land mass.<sup>24</sup>

The analysis next determines which ZIP codes lay inside each ring, considering only those ZIP codes or portions of ZIP codes that fall within the boundaries of the 98 metro areas.<sup>25</sup> ZIP code boundaries rarely conform to metro area boundaries, and are even less likely to align with the constructed rings (or “buffers”). They also change from year to year, making time series analysis a challenge. In response to these issues this assessment uses a combination of GIS and statistical software to allocate employment from ZIP codes that cross metro area and buffer boundaries. To “split” these ZIP codes, this analysis uses block-level data from Census 2000 to calculate the proportion of the ZIP code’s households that falls within the relevant geographic areas.<sup>26</sup> For instance, if 25 percent of a ZIP code’s households are located within the metro area’s three-mile ring, while the remaining 75 percent fall in the 10-mile ring, 25 percent of the ZIP code’s total employment is allocated to the three-mile ring, and the remainder to the 10-mile ring. Separate allocation factors are created for each year of the analysis, taking into account any ZIP code boundary changes that occur over time.<sup>27</sup> Finally, total jobs are summed for each buffer and the share of metropolitan employment within the inner ring (zero to three miles, including the CBD), the middle ring (three to 10 miles), and the outer ring (10 to 35 miles) is calculated.<sup>28</sup>

## Findings

### A. Only 21 percent of employees in the largest 98 metro areas work within three miles of downtown, while over twice that share (45 percent) work more than 10 miles away from the city center.

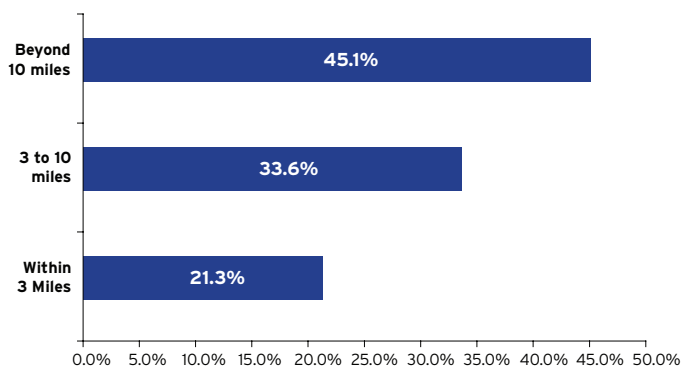
As of 2006, the top 98 metro areas contain over 77 million jobs within 35 miles of their downtowns. More than 16 million of these jobs fall within three miles of the central business district, while more than twice that number—almost 35 million—are more than 10 miles away from downtown. **Figure 1** illustrates the geographic distribution of jobs in 2006 for the 98 metro areas, and depicts the increase in employment share as the distance from downtown grows. Over 21 percent of jobs locate within three miles of downtown, while the middle ring contains one-third of employment in the top 98 metro areas. At just over 45 percent, the outer ring contains the largest share of metro area jobs and more than twice the proportion located in the inner ring.

Notwithstanding the aggregate pattern, striking differences in the spatial location of jobs arise among individual metropolitan areas (**Map 3**). In particular, the total number of jobs in a metro area relates to the spatial location of employment in the region.<sup>29</sup> To assess job location among metro areas of different size, this analysis uses two categories based on total metro area employment: *small* metro areas with fewer than 500,000 jobs, and *large* metro areas with 500,000 or more jobs.<sup>30</sup>

With these distinctions in place, the relationship between job decentralization and metro area size becomes apparent. **Table 1** presents the average employment distribution across the two types of metro areas and reveals that larger metro areas demonstrate more decentralized employment patterns, while regions with fewer jobs show a more centralized employment distribution. Small metro areas locate more than 28 percent of jobs in the inner ring and a slightly smaller share (27 percent) in the most distant ring beyond 10 miles. In contrast, larger metro areas have only one in five jobs in the urban core, while the bulk of their employment—50 percent—lies more than 10 miles from downtown.

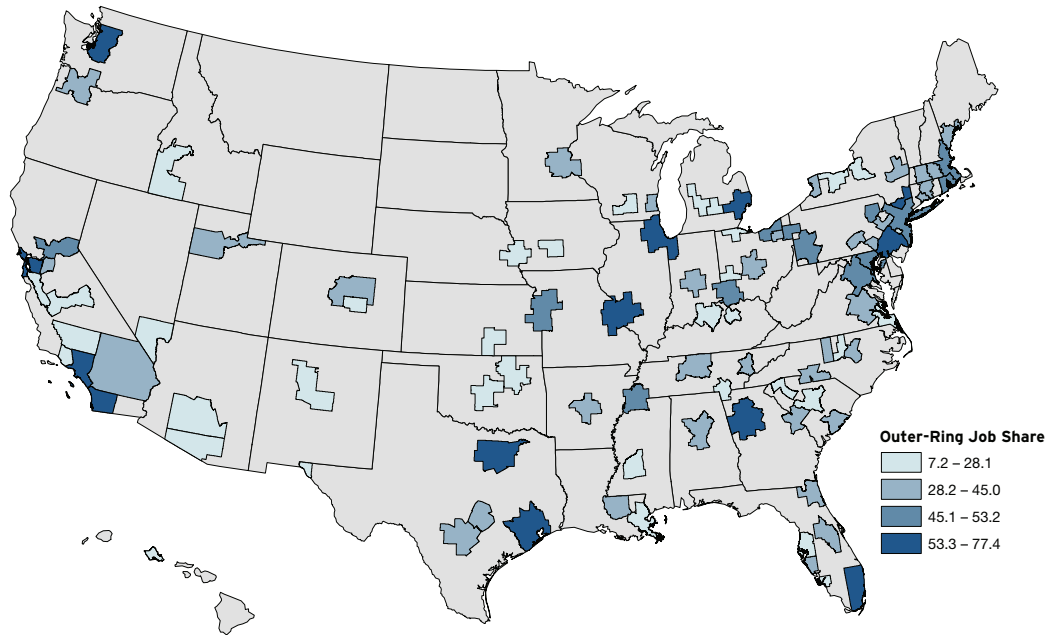
Employment location patterns within individual metro areas bear out these findings by size. **Table 2** identifies the metro areas within each type that are the most centralized (i.e., have the highest concentrations

**Figure 1. Geographic Distribution of Jobs Within 35 Miles of the CBD, 98 Metro Areas, 2006**



Source: Brookings Institution analysis of ZIP Code Business Patterns data

**Map 3. Share of Employment 10 to 35 Miles from Downtown, 98 Metro Areas, 2006**



Source: Brookings Institution analysis of ZIP Code Business Patterns data

**Table 1. Distribution of Jobs Within 35 Miles of the CBD by Metro Area Employment Size, 98 Metro Areas, 2006**

Employment Class Size	Number of Metro Areas	Total Number of Jobs within 35 Miles of CBD	Share of Jobs		
			Within 3 Miles of CBD	Within 3 to 10 Miles of CBD	Beyond 10 Miles from the CBD
Large (>500,000 jobs)	45	62,453,654	19.6%	30.9%	49.5%
Small (<500,000 jobs)	53	14,957,838	28.3%	45.1%	26.6%
<b>All Metro Areas</b>	<b>98</b>	<b>77,411,492</b>	<b>21.3%</b>	<b>33.6%</b>	<b>45.1%</b>

Source: Brookings Institution analysis of ZIP Code Business Patterns data

of jobs in the inner ring) and the most decentralized (i.e., have the highest job shares in the outer ring). Each of the metros listed with the highest urban core job shares have three-mile job shares above the 98-metro average; however, smaller metro areas show even higher concentrations of employment in the inner ring compared to large metro areas.

Honolulu and Lexington lead the list for inner ring job share among all 98 metro areas, with each metro locating more than twice the average share of jobs in the urban core. Geographic constraints play a role in Honolulu's centralized employment pattern, but it is also notable that both of these regions were early adapters of policies to contain urban sprawl in the late 1950s, which may help explain their current spatial patterns of employment. Honolulu has had urban containment policies in place since Hawaii officially became a state, while Lexington and Fayette County have been credited with the nation's first urban containment effort—an urban service line that limited development in the green fields surrounding the urban area.<sup>31</sup>



**Table 2. Most Centralized and Decentralized Metro Areas by Employment Share, by Metro Area Employment Size, 2006**

Highest shares within 3 miles	Most Centralized			Most Decentralized			
	Share of Jobs			Share of Jobs			
	Within 3 Miles	3 to 10 Miles	More Than 10 Miles	Highest shares more than 10 miles away	Within 3 Miles	3 to 10 Miles	More Than 10 Miles
<i>Large Employment Centers</i>							
Virginia Beach, VA-NC	36.4%	46.4%	17.1%	Detroit, MI	7.0%	15.7%	77.4%
New York, NY-NJ-PA	34.8%	19.0%	46.2%	Chicago, IL-IN-WI	17.9%	13.4%	68.7%
Salt Lake City, UT	32.8%	38.9%	28.3%	Dallas, TX	10.6%	22.5%	66.9%
Las Vegas, NV	29.9%	62.8%	7.2%	Los Angeles, CA	8.2%	26.2%	65.6%
Boston, MA-NH	28.0%	24.2%	47.9%	Philadelphia, PA-NJ-DE-MD	15.5%	20.8%	63.7%
Louisville, KY-IN	27.8%	50.5%	21.7%	Atlanta, GA	9.3%	27.5%	63.2%
Pittsburgh, PA	25.9%	29.1%	45.1%	Miami, FL	9.3%	28.2%	62.6%
Phoenix, AZ	25.8%	50.0%	24.2%	St. Louis, MO-IL	14.1%	25.0%	60.9%
Tampa, FL	24.9%	56.5%	18.6%	San Francisco, CA	23.7%	19.0%	57.3%
Nashville, TN	24.8%	31.9%	43.3%	Seattle, WA	19.1%	24.8%	56.0%
<i>Small Employment Centers</i>							
Honolulu, HI	55.6%	29.5%	14.8%	Poughkeepsie, NY	18.3%	14.3%	67.4%
Lexington-Fayette, KY	48.0%	25.9%	26.1%	Scranton-Wilkes-Barre, PA	24.0%	24.0%	52.0%
Bakersfield, CA	43.0%	42.9%	14.1%	Youngstown, OH-PA	17.1%	37.3%	45.6%
Boise City, ID	42.6%	33.0%	24.4%	Worcester, MA	31.4%	23.8%	44.8%
Des Moines, IA	40.2%	50.6%	9.2%	Knoxville, TN	19.5%	36.2%	44.3%
Oxnard, CA	39.4%	51.0%	9.6%	* Portland, ME	36.1%	21.1%	42.7%
Lansing, MI	39.0%	44.6%	16.4%	New Haven, CT	25.2%	32.5%	42.3%
Syracuse, NY	37.7%	40.4%	21.9%	Greensboro, NC	21.1%	39.0%	39.9%
Wichita, KS	36.9%	48.7%	14.4%	Augusta, GA-SC	22.0%	40.9%	37.1%
* Portland, ME	36.1%	21.1%	42.7%	Albany, NY	24.0%	39.8%	36.2%

\*"Centralized" measures inner ring job share. "Decentralized" measures outer ring job share. Compared to other small metros, Portland, ME appears in both categories because its employment concentrates in both the core and metro fringe (its middle-ring share is less than half the small metro average).

Source: Brookings Institution analysis of ZIP Code Business Patterns data

Note: Official metro names are shortened; see Appendix for full OMB designations

Among larger metro areas, the Virginia Beach-Norfolk-Newport News metro area contains the highest inner ring employment share, followed by the New York metro area. With employment hubs in each of the primary central cities in its region, the polycentric structure of the Virginia Beach-Norfolk-Newport News metro concentrates higher shares of employment around the CBDs. A different pattern emerges in the New York metro area, the nation's largest by employment. More than a third of jobs within 35 miles of its CBD lie in the inner ring, while the outer ring share contains a higher-than-average share of metropolitan jobs (46 percent). Clearly, the job centers of Lower and Midtown Manhattan serve to anchor employment for the entire region. Boston, the nation's seventh-largest metro area by employment, also emerges among those with a high share of jobs around the downtown.

As for the most decentralized metro areas, each of the large metro areas locate more than half of jobs in the outer ring, and eight have outer-ring employment shares at least 15 points above the 98 metro average. The Detroit metro area has the highest incidence of job decentralization by far. The current spatial location of employment in this region in part reflects shifts in population and firms dating back several decades. Starting in the 1960s, people and businesses left Detroit's central city for the



surrounding suburbs, reducing the city's population by half, and in the years since, the central city has not managed to recapture its previous level of population or employment.<sup>32</sup>

Atlanta and Los Angeles also top the list for decentralized employment. Atlanta has never historically been a dense urban center, and it lacks any geographic barriers to check its outward growth.<sup>33</sup> As for the Los Angeles metro area, the passage of Proposition 13 in 1978, which limited local property tax revenues, may have helped shape employment distribution patterns in the region. In the two decades after its passage, the metro area saw the number of newly incorporated cities expand by 20 percent as jurisdictions competed for employers that could produce sales taxes.<sup>34</sup> Previous research has shown that metro areas containing higher numbers of political units are more likely to demonstrate decentralized employment patterns.<sup>35</sup> Large patches of un-developable land coupled with political fragmentation and a lack of regional cohesion may thus have contributed to job decentralization within the Los Angeles region.<sup>36</sup>

The small metros that make the list, most in the Northeast and Midwest, have outer-ring jobs shares that exceed the small metro average by almost 10 percentage points or more, with the top three outpacing the 98 metro average. Several of these metro areas also have above-average shares of employment in the manufacturing industry, and four—Scranton, Youngstown, New Haven, and Albany—are home to Older Industrial Cities.<sup>37</sup> On the whole, the 33 Older Industrial metro areas in this study tend to exhibit higher-than-average levels of employment decentralization. The following section explores the relationship between industries and job decentralization in more detail.

### ***B. Job location within metropolitan areas varies widely across industries.***

Land use and zoning, topography, transportation investments, and governance arrangements can all influence the spatial location of jobs in a metro area. The metro area's underlying industrial structure may be an important factor as well. Some industries are land-intensive, while others tend toward denser urban locations. Thus, a metro area's specializations may also help to explain its degree of employment decentralization.

**Table 3** shows the spatial distribution of jobs for each major industry in 2006. In keeping with the overall employment share pattern in the top 98 metro areas, almost every industry has the highest share of jobs in the outer ring, the next-highest share in the middle ring, and lowest share in the inner ring. The finance and insurance and utilities industries, however, locate almost one-third of their jobs in the inner ring—well above average across all jobs of 21 percent.

In addition to these two industries, several other human capital-intensive sectors demonstrate a more centralized employment distribution than average. At least one-quarter of all information; professional, scientific, and technical services; and health care and social assistance jobs locate within the urban core. Educational services jobs distribute relatively evenly across each ring.

At the other end of the spectrum, the industries exhibiting the greatest decentralization of employment in 2006 were more land-intensive sectors that often locate towards the metropolitan fringe. Forestry, fishing and hunting, and agriculture support; manufacturing; and mining top the industry list for share of employment located more than 10 miles from downtown, with jobs shares above 50 percent in the outer ring. At least half of construction and retail trade jobs also locate more than 10 miles from the CBD.

The types of industries in which a metro area specializes may thus relate to its spatial pattern of employment.<sup>38</sup> For instance, metro areas with a specialization in the manufacturing industry show higher-than-average levels of job decentralization. Large metro areas in this category—like Detroit or Chicago—locate less than 16 percent of jobs in the urban core and 56 percent of employment more than 10 miles away from downtown on average. Smaller manufacturing metro areas—including Youngstown and Poughkeepsie—locate almost 30 percent of jobs in the outer ring, three points higher than the small metro average.

In contrast, smaller metro areas with a specialization in information show higher levels of employment centralization on average. Larger metro areas in this category—like New York and Boston—locate more than 23 percent of jobs downtown, almost four points higher than the large metro average for total employment. Smaller metro areas—including Des Moines and Oxnard-Thousand Oaks—locate more than 31 percent of total employment in the urban core and just 21 percent in the outer ring, notably more centralized than the small metro average.

**Table 3. Geographic Distribution of Jobs Within 35 Miles of the CBD by Industry, 98 Metro Areas, 2006**

Industry	Share of Jobs, 2006		
	Within 3 Miles of CBD	3 to 10 Miles from CBD	More than 10 Miles from CBD
<b>All Jobs</b>	<b>21.3%</b>	<b>33.6%</b>	<b>45.1%</b>
Retail Trade	13.0%	36.5%	50.5%
Construction	13.8%	33.9%	52.3%
Manufacturing	14.0%	32.4%	53.7%
Forestry, Fishing, Hunting, and Agriculture Support	16.2%	18.8%	65.1%
Transportation and Warehousing	16.6%	39.2%	44.2%
Wholesale Trade	18.3%	33.8%	47.9%
Administrative, Support, Waste Management Services	20.3%	35.9%	43.8%
Mining	21.3%	25.8%	53.0%
Accommodation and Food Services	21.5%	33.9%	44.6%
Real Estate, Rental, and Leasing	22.5%	36.2%	41.3%
Management of Companies, Enterprises	23.2%	30.8%	46.0%
Health Care and Social Assistance	24.7%	34.8%	40.5%
Arts, Entertainment, and Recreation	24.7%	28.8%	46.5%
Professional, Scientific, and Technical Services	28.7%	29.3%	42.0%
Information	28.7%	31.9%	39.4%
Educational Services	31.2%	34.3%	34.5%
Finance and Insurance	31.7%	30.0%	38.3%
Utilities	32.7%	25.1%	42.2%

Source: Brookings Institution analysis of ZIP Code Business Patterns data

While industry structure may be one factor associated with the extent of employment decentralization within metro areas, causation remains unclear. For instance, is the finance and insurance industry relatively centralized because of something inherent in the industry (e.g., agglomeration benefits), or because so many finance jobs are located in New York? It is likely that both are factors, but further research will be needed to tease out the contribution each makes to the patterns seen here.

**C. Employment steadily decentralized between 1998 and 2006: 95 out of 98 metro areas saw a decrease in the share of jobs located within three miles of the downtown.**

Over the course of the 1990s, downtowns in major metro areas throughout the country experienced a sort of renaissance. The population living in downtowns grew by 10 percent over that decade, after 20 years of decline.<sup>39</sup>

While that upswing has continued to a certain extent in this decade, the “rebirth” of downtowns appears to have remained a residential rather than a jobs-based phenomenon.<sup>40</sup> From 1998 to 2006, the top 98 metro areas experienced a 10 percent increase in the number of jobs within 35 miles of downtown. However, the urban core saw an increase of less than one percent, compared to job growth of 9 percent in the middle ring and more than 17 percent growth in the outer ring. As a result, the geographic distribution of employment steadily decentralized in the top 98 metro areas over this time period.

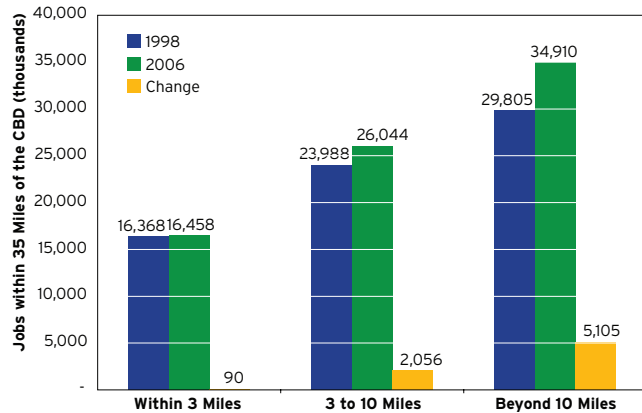
**Figures 2A and 2B** depict the outward shift of job share. The outer ring added two and a half times the net number of jobs gained in the middle ring, and almost 57 times more jobs than the inner ring. Overall, the area within three miles of downtown lost 2.1 percentage points of metropolitan job share between 1998 and 2006. In contrast, the share of jobs located more than 10 miles from downtown grew by 2.6 percentage points.

This growth in outer-ring employment share matches the increase seen in the share of the population living more than 10 miles from downtown (2.7 percentage points); however, the decline in urban core job share over this time period outstripped the decrease in the share of households located downtown (2.1 versus 1.1 percentage points, respectively).<sup>41</sup> This “hollowing out” of jobs progressed gradually over the five points in time assessed, through a period of economic growth, contraction, and slow recovery.

The trend of declining job share in the inner core, and expanding job share outside the inner ring, was evident in 95 of the 98 metro areas analyzed (see Appendix A for detailed data on individual metro areas). However, the exact pattern of decentralization was not uniform across metro areas. Overall, four overarching patterns of change in the spatial distribution of jobs emerge (Table 4).

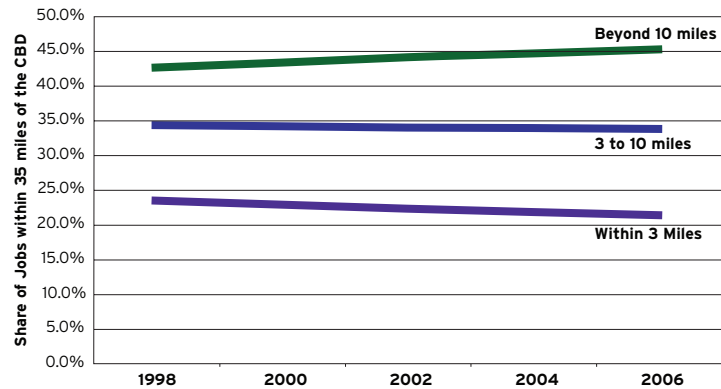
As shown in Table 4, more than half of the metro areas in the study experienced *rapid decentralization*. Together, these 53 metro areas, listed in Table 5, had a higher-than-average gain in the share of jobs beyond 10 miles, and losses in job share in both the urban core and 3- to 10-mile ring. For some metro areas, this outward shift came amidst net job gains shared across the region. Atlanta and Washington, D.C. experienced this type of growth, as did many of the metro areas that lead the list for largest gains in outer-ring job share overall, including Phoenix-Mesa, Austin, and Cape Coral (Table 6). For other metro areas, rapid decentralization occurred during a period of declining total employment. Metro areas like Sarasota, Cleveland, and Syracuse lost jobs overall between 1998 and 2006, but employment in their outer-ring areas either grew or declined less slowly relative to closer-in areas.

Figure 2A. Change in Employment, 98 Metro Areas, 1998 to 2006



Source: Brookings Institution analysis of ZIP Code Business Patterns data

Figure 2B. Geographic Distribution of Job Share, 98 Metro Areas, 1998 to 2006



Source: Brookings Institution analysis of ZIP Code Business Patterns data

Table 4. Change in the Geographic Distribution of Jobs by Metro Type, 98 Metro Areas, 1998 to 2006

Number of Metros	Type	1998 Share of Jobs			2006 Share of Jobs			Change in Share of Jobs 1998 to 2006		
		Within 3 Miles	3 to 10 Miles	More Than 10 Miles	Within 3 Miles	3 to 10 Miles	More Than 10 Miles	Within 3 Miles	3 to 10 Miles	More Than 10 Miles
53	Rapid Decentralization	20.7%	36.0%	43.4%	18.5%	34.3%	47.2%	-2.2%	-1.7%	3.9%
30	Moderate Decentralization	27.6%	30.3%	42.1%	25.5%	31.5%	43.0%	-2.0%	1.2%	0.9%
12	Shift to the Middle	28.8%	32.0%	39.2%	27.3%	34.9%	37.8%	-1.5%	2.9%	-1.4%
3	Gains in the Center	26.9%	44.5%	28.6%	28.1%	42.3%	29.6%	1.2%	-2.2%	1.0%
<b>98</b>	<b>Total</b>	<b>23.3%</b>	<b>34.2%</b>	<b>42.5%</b>	<b>21.3%</b>	<b>33.6%</b>	<b>45.1%</b>	<b>-2.1%</b>	<b>-0.5%</b>	<b>2.6%</b>

Source: Brookings Institution analysis of ZIP Code Business Patterns data

**Table 5. 98 Metro Areas by Type of Change in the Spatial Location of Employment, 1998 to 2006**

	<b>Rapid Decentralization</b>	<b>Moderate Decentralization</b>	<b>Shift to the Middle</b>	<b>Gains in the Core</b>
<b>Total</b>	<b>53 Metro Areas</b>	<b>30 Metro Areas</b>	<b>12 Metro Areas</b>	<b>3 Metro Areas</b>
Large	Atlanta-Sandy Springs-Marietta, GA Austin-Round Rock, TX Baltimore-Towson, MD Chicago-Naperville-Joliet, IL-IN-WI Cincinnati-Middletown, OH-KY-IN Cleveland-Elyria-Mentor, OH Columbus, OH Dallas-Fort Worth-Arlington, TX Denver-Aurora, CO Detroit-Warren-Livonia, MI Houston-Baytown-Sugar Land, TX Indianapolis, IN Jacksonville, FL Kansas City, MO-KS Louisville, KY-IN Memphis, TN-MS-AR Miami-Fort Lauderdale-Miami Beach, FL Minneapolis-St. Paul-Bloomington, MN-WI Nashville-Davidson-Murfreesboro, TN Orlando, FL Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Phoenix-Mesa-Scottsdale, AZ Pittsburgh, PA Portland-Vancouver-Beaverton, OR-WA Providence-New Bedford-Fall River, RI-MA Richmond, VA Riverside-San Bernardino-Ontario, CA Sacramento-Arden-Arcade-Roseville, CA Salt Lake City, UT San Antonio, TX San Diego-Carlsbad-San Marcos, CA San Jose-Sunnyvale-Santa Clara, CA Seattle-Tacoma-Bellevue, WA St. Louis, MO-IL Tampa-St. Petersburg-Clearwater, FL Washington-Arlington-Alexandria, DC-VA-MD-WV	Charlotte-Gastonia-Concord, NC-SC Hartford-West Hartford-East Hartford, CT Las Vegas-Paradise, NV Los Angeles-Long Beach-Santa Ana, CA New York-Northern New Jersey-Long Island, NY-NJ-PA San Francisco-Oakland-Fremont, CA Virginia Beach-Norfolk-Newport News, VA-NC	Boston-Cambridge-Quincy, MA-NH	Milwaukee-Waukesha-West Allis, WI
Small	Albany-Schenectady-Troy, NY Birmingham-Hoover, AL Cape Coral-Fort Myers, FL Colorado Springs, CO El Paso, TX Honolulu, HI Knoxville, TN Little Rock-North Little Rock, AR New Haven-Milford, CT New Orleans-Metairie-Kenner, LA Oklahoma City, OK Omaha-Council Bluffs, NE-IA Raleigh-Cary, NC Sarasota-Bradenton-Venice, FL Springfield, MA Syracuse, NY Tucson, AZ	Akron, OH Albuquerque, NM Augusta-Richmond County, GA-SC Baton Rouge, LA Boise City-Nampa, ID Buffalo-Niagara Falls, NY Charleston-North Charleston, SC Columbia, SC Dayton, OH Des Moines, IA Grand Rapids-Wyoming, MI Greenville, SC Jackson, MS Lancaster, PA Lansing-East Lansing, MI Lexington-Fayette, KY Poughkeepsie-Newburgh-Middletown, NY Rochester, NY Stockton, CA Toledo, OH Tulsa, OK Wichita, KS Worcester, MA	Allentown-Bethlehem-Easton, PA-NJ Bakersfield, CA Durham, NC Fresno, CA Greensboro-High Point, NC Harrisburg-Carlisle, PA Madison, WI Portland-South Portland-Biddeford, ME Scranton-Wilkes-Barre, PA Trenton-Ewing, NJ Youngstown-Warren-Boardman, OH-PA	Chattanooga, TN-GA Oxnard-Thousand Oaks-Ventura, CA

**Table 6. Metro Areas with the Largest Increase in Share of Jobs More than 10 Miles from the CBD, 1998 to 2006**

Metro Area	Change Within 3 Miles, 1998-2006	Change 3 to 10 Miles, 1998-2006	Change Beyond 10 Miles, 1998-2006
Phoenix, AZ	-7.0%	-1.5%	8.5%
Memphis, TN-MS-AR	-2.4%	-6.0%	8.4%
Jacksonville, FL	-5.5%	-2.2%	7.8%
Orlando, FL	-2.9%	-4.6%	7.5%
Austin, TX	-3.3%	-3.6%	6.9%
Houston, TX	-2.6%	-4.3%	6.9%
Salt Lake City, UT	-4.2%	-2.7%	6.9%
Sacramento, CA	-2.6%	-4.2%	6.8%
New Orleans, LA	-5.3%	-1.5%	6.8%
Cape Coral, FL	-5.7%	-1.0%	6.7%

Source: Brookings Institution analysis of ZIP Code Business Patterns data  
 Note: Official metro names are shortened; see Appendix for full OMB designations

The metro areas that experienced *moderate decentralization* over this time period distinguish themselves from the previous category in that, while losing job share around their downtowns, the 3- to 10-mile ring gained job share along with the outer ring. While jobs shifted outward in these regions between 1998 and 2006, metro areas like Las Vegas, San Francisco, and Buffalo did not experience the rapid pace of job decentralization that many other metro areas did.

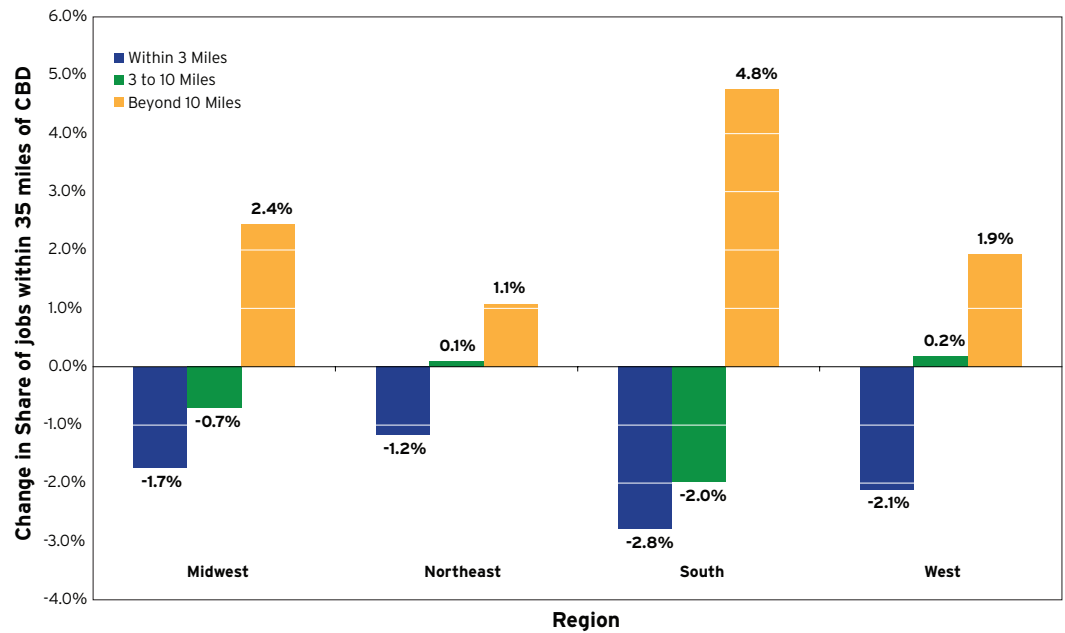
In contrast, metro areas experiencing a *shift to the middle* actually saw the share of their jobs located more than 10 miles from downtown drop during this period. Taken together, the 12 metro areas in this category experienced an increase in middle ring job share of almost 3 percentage points, coupled with a roughly one-and-a-half percentage point decline in the inner and outer rings. Between 1998 and 2006, the 3- to 10-mile ring gained employment, either at a faster rate than the urban core and outer ring (e.g., Boston, Allentown, and Bakersfield) or while downtown and outer-ring jobs declined (e.g., Greensboro and Youngstown).

The remaining three metro areas were the only ones to experience *gains in the core* ring between 1998 and 2006. Of these three, just one—Oxnard-Thousand Oaks—saw the share of metropolitan jobs in the urban core increase by more than one percentage point. Oxnard-Thousand Oaks experienced a two-point shift towards the inner ring coupled with declines in both the middle- and outer-ring job share. This is a fast-growing region anchored by two CBDs, in “boomburbs” that sustained double-digit population growth each decade between 1950 and 2000, and have continued to grow since 2000.<sup>42</sup> In addition, both cities are located in a county with strong urban containment policies regulating development.<sup>43</sup>

On the whole, while almost every major metro area experienced decentralizing employment trends, differences in the magnitude of that decentralization emerge by region (**Figure 3**). Though all four regions saw employment share shift away from the urban core, the trends in the South are the most emblematic of the spatial changes in metropolitan employment that occurred between 1998 and 2006; southern metros experienced the largest decrease in urban core job share among the regions (2.8 percentage points), coupled with a 4.8 percentage-point increase in the outer-ring.

Moreover, total metropolitan employment also seems to play a role in the extent of job decentralization that took place over this period. As **Table 5** illustrates, smaller metro areas experienced the complete range of change in job distribution between 1998 and 2006, with significant representation in every category. Large metro areas, on the other hand, are much more likely to have undergone rapid decentralization. This may reflect the fact that larger metros started out more decentralized than smaller metros in 1998, and may therefore be at different points on their development continua. It may also reflect differing economic choices and strategies for land use and development.

**Figure 3. Change in Distribution of Jobs by Region, 98 Metro Areas, 1998 to 2006**



Source: Brookings Institution analysis of ZIP Code Business Patterns data

**D. In almost every major industry, jobs shifted away from the city center between 1998 and 2006.**

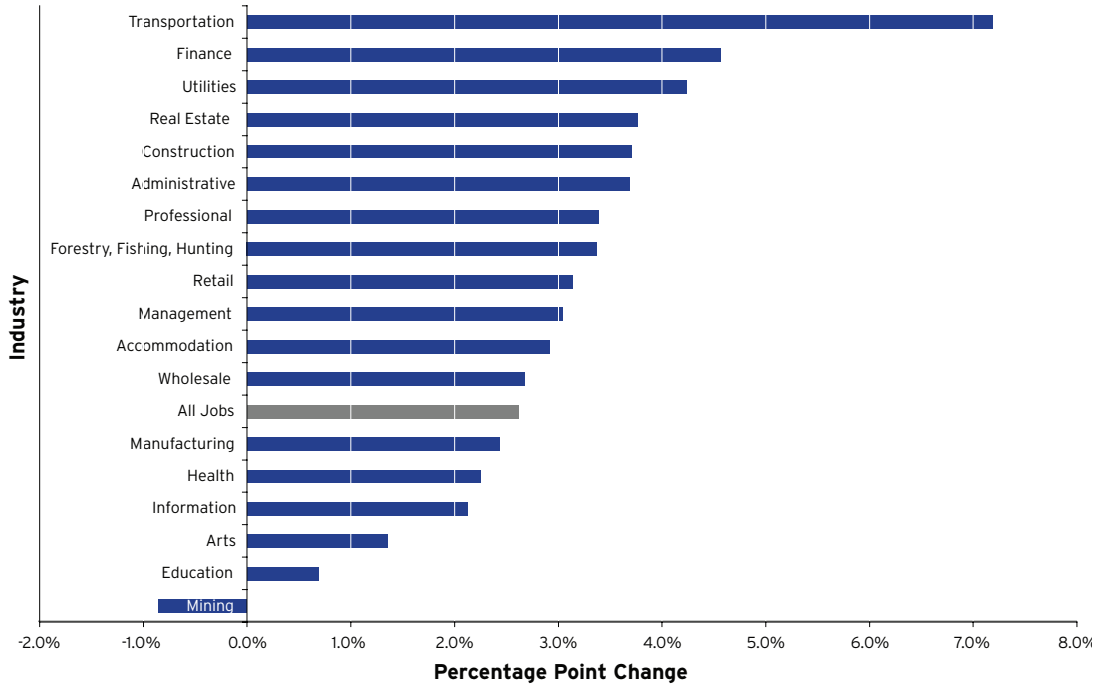
Similar to the overall trend of job decentralization during this period of economic growth, recession, and recovery, almost every major industry (17 out of 18) saw its share of jobs beyond 10 miles from downtown expand, and all but two saw job shares within 3 miles of downtown contract, between 1998 and 2006. **Figure 4** presents the change in outer ring employment share from 1998 to 2006 by industry. The construction industry experienced a boom in employment between 1998 and 2006, particularly in many Sun Belt metros in the South and West, and exhibited a marked shift toward outer-ring locations.<sup>44</sup> Forty-seven (47) of the 98 metro areas have a specialization in construction, and they saw an average gain of 3.9 percentage points in outer-ring job share. All but seven of these metro areas are located in the South and West, and several rank among those with the greatest outer-ring job share gains overall, including Orlando, Cape Coral, and Houston as well as Sacramento and Phoenix-Mesa. Consistent with the housing boom in the Sun Belt, as construction jobs increased overall in these metro areas, the fastest growth occurred in the metropolitan fringe.

Manufacturing employment decentralized, too, but in a very different context. Overall, this industry lost jobs between 1998 and 2006, with net decreases in each metropolitan ring. Because employment declines in the urban core outpaced those in the outer ring, manufacturing jobs continued to decentralize. As a group, the 38 metro areas with a specialization in manufacturing—most in the Rust Belt and South—followed this pattern, with an average gain of 1.9 percentage points in outer-ring job share.

Even industries that remain relatively rooted in and around downtowns, such as health care and social assistance; finance and insurance; and professional, scientific, and technical services saw job share spread outward over the eight-year period. For instance, the 31 metro areas that specialize in professional, scientific, and technical services, including Austin, Albuquerque, and Oklahoma City, experienced a shifting of job share away from downtown and the middle ring, resulting in an outer-ring gain of more than two points.

As these examples suggest, metropolitan-level and industry-level changes in employment location relate to one another. Of the 22 metro areas that saw their outer-ring job share increase by at least 5 percentage points from 1998 to 2006, all specialized in at least one industry that decentralized at an

**Figure 4. Change in Share of Jobs beyond 10 Miles from CBD by Industry, Top 98 Metro Areas, 1998 to 2006**



Source: Brookings Institution analysis of ZIP Code Business Patterns data

above-average rate, and 21 specialized in more than one such industry. Conversely, of the 25 metros that experienced a decline in outer-ring job share or a growth of less than one percentage point, all but one specialized in at least one industry that experienced a below-average rate of job decentralization.

These patterns help illustrate the association between industry structure and the spatial location of employment at the metro area level, though they raise questions about that relationship. For instance, did changes in the finance industry lead to decentralization of finance jobs within metro areas, or did developments across metro areas (growth in some metro areas, declines in others) lead to shifts in the overall spatial location patterns at the industry level? These trends also raise questions about what might be appropriate location decisions for certain industries as metro areas change over time. For instance, the transportation and warehousing industry leads the list for highest increases in outer-ring job share. It might be expected that, as metro areas grow, this industry would decentralize away from densely populated areas in the city center.<sup>45</sup>

While not all industry employment location trends map neatly to the experience of the individual metro areas that specialize in them, this analysis suggests that industry structure serves as one of a number of factors that shape the changing location of employment within metro areas.



## Conclusion

This analysis sheds light on the decentralization of employment that took place in almost all of the leading metropolitan areas in the country between 1998 and 2006. While many once declining central-city downtowns have captured visible new residential and commercial vitality in recent years, the dominant trend across metropolitan areas and industries has produced further spreading out of jobs toward the metropolitan fringe.

By 2030, the United States will add over 90 billion square feet of commercial and industrial development—nearly twice as much as existed in 2000—to accommodate a projected 60 million new jobs.<sup>46</sup> Even if, as anticipated, only half of that new development occurs as low-density new construction, we can expect to see a continued shift of employment share away from downtowns across the country. In particular, the southern and western regions of the United States are projected to experience the most significant growth. As those regions grow, will jobs become even more decentralized, as in Dallas, Atlanta, and Charlotte; or will they shift to a more compact form, as in Albuquerque, San Jose, and Tucson?

This analysis also makes clear that job decentralization results not solely from growth. Metro areas that lost jobs between 1998 and 2006 also exhibited decentralizing patterns as net employment losses shifted job share away from the urban core. Clearly, the continued decentralization of jobs affects communities across the country, regardless of size or region, growth or decline.

Economic circumstances have shifted markedly since 2006, of course. Since the current recession began in December of 2007, the U.S. economy has shed almost 4.4 million jobs. Certain industries, such as construction, administrative and waste support services, and manufacturing have been hit especially hard over this period, though almost every industry—with exceptions in education services and health care and social services—has shared in the downturn.<sup>47</sup> Several of the harder-hit industries exhibited an above-average rate of metropolitan decentralization in 2006, indicating that the initial effects of the recession may slow further job sprawl over the short term (**Table 3**). The underlying industry specializations of each metro area will most likely affect the extent to which the current downturn impacts its job decentralization trend post-2006.

As this analysis has shown, however, job decentralization trends do not move in lock-step with the economic cycle; jobs continued to shift towards the fringe in almost every major metro area, regardless of overarching economic circumstances between 1998 and 2006. Therefore, though the current downturn may slow the long-term trend, it is unlikely on its own to reverse the patterns documented here. The more important question regards the eventual economic recovery of our nation and its metropolitan economies: When jobs begin to grow again in these regions, how and where will that growth occur?

Just as they have for the past several decades, policymakers are making decisions right now that will shape future development patterns across the country.<sup>48</sup> Currently, members of the 111th Congress and the new administration, along with leaders at the state and local level, are crafting policies with the potential to directly impact metropolitan development patterns and, by extension, the location of employment. The recently passed American Recovery and Reinvestment Act of 2009 will result in billions of dollars of new spending in areas including transportation and infrastructure, housing, energy, and job creation. If used wisely by federal, state, and local leaders, these investments could help spur cohesive planning and policies that connect decisions around affordable housing, transportation, and jobs to foster more compact and sustainable development. If not, these investments could accelerate low-density exurban development and exacerbate the range of challenges associated with unchecked sprawl.

Clearly, the spatial distribution of employment within a region intersects with a whole host of policy areas. These issues do not exist in independent silos, though too often policy decisions have been made as if they do. Understanding the changing location of jobs within U.S. regions represents a necessary step towards implementing more cohesive, comprehensive policies for economically productive, socially inclusive, and environmentally sustainable metropolitan growth.

**Appendix A. Change in the Geographic Distribution of Jobs, 98 Metro Areas, 1998 to 2006**

Metro Area	1998				2006				Change, 1998 to 2006			
	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles	Share of Jobs Beyond 10 Miles	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles	Share of Jobs Beyond 10 Miles	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles	Share of Jobs Beyond 10 Miles
<b>98 Metro Area Total</b>	<b>70,159,860</b>	<b>23.3%</b>	<b>34.2%</b>	<b>42.5%</b>	<b>77,411,492</b>	<b>21.3%</b>	<b>33.6%</b>	<b>45.1%</b>	<b>7,251,632</b>	<b>-2.1%</b>	<b>-0.5%</b>	<b>2.6%</b>
Akron, OH	290,022	28.8%	43.2%	28.0%	300,323	25.1%	44.0%	30.9%	10,301	-3.7%	0.8%	2.9%
Albany-Schenectady-Troy, NY	299,181	25.2%	40.8%	34.0%	333,252	24.0%	39.8%	36.2%	34,071	-1.2%	-1.0%	2.2%
Albuquerque, NM	272,383	29.7%	59.6%	10.7%	307,753	25.9%	59.7%	14.4%	35,370	-3.9%	0.2%	3.7%
Allentown-Bethlehem-Easton, PA-NJ	270,026	28.3%	42.2%	29.5%	289,827	26.4%	44.1%	29.4%	19,801	-1.9%	1.9%	-0.1%
Atlanta-Sandy Springs-Marietta, GA	1,662,324	11.4%	31.5%	57.1%	2,062,147	9.3%	27.5%	63.2%	399,824	-2.1%	-4.0%	6.1%
Augusta-Richmond County, GA-SC	166,750	25.0%	39.0%	36.1%	179,579	22.0%	40.9%	37.1%	12,829	-3.0%	2.0%	1.0%
Austin-Round Rock, TX	469,147	27.8%	45.5%	26.7%	601,731	24.4%	41.9%	33.7%	132,584	-3.3%	-3.6%	6.9%
Bakersfield, CA	125,404	45.7%	37.3%	17.0%	163,687	43.0%	42.9%	14.1%	38,284	-2.7%	5.6%	-3.0%
Baltimore-Towson, MD	966,460	20.2%	36.6%	43.2%	1,118,673	18.0%	33.6%	48.4%	152,213	-2.2%	-3.0%	5.2%
Baton Rouge, LA	265,483	18.5%	52.5%	29.0%	314,285	16.0%	54.4%	29.6%	48,802	-2.4%	1.8%	0.6%
Birmingham-Hoover, AL	429,542	36.6%	36.8%	26.6%	453,079	33.7%	35.7%	30.6%	23,537	-3.0%	-1.1%	4.0%
Boise City-Nampa, ID	178,876	52.6%	24.7%	22.7%	232,882	42.6%	33.0%	24.4%	54,006	-10.0%	8.3%	1.7%
Boston-Cambridge-Quincy, MA-NH	1,924,748	29.5%	21.9%	48.6%	2,131,017	28.0%	24.2%	47.9%	206,269	-1.6%	2.3%	-0.8%
Buffalo-Niagara Falls, NY	464,622	21.3%	50.4%	28.3%	478,466	19.5%	51.1%	29.5%	13,844	-1.8%	0.6%	1.2%
Cape Coral-Fort Myers, FL	132,568	34.6%	49.6%	15.9%	196,557	28.8%	48.5%	22.6%	63,988	-5.7%	-1.0%	6.7%
Charleston-North Charleston, SC	200,682	29.0%	40.4%	30.6%	234,697	21.6%	44.1%	34.3%	34,015	-7.4%	3.7%	3.7%
Charlotte-Gastonia-Concord, NC-SC	654,995	25.8%	37.3%	36.8%	750,702	20.5%	38.8%	40.7%	95,707	-5.3%	1.4%	3.9%
Chattanooga, TN-GA	202,089	31.0%	43.6%	25.5%	220,826	31.9%	42.1%	26.1%	18,737	0.9%	-1.5%	0.6%
Chicago-Naperville-Joliet, IL-IN-WI	3,517,263	18.7%	14.5%	66.8%	3,631,387	17.9%	13.4%	68.7%	114,124	-0.9%	-1.1%	2.0%
Cincinnati-Middletown, OH-KY-IN	876,497	20.4%	31.4%	48.2%	917,480	17.1%	30.6%	52.3%	40,984	-3.3%	-0.8%	4.1%
Cleveland-Elyria-Mentor, OH	1,000,374	18.0%	38.9%	43.1%	959,388	16.2%	38.1%	45.7%	-40,986	-1.8%	-0.8%	2.5%
Colorado Springs, CO	199,907	38.6%	53.5%	7.9%	224,430	34.9%	53.2%	11.9%	24,523	-3.7%	-0.3%	4.0%
Columbia, SC	257,204	35.9%	39.0%	25.2%	281,198	32.0%	40.0%	28.0%	23,995	-3.9%	1.0%	2.8%
Columbus, OH	729,986	23.2%	47.2%	29.5%	774,127	19.3%	45.0%	35.7%	44,141	-3.9%	-2.3%	6.1%
Dallas-Fort Worth-Arlington, TX	2,229,454	12.2%	25.5%	62.4%	2,399,155	10.6%	22.5%	66.9%	169,701	-1.6%	-2.9%	4.5%
Dayton, OH	371,829	26.1%	52.8%	21.1%	361,810	23.8%	54.4%	21.9%	-10,019	-2.3%	1.5%	0.8%
Denver-Aurora, CO	978,571	24.3%	46.9%	28.9%	1,076,423	22.1%	44.9%	33.0%	97,852	-2.2%	-2.0%	4.1%
Des Moines, IA	243,099	46.9%	44.3%	8.8%	280,041	40.2%	50.6%	9.2%	36,942	-6.7%	6.2%	0.4%
Detroit-Warren-Livonia, MI	1,787,063	7.3%	18.5%	74.2%	1,679,362	7.0%	15.7%	77.4%	-107,701	-0.3%	-2.8%	3.1%
Durham, NC	198,339	29.1%	53.4%	17.5%	222,312	27.5%	55.7%	16.8%	23,973	-1.6%	2.3%	-0.7%
El Paso, TX	199,202	23.5%	58.8%	17.7%	204,004	20.2%	56.5%	23.3%	4,801	-3.3%	-2.3%	5.6%
Fresno, CA	198,854	25.9%	60.2%	14.0%	251,219	23.1%	63.7%	13.2%	52,365	-2.7%	3.5%	-0.8%
Grand Rapids-Wyoming, MI	342,456	30.4%	55.5%	14.1%	344,745	27.8%	56.9%	15.2%	2,288	-2.6%	1.4%	1.2%

**Appendix A. Change in the Geographic Distribution of Jobs, 98 Metro Areas, 1998 to 2006 (continued)**

Change, 1998 to 2006

2006

1998

Metro Area	1998			2006			Change, 1998 to 2006		
	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles Beyond 10 Miles	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles Beyond 10 Miles	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles Beyond 10 Miles
Greensboro-High Point, NC	329,946	23.0%	36.7%	330,791	21.1%	39.0%	845	-1.9%	2.3%
Greenville, SC	285,612	38.2%	39.7%	279,776	35.2%	41.2%	-5,837	-2.9%	1.5%
Harrisburg-Carlisle, PA	253,325	30.3%	40.9%	263,917	29.4%	41.9%	10,592	-0.9%	1.0%
Hartford-West Hartford-East Hartford, CT	538,211	25.3%	39.6%	554,537	23.6%	40.0%	16,326	-1.7%	0.4%
Honolulu, HI	309,729	56.1%	31.6%	358,873	55.6%	29.5%	49,144	-0.5%	-2.0%
Houston-Baytown-Sugar Land, TX	1,750,155	14.2%	36.8%	1,975,566	11.6%	32.4%	225,411	-2.6%	-4.3%
Indianapolis, IN	720,297	24.0%	48.3%	797,418	21.0%	45.4%	77,121	-3.0%	-2.9%
Jackson, MS	203,586	35.9%	50.1%	212,194	29.4%	50.2%	8,608	-6.6%	0.1%
Jacksonville, FL	431,769	23.9%	46.6%	514,466	18.3%	44.4%	82,697	-5.5%	-2.2%
Kansas City, MO-KS	793,737	19.1%	33.7%	887,724	17.3%	32.4%	93,987	-1.8%	-1.3%
Knoxville, TN	263,519	22.1%	36.3%	306,166	19.5%	36.2%	42,647	-2.7%	-0.1%
Lancaster, PA	201,082	31.6%	36.6%	221,687	29.7%	37.9%	20,606	-1.9%	1.2%
Lansing-East Lansing, MI	166,471	44.6%	39.9%	165,542	39.0%	44.6%	-929	-5.6%	4.8%
Las Vegas-Paradise, NV	519,003	37.1%	58.1%	825,279	29.9%	62.8%	306,276	-7.1%	4.8%
Lexington-Fayette, KY	196,297	50.6%	24.0%	214,579	48.0%	25.9%	18,282	-2.6%	1.9%
Little Rock-North Little Rock, AR	268,471	28.0%	46.3%	287,175	26.6%	44.8%	18,705	-1.3%	-1.5%
Los Angeles-Long Beach-Santa Ana, CA	4,466,943	8.8%	26.0%	4,887,307	8.2%	26.2%	420,364	-0.6%	0.2%
Louisville, KY-IN	521,835	30.6%	50.9%	539,783	27.8%	50.5%	17,948	-2.8%	-0.4%
Madison, WI	228,574	34.5%	47.1%	266,716	30.5%	52.3%	38,142	-3.9%	5.2%
Memphis, TN-MS-AR	514,443	14.4%	44.7%	537,027	12.0%	38.6%	22,584	-2.4%	-6.0%
Miami-Fort Lauderdale-Miami Beach, FL	1,323,346	9.9%	29.6%	1,476,060	9.3%	28.2%	152,714	-0.7%	-1.4%
Milwaukee-Waukesha-West Allis, WI	763,429	22.6%	42.5%	785,979	23.0%	39.2%	22,549	0.3%	-3.2%
Minneapolis-St. Paul-Bloomington, MN-WI	1,478,847	19.7%	45.3%	1,618,645	16.9%	42.7%	139,798	-2.8%	-2.7%
Nashville-Davidson-Murfreesboro, TN	599,072	29.4%	33.5%	684,063	24.8%	31.9%	84,991	-4.6%	-1.6%
New Haven-Milford, CT	331,644	26.2%	33.1%	337,753	25.2%	32.5%	6,109	-1.0%	-0.7%
New Orleans-Metairie-Kenner, LA	506,189	34.0%	47.4%	408,242	28.7%	46.0%	-97,947	-5.3%	-1.5%
New York-Northern New Jersey-Long Island, NY-NJ-PA	6,989,858	35.5%	19.0%	6,864,003	34.8%	19.0%	474,145	-0.7%	0.1%
Oklahoma City, OK	406,324	30.8%	49.9%	455,552	26.7%	49.4%	49,229	-4.1%	-0.5%
Omaha-Council Bluffs, NE-IA	360,258	26.2%	57.4%	388,351	23.6%	56.4%	28,093	-2.6%	-1.0%
Orlando, FL	739,582	16.3%	47.9%	958,240	13.4%	43.3%	218,659	-2.9%	-4.6%
Oxnard-Thousand Oaks-Ventura, CA	226,636	37.6%	52.4%	283,983	39.4%	51.0%	57,346	1.8%	-1.3%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	2,313,044	16.8%	22.5%	2,460,205	15.5%	20.8%	147,161	-1.3%	-1.7%
Phoenix-Mesa-Scottsdale, AZ	1,251,524	32.9%	51.5%	1,622,947	25.8%	50.0%	371,423	-7.0%	-1.5%

Metro Area	1998					2006					Change, 1998 to 2006				
	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles	Share of Jobs Beyond 10 Miles	Share of Jobs	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles	Share of Jobs Beyond 10 Miles	Share of Jobs	Total Jobs Within 35 Miles of Downtown	Share of Jobs Within 3 Miles	Share of Jobs 3 to 10 Miles	Share of Jobs Beyond 10 Miles	
Pittsburgh, PA	973,150	27.0%	29.7%	43.4%		1,008,801	25.9%	29.1%	45.1%		35,651	-1.1%	-0.6%	1.7%	
Portland-South Portland-Biddeford, ME	189,037	37.8%	18.2%	44.0%		214,068	36.1%	21.1%	42.7%		25,031	-1.7%	3.0%	-1.3%	
Portland-Vancouver-Beaverton, OR-WA	828,529	27.4%	48.7%	23.8%		907,052	24.3%	46.3%	29.4%		78,523	-3.1%	-2.4%	5.6%	
Poughkeepsie-Newburgh-Middletown, NY	161,217	18.9%	14.1%	67.0%		194,171	18.3%	14.3%	67.4%		32,953	-0.7%	0.2%	0.5%	
Providence-New Bedford-Fall River, RI-MA	584,309	23.4%	29.8%	46.8%		635,912	22.3%	29.7%	48.0%		51,603	-1.1%	-0.1%	1.1%	
Raleigh-Cary, NC	332,364	17.5%	55.4%	27.1%		411,320	15.9%	53.6%	30.5%		78,956	-1.7%	-1.8%	3.5%	
Richmond, VA	452,977	22.6%	48.6%	28.8%		521,322	20.0%	48.0%	32.1%		68,346	-2.6%	-0.7%	3.3%	
Riverside-San Bernardino-Ontario, CA	605,706	23.6%	46.2%	30.3%		933,467	19.8%	44.7%	35.5%		327,760	-3.7%	-1.5%	5.2%	
Rochester, NY	415,916	33.9%	46.9%	19.2%		416,823	32.0%	47.3%	20.7%		907	-1.9%	0.4%	1.5%	
Sacramento-Arden-Arcade-Roseville, CA	525,230	21.2%	38.4%	40.4%		687,080	18.6%	34.1%	47.3%		161,850	-2.6%	-4.2%	6.8%	
Salt Lake City, UT	478,964	37.0%	41.6%	21.4%		532,387	32.8%	38.9%	28.3%		53,423	-4.2%	-2.7%	6.9%	
San Antonio, TX	584,024	17.8%	58.9%	23.3%		689,117	14.7%	55.7%	29.6%		105,092	-3.2%	-3.1%	6.3%	
San Diego-Carlsbad-San Marcos, CA	928,424	13.6%	35.1%	51.3%		1,160,030	11.3%	34.5%	54.2%		231,605	-2.3%	-0.6%	2.9%	
San Francisco-Oakland-Fremont, CA	1,802,750	26.3%	18.4%	55.3%		1,896,056	23.7%	19.0%	57.3%		93,305	-2.6%	0.6%	2.0%	
San Jose-Sunnyvale-Santa Clara, CA	921,176	25.9%	55.2%	18.9%		885,520	24.4%	55.0%	20.6%		-35,656	-1.5%	-0.2%	1.7%	
Sarasota-Bradenton-Venice, FL	235,751	27.4%	46.5%	26.2%		232,300	24.4%	45.6%	30.0%		-3,452	-2.9%	-0.9%	3.8%	
Scranton-Wilkes-Barre, PA	211,023	24.7%	22.4%	52.9%		223,210	24.0%	24.0%	52.0%		12,187	-0.7%	1.6%	-0.9%	
Seattle-Tacoma-Bellevue, WA	1,321,086	20.0%	26.9%	53.1%		1,461,291	19.1%	24.8%	56.0%		140,205	-0.8%	-2.1%	2.9%	
Springfield, MA	241,098	34.8%	39.0%	26.2%		245,318	30.3%	37.3%	32.4%		4,220	-4.5%	-1.7%	6.2%	
St. Louis, MO-IL	1,125,324	15.3%	27.0%	57.7%		1,178,589	14.1%	25.0%	60.9%		53,265	-1.2%	-2.0%	3.3%	
Stockton, CA	142,044	35.7%	30.1%	34.3%		178,850	33.1%	31.4%	35.5%		36,806	-2.6%	1.3%	1.2%	
Syracuse, NY	262,441	38.9%	40.8%	20.3%		253,476	37.7%	40.4%	21.9%		-8,965	-1.1%	-0.4%	1.6%	
Tampa-St. Petersburg-Clearwater, FL	891,976	25.4%	58.2%	16.4%		1,020,205	24.9%	56.5%	18.6%		128,229	-0.5%	-1.7%	2.2%	
Toledo, OH	279,086	26.8%	54.0%	19.3%		282,840	25.8%	54.3%	19.9%		3,755	-0.9%	0.3%	0.6%	
Trenton-Ewing, NJ	155,135	24.1%	53.1%	22.9%		184,624	22.0%	57.7%	20.2%		29,489	-2.0%	4.7%	-2.7%	
Tucson, AZ	263,181	24.1%	66.3%	9.6%		333,480	21.0%	64.7%	14.3%		70,300	-3.1%	-1.6%	4.7%	
Tulsa, OK	353,033	24.8%	55.9%	19.4%		372,840	19.1%	57.7%	23.1%		19,807	-5.7%	1.9%	3.8%	
Virginia Beach-Norfolk-Newport News, VA-NC	542,783	38.9%	45.0%	16.1%		630,246	36.4%	46.4%	17.1%		87,464	-2.4%	1.4%	1.1%	
Washington-Arlington-Alexandria, DC-VA-MD-WV	1,825,203	22.8%	32.6%	44.5%		2,215,738	20.8%	30.1%	49.1%		390,535	-2.1%	-2.5%	4.6%	
Wichita, KS	247,072	44.2%	42.8%	13.0%		255,204	36.9%	48.7%	14.4%		8,132	-7.3%	5.9%	1.4%	
Worcester, MA	289,499	33.6%	22.0%	44.4%		288,378	31.4%	23.8%	44.8%		-1,121	-2.2%	1.8%	0.4%	
Youngstown-Warren-Boardman, OH-PA	232,192	17.3%	34.3%	48.4%		214,663	17.1%	37.3%	45.6%		-17,528	-0.2%	3.1%	-2.8%	

Source: Brookings Institution analysis of ZIP Code Business Patterns data

Note: Estimates of total jobs within 35 miles were tabulated based on GIS analysis and may not match metropolitan area totals from the U.S. Census County Business Patterns data.

## Endnotes

1. See, e.g., Peter Mieszkowski and Edwin S. Mills, "The Causes of Metropolitan Suburbanization." *Journal of Economic Perspectives* 7(3)(1993): 135-147.
2. See Robert E. Lang, *Edgeless Cities: Exploring the Elusive Metropolis* (Washington: Brookings Institution, 2003), and Tara Watson, "New Housing, Income Inequality, and Distressed Metropolitan Areas" (Washington: Brookings Institution, 2007).
3. Robert Burchell, et al, *Sprawl Costs: Economic Impacts of Unchecked Development* (Washington: Island Press, 2005).
4. Lang, *Edgeless Cities*.
5. Michael A. Stoll, "Job Sprawl and the Spatial Mismatch between Blacks and Jobs" (Washington: Brookings Institution, 2005).
6. Harry Holzer and Michael Stoll, "Where Workers Go, Do Jobs Follow? Metropolitan Labor Markets in the U.S., 1990-2000" (Washington: Brookings Institution, 2007).
7. Gerald Carlino, Satyajit Chatterjee, and Robert Hunt, "Urban Density and the Rate of Invention." Working Paper 06-14 (Federal Reserve Bank of Philadelphia, 2006).
8. Marilyn A. Brown, Frank Southworth, and Andrea Sarzynski, "Shrinking the Carbon Footprint of Metropolitan America" (Washington: Brookings Institution, 2008).
9. Reid Ewing and others, "Growing Cooler: The Evidence on Urban Development and Climate Change" (Washington: Urban Land Institute, 2007).
10. See Edward Glaeser and Matthew Kahn, "Decentralized Employment and the Transformation of the American City" (Cambridge: Harvard Institute of Economic Research, Discussion Paper Number 1912, 2001) and Edward Glaeser, Matthew Kahn, and Chenghuan Chu, "Job Sprawl: Employment Location in U.S. Metropolitan Areas" (Washington: Brookings Institution, 2001).
11. Brookings analysis of Bureau of Economic Analysis 2005 Wage and Salary Employment data. This analysis started with the top 100 metro areas based on 2005 employment figures. The Palm Bay-Melbourne-Titusville, FL metro area (ranked 100th) was excluded due to lack of a defined central business district, and Bridgeport-Stamford-Norwalk, CT metro area (ranked 55th) was excluded based on limitations in the ZIP code employment data.
12. The geographic classification of an establishment is based on its physical location. For multi-establishment firms, the Economic Census requests an address for each establishment in the firm. Administrative payroll and employment data are tabulated at the establishment level. See [www.census.gov/epcd/cbp/view/cbpmethodology.htm](http://www.census.gov/epcd/cbp/view/cbpmethodology.htm), accessed December 30, 2008.
13. Counts include government employees working in wholesale liquor establishments, retail liquor stores, Federally-chartered savings institutions, Federally-chartered credit unions, and hospitals. Employees of publicly owned and operated schools are also included. See [www.census.gov/epcd/cbp/view/cbpfaq.html](http://www.census.gov/epcd/cbp/view/cbpfaq.html), accessed November 30, 2007.
14. See e.g., Leah Platt Boustan and Robert Margo, "Job Decentralization and Postwar Suburbanization: Evidence from State Capitals" Prepared for the Brookings-Wharton Conference on Urban Affairs (Washington: Brookings, 2008). According to a Brookings analysis of 2006 U.S. Bureau of Economic Analysis data, six metros have at least 20 percent of metro area employment in the government sector, which includes Federal civilian, military, and state and local government jobs. The six metro areas include Columbia, SC, Sacramento, CA, Lansing, MI, and Honolulu, HI—all of which contain state capitals. El Paso, TX and Virginia Beach-Norfolk-Newport News, VA-NC also make this list, with the Virginia Beach metro showing the highest share of jobs in the government sector (25.3 percent).
15. In a given year between 14 and 15 percent of ZIP codes have their total employment figures suppressed for the sake of confidentiality. For ZIP codes with suppressed employment data, the Census Bureau sets total employment to zero and provides a suppression flag indicating the range within which actual total employment falls. For these ZIP codes, employment totals are estimated by multiplying national average employment figures for each employment size class by the number of ZIP code establishments in each size class. The size class results are then summed to arrive at the ZIP code employment total. For example, consider a ZIP code that contained two establishments in 2000. One establishment falls in the "20 to 49 employees" size class and the other falls in the "50 to 99 employees" size class. The average number of employees for establishments with 20 to 49 employees was 30.2 in 2004, while the average for establishments with 50 to 99 employees was 68.8. Thus, the 2004 imputed employment total for this ZIP is 99. If necessary, the imputed total is adjusted to align with the employment range indicated by the suppression flag. Beata Bajaj and Kathryn Pettit of the Urban Institute developed this imputation method for ZBP employment in their work with DataPlace by Knowledgeplex. See Beata Bajaj and Kathryn L.S. Pettit, "Business Patterns Data Set:

- Technical Documentation” (Washington: DataPlace, 2006). This same method is used to estimate employment totals by industry at the ZIP code level; the data do not include these totals, but they do include the number of establishments in each size class by industry.
16. This assessment uses industry employment totals for each sector in the North American Industry Classification System (i.e., at the two-digit NAICS code level). Where employment figures have been suppressed at the two-digit NAICS level, national employment averages are substituted for the relevant establishment size class. One difference exists in the imputation methods used for ZIP code employment totals versus employment by industry. ZBP does not contain suppression flags for employment by industry, so there is no way to confirm that imputed industry totals fall within the correct range at the ZIP code level. However, imputed ZIP code industry numbers are summed to produce a metro level total, which is then tested against the actual County Business Patterns metro-level employment by industry figures. The imputed totals are robust in the aggregate (i.e., the sum of the 98 metro areas jobs by industry), though there is a higher incidence of variation at the individual metro level. Thus, this assessment only presents findings on employment by industry in the aggregate.
  17. The Census Bureau defines a central business district as an “area of very high land valuation characterized by a high concentration of retail businesses, service businesses, offices, theaters, and hotels, and by a very high traffic flow.” See [www.census.gov/geo/www/cbd.html](http://www.census.gov/geo/www/cbd.html), accessed November 30, 2007.
  18. Two central cities that appear first in the metro area name do not have CBDs listed in the 1982 Census of Retail Trade. The Virginia Beach, VA and Jacksonville, FL metros rank 33rd and 41st as employment centers, respectively. To exclude these central cities from the analysis would skew the metro-level results; therefore, this analysis designates a CBD in these cases. For Jacksonville, the CBD corresponds with the ZIP code with the highest employment density. The Virginia Beach CBD corresponds with the area officially zoned as the CBD by the city council in 1973. See [www.cbda.net/index.php?p=history.html](http://www.cbda.net/index.php?p=history.html), accessed December 17, 2008.
  19. The following metro areas have multiple CBDs: Oxnard-Thousand Oaks-Ventura, CA (Oxnard and Thousand Oaks contain CBDs); Phoenix-Mesa-Scottsdale, AZ (Phoenix and Mesa contain CBDs); Riverside-San Bernardino-Ontario, CA (Riverside and Ontario contain CBDs); Tampa-St. Petersburg-Clearwater, FL (all three cities contain CBDs); and Virginia Beach-Norfolk-Newport News, VA-NC (all three cities contain CBDs). Other metro areas, such as San Francisco-Oakland, CA and Minneapolis-St. Paul, MN-WI, contain secondary cities of regional importance (Oakland and St. Paul), yet their downtowns are small employment centers compared to those of the primary city (San Francisco and Minneapolis).
  20. The 1982 Census of Retail Trade identified CBDs using 1980 census tracts. The GIS layer file of the 1980 census tract boundaries was obtained from the Minnesota Population Center. See [www.nhgis.org](http://www.nhgis.org), Minnesota Population Center, “National Historic Geographic Information System: Pre-Release Version 0.1” (Minneapolis: University of Minnesota, 2004).
  21. Throughout the analysis, this paper often refers to the region within three miles of the CBD as the “inner ring” or “urban core,” the region between three and 10 miles from the CBD as the “middle ring,” and the region between 10 and 35 miles from the CBD as the “outer ring”.
  22. Glaeser, Kahn, and Chu, “Job Sprawl.”
  23. Of the 98 metro areas, 88 extend beyond the 35-mile ring to some extent. The metro areas completely contained by the 35-mile ring include: Akron, OH; Cape Coral, FL; Dayton, OH; Lancaster, PA; Lansing, MI; Lexington, KY; New Haven, CT; Sarasota, FL; Stockton, CA; and Trenton, NJ. Although the majority of metros extend beyond the 35-mile ring, that boundary actually captures the vast majority of metro area jobs in most regions. Exceptions include five metro areas that have 10 percent or more of their jobs beyond the 35-mile ring: Miami, FL; Riverside, CA; Chicago, IL; Bakersfield, CA; and New York, NY.
  24. This approach appears successful in that there is no significant correlation between land area and decentralization in this analysis. The correlation coefficient for land area and share of employment beyond 10 miles equals 0.10.
  25. For instance, a 35-mile radius around the downtown of New Haven, CT extends into the adjoining Hartford-West Hartford-East Hartford, CT and Bridgeport-Stamford-Norwalk, CT metropolitan areas. However, only employment in those ZIP codes that lie within the New Haven metro area (New Haven County, CT) is considered in calculating that metro area’s job sprawl measures.
  26. There is a strong correlation between total population and total employment at the metro area level. Previous research has also found a strong relationship between population decentralization and employment decentralization (a correlation of 0.79). See Glaeser and Kahn, “Decentralized Employment and the Transformation of the American City.”

27. A comparison of the ZIP code allocation, aggregated to metro area level, and the actual County Business Patterns (CBP) metro area total employment figures reveals that this allocation method produces total employment estimates in line with CBP estimates. In 2006, for example, the individual metro area employment estimates for this analysis fall within 3.8 percent of CBP totals, with 88 metros within 1 percent or less of the CBP totals. In the aggregate, this study's estimate of total employment in the 98 metro areas is within 0.1 percent of the CBP total employment figure.
28. In 2006, 33 percent of ZIP codes were "split" within the three-mile ring, 22 percent of ZIP codes were split within the 3- to 10-mile ring, and 12 percent of ZIP codes were split within the 10- to 35-mile ring.
29. This analysis found no significant correlation between total land area and the extent of employment decentralization in the 98 metro areas, but a stronger relationship exists between the total number of jobs in a region and decentralization. The correlation coefficient for total jobs and the share of employment beyond 10 miles equals 0.54.
30. For the sake of categorizing metro areas by size, this assessment uses total metro area employment rather than just the number of jobs within 35 miles of the CBD.
31. Arthur C. Nelson, Casey J. Dawkins, and Thomas W. Sanchez, *The Social Impacts of Urban Containment* (Burlington, VT: Ashgate Publishing Company, 2007).
32. Ibid.
33. The Brookings Institution, "Moving Beyond Sprawl: The Challenge for Metropolitan Atlanta" (2000).
34. The Southern California Studies Center at the University of Southern California and the Brookings Institution, "Sprawl Hits the Wall: Confronting the Realities of Metropolitan Los Angeles" (2001).
35. Glaeser, Kahn, and Chu, "Job Sprawl."
36. Jennifer Wolch, et al, "Los Angeles: Region by Design." In Janet Rothenberg Pack, ed., *Sunbelt/Frostbelt: Public Policies and Market Forces in Metropolitan Development* (Washington: Brookings Institution, 2005).
37. Jennifer Vey, "Restoring Prosperity: The State Role in Revitalizing America's Older Industrial Cities" (Washington: Brookings Institution, 2007).
38. Metropolitan specialization in a particular industry is measured by the metro area having a location quotient of at least 1 in the industry; that is, the share of metropolitan employment in that industry exceeds the share of U.S. employment in that industry.
39. Eugenie Birch, "Who Lives Downtown?" (Washington: Brookings Institution, 2005).
40. Brookings Institution analysis of IRS tax return data.
41. Estimates of the change in the distribution of households across metro areas are based on Brookings Institution analysis of IRS ZIP code-level data on total tax returns filed in tax years 1997 and 2005. (Tax returns for those years would have been filed in calendar years 1998 and 2006, respectively.)
42. Robert E. Lang, *Boomburbs: The Rise of America's Accidental Cities* (Washington: Brookings Institution, 2007).
43. Nelson, Dawkins, and Sanchez, *The Social Impacts of Urban Containment*.
44. It should be noted that construction establishments have moved away from the urban core over this time period, but, like certain transportation and warehousing jobs, construction jobs are more mobile and may not be tied to establishment location.
45. Note that the transportation and warehousing industry includes fixed establishments—like those operating warehouses or bus, rail, or air terminals—but it also includes transportation operators—like bus or taxi drivers, airline pilots and truck drivers—whose jobs may take them throughout or beyond the metro area.
46. Arthur Nelson, "Toward a New Metropolis: The Opportunity to Rebuild America" (Washington: Brookings Institution, 2004).
47. Bureau of Labor Statistics, "The Employment Situation: February 2009" (Washington: U.S. Department of Labor, 2009).
48. See Joseph Gyourko and Richard Voith, "Does the U.S. Tax Treatment of Housing Promote Suburbanization and Central City Decline?" (Philadelphia, PA: Federal Reserve Bank of Philadelphia, Working Paper 97-13, 1997); Janet Rothenberg Pack, ed., *Sunbelt/Frostbelt: Public Policies and Market Forces in Metropolitan Development* (Washington: Brookings Institution, 2005); and Bruce Katz, "Smart Growth: The Future of the American Metropolis?" (London: Centre for Analysis of Social Exclusion, London School of Economics CASEpaper 58, 2002).



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