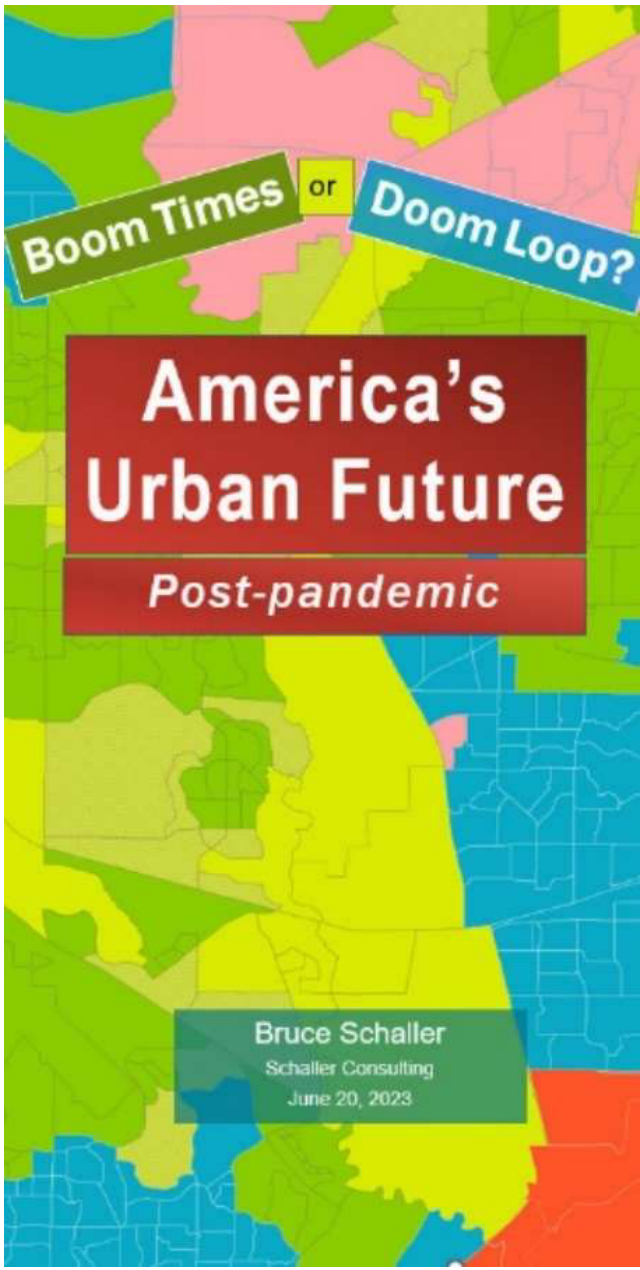
Boom Times
or
Doom Loop?
America's Urban Future
Post-pandemic
Bruce Schaller
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June 20, 2023

This report was prepared by Bruce Schaller, Principal of Schaller Consulting. Mr. Schaller has over four decades of experience on urban transportation policy and operations as a consultant and senior local government official, most recently as Deputy Commissioner for Traffic and Planning at the New York City Department of Transportation. Early in his career he was a Senior Economic Analyst with the New York City Office for Economic Development, and he has also worked in the areas of housing and energy policy. He has published his work in peer-reviewed journals and been quoted in a wide variety of national publications. He is currently working on a book about the origins of American cities, from Jamestown to Los Angeles. This report pursues overlapping themes focused on the economic and spatial development of great urban centers in the United States.

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Summary

The Covid-19 pandemic was tremendously disruptive to American life and had profound effects on American cities and metropolitan areas. This report seeks to unpack the effects of the pandemic on urban America and place these effects on a much larger canvas that includes the urban revival of the last four decades and the advent of the knowledge-based economy as the key driver of metro area growth and prosperity. The question going forward, and focus of this report, is what the pandemic together with this larger picture mean for the future of the American metropolis.

Highlights of the report are:

Of 43 metro areas examined in this report,* just six experienced a boost from the pandemic in population, domestic migration, jobs, and housing construction when comparing pre-pandemic and pandemic-era growth rates. These six are Austin, Dallas, San Antonio, Tampa, Jacksonville, and Indianapolis. The metro receiving the biggest boost was clearly Austin, which had 2.3 percent faster job growth, 4.1 percent faster growth of its housing stock, and slightly higher domestic in-migration during the pandemic than in years immediately before the pandemic. For the others, the "boost" was quite modest, with increases in these indicators of less than two percent above pre-pandemic trends.

Other Sunbelt metros experienced reduced population and job growth during the pandemic while domestic in-migration and housing construction were barely above their pre-pandemic levels. This group includes Nashville, Salt Lake City, Orlando, Houston, Miami, Charlotte, and Atlanta. (See page 44 for which metros gained and which lost during the pandemic.)

Among the hardest-hit metros were San Francisco, Seattle, New York, Washington, Los Angeles, and Boston, the "super-star" metros of the 2010s. But over the last year their population losses slowed or reversed, they regained pre-pandemic job levels, and jobs rose faster than before the pandemic. Wage growth, however, has not regained pre-pandemic rates and is lagging that of growing Sunbelt metros. (See pages 37 and 44-45.)

Overall, the leaders in job and wage growth coming out of the pandemic were the six metros that received a pandemic boost (Austin, Dallas, San Antonio, Tampa, Jacksonville, and Indianapolis), three metros that resumed strong pre-pandemic growth in jobs and wages (Nashville, Salt Lake City, and Orlando), and two that are newly among the top performers on these metrics (Houston and Miami). The leaders among super-star metros are Seattle, Washington, Boston, and New York; among slower-growing metros, the leaders are Philadelphia, Buffalo, and Cincinnati. (See pages 44-45.)

The pandemic-era run-up in housing prices was strongly related to economic factors, in particular job growth and increases in wages in tech and other knowledge-economy sectors. Austin once again stood out from other metros, with strong economic growth and by far the biggest increase in housing prices, followed by six other Sunbelt metros (Nashville, Tampa, Phoenix, Miami, Charlotte, and Raleigh) and Salt Lake City. (See pages 39-40.)

Escalating housing prices in Sunbelt metros narrowed and sometimes erased the gap in housing costs between Sunbelt and expensive super-star metros. In 2022, suburban housing prices were higher in Austin, Nashville, Miami, Salt Lake City, Phoenix, and Jacksonville than Boston or Washington. The same was true for Austin, Nashville, Miami, Salt Lake City, Houston, Charlotte, and Tampa for housing in the urban core. (See pages 42-43.)

Putting these findings together, the central effect of the pandemic was to reduce the differences between fast-growing, largely Sunbelt metros and the denser, older metros that have most thrived from the growth of the knowledge economy. All have seen rapid escalation in housing prices, the product of pre-pandemic growth in central cities and inner suburbs, now combined with the desire for more living space in an era of widespread remote work. All will continue to experience the centripetal pull created by the knowledge economy's dependence on rich ecosystems of talent, skill, capital, and inventiveness. The central task in coping with these pressures is to make more intensive use of land in and near the metropolitan center. The all-but existential need is in housing, where pandemic-era housing appreciation put more and more housing out of the reach of everyday households. Beyond housing there is a vital need to expand transportation systems essential to accommodate growth, and to enlarge and enrich the public realm. These are the essential ingredients to a future in which the nation's largest cities and metro areas best utilize their unique strengths of density, diversity, economic sophistication and interconnectedness for their own benefit and the benefit of the country as a whole.

The stakes of getting this right are enormous. The urban revival of the last four decades, led by big, dense "super-star" cities such as New York and San Francisco, demonstrated the economic benefits of size and concentration. For decades, however, housing shortfalls pushed growth out from the nation's most successful urban centers. This comes at a substantial cost to individuals in job and career opportunities and for the nation in innovation, productivity, and economic output. This report estimates that the additional GDP that would be generated from faster growth in the most housing-constrained metros (like New York and San Francisco) and greater downtown concentration of jobs and population in relatively decentralized metros (a group that includes all the Sunbelt metros), totals $1.22 trillion annually, or 12.2 percent of the GDP of the metros analyzed and 5.7 percent of the economic output of the nation as a whole. (See pages 30-31.)

America's urban future, then, depends on squaring the circle between the desire for personal space, made more acute in the pandemic, and the economic and social benefits of concentration which functions as both cause and effect in the feedback loops of the knowledge economy. The pandemic both exemplified and intensified the tug-of-war between these outward and inward economic and spatial dynamics. In so doing, it made city-building processes more important, and in more places.

Additional highlights:

Growth in the metropolitan core:

- In the last decade, all but one of the 43 metro areas experienced population growth in the metropolitan core, and all but five experienced accelerated population growth in suburbs developed in the 1950s and 1960s. (See pages 17-20.)
- Metro area economic output, productivity, and wages correlate most closely with the size and density of the downtown office district and close-in neighborhoods with ready access to downtown jobs and urban amenities. (See pages 24, 26-27.)
- These metros achieve a concentration of jobs and population by extensive rail and bus systems which make possible population and job growth without the traffic congestion and parking demands that constrain urban densities. (See pages 27-28.)
- The proportion of downtown land devoted to surface lots corresponds strongly with metro area economic output and wages. (See pages 28-29.)

The shifting urban hierarchy among U.S. metro areas:

- Between 2012 and 2022, Austin moved from twentieth to ninth place in a ranking of metro area economic output, productivity and wages.
- Other big gainers were Portland. Raleigh, and Salt Lake City, rising centers of tech and other knowledge-economy jobs, and Miami, a gateway for trade and commerce with Latin America and the Caribbean. (See pages 44-46.)

Contents

Introduction

Pandemic-era migrations, the rise of remote work, and the emptying out of big city downtowns has led to widespread speculation that the Covid-19 pandemic will fundamentally alter the trajectory of economic and spatial development in American cities and metropolitan areas. *New York Times* columnist Thomas Edsall opined that migration of blue state residents to red states "will bring the three-decade renaissance of major cities to a halt, setting off an era of urban decay."[1] In a lengthy academic paper, Columbia business professor Stijn Van Nieuwerburgh wrote that the combination of half-empty offices, vacant storefronts, falling tax revenues, and rising crime and homelessness in cities like San Francisco and New York may spell the beginning of an "urban doom loop" that ends in a 1970s-style urban implosion[2]. In the *Wall Street Journal*, Josh Mitchell reported on speculation about a new "geography of the American economy," in which the pandemic's "severing of the link between geography and the workplace" puts housing prices, weather, traffic congestion and taxes ahead of the pre-pandemic lure of professional opportunities and cultural amenities in the biggest American cities[3].

Against these pessimistic prognostications, others pointed out that cities have proved remarkably resilient through the centuries despite wars, fires, floods, earthquakes, and epidemics. The post-pandemic world may in fact bring another example of "continued resilience under duress," Harvard professor Edward Glaeser has said[4]. Lower downtown office rents may attract small firms and non-profits and a younger, more economically and socially diverse population that had been priced out of the pre-pandemic super-star cities, Stanford University's Nicholas Bloom suggested.[5] Ailing downtowns might be transformed from monotonous office districts into thriving live-work-play "connectivity districts," wrote University of Toronto professor Richard Florida.[6]

At the center of this debate about the future of metropolitan America are the particular things that happened as a result of the pandemic – migration flows, remote work, half-occupied downtown offices, falling transit ridership, and plunging tax revenues.

Lurking behind the scenes is what mattered most on the eve of the pandemic – rising rents and housing prices, congested highways, packed transit systems, the divergent fortunes of "super-star" and "left-behind" metros, inequality in incomes and wealth, and the imperatives of climate change.

Behind them is another layer – perhaps now re-invigorated – of things from earlier eras. Decline of central cities. Migration to the Sunbelt. Suburban sprawl.

The premise of this report is that both the pandemic and what came before it are indispensable to piecing together a complete picture of the post-pandemic world. The seeming opposites of metropolitan growth today – city versus suburb, red state versus blue state, coastal versus inland city – are in fact the product of a singular process of growth, development, and urbanization. This urbanizing process produces great cities and also the congestion and high living costs that in turn prompt city residents to leave for more spacious and less expensive quarters. The core dynamic is between forces that pull inward, most notably the opportunities and wealth created by the knowledge economy, and forces

that push outward. This dynamic has always been a part of the country's development, from seaport cities and inland settlement in colonial times to colossal manufacturing cities and the western frontier in the nineteenth century to suburbanization accompanied by downtown boom a century ago and in recent decades. The inward/outward tug-of-war continues today and will be the central shaping force of the country's urban future.

To give elucidate this complex set of economic and spatial dynamics and give them focus and coherence, I have divided the big picture into a sort of historical play in three acts. Each acts shines the spotlight on a set of forces and tendencies that were pervasive in their own day and are still in play today. First, there is the outward movement of the immediate decades after the Second World War – suburbanization, job decentralization, and the decline of central cities. What drove that? What were the consequences? What ultimately were the limits? That is the first section of the report, the "exploding metropolis."

Second, there is the urban revival that began in the 1970s and spread across the country over the last four decades. Here, the forces are centripetal, a product of the virtuous feedback loops of the knowledge economy. They produce the opposite of suburbanization, sprawl, decentralization – the big, dense, economically and socially diverse city center. The questions are the same – sources, consequences, limits. This is the second section, the "virtuous circle."

Finally, there is the pandemic. It may hardly seem to need re-visiting; didn't we all just live through it? Perhaps we have a strong desire to keep it in the rear view mirror? Oddly, however, the pandemic is a phenomenon more experienced than understood. The third section measures out the pandemic's effects on the things that matter to the future of the metropolis: where people live, where the best jobs are, and what powers the metropolitan economy's forward motion.

Each of the three acts has something to show us about the dynamics of growth in the American metropolis. They show how the dynamics of growth can push development inward and produce big, dense, economically diverse, and globally connected "super star" cities. And also how they can push development outward and produce suburban sprawl and job decentralization. The common theme throughout the three dramas is the transition from a manufacturing economy to one centered on services and knowledge. And as a result of that shift, the overarching processes of urbanization which I will argue is the core of what cities and metro areas have to grapple with post-pandemic.

In all of this, my focus is on patterns and tendencies shared across cities and metro areas, working up from what can be seen in each individually. The report has a series of maps, tables and graphics, each with data for individual metropolitan areas. I use a simple, four-way typology to organize tabular data but in the main, the point is to see what groupings and patterns emerge, how we should think about (to paraphrase the Sesame Street song), which of these metros is not like the other one?

In examining the economic and spatial dynamics of metropolitan growth, this report breaks new ground in two ways. First, to my knowledge there has not been a detailed assessment of the effects of the pandemic on population, jobs, wages and housing across a large group of major U.S. metro areas. With well over a year of essentially post-pandemic experience, that is now possible.

Second, the report ties together metro area spatial development and economic performance and relates both to housing supply, housing prices and commuting patterns on a metropolitan-wide basis. These topics have been discussed and written about extensively, but mainly with a focus on particular elements from sprawl to center city revitalization to transport needs and the housing crisis. My objective is to put them together into one all-inclusive metropolitan-wide picture.

To aid this discussion, the report includes a series of maps and tables that show the explosion of suburbanization from the 1950s onward and of downtown growth since the 1970s. The maps show the decade-by-decade geographic expansion of metro areas from 1950 to 2020; tables for each metro area show population change in each band of newly developing suburbs, older suburbs, and the central city. To put numbers on "downtown" growth, I have defined a "central area" in each city/metro that includes the downtown office district and residential neighborhoods that are readily accessible to the downtown jobs and urban amenities that make for a dense, thriving urban core. The maps and accompanying tables thus document both sides of the spatial dynamic, suburbanization and diffusion of population on the one side, and downtown decline and revival on the other.

The maps are based on census tracts and the more fine-grained census block groups since 1990. This allows for mapping central area neighborhoods and bands of suburbanization independently of municipal boundaries or county lines. This approach provides a more precise and robust framework for seeing and quantifying outward/inward dynamics of population, jobs, housing supply, and housing prices than municipal, county or metro area boundaries often used for analysis of economic and spatial trends.

Next, a few housekeeping items, beginning with data sources. This report relies largely on data from the U.S. Census Bureau and other federal agencies, complemented by data from private sources such as housing prices from the real-estate firm Zillow. Data sources are listed at the end of the report; bracketed numbers (e.g., [1]) in the figures and tables refer to that listing.

Second, an explanation of terminology used in the report. Throughout, I use the word "city" in the municipal sense, like Boston or Charlotte. I use "metro" and "metro area" to refer to the contiguous urbanized area around a central city like Boston or Charlotte. The boxes on the next two pages describe how I constructed each of 43 urbanized metro areas and identified neighborhoods for the "central area" of each city/metro.

The 43 metros examined in this report include the 25 most populous metros of 1950 and of 2020 and other fast-growing metro areas. Of the total 43 metros, 16 were in the top 25 in both 1950 and 2020; nine dropped out of the top 25 during the period; nine replaced them; and nine other metros grew by over 10 percent from 2010 to 2020. Including the largest metros from the two ends of the period affords a look at both those metros that lost ground in the cycle of decline and renewal and those which grew to prominence. The nine smaller metros provide a look at the candidates to join this group. As a group, these 43 metros form the foundation of the U.S. economy, accounting for 46 percent of the total U.S. population and 62 percent of the country's GDP (gross domestic product).

Table 1 lists the metros and their urbanized population in 1950 and 2020. Metros that moved up at least seven spots in the rank order are highlighted in green; those that moved down at least seven spots are shown with red highlighting. The table shows in a simple way that the fortunes of U.S. metros include both a great deal of change – note the number of red-shaded metros at the top of the 1950 list – and stability, visible in the fact that nine of the 14 largest metros in 1950 remain in that group in 2020. The sources and consequences of both change and continuity, and what they mean for the post-pandemic city and metro area, is a core topic of the pages that follow.

Mapping Metropolitan Growth

Between 1950 and 2020, the American metropolis was fundamentally reshaped by growth in both population and land area, and by shifts between regions and within metro areas. Overall, the urbanized population of the 43 metro areas examined in this report increased from 55.9 million inhabitants to 151.5 million; land area expanded from 9,600 square miles to 50,700 square miles; population of central cities increased from 33.0 million to 46.4 million, and outside central cities from 23.0 million to 105.1 million. Population of the 43 metros also grew as a percentage of the U.S. population, from 37 percent to 46 percent between 1950 and 2020.

The maps in this report show where and when this happened, decade by decade. The most basic change was urbanization of rural land. The Census Bureau has tracked the country's urban and rural population starting with the First Census in 1790. The original definition of "urban" was cities and towns with at least 8,000 inhabitants.[7] As cities grew and spread out, the Census Bureau set lower thresholds, settling on 2,500 population in 1900. The well-known figure that one-half of the U.S. population was urban as of 1920 is based on this threshold. Currently, the Census Bureau defines urban centers as any "densely developed territory" encompassing at least 2,000 housing units or 5,000 population. The surrounding urbanized area is comprised of census blocks with a density of at least 200 housing units per square mile, equivalent to about 5,200 inhabitants per square mile.[8]

The Census Bureau has amended and refined where it draws the line between rural and urban repeatedly over many decades, producing somewhat non-comparable counts of the urbanized population in each decennial census. I have applied the current threshold of 200 housing units per square mile back to 1950 for consistency over time. I use census tracts in identifying the urbanized area for 1950 to 1980, and the smaller census block groups for 1990 to 2020, which provide a more precise accounting of metro area expansion.

A density of 200 housing units per square mile is equivalent to three acres per housing unit. This may not seem very dense or very urban. In practice, it is about the point at which at least a few subdivisions have been built in an area, and which with few exceptions launches several decades in which a landscape of scattered rural houses and other structures is filled with housing, shopping centers, office and industrial parks, schools, and other urban land uses. It is thus a good benchmark for tracing the expansion of metropolitan areas.

"Metro areas" as I use the term include the largely contiguous developed city/suburban area that includes a central city, built-up suburbs, and lower-density areas that meet the 200 housing unit per square mile criterion. This differs from the federally defined Core-Based Statistical Areas (CBSAs, formerly called SMSAs), which are comprised of counties and include large amounts of rural land. The map below shows the Atlanta CBSA (in black outline) and the urbanized metro area (in red) as an example. (The Atlanta metro also illustrates that the urbanized metro area sometimes spills outside the county-based CBSA.)

Note that the Atlanta urbanized area is largely contiguous, but (as in current Census Bureau protocols) I allow small breaks of a few miles where intervening block groups do not meet the criterion for urban, but there are connecting non-rural land uses (e.g., housing, shopping areas, other commercial facilities), generally along a major road.

Finally, I have combined federally defined metros in three instances. I treat the San Francisco and San Jose areas as one urbanized area, reflecting the strong economic ties of Silicon Valley with both cities and the gravitational pull that San Francisco exerts over the entire region. I have also combined Raleigh and Durham as one urbanized area for much the same reasons, and Provo-Orem and Ogden with Salt Lake City. All of these are close calls (the federal government has gone back and forth on how they treat each of these), but I think they provide the best way to look at each of these regions.

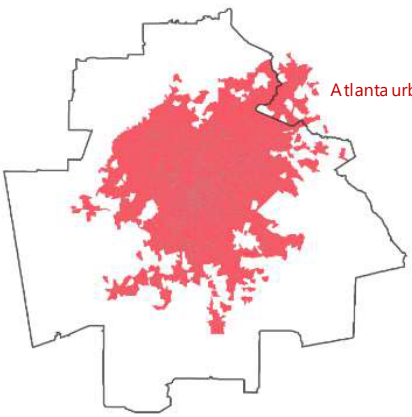


Table 1. Metro area urbanized population, 1950 and 2020
See page 4 for methodology and distinction between "urbanized area" used here and the federal metro area definition.
Source of data: Census [1]

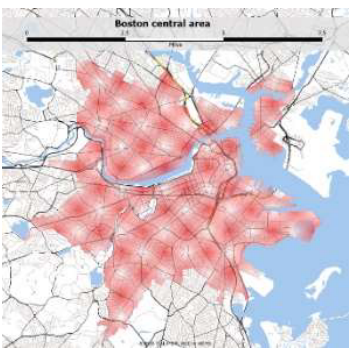
	Metro area	1950 Population		Metro area	2020 Population
1	New York	12,427,196	1	New York	19,433,038
2	Chicago	5,199,964	2	Los Angeles	13,555,967
3	Los Angeles	4,190,182	3	Chicago	8,604,067
4	Philadelphia	3,519,439	4	Dallas	6,458,507
5	Detroit	2,810,534	5	San Francisco	6,347,138
6	Boston	2,453,703	6	Houston	6,019,045
7	San Francisco	2,174,950	7	Miami	6,012,209
8	Pittsburgh	1,709,249	8	Philadelphia	5,620,707
9	Cleveland	1,463,130	9	Washington	5,119,785
10	St. Louis	1,319,546	10	Atlanta	5,104,929
11	Washington	1,275,068	11	Boston	4,592,544
12	Baltimore	1,175,782	12	Phoenix	4,284,746
13	Minneapolis	1,019,425	13	Detroit	3,740,841
14	Seattle	1,000,820	14	Seattle	3,666,523
15	Buffalo	926,733	15	San Diego	3,042,289
16	Cincinnati	875,162	16	Minneapolis	2,866,018
17	Dallas	830,807	17	Tampa	2,766,593
18	Milwaukee	813,039	18	Denver	2,674,603
19	Providence	780,092	19	Baltimore	2,258,065
20	Kansas City	752,601	20	St. Louis	2,168,484
21	Houston	723,681	21	Salt Lake City	2,166,078
22	New Orleans	648,011	22	Orlando	2,120,346
23	Miami	570,075	23	Las Vegas	2,105,455
24	Atlanta	553,821	24	Portland	2,084,332
25	Indianapolis	522,980	25	Riverside	1,992,093
26	Portland	507,616	26	Charlotte	1,956,850
27	Denver	490,237	27	Cleveland	1,950,394
28	San Diego	441,729	28	San Antonio	1,937,006
29	Columbus	422,955	29	Sacramento	1,892,046
30	San Antonio	415,020	30	Pittsburgh	1,688,983
31	Salt Lake City	329,446	31	Kansas City	1,679,559
32	Charlotte	313,559	32	Cincinnati	1,662,043
33	Tampa	295,140	33	Austin	1,629,103
34	Oklahoma City	268,630	34	Indianapolis	1,607,293
35	Nashville	252,621	35	Columbus	1,526,320
36	Phoenix	242,606	36	Raleigh	1,431,252
37	Jacksonville	226,165	37	Milwaukee	1,328,116
38	Sacramento	223,898	38	Nashville	1,220,516
39	Riverside	169,428	39	Providence	1,187,454
40	Raleigh	145,422	40	Jacksonville	1,139,607
41	Austin	129,584	41	Buffalo	981,295
42	Orlando	85,779	42	New Orleans	919,860
43	Las Vegas	24,594	43	Oklahoma City	909,287

Mapping "Downtown"

While metropolitan expansion was embodied in the suburban subdivision, the roller coaster fortunes of central cities was embodied in the decline and revival of "downtown." To trace this with any precision requires a geographic definition of "downtown." The term certainly includes the central business district of tall office buildings and concentrated employment. In speaking of the "downtown revival" of recent decades, it also clearly encompasses nearby residential neighborhoods. The question is, which ones? Some researchers include a few neighborhoods adjoining the business district; others standardize to a radius of 2 to 5 miles around downtown offices.[9] For purposes of this report I have adopted a more expansive definition aimed at encompassing neighborhoods that are currently or could become part of a thriving urban core with ready access to a dense concentration of jobs and to urban amenities such as restaurants, cafes, bars, shops, galleries and museums, clubs and entertainment venues, etc. To ensure scalability, the geographic definition is based on accessibility by public transportation, which makes possible population and job growth without the traffic congestion and parking demands that put a ceiling on urban densities.

I base the boundaries of "central areas" on fine-grained (and beautiful) maps produced by the University of Minnesota's Accessibility Observatory, which has mapped job accessibility in each of the top 50 U.S. metropolitan areas including the 43 examined here. The Observatory's transit maps show the number of jobs within a 30 minute commute by public transportation, inclusive of walking and waiting time. I use their maps to define the central area of each metro, keyed on the area shown on the Observatory's maps that have a high density of jobs accessible within a 30-minute transit commute. While job densities vary greatly from city to city, this definition of "central area" is consistent across cities in identifying the neighborhoods that are readily accessible to the most jobs in that particular metro area.

Generally speaking, central area neighborhoods are within a five to seven mile radius of the downtown business district in larger metros, and two to four miles of smaller metros. They may be entirely within the central city or they may include adjacent jurisdictions. Examples of the latter are Cambridge and parts of West Somerville and Brookline outside of Boston, and parts of Oakland and Berkeley across the bay from San Francisco. (I do not include non-contiguous twin cities such as Fort Worth and Saint Paul.) The map at left shows the Boston central area; additional maps are on the next page. Table 2



above shows the land area and 2020 population of the central area for all 43 metros examined in this report. A table with central area populations since 1950 is in Appendix A.

Table 2. Central area land area and population, 2020
Source: Census [1]

Metro	Land area (sq. miles)	2020 Population
Los Angeles	72	1,182,039
San Francisco	41	865,202
New York	38	2,513,806
Philadelphia	35	759,068
Houston	34	266,098
Chicago	34	645,562
Washington	28	492,048
Boston	24	546,650
Seattle	23	287,325
Salt Lake City	23	163,564
Dallas	23	163,080
Pittsburgh	19	155,438
Denver	18	181,742
Minneapolis	17	198,688
Austin	16	120,872
Phoenix	15	74,997
Riverside	15	95,654
Baltimore	14	201,707
Miami	14	235,622
Detroit	14	64,975
Columbus	13	107,497
Indianapolis	12	57,106
Portland	11	129,134
Cleveland	11	47,957
Atlanta	11	109,735
Nashville	11	62,595
Charlotte	10	51,542
Milwaukee	10	107,712
Cincinnati	9	65,327
New Orleans	8	59,759
Buffalo	8	65,317
Sacramento	7	55,396
Kansas City	6	35,789
St. Louis	6	41,122
San Antonio	6	28,870
Raleigh	5	30,447
Orlando	5	29,146
Las Vegas	5	17,953
San Diego	5	78,371
Jacksonville	4	17,450
Tampa	4	27,597
Oklahoma City	3	9,702
Providence	2	29,648

The Exploding Metropolis

In 1957, *Fortune* magazine published a series of articles on the all-too-evident decline of American cities. With contributions from William H. Whyte, who was also an editor at the magazine, and Jane Jacobs, an editor at *Architectural Forum*, the series was aptly entitled "The Exploding Metropolis."[10] Figure 1 shows what they were talking about using the Houston metro area to illustrate. The upper left map shows (in red) the Houston metro area as of 1950. In that year, it encompassed most of the land area inside the then-city limits plus a handful of suburbs, the largest of which was Pasadena, and small patches of unincorporated areas outside the city limits. The map on the upper right shows additional development in the 1950s (in darker blue) and 1960s (a lighter shade of blue). The bottom two maps show suburbs developed in the 1970s and 1980s in darker green and those developed from 1990 to 2010 in lighter green. Finally, Figure 2 shows the urbanized area in 2020, with the last decade of suburban development shown in pink. (White indicates rural land and bodies of water.)

As shown in the first data column of the table at the bottom of Figure 2, the physical extent of the 1950 metro area was 202 square miles. To that was added 144 square miles in the 1950s, 233 square miles in the 1960s, and a peak of 449 square miles in the 1970s. This was truly an "exploding metropolis."

In the same table, the columns show how population growth followed suburban development outward from the central city. In the 1950s, somewhat over half the growth in the urbanized area was in the suburbs first developed in that decade. In the 1960s, nearly three-quarters of population growth was in the suburbs first developed in that or the previous decade. In the 1970s the same pattern holds; three-quarters of population growth was in suburbs developed in that or the previous decade. The pattern held in the 1980s as well, when two-thirds of growth was in suburbs developed between 1970 and 1990, while population declined in the 1950 city/suburban extent. (Green highlighting shows the decade-to-decade concentrations of population growth.)

The outward wave of population growth in Houston exemplifies what generally happened across metro areas in both the North and the Sunbelt. From the 1950s to 1980s, population growth was concentrated in a broad band of suburban development that moved steadily outward decade by decade. The process was one in which homebuilders tended to leapfrog to choice sites past existing subdivisions, and then they or others filled in the gaps. It took two or sometimes three decades for most of the developable land to fill in, after which the pace of growth in that band slowed and the process repeated further out. As a shorthand, I will use the terms "outer band" of new suburbs to refer to two-decade bands of new suburban development, i.e., the suburbs first developed in that decade and those first developed in the previous decade that continued to fill up.

The pattern seen in Houston between 1950 and 1990 was mirrored in other large Sunbelt metros like Atlanta, Dallas, and Phoenix, in smaller metros like Las Vegas, Austin, Charlotte, Nashville, Raleigh, and Tampa, and at least up to 1980 in big northern metros like New York, Boston, Washington, Philadelphia, and Chicago. Chicago is a good example of the latter group. Chicago's urbanized area in 1950 was much larger than

Figure 1. Houston metro area development, 1950 to 2010

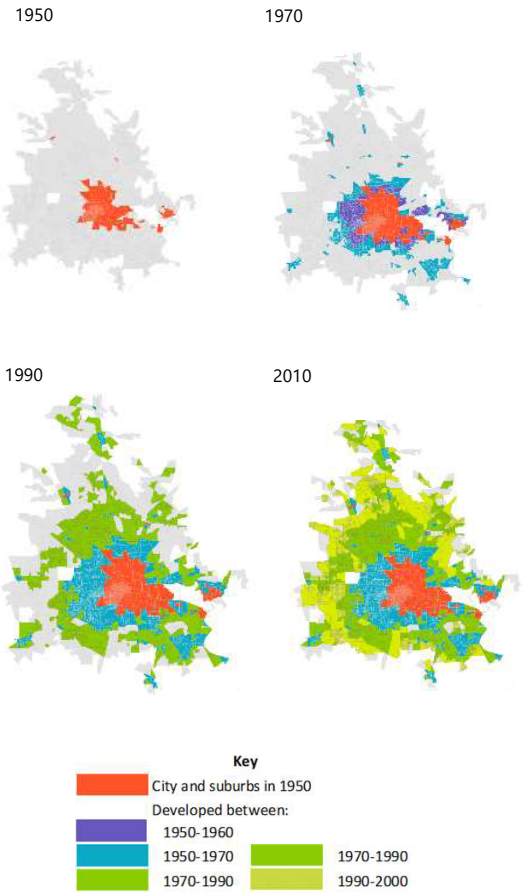
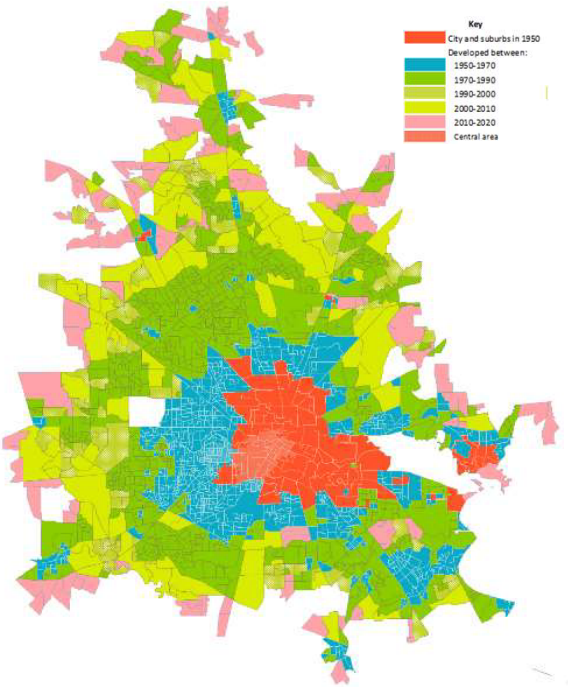


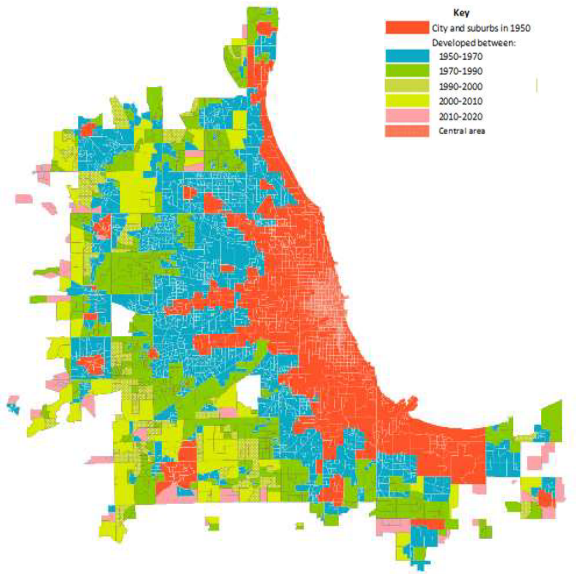
Figure 2. Houston metro area development, 1950-2020



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	202	135,821	80,556	(38,833)	(116,749)	62,430	9,182	52,106
1950-60	144	221,326	182,812	115,621	26,246	93,672	15,163	43,744
1960-70	233	33,363	189,109	249,238	165,130	108,831	71,341	73,520
1970-80	449	12,905	58,061	405,079	218,892	218,847	287,398	171,649
1980-90	260		22,879	29,816	281,465	129,083	136,599	76,491
1990-2000	185			27,008	8,227	153,964	180,012	76,593
2000-10	448				(10,890)	56,119	382,948	407,451
2010-20	239					13,552	47,906	241,015
Total	2,161	403,414	533,418	787,930	572,322	836,499	1,130,550	1,142,570

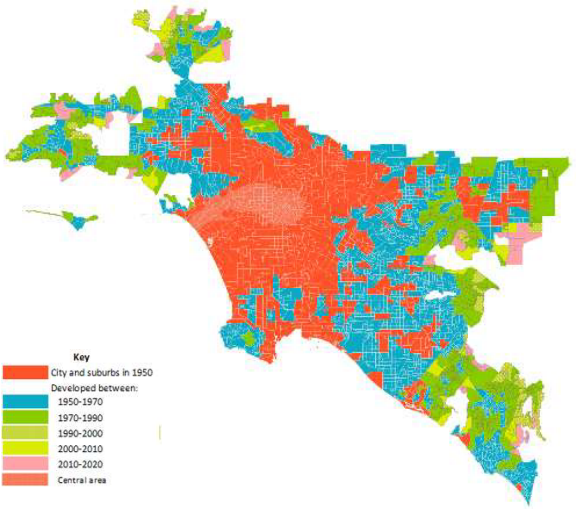
Figure 3. Chicago metro area development, 1950-2020



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	745	619,544	80,738	(571,531)	(365,357)	188,084	(229,076)	23,568
1950-60	256	244,816	178,973	100,510	27,840	46,004	22,339	12,697
1960-70	495	112,764	335,517	353,631	307,838	139,657	24,416	21,516
1970-80	372	62,820	57,657	212,123	35,377	139,627	65,792	8,357
1980-90	139		29,578	(10,392)	124,150	55,658	24,084	6,361
1990-2000	156			1,309	(4,494)	147,385	108,033	13,576
2000-10	350				(25,671)	44,741	160,399	31,333
2010-20	88					5,508	19,990	51,483
Total	2,601	1,039,945	682,462	85,650	99,683	766,664	195,978	168,892

Figure 4. Los Angeles metro area development, 1950-2020



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	966	1,462,056	785,543	329,344	1,191,905	575,004	119,226	109,119
1950-60	403	841,309	555,157	185,883	196,252	188,546	72,493	52,844
1960-70	244	36,997	371,067	314,192	250,114	71,535	30,008	23,622
1970-80	282	30,850	61,855	236,222	137,488	114,617	79,003	64,602
1980-90	159		20,774	14,946	248,776	103,612	39,571	31,169
1990-2000	57			3,071	1,751	87,875	32,692	13,853
2000-10	75				(4,453)	4,769	65,887	31,593
2010-20	93					9,115	18,305	74,789
Total	1,176	2,371,212	1,794,395	1,083,658	2,021,833	1,155,073	457,185	401,591

that of Houston, 745 square miles compared with 202 square miles in Houston. Additions were also larger in the 1950s (256 square miles) and 1960s (495 square miles), but declined somewhat to 372 square miles in the 1970s and 139 square miles in the 1980s. As in Houston, population growth in the 1960s and 1970s followed the development of new suburbs. Also as in Houston, growth in the 1980s spread out to include the 1960s band as well as the new suburbs developed in the 1970s and 1980s. (See Figure 3.)

The main point to these maps is the pervasiveness of steady outward growth over the first several post-war decades in metro areas north, south, east, and west. The only significant exceptions were on the California coast. In San Francisco, Los Angeles, and San Diego, growth turned inward much sooner than elsewhere. The reason was partly the barriers of ocean, desert and mountain, partly the inward tug of sand and surf. Figure 4 shows the expansion of Los Angeles as an example. Its urbanized land area (city and suburbs) in 1950 was massive – 966 square miles, second only to New York. The metro added land area comparable to other large metros from the 1950s to the 1970s. But population growth was more concentrated in the 1950 extent of city and suburbs, which accounted for one-third of metro-wide population increase in the 1970s (when many metros lost population in this area), and one-half or more in the 1980s and 1990s. The land pressure created by this inward growth is a major part of the story behind coastal California becoming the most expensive housing market in the country.

Houses in the first wave of post-war suburbs were spartan by today's standards – 800 square feet, slab construction, an unfinished upstairs. To working-class homebuyers, their appeal was affordability, space, and privacy in sharp contrast to the city tenement.[11] In 1949, the Pulitzer Prize-winning poet Phyllis McGinley wrote in *Harper's Magazine* of the joys of suburban life, "free of the city's noise, of its ubiquitous doormen, of the soot on the windowsill and the radio in the next apartment."[12] Developers soon saw the opportunity to move up-market. Houses in the first Levittown, built on Long Island in the late 1940s, sold for $7,990. The third Levittown, built outside Philadelphia a decade later, offered buyers three types of houses varied in size and ranging in price from $11,500 to $14,500.[13] Around the same time, developers touted a subdivision in Houston called Memorial Bend as a "Scenic Wooded Wonderland" where one could find "Country Living in a Metropolitan Area." They marketed to people of "high standing" as luxurious as well as affordable, with desirable country clubs as well as top-notch schools.[14] The first homes were sold in 1955 for $16,000 to $26,000 on wooded, one-third to one-half acre homesites.[15] Like all three Levittowns and most new suburbs, it was virtually all white.

Residents of the 1950s suburbs still came back into the city to work, shop, go to the doctor and attend the theater. The suburb was at first a residential refuge, not a world of its own. In this, as Jon C. Teaford wrote in his history of this era, "the suburban boom of the postwar decade was as much a continuation of the past as a departure."[16] But as more people moved out, businesses followed. Professionals like doctors and lawyers set up practices in the new suburbs. Downtown department stores opened branch stores. Shopping malls, anchored by department stores at one or both ends, opened outside Detroit in 1954 and Minneapolis in 1956 and proliferated around the country in the 1960s.

There became less reason to trudge downtown, and with rising crime, racial tensions, and deteriorating transit systems, suburban residents had good reason not to. Slowly but inexorably, the suburbs became more populous than central cities, the center of daily living and the focal point of the metropolitan economy.

For land speculators and builders who led much of the push toward development of new suburbs, there was a sort of virtuous circle to the process. As early suburbs filled up, local officials could be persuaded to change the zoning and install the infrastructure necessary to build yet more subdivisions on the rural fringe. When early expressways filled with traffic, it could be argued that this demonstrated demand and the need to build more. The resulting development expanded metro areas at a phenomenal rate. The total land area of the 43 metros increased by 56 percent in the 1950s, another 51 percent in the 1960s and 27 percent in the 1970s. Land area for the period as a whole tripled from 9,600 square miles in 1950 to 28,800 square miles in 1980. In that year, the suburbs developed in these three decades comprised two-thirds of the total urbanized land area of the 43 metros. But being less dense than the 1950 city/suburbs, the suburbs developed in this period housed only one-third of the total population (33.6 million out of a total of 93.9 million).

Despite the qualms of planners and many commentators, the great expansion of suburban life came to be seen by many as both necessary and welcome. A half century after Phyllis McGinley's *Harper's* article, Robert Bruegmann wrote in *Sprawl: A Compact History* that the suburbs "afforded many people greater levels of mobility, privacy, and choice than they were able to obtain in the densely settled large cities." His conclusion: "sprawl is inevitable and ... efforts to stop it are doomed."[17]

Slowly but inexorably, the suburbs became more populous than central cities, the center of daily living and the focal point of the metropolitan economy.

There was, however, a problem with traffic. The interstate highway system both anticipated and spurred outward growth. But there was a built-in limit. The system was designed in the 1950s to accommodate 1970-forecasted traffic volumes. After it was officially completed in 1992, construction dropped to less than 100 miles annually, far below the 2,000-plus miles a year in the 1960s and 1,000-plus miles in the early 1970s.[18] For suburban commuters, the reckoning arrived in the 1990s. In that decade, commute times rose by double-digit percentages in all but three of the 43 metro areas, and by more than 20 percent in eight of them (Atlanta, Boston, Miami, Denver, Charlotte, Sacramento, Jacksonville, and Riverside).[19]

The solution, it seemed to many, was for decentralization to be more thorough-going, which meant for jobs to follow population out of the metropolitan center. And in fact, that is what happened. In the 1990s, jobs for the first time dispersed faster than population in a game of catching up.[20] Bringing jobs closer to where people lived slowed the rise in commute times; one study found that sprawling metros could double in size but increase commute times by only two minutes for workers commuting to dispersed suburban jobs. (For those going downtown,

the increase was six minutes.)[21] Employment decentralization also seemed essential to economic growth; the same study found that among large metros, those with the most job dispersion had the greatest job growth in the 1990s.[22]

Job decentralization did not necessarily mean job diffusion. In *Edge Cities,* Joel Garreau gave it an element of urban character in pointing to agglomerations of office parks, retailing, and housing in places like Tysons Corner, Virginia, Buckhead outside Atlanta, and Irvine in Orange County, California.[23] Less visible but no less numerous, however, were the scattered and isolated office buildings spread across the suburban landscape. In a comprehensive tally of suburban office space, Robert Lang found that this sprawling form of development accounted for the bulk of office space outside of traditional downtowns – an elusive *Edgeless City* separate from Garreau's new suburban centers.[24]

The lesson from all of this was that suburbanization could keep housing affordable and commute times reasonable, provided a few conditions were met. One was an inexhaustible supply of inexpensive land. A second was strong government support exemplified by federally backed mortgages and deductions for mortgage interest. A third was provision for the rising tide of auto ownership in road widenings, limited-access highways and acres of parking lots. The fourth was for jobs to follow population.

> Employment decentralization seemed essential to economic growth; metros with the most job dispersion had the greatest job growth in the 1990s.

A final and rather trickier condition involved the types of work that were best performed in scattered offices or suburban sub-centers far from dense downtowns. There had to be a certain amount of what James Bessen called the "standardization of technical knowledge." Technical knowledge that was "simplified by limiting the range of technical parameters" could more readily be divvied up among scattered offices because it could be taught to employees in classrooms and acquired from textbooks rather than being reliant on the guidance of people who had mastered the requisite skills and knowledge.[25] Where knowledge was not codified, a group of employees could burrow deep into a specific topic, as in a corporate R&D center. But they had less opportunity to learn from colleagues in distant offices or to interact with people with different skill sets and areas of expertise. Thus, in significant ways, in white collar jobs as well as on the factory floor, geographic diffusion went hand-in-hand with a degree of standardization and routinization of work.

Decades of metropolitan decentralization and dispersion of population and jobs made the great movement outward seem inevitable and, quite simply, normal. But it was also fragile. It came with conditions. And were any of them to go unmet, the advantages of suburbia could start to unravel.

The Original "Urban Doom Loop"

As the suburbs turned their back on the central city, the aging urban core lost population and jobs in a vicious cycle of abandonment, blight, and crime. Like the urban revival that eventually followed, it started in a few major cities. In the 1950s, four of the dozen largest cities in the Northeast and Midwest lost 10 percent or more of their population (Boston, Pittsburgh, Detroit, and St. Louis). By the 1970s, all twelve of these cities lost 10 percent or more of their populations. Pre-1950 suburbs tended to share the central city's downward trajectory. Combining pre-1950 city and suburbs, New York lost 1.6 million residents from 1970 to 1980; Chicago and Detroit over 500,000; Philadelphia and Buffalo over 400,000; Cleveland, St. Louis, Washington, and Pittsburgh over 200,000 each. In the Sunbelt, city populations increased (often helped by annexations), but only a few of them escaped population declines in the part of the central city and older suburbs developed as of 1950. In these older sections, Dallas lost 100,000 inhabitants between 1970 and 1980 and Charlotte, San Antonio and Houston around 40,000. Of the 43 metros examined in this report, only Los Angeles, San Diego, Miami, and Riverside experienced population growth from 1970 to 1980 in the area (city and suburbs) developed by 1950.

The downward spiral pervaded every part of city life, from the prospect of getting mugged every time you walked home at night to shrunken job opportunities to sinking property values. Population outflow and rising crime, job losses and growing poverty, abandonment and disinvestment, "urban renewal" and burning buildings, all went hand-in-hand in the vicious downward cycle.[26] There were thus many causes of urban decline. My focus here is on economics, where the pivotal change was the collapse of manufacturing employment. Manufacturing was the wellspring of urban growth in the late nineteenth and early twentieth centuries, rooted in immigrant labor, taking advantage of shipping costs that plummeted under the pressures of competition among railroads and waterborne shippers, and spurred by vast local and regional markets for every sort of good and service. A rich ecosystem of tinkerers and inventors, small suppliers and larger firms gave rise to whole new industries which made cities like Detroit synonymous with a single industry. The whole process became a virtuous circle of invention and mass production, of economies of scale, industrial specialization, and division of labor.[27] Growth fed growth; as Harold Cox, a British MP and author of a book titled, *The Problem of Population*, wrote in 1922, "the greater the city becomes the greater the attractive force it will exercise."[28]

In 1950, big cities were still emphatically centers of manufacturing. In the Census of that year, there were twice as many laborers as college educated workers in industrial heartland metros like Chicago, Detroit, Philadelphia, Baltimore, Pittsburgh and St. Louis. In metros with relatively high proportions of college-educated workers like Boston, New York, San Francisco, Seattle, and Denver, there were still more craftsmen, foremen and operatives than professional, technical, and managerial workers.[29] Union jobs in manufacturing paid well, and as a result, median family incomes were higher in the cities of Detroit and Flint, Michigan than in San Francisco or San Jose.[30] But this was not to last. After 1950 and especially after 1970, plants moved from cities to suburbs

and from the North to the Sunbelt. At least as importantly, soaring productivity meant that the same number of autos or tons of steel could be produced with far fewer workers. American ingenuity and industrial efficiency, often spurred by the threat of foreign competition, had as much to do with job losses as relocated plants or foreign imports[31].

Cities were probably destined to lose their manufacturing base as manufacturing industries matured. Long before 1950, auto manufacturing had moved from the stage of constant experimentation and reliance on small-scale local suppliers to assembly lines and standardized work processes that could be codified in manuals and taught in the classroom. Companies became footloose, able to move production to any location with land, labor, and transport networks. Especially as foreign competition intensified in the 1970s, manufacturers looked to automation, non-union labor and inexpensive land with the result that big-city manufacturing jobs plummeted. [4]

Job losses moved as a wave across the country, with the sharpest declines in occurring first in the Northeast, then the Midwest, and later the West Coast. The counties that include the cities of Boston, New York, and Philadelphia lost one-third or more of their manufacturing jobs from 1950 to 1974. In the same period, Detroit, St. Louis and Pittsburgh lost 15 percent to 23 percent and Chicago and Cleveland were about flat. From 1974 to 1990, all of these lost at least one-third of their remaining manufacturing jobs; the counties that include Philadelphia, St. Louis and Pittsburgh lost over one-half. On the West Coast, the counties that include Los Angeles, San Francisco, San Diego and Seattle all had sizeable gains in manufacturing employment from 1950 to 1974, almost doubling in Seattle and more than doubling in the other three. All continued to gain manufacturing jobs until the early 1990s, but experienced steep declines thereafter, most intensively from 2000 to 2010, decimated by competition from Asia, most notably China[32].

Population losses were most severe in central area neighborhoods in and around downtown. From 1950 to 1980, the central area population of the 43 metros examined in this report declined by one-third, from 13.0 million inhabitants in 1950 to 8.85 million in 1980. Hardest-hit were Detroit and St. Louis, where central area populations fell by 70 percent over these three decades. They were far from alone; Cleveland lost 61 percent of its central area population, Pittsburgh, Milwaukee and Buffalo about 50 percent, Chicago 44 percent, and Philadelphia 38 percent. Sunbelt cities also experienced steep declines. Atlanta lost 63 percent of its central area inhabitants; Nashville 46 percent; Tampa 38 percent; Phoenix 28 percent; San Diego 22 percent; and Dallas 18 percent over these three decades. Others made off relatively well compared to cities in the same region: New York's central area population fell by 26 percent; Austin and Houston by less than 10 percent. The two central areas that bucked the trend were in Los Angeles and Miami, which gained 13 percent and 26 percent, respectively, between 1950 and 1980.

By the 1970s, urban decline was so pervasive that it became a staple not just of front page headlines but also sports, entertainment and business news. During a 1977 World Series game at Yankee Stadium, Howard Cosell announced, "Ladies and Gentlemen, the Bronx is burning" as the camera panned the flames visible beyond the center field bleachers. Berry Gordy, Jr. packed up Motown Records, the most successful Black-owned music company in the country, and moved from Detroit to

Hollywood. Developers laid out "new towns" like Reston, Virginia, Columbia, Maryland and Irvine, California as new paradigms for the future of the American city.[33] Meanwhile, in the "older Snow Belt cities," *Newsweek* magazine wrote in 1979, "most long-term indicators are still gloomy ..."[34]

Downtown Comes Back

Yet, there were also glimmers of rebound. *U.S. News & World Report*, one of the three weekly newsmagazines, ran stories headlined "Downtown – where a new look brings rising hope," (May 1975) "Why more and more people are coming back to cities," (August 1977) and "New respect for old neighborhoods" (August 1978). The same month, the *Saturday Review*, an influential general-interest magazine, ran a cover story about "The Comeback of Downtown" that reported on a "monumental renaissance that has given new life to cities like Cincinnati, Minneapolis, Detroit, Hartford, Atlanta, Birmingham, and a dozen other cities."[35]

> Downtown revival, like decentralization, took decades. As it became the norm, not the exception, growth inward became nearly as pervasive as growth outward had been in earlier decades.

Indeed, cities did begin to see middle-class "urban pioneers" renovating dilapidated houses in central city neighborhoods that were, not incidentally, within an easy commute to remaining downtown jobs. There also began to emerge the outlines of a new economy that would replace manufacturing as the centerpiece of the urban economy and driver of urban growth. It was called various nebulous things at the time: services, information, finance. It built off of banking, insurance, business and professional services and media companies that, dependent on proximity to each other, had never abandoned downtown business districts. Growth in this new economy was spurred by international trade compacts that embraced market- and export-oriented policies. With the boom in global trade, financial capitals like New York, Chicago, and Los Angeles became "headquarters cities" from which multinational corporations, using new computer and communications technologies, managed worldwide production and distribution networks, subsidiaries, branch offices and corporate research and development centers.[36] "Globalization" had drained cities of the industries which had driven their growth a century earlier. Now, in making cities with the most extensive global connections centers of financial services, law, advertising, and management consultancy, it gave new life to big-city downtowns.[37]

Spatially, these cities had room to grow. Population declines had left thousands of vacant and often burned out apartment buildings that could be renovated into modern apartments. In older cities, historic brownstones that had been subdivided and rented and could now be turned back into single-family or duplex housing. In central business districts, vacant lots warehoused as surface parking lots could give rise to glass-walled skyscrapers filled with offices and condos.

Downtown revival started slowly and, like decentralization, took decades. Of the 43 metros, only four gained central area population in the 1970s

(Los Angeles by 125,000 inhabitants, and Las Vegas, San Diego, and Riverside by a few thousand.) Eight more central areas grew appreciably in the 1980s (Boston, New York, Washington, Dallas, Milwaukee, San Francisco, Sacramento, and Seattle); nine more in the 1990s (Chicago, Minneapolis, Atlanta, Denver, Houston, Austin, Phoenix, Salt Lake City, and Portland); five in the 2000s (Philadelphia, Charlotte, Miami, Nashville, and St. Louis); and eight in the 2010s (Detroit, Columbus, Indianapolis, Cincinnati, Orlando, Tampa, Kansas City, and New Orleans). Of the 43 metros examined in this study, only Baltimore lost central area population between 2010 and 2020. The revival of "downtown" was now the norm instead of the exception.

Growth Turns Inward

As downtown and then central city populations recovered, metro-wide growth patterns slowly shifted inward to a combination of the central city and suburbs developed in the 1950s and 1960s. Figure 5 shows the shift for New York, Seattle, Atlanta, and Orlando, metro areas that illustrate both the shift inward and the widely varying magnitude of it.

At one end of the spectrum is New York, where in the 1990s, 86 percent of metro-wide growth was in the area developed by 1970. The figure dropped to 72 percent in the 2000s, and rose to 90 percent in the 2010s. In the last decade, the central city (virtually all of which was developed by 1950) accounted for exactly one-half of total metro area growth, much of it in the central area. (See Appendix B for maps of metros shown in Figures 5 and 6.)

Seattle's pattern is similar, except that having a much smaller pre-1950 area than New York, a greater proportion of the growth is in areas developed in the 1950s-60s rather than earlier. The 1950s-60s suburbs accounted for one-third of total metro-wide population growth from 2010 to 2020. Together with pre-1950 suburban and city development, the area developed by 1970 accounted for two-thirds of metro-wide growth in the 2010s.

Seattle is also an example of declining growth rates in the new suburbs developed on the metropolitan periphery. The outer band of suburbs added 76,000 residents in the 2010s, the lowest figure since the 1970s for the outer band of new suburbs.

Moving beyond the super-star metros, Atlanta has had a similar albeit more modest shift inward. The central area, rest of the central city, and pre-1950s suburbs each grew by 19,000 or more inhabitants in the 2010s in contrast to population decline or much slower growth in these areas in prior decades. The 1950s-60s suburbs increased by 111,000 population, reversing a slowdown in growth in the 1990s and 2000s. The area developed by 1970 accounted for 24 percent of metro-wide growth in the 2010s. The outer band of new suburbs accounted for a still-substantial 40 percent of metro-wide growth, but this was down from 67 percent in the 2000s, 54 percent in the 1990s and 66 percent in the 1980s.

An example of a very modest shift inward is Orlando, a quintessential outward-expanding Sunbelt metro. In the 2010s, the city and suburbs developed by 1950 gained about 10,000 population after losing population in previous decades. There was also a significant uptick in growth in the 1950s-60s suburbs while growth was somewhat smaller in the outer band of new suburbs in the 2010s than earlier decades. Like

Atlanta, growth in the newer areas was still substantial (accounting for 43 percent of total metro area growth), but the figure was down from 63 percent in the 2000s and 58 percent in the 1990s.

Overall, the central area grew more rapidly in the 2010s than the 2000s in 40 of the 43 metros. The rest of the central city developed by 1950 grew more rapidly in the 2010s than the previous decade in 35 of the 43 metros. The pre-1950 suburbs grew more rapidly in 38 metros; as did the 1950s-60s suburbs. Accelerating growth in the central city and pre-1970 suburbs was thus the predominant pattern across major U.S. metros in the 2010 to 2020 decade. The magnitude varied widely, but the trend was unmistakable.

As central cities and older suburbs grew more rapidly, growth ebbed in the outer band of new suburbs in 31 metros. This group includes Las Vegas, Phoenix, Tampa, and Riverside, metros where earlier growth was heavily tilted toward the outer band. Elsewhere, however, the outer band growth continued unabated. In Houston, San Antonio, Salt Lake City, Nashville, and Jacksonville, more population was added in the 2010s than in the 2000s. In Dallas, Austin, Charlotte, and Raleigh, growth in the 2010s was a bit lower than in the super-charged 2000s, but higher than any decade prior to 2000. Nonetheless, in these metros where much of the growth remained in the outer band of development, there was also rising (if often modest) growth in the central city and pre-1970 suburbs. (See Figure 7.)

Table 3 on pages 19-20 shows population change in the 2000s and 2010s for the central area out to the outer band of suburban development for all 43 metros. As shown in the first set of panels, with only a few exceptions (marked in red) population gains were higher in the 2010s than the 2000s

Figure 5. Metro area population change, 2010-20 and previous decade

Source: Census [1]

New York

90% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	253,800	185,231
Rest of pre-1950 city*	388,144	283,897
Pre-1950 suburbs	424,611	310,067
1950s-60s suburbs	79,058	2,621
1970s-90s suburbs	56,984	(44,478)
New suburbs**	74,689	21,328
Total	1,277,286	772,914

Seattle

68% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	75,769	51,430
Rest of pre-1950 city*	52,577	32,093
Pre-1950 suburbs	94,060	51,815
1950s-60s suburbs	181,781	70,946
1970s-90s suburbs	116,418	994
New suburbs**	76,003	(17,661)
Total	596,608	214,906

Atlanta

24% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	29,220	19,205
Rest of pre-1950 city*	36,299	40,794
Pre-1950 suburbs	19,738	30,281
1950s-60s suburbs	111,267	93,718
1970s-90s suburbs	297,164	(141,998)
New suburbs**	334,692	(214,653)
Total	828,380	14,906

Orlando

19% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	6,937	4,601
Rest of pre-1950 city*	3,877	8,027
Pre-1950 suburbs	3,132	1,273
1950s-60s suburbs	77,642	41,476
1970s-90s suburbs	179,779	(43,997)
New suburbs**	204,358	(26,176)
Total	475,725	89,609

*Areas of city developed after 1950 are counted in post-1950 development bands.

**Outer 2-decade band of development in each decade

in areas developed by 1970. For the 43 metros as a whole, central area population increased by 1.1 million in the 2010s compared with 250,000 in the 2000s. The rest of the 1950 developed area increased by 2.2 million in the 2010s versus a loss of a half million in the previous decade. And the 1950s-60s suburbs added 2.4 million population compared with 1.4 million in the 2000s.

Growth in suburbs that were first developed from 1970 to 2000, on the other hand, declined from 5.7 million in the 2000s to 3.5 million in the 2010s, a pattern broadly typical of suburbs as they age (growth continues but at a declining rate). Growth in the outer band of suburbs also slowed from 7.1 million on average in the three previous decades to 5.9 million in the 2010s.

Thus far I have stressed the perhaps surprising degree to which the inward shift of recent population growth in the 43 metros cuts across distinctions of region, proximity to the coasts or overall rate of population increase. Just as suburbanization was pervasive decades ago, growth in and near the metropolitan center is now pervasive. However, the magnitude of growth differs across metro areas, particularly when it comes to central areas. From 2010 to 2020, six metros – New York, San Francisco, Washington, Chicago, Seattle, and Boston – accounted for 55 percent of all central area population growth in the 43 metros. Going back a decade, the figure was essentially the same (56 percent). Likewise with jobs. The downtowns of these six cities accounted for just over one-half of total downtown job growth from 2012 to 2020, and also from 2000 to 2012 (measuring from recession low to recession low in the latter period).

Figure 6. Metro area population change, 2010-20 and previous decade

Source: Census [1]

Houston

15% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	44,148	13,758
Rest of pre-1950 city*	15,804	32,096
Pre-1950 suburbs	1,660	(3,378)
1950s-60s suburbs	107,759	31,210
1970s-90s suburbs	324,733	(279,276)
New suburbs**	652,077	89,116
Total	1,146,181	15,631

Dallas

18% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	24,456	23,772
Rest of pre-1950 city*	19,039	35,244
Pre-1950 suburbs	43,643	30,098
1950s-60s suburbs	122,964	91,850
1970s-90s suburbs	302,883	(165,238)
New suburbs**	686,969	(35,869)
Total	1,199,954	139,078

Austin

10% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	23,102	15,075
Rest of pre-1950 city*	11,775	11,067
Pre-1950 suburbs	-	0
1950s-60s suburbs	10,763	13,025
1970s-90s suburbs	125,599	(42,183)
New suburbs**	271,255	(6,064)
Total	442,495	65,203

Charlotte

20% of 2010-2020 growth in area developed by 1970

	Popn change 2010 to 2020	Difference with 2000s
Central area	17,354	10,705
Rest of pre-1950 city*	15,777	21,818
Pre-1950 suburbs	14,940	9,936
1950s-60s suburbs	36,627	2,928
1970s-90s suburbs	100,960	(72,625)
New suburbs**	228,069	(74,129)
Total	413,727	(22,311)

*Areas of city developed after 1950 are included in post-1950 development bands.

**Outer 2-decade band of development in each decade

In the great post-war suburban boom, all metros grew outward. In the last decade, growth shifted inward across-the-board. But growth in the urban core was concentrated where the knowledge economy exerted the greatest centripetal force. Led by tech companies, the knowledge economy if anything picked up steam during the pandemic. Its inward pull will thus be consequential for the American metropolis in the post-Covid world. How that inward dynamic works is thus the focus of the next section.

In the last two decades, growth in the urban core was concentrated where the knowledge economy exerted the greatest centripetal force – an inward pull that will be consequential in the post-Covid world.

Table 3. Population change from 2010 to 2020, and change from previous decade

Source: Census [1]

	Central area			Rest of 1950 city/suburbs			1950s and 1960s suburbs		
	Populating change 2010 to 2020	Difference between 2010s and 2000s		Populating change 2010 to 2020	Difference between 2010s and 2000s		Populating change 2010 to 2020	Difference between 2010s and 2000s
Growth/tech-oriented								
Dallas	24,456	23,772	Dallas	62,683	65,342	Dallas	122,964	91,850
Houston	44,148	13,758	Houston	17,464	28,718	Houston	107,759	31,210
Atlanta	29,220	19,205	Atlanta	56,036	71,074	Atlanta	111,267	93,718
Phoenix	7,933	16,917	Phoenix	38,881	62,295	Phoenix	84,805	59,751
Denver	41,946	39,595	Denver	44,041	47,342	Denver	68,040	43,641
Salt Lake City	12,263	10,109	Salt Lake City	25,742	9,553	Salt Lake City	54,613	12,726
Charlotte	17,354	10,705	Charlotte	30,717	31,754	Charlotte	36,627	2,928
Portland	27,618	11,644	Portland	55,256	3,709	Portland	56,989	(618)
Austin	23,102	15,075	Austin	11,775	11,067	Austin	10,763	13,025
Raleigh	3,950	537	Raleigh	13,271	16,837	Raleigh	21,632	78
Nashville	16,758	13,990	Nashville	17,482	21,295	Nashville	29,622	6,701
Total	248,747	175,307	Total	373,349	368,986	Total	705,082	355,010
Other growth								
Miami	36,894	6,546	Miami	47,143	33,862	Miami	194,427	82,467
San Diego	12,651	627	San Diego	28,490	16,148	San Diego	50,654	21,329
Minneapolis	34,658	27,409	Minneapolis	63,445	70,991	Minneapolis	56,773	63,070
Tampa	9,987	6,592	Tampa	23,535	28,860	Tampa	79,608	65,467
Orlando	6,937	4,601	Orlando	7,010	9,299	Orlando	77,642	41,476
Las Vegas	1,146	9,773	Las Vegas	(356)	5,541	Las Vegas	31,163	8,124
San Antonio	1,394	3,274	San Antonio	(17,365)	(2,711)	San Antonio	31,405	(1,236)
Riverside	2,170	(3,949)	Riverside	17,043	(27,351)	Riverside	44,394	(49,336)
Sacramento	9,312	11,091	Sacramento	39,513	37,719	Sacramento	53,017	37,826
Kansas City	7,342	6,885	Kansas City	16,207	47,087	Kansas City	24,583	25,406
Indianapolis	8,234	16,113	Indianapolis	18,959	37,362	Indianapolis	43,527	6,966
Columbus	15,384	17,028	Columbus	17,807	34,454	Columbus	42,013	22,100
Jacksonville	1,082	(1,546)	Jacksonville	14,321	30,848	Jacksonville	29,131	27,079
Oklahoma City	933	928	Oklahoma City	(201)	(2,473)	Oklahoma City	12,421	12,520
Total	148,124	105,373	Total	275,551	319,636	Total	770,758	363,259
Super-star								
New York	253,800	185,231	New York	812,755	593,964	New York	79,058	2,621
Los Angeles	29,751	37,460	Los Angeles	79,367	(47,567)	Los Angeles	76,467	(26,035)
San Francisco	92,205	56,474	San Francisco	189,941	137,712	San Francisco	126,869	76,622
Washington	80,836	37,880	Washington	114,888	74,849	Washington	155,312	9,976
Boston	53,343	22,589	Boston	214,099	171,621	Boston	54,757	35,551
Seattle	75,769	51,430	Seattle	146,637	83,908	Seattle	181,781	70,946
Total	585,704	391,064	Total	1,557,687	1,014,489	Total	674,244	169,680
Slow growth								
Chicago	76,907	74,174	Chicago	(51,636)	179,974	Chicago	34,213	(12,542)
Philadelphia	57,696	55,129	Philadelphia	74,141	63,929	Philadelphia	63,313	29,043
Detroit	4,199	16,397	Detroit	(42,765)	252,869	Detroit	40,437	30,208
Baltimore	(12,337)	3,788	Baltimore	(2,076)	(202)	Baltimore	66,931	6,586
St. Louis	4,973	(3,507)	St. Louis	(52,745)	14,669	St. Louis	842	4,482
Cleveland	1,797	4,516	Cleveland	(29,810)	100,242	Cleveland	13,301	9,773
Pittsburgh	2,967	12,938	Pittsburgh	(13,321)	66,853	Pittsburgh	10,336	10,397
Cincinnati	5,268	12,106	Cincinnati	11,816	52,348	Cincinnati	15,366	12,864
Milwaukee	2,016	441	Milwaukee	(16,762)	(9,718)	Milwaukee	10,917	3,288
Providence	2,131	1,351	Providence	39,763	50,888	Providence	5,404	6,080
Buffalo	3,073	9,888	Buffalo	12,407	55,471	Buffalo	8,305	11,011
New Orleans	4,697	27,482	New Orleans	25,682	125,769	New Orleans	21,097	86,385
Total	153,388	214,703	Total	(45,307)	953,093	Total	290,462	197,576
Grand Total	1,135,962	886,447	Grand Total	2,161,280	2,656,204	Grand Total	2,440,546	1,085,524

Increased in 2010s vs 2000s

Decreased in 2010s vs 2000s

Table 3 continued

1970s, 1980s and 1990s suburbs			2000s and 2010s ("outer band")		
	Populating change 2010 to 2020	Difference between 2010s and 2000s		Populating change 2010 to 2020	Difference between 2010s and 2000s
Growth/tech-oriented					
Dallas	302,883	(165,238)	Dallas	686,969	69,806
Houston	324,733	(279,276)	Houston	652,077	203,288
Atlanta	297,164	(141,998)	Atlanta	334,692	(219,529)
Phoenix	122,640	(11,629)	Phoenix	359,079	(191,832)
Denver	80,073	(38,551)	Denver	158,149	(54,158)
Salt Lake City	61,633	(58,265)	Salt Lake City	214,379	67,328
Charlotte	100,960	(72,625)	Charlotte	228,069	24,666
Portland	86,428	(20,821)	Portland	26,004	(24,250)
Austin	125,599	(42,183)	Austin	271,255	55,630
Raleigh	96,256	(57,760)	Raleigh	184,706	18,450
Nashville	74,409	(20,393)	Nashville	103,157	20,090
Total	1,672,778	(908,740)	Total	3,218,536	(30,512)
Other growth					
Miami	229,146	(45,333)	Miami	83,178	(261,231)
San Diego	46,304	(81,585)	San Diego	67,170	(39,986)
Minneapolis	53,394	(27,988)	Minneapolis	120,018	(67,722)
Tampa	102,807	(60,181)	Tampa	152,224	(25,349)
Orlando	179,779	(43,997)	Orlando	204,358	(12,944)
Las Vegas	71,816	(127,378)	Las Vegas	192,411	(155,726)
San Antonio	86,712	(71,553)	San Antonio	241,292	96,563
Riverside	23,447	(90,361)	Riverside	79,835	(45,042)
Sacramento	45,623	(72,213)	Sacramento	103,095	(57,628)
Kansas City	44,006	(51,873)	Kansas City	70,874	(46,374)
Indianapolis	43,437	(37,762)	Indianapolis	118,297	(5,159)
Columbus	78,278	(29,844)	Columbus	59,189	(63,898)
Jacksonville	45,475	(11,884)	Jacksonville	126,312	17,648
Oklahoma City	45,405	(15,345)	Oklahoma City	85,544	27,862
Total	1,095,629	(767,297)	Total	1,703,797	(638,986)
Super-star					
New York	56,984	(44,478)	New York	74,689	(14,069)
Los Angeles	109,624	(41,642)	Los Angeles	106,382	(119,061)
San Francisco	80,664	(12,871)	San Francisco	66,625	(15,967)
Washington	101,509	(94,721)	Washington	140,390	(145,340)
Boston	27,661	13,123	Boston	55,986	23,576
Seattle	116,418	994	Seattle	76,003	(27,384)
Total	492,860	(179,594)	Total	520,075	(298,246)
Slow growth					
Chicago	26,592	(171,119)	Chicago	82,816	(128,243)
Philadelphia	36,367	(43,352)	Philadelphia	127,237	(7,269)
Detroit	44,402	(14,434)	Detroit	45,299	(36,205)
Baltimore	37,998	(16,451)	Baltimore	20,640	(34,596)
St. Louis	23,396	(41,721)	St. Louis	53,882	(30,691)
Cleveland	11,690	(18,374)	Cleveland	35,764	12,972
Pittsburgh	12,012	(1,734)	Pittsburgh	50,683	21,170
Cincinnati	41,392	(45,062)	Cincinnati	53,274	(10,952)
Milwaukee	7,423	(11,327)	Milwaukee	12,887	(9,597)
Providence	7,372	366	Providence	11,075	4,882
Buffalo	4,857	(2,461)	Buffalo	814	(13,521)
New Orleans	2,914	1,010	New Orleans	1,836	(11,131)
Total	256,416	(364,661)	Total	496,207	(243,181)
Grand Total	3,517,683	(2,220,292)	Grand Total	5,938,615	(1,210,924)

Increased in 2010s vs 2000s
Decreased in 2010s vs 2000s

Increased in 2010s vs previous 3 decades
Decreased in 2010s vs previous 3 decades

The Virtuous Circle

As the urban revival blossomed in cities across the country in recent decades, more and more cities homed in on developing their ailing downtowns into thriving urban districts. City leaders saw revitalized downtowns as the catalyst for metropolitan growth, dishing up a menu of culinary and cultural treats sought after by the young, educated, and mobile – Richard Florida's famous "creative class."[38] Downtown development would be the instrument for cities to become "a first-choice community for talent and employers," as the mayor and business leaders in Omaha, Nebraska put it last year in announcing an ambitious plan for downtown that include a boulevard lined with housing, offices, restaurants and shops, landscaped public spaces over two blocks of an expressway, and expansion of its streetcar system. Like their peers in many other cities, they hoped to create the "magnetism" of larger cities that have "a more dynamic, dense urban environment downtown."[39]

Yet it wasn't restaurants or bars or the opera that sparked the resurgence of New York, Chicago, Los Angeles, San Francisco or Boston. They were hardly alone as centers of culture, entertainment, dining and shopping. (Think of elite institutions like the Cleveland Orchestra or Detroit Institute of Arts.) What made these cities distinctive was their status as regional, national and global centers of capital, trade, and finance, their educated labor forces, and their wide variety of professional opportunities. And their size, which meant they had a depth of expertise in highly specialized and sophisticated financial and business and professional services that could compete in the increasingly market-driven globalized economy. This is what met the moment and from which the urban revival of the last four decades blossomed. Amenities were, to be sure, motors in the virtuous feedback loops, but they were conditioned on there being sufficient patronage for a large collection of museums, theater, opera, dance, jazz clubs, art galleries, bars and restaurants. The extent and variety of their amenities were certainly important but they were not the basic causal agent of urban revitalization.

We should turn, then, to the economic basis of the inarguable magnetism of dense urban environments. The word "magnetism" itself implicitly or explicitly harkens back to Jane Jacobs. Sixty-five years ago, she asked, "what makes a city center magnetic, what can inject the gaiety, the wonder, the cheerful hurly-burly that make people want to come into the city and to linger there?"[40] She is best known for her book-length answer to that question, *The Death and Life of Great American Cities*. Equally important to understanding what makes cities magnetic were her later books that delved into how cities work economically. More than the writings of any economists (a profession that tardily adopted many of her insights), she lucidly laid out the economics behind the virtuous feedback loop responsible for both city rebirth and the concentration of its fruits in the biggest, densest, and most economically diverse cities and metro areas.

At the center of Jacobs' thinking were two basic notions. First, that cities and not states or nations are the primary economic unit. Economic processes flow in, through and between cities, making them the hubs of the interaction and exchange that drives economic processes. Second, that the driver of economic growth is the creation of work, which comes in two flavors, new work and old work. "Old work" is doing more of the stuff that's already being done. It creates jobs and wealth through

replication, as in doubling the size of a factory or adding software engineers to do the same thing as existing staff but at larger scale. It contributes to city growth through processes such as import replacement, i.e., making locally what was previously made elsewhere and then "imported" into the metropolitan area. It depends on copying what the same company or another company is already doing.[41]

"New work" is, as its name suggests, making stuff and doing stuff that has not been done before. Today, the word most often attached to this is "innovation." The product or service is different from what is already in the market; the processes and inputs used to create the new product or service may be different as well. New work drives economic development as opposed to simple expansion of economic activity. Jacobs' central insight was that new work typically derives from old work. She illustrates the concept in decidedly non-technological contexts. She cites the example of a "custom seamstress, Mrs. Ida Rosenthal," who made dresses from her small shop in New York in the early 1920s. Dissatisfied "with the way her dresses hung on her customers," Jacobs wrote, "she experimented with improvements to underclothing and the result was the first brassiere."[42] Brassiere-making thus started as a side business. But as she became more interested in making brassieres than in making dresses, Mrs. Rosenthal found a partner, raised capital, and opened a rudimentary factory. The new work of brassiere-making thus came out of the old work of dress-making. Jacobs follows this with another example. In its early days the Minnesota Mining and Manufacturing Company went from producing sand to making sandpaper. The adhesives it used did not work well, so it developed a suit of new adhesives. These turned into a whole family of different types of gummed paper such as masking tape, shoe tape, cellophane tape, and even sound recording magnetic tape.[43] Decades later, an engineer at the company, by then renamed 3M, invented an adhesive that stuck to surfaces but could be easily peeled off and re-stuck to something else. That became the basis for Post-it notes, now a ubiquitous item around the office.[44]

To a certain extent, the chain of events that lead to new work come about through intentional activity that responds to particular problems or, as Jacobs wrote, may be "suggested by the materials or skills already being used."[45] But as she also pointed out, "the process is full of surprises and is hard to predict – possibly it is unpredictable – before it has happened."[46] The serendipity and randomness inherent to the process of creating new work means that, as economist Enrico Moretti wrote, "New ideas arise in mysterious and unpredictable ways from free and unstructured interactions."[47] Post-it notes illustrate this point. Spencer Silver, the 3M engineer who came up the new adhesive, tried for two years to interest product developers at the company. The path to commercialization led through an acquaintance from the bicycle club who had heard about Silver's adhesive from a colleague during a golf outing and then realized its practical application while trying to keep a bookmark in place during church choir practice.[48] Post-it notes were thus an example of intentional activity that awaited serendipity. The inventive process can also interweave serendipity and intentionality, as illustrated by the story of Apple and the computer mouse. The mouse was invented by an engineer named Douglas Engelbart, who filed a patent for it in 1967. A decade later, engineers at Xerox's R&D center in Palo Alto (PARC) further refined the idea and combined it with a

graphical interface to replace the then-ubiquitous glowing green cursor. Around the same time, Xerox's venture capital arm wanted to buy stock ahead of Apple's public stock offering. Steve Jobs knew enough about PARC to want to know more. He struck a deal with Xerox, selling the company $1 million in shares in exchange for letting him see what PARC engineers were up to. On his first visit, Jobs was shown a boxy three-button prototype mouse connected to a graphical interface. Jobs was thrilled with both the graphical interface and mouse. A few days later, he hired a local industrial design firm to design a simple, intuitive, and affordable mouse that would have one button and cost $15 apiece (Xerox's mouse cost $300).[49]

> There can be something very random about the development of whole clusters of production and expertise. But what happens next is not random.

These examples are specific to certain individuals and products but the point is much broader. There can be something very random about the development of whole clusters of production and expertise. Famously, in the 1950s William Shockley, the coinventor of the transistor, left Bell Labs in New Jersey and set up a semiconductor lab in what would become Silicon Valley in order to be near his ailing mother in Palo Alto. (His autocratic and domineering personality led dissatisfied engineers to resign en masse and establish Fairchild Semiconductor Corporation nearby; that company went on to coinvent the integrated circuit in 1958.) Two decades later, Bill Gates and Paul Allen moved their tiny start-up from Albuquerque to Seattle to be closer to their families. Michael Dell enrolled as a pre-med student at the University of Texas, Austin in 1984 at his parents' behest, while also selling computer disk drives out of his dorm room as a side business.

What happened next was not random. Palo Alto was fertile ground for Shockley and the start-ups that spun off from his company because a dean at Stanford University, who had worked on microwave radar during the war, had built an engineering school aimed at rivaling MIT. Seattle had a top computer science and engineering program at the University of Washington and a rich ecosystem of skilled technical workers at firms such as Boeing, Intel, and Hewlett-Packard. Austin also had a first-rate university, plus a long tech history dating to federal contracts with the University of Texas for research into radar, sonar, and other defense-related equipment in the late 1940s, which led to the founding of Tracor, Austin's first major private sector manufacturer; and the owner of an auto dealership creating an economic development foundation that promoted Austin as a site of industrial relocation and pressed for rezoning and tax and energy rates that would attract business, followed by IBM building a factory that started out manufacturing Selectric electric typewriters and companies such as Texas Instruments and Motorola building plants to fabricate semiconductors.[50]

Once begun, a virtuous circle builds on itself. Software engineers go to Silicon Valley just as screenwriters go to Los Angeles, book editors to New York, and musicians to Nashville. Companies follow, drawn to the rich ecosystem of capital, skilled workers, suppliers and universities. The process can bridge between cities as employees and firms look to marry

their specialties with other fields. In 2008, a Google engineer set up a small office in New York City in hopes of building the company's advertising business, which became the foundation for its great wealth. New York also offered software engineers something different than Silicon Valley – city living combined with the chance to apply their technical skills to real-world problems rather than developing cool technology and then figuring out applications.[51]

In all of this, the bundle of scale, density, complexity and economic diversity act as both cause and effect. Bigger and denser cities offer greater chances for serendipity and random encounters and cross-fertilizing of interests, experiences, expertises, and ideas. Because of this, bigger and more economically diverse cities tend to produce more innovation and are the source of a disproportionately large share of patents.[52] With a bigger local market and more far-flung trading network, there is more opportunity to develop specialized products and services, and also to realize economies of scale. More jobs and more workers create more opportunities for workers to match exacting and specialized skills to specific jobs and employers. (This makes larger cities especially attractive to two-earner couples.) Bigger metros also offer more opportunities for workers to change jobs and thus cross-fertilize between firms in the same line of business and, even more consequentially, between different but potentially related lines of business.[53]

> Once begun, a virtuous circle builds on itself. Scale, density, complexity, and economic diversity act as both cause and effect.

Notably, the relationship between size, density, and economic performance is exponential, not linear. This is partly because the number of potential interactions increases exponentially with the number of people. In a group of three people, for example, there are a total of six possible person-to-person interactions. In a group of six, there are 21 possible interactions. Among a thousand people, the number of potential exchanges grows to half a million. In addition, as Luis Bettencourt and colleagues found across a diversity of settlements from ancient to present-day times, as cities grow in size they also grow more dense. With concentrated centers of activity, there are greater chances for both intentional and unplanned encounters and interactions. The result is that output increases exponentially with city size. Bettencourt estimated an exponent of 7/6, meaning that a city twice as large as another one will have 125 percent more economic outputs like GDP, the number of patents, and income. It will also have 125 percent more negative quantities such as the cost of housing and amount of disease, crime and poverty.[54]

The mathematical regularities that Bettencourt found looking across a multitude of times and places are only partially reflected in the experience of American cities. Larger U.S. cities do tend to have higher wages and economic output. They produce more innovation, or what Jacobs called new work. They generally have more traffic and congestion. They sometimes have higher crime rates and higher housing prices, but not uniformly. And size has not equated with

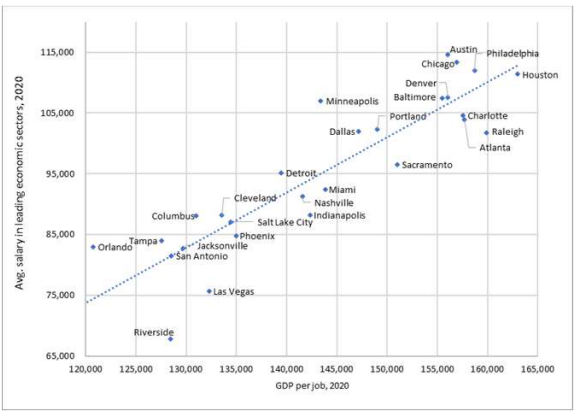
density; only eight of the top 15 metros in population are also in the top 15 in population density. And if growth is not accommodated, the cost and congestion of big city life may start to work against the economic and social benefits that draw people and firms there in the first place.

The factors of size and density together with history and the institutional, political and civic infrastructure never interact in quite the same way. The cities and metro areas they produce are each unique, and in uniquely different ways. The previous section showed the range of spatial pictures that result. We can now turn to the economic picture, again taking us to the eve of the pandemic.

The place to start is with jobs, wages, and economic output of each of the 43 metro areas. Figure 7 shows GDP, the broadest measure of economic output and productivity, on a per-job basis for each metro (horizontal axis). The vertical axis shows average salaries for what I will refer to as the leading sectors of the economy. "Leading sectors" encompass industries that, broadly speaking, drive metro area economic growth by producing its principal exports and by replacing goods and services previously made elsewhere with home-grown products.[55] In today's knowledge economy, they are also generally the highest-paid sectors of the economy, reflecting high levels of innovation and productivity and also serving to attract talent to metro area firms. These sectors range from finance to business and professional services to media and entertainment. Included are banks, insurance companies, stock and commodity markets, architectural and engineering firms, computer programming, data processing, software development, management consulting, advertising, radio, television, publishing, motion pictures and theatrical productions. They are the highest-wage sectors of the economy; in the 43 metros, the average salary in these leading sectors was $121,000 in 2020 compared with $48,600 across all other sectors combined.[56] Leading sector employment accounts for 22 percent of all jobs in the 43 metros and 41 percent of total salaries.

Figure 7. Metro area GDP per job and salaries in leading economic sectors

Sources: Census [4], BLS [6], BEA [7]



These numbers, significant by themselves, understates the outsize role they play in driving innovation and technological change that attracts capital, increases productivity, and generates wealth.

Figure 7 shows that the San Francisco metro (including Silicon Valley and San Jose) is leagues apart from any other metro in GDP and wages. Its GDP per job is 27 percent above second-ranking Seattle; it is also 43 percent above Seattle in the average salary in leading economic sectors. These two, plus New York, Boston, Washington, Los Angeles, and San Diego, stand apart from other metros in GDP and wage measures. The first six in particular are often referred to as "super-star" cities[57], characterized by a concentration of well-paying jobs on the forefront of the knowledge economy, large central area populations, and a great breadth of culinary and cultural amenities. San Diego also fit this description albeit with less centralization of population and jobs.

The second chart in Figure 7 shows that somewhat below San Diego is a group that includes the large metros of Houston, Philadelphia, Chicago, Atlanta, Denver, and Baltimore and the smaller metros of Austin, Charlotte, and Raleigh, and continuing down to Oklahoma City and Riverside in the lower left corner of the graph.

It will surprise no one that the super-star metros combine high GDP and wages with a large number of downtown jobs and large central area populations. Perhaps less self-apparent is that the relationship between economic performance and the concentration of jobs and residents extends from the top to the bottom of the 43 metros examined in this report. Figure 8 shows these relationships by combining the economic and centralization metrics. An index of economic performance is created by summing GDP per job and the average wage in leading sectors; this is shown on the vertical axis. The horizontal axis is the sum of the number of downtown jobs and central area population, measures of concentration of people in the urban core. Both axes are on a log scale to spread out what would otherwise be an indecipherable cluster of.

Figure 8. Economic and centrality indicators

Sources: BLS [6], BEA [7], Census [1] [4] [8]

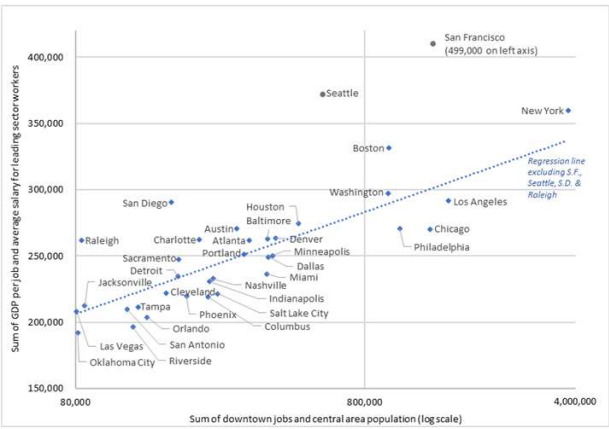
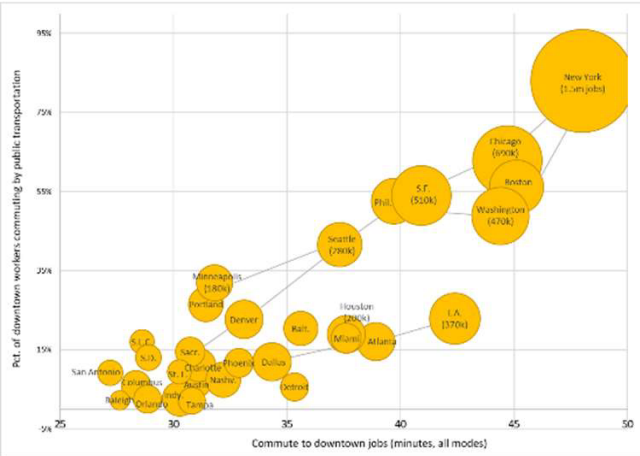


Figure 9. Downtown jobs, transit commutation, and commute times
Balloon size reflects number of jobs within 2-mile radius of central business district.
Sources: Census [8] [9]



metros in the lower left. The regression line in the figure excludes the heavily tech and biotech-influenced metros that are well above the pack (San Francisco, Seattle, San Diego, and Raleigh) so as to create a benchmark for the other metros

The resulting graph shows that output and wages correlate closely with size and concentration. Causality runs both ways because bigness and concentration facilitate economic success and through virtuous feedback loops spur greater size and concentration. The correlation transcends distinctions based on region of the country, climate, or history of rapid or slow growth. What relates most to GDP and wages is size. And what counts most in size is downtown jobs and central area population. Statistical testing shows that these correlate more strongly with metro area economic performance than does total metro area population or population within various radii of between 3 and 20 miles of downtown. Two metros illustrate this point. Seattle ranks in the top 10 in GDP per job, leading sector wages, central area population and downtown jobs while it ranks only fourteenth in metro area population. Conversely, Phoenix ranks twelfth in metro area population but between twenty-second and twenty-seventh in economic and centrality indicators.

If the key to output and wages is size and concentration, then the key to size and concentration is public transportation. In the cities with the biggest downtowns (New York, Chicago, San Francisco, Washington, and Boston) 49 percent or more of downtown workers commuted by public transportation pre-pandemic. These cities pack more jobs and people into a few square miles because they do not have to set aside the space that would be required for roads and parking were everyone to get around by automobile. All rely heavily on subway and commuter rail systems which have the capacity to move huge numbers of people. In

San Francisco, 32 percent of downtown commuters used rail and 20 percent bus pre-pandemic, a ratio of 1.6 to one; in the other big downtowns, the ratio is at least three to one.

In smaller and less-dense downtowns, there is less reliance on rail and more on buses, which serve quite nicely as the mode of choice for downtown commuters. Los Angeles, San Diego, Seattle, Denver, Portland, Minneapolis, and Phoenix all had more bus than rail commuters to downtown jobs pre-pandemic, even with substantial light rail systems that reach well into the suburbs. Buses are the workhorse for two reasons. First, bus networks are always denser and more extensive than rail networks, and thus accessible to more commuters. Second, new bus routes can be designed and put into service in a matter of months, as opposed to rail systems that take years from conception to ribbon cutting and at far greater cost. It is particularly notable that Seattle rose to the ranks of super-star metros with a strategy centered on bus frequency and service area coverage rather than rail construction. Rail followed, not led.[8]

What relates most to GDP and wages is size. What counts most in size is downtown jobs and central area populations.

The final important factor in downtown size and concentration involves the travel time to work. How this works is easily misunderstood because the metros with the biggest downtowns and the heaviest reliance on public transportation also have the lengthiest commutes, on average. One might suppose that the long commutes are a function of greater use of transit. In fact, for downtown commuters in the most transit-oriented downtowns, the difference in commute times for transit versus auto is at most 15 percent. [9] Commutes are longer in transit-rich metros simply because their large size – and so more people commute further from downtown – coupled with wages and professional opportunities that make downtown jobs worth the long commute.

How all of this played out in U.S. metro areas pre-pandemic can be seen by looking at transit mode shares and the number of downtown jobs in conjunction with commute times. These are shown in Figure 9. Commute times to downtown jobs are on the horizontal axis, the percentage of downtown workers commuting by train and bus is on the vertical axis, and the number of downtown jobs is indicated by the size of the balloons (the number of jobs is shown along with the metro name in a selection of metros).

New York, no surprise, has the most of everything: downtown workers, longest commutes, and highest transit mode share. From New York, there is a strong relationship between these three metrics running through Chicago, Boston and Washington to San Francisco, Philadelphia, Seattle, Minneapolis, Portland, and Denver.

All of these metros have relatively high public transportation usage and a relatively large number of downtown jobs given their average commute time to downtown jobs.

There is a second tier from Los Angeles to Atlanta, Miami, Houston, Dallas, and Phoenix. These metros have less transit use and smaller central business districts for a given commute time. Lower transit shares

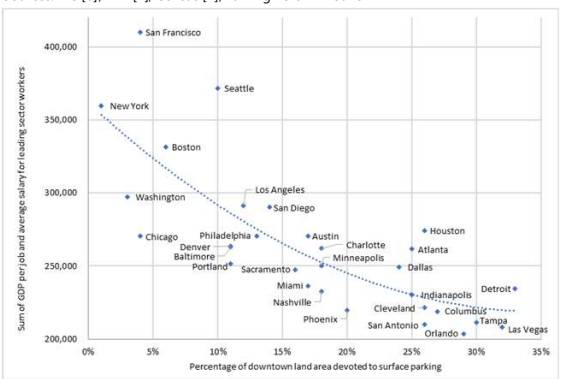
limit the concentration of jobs in their downtowns because of the space that cars require for the commuter driving in and for parking. Compare, for example, the relatively auto-oriented Los Angeles with San Francisco and Philadelphia. Commute times are similar for the three but Los Angeles has a smaller downtown than the other two. Likewise comparing Houston, Miami and Atlanta with the more transit-oriented Seattle; the first three have a higher share of auto commuters and smaller downtowns.

The feedback loop in which less driving feeds downtown size and density shapes not only economic outcomes but also the built environment. Thomas Carpenito and colleagues at a non-profit organization called the Parking Reform Network put together a series of maps measuring the amount of surface parking in 50 U.S. downtowns. The proportion of downtown land devoted to surface lots corresponds strongly with metro area economic output and wages, as shown in Figure 10. Metros with the strongest economic performance have less than 10 percent of downtown land devoted to surface parking. Those far down the ladder economically have one-quarter to one-third of downtown land area taken up by parking lots.

Less surface parking is more effect than cause of downtown density and high economic output, since the latter make the land too valuable to use for parking. But less surface parking also contributes to the virtuous circle. With development of surface parking lots – perhaps the most deadening form of urban land use – sidewalks fill with office workers and residents who live and work upstairs and frequent the shops, cafes and restaurants in the same buildings at street level. A once-barren urban landscape is transformed into one with "the gaiety, the wonder, the cheerful hurly-burly that make people want to come into the city and to linger there."

Figure 10. Economic performance and the proportion of downtown land used for surface parking

Sources: BLS [6], BEA [7], Census [4], Parking Reform Network [59]



The discussion of the last few pages has focused on big metros that have dense downtowns and high economic output and wages. What about other metros that exhibit much less centrality? In 2019, downtown's share of leading sector jobs ranged from 14 percent or less in Houston, Atlanta, Salt Lake City, Dallas, and Raleigh to 19 percent in Austin, 20 percent in Denver, 26 percent in Nashville, 27 percent in Charlotte and Seattle and 35 percent in Portland. Moreover, the degree of decentralization has increased over the past two decades. From 2002 to 2019, downtown's share of leading sector jobs fell by at least 2 percentage points in Austin, Charlotte, Dallas, Denver, Raleigh, and Salt Lake City. (The exception was Nashville, with a 2 percentage point increase. The downtown share was unchanged in Houston, and declined slightly in Atlanta, Portland, and Seattle.) Rather than be concentrated downtown, the majority of leading sector jobs and of job growth was generally 8 miles to 20 miles from the city center. (By contrast, downtown accounted for around 40 percent of leading sector jobs in New York, San Francisco, and Chicago in 2019. Moreover, leading sector jobs became substantially more centralized in the super-star metros since 2002.)[60]

Jobs in these metros are decentralized but they are not necessarily diffused. Especially in leading sectors, there are often clusters of firms in related lines of work. A 2019 Brookings Institution study found pronounced job clustering across a range of growing metros including Portland, Charlotte, Nashville, Denver, Austin, Atlanta and Raleigh. This regional clustering creates the same type of advantage of bigger downtown clusters; the Brookings study found that increases in job density in these regional clusters were associated with faster metro area job growth in a sort of mini-virtuous circle.[61] Along the same lines, a 2022 Brookings study found that metros with relatively more clustering have higher worker productivity and economic output than metros in which jobs are more diffused.[62]

As the 2022 Brookings study also noted, and as Figure 8 shows, regional clustering is helpful but falls short of the economic benefit in GDP and wages that comes with the intensive downtown job concentration found in the super-star metros. The implication is that non-super star metros that benefit from regional clustering would benefit even more from downtown agglomeration. To come up with an estimate of how much, I developed a regression model of the relationship between centrality and economic performance, using the number of downtown leading sector jobs and central area population as the independent variables and metro area GDP per job as the dependent variable. (GDP per job multiplied by the number of jobs then produces total GDP.) I excluded from the modeling four metros where tech and biotech industries have produced exceptionally high GDP per job given their size (San Francisco, Seattle, San Diego and Raleigh). I also excluded slower growing metros of the Northeast and Midwest where housing production is likely not the main constraint on growth. This produces a total of 28 metros. Six of these are characterized by centrality in jobs and population (New York, Chicago, Philadelphia, Boston, Washington and to a lesser extent Los Angeles) but their growth has been constrained by limits on housing construction in and near the metropolitan core. The other 22 metros are both relatively decentralized and have grown robustly in recent years.

If we suppose that the group of 22 relatively decentralized metros had as much downtown concentration of leading sector jobs and as much central area concentration of population as the six dense metros, the model estimates that GDP in these metros would be 9.6 percent higher than the actual figure in 2019. The gain was highest in metros like Tampa, Phoenix, San Antonio, Jacksonville, Orlando and Riverside where jobs and population are least centralized, and more modest in metros like Houston, Charlotte, Salt Lake City, Nashville, Denver, and Austin which have greater concentration of downtown jobs and/or central area residents. Even so, the latter group would gain 3 percent to 7 percent in metro area GDP, while the first group's gains would be 14 percent or more. (See Table 4.)

It should be emphasized that these figures are the product of a statistical model and by their nature cannot account for myriad factors that also affect the interaction of job and population growth and knowledge economy feedback loops. They are valuable, however, in gauging the magnitude of potential economic gains from greater clustering of jobs and population. The potential gain is quite substantial – about $460 billion in added GDP per year for the 22 metros. These GDP increases are generated simply from greater concentration of jobs and population in the downtown area – not from more jobs or higher population in the metro area as a whole.

For the six metros with relative centrality in jobs and population, the issue is not so much downtown concentration as their relatively slow growth rates compared with Sunbelt metros. Over the two decades before the pandemic, jobs increased by 12 percent in the six metros with the most centrality compared with 31 percent in the group of 22 growth metros. The population of the six metros increased by 10 percent compared with 41 percent for the growth metros. If we suppose a 28 percent growth in jobs and population in these six metros (still below that of the growth metros), the six metros' GDP would have been 14.9 percent higher in 2019 than was in fact the case. These gains in GDP are entirely from faster growth and assume the same percentage of population and jobs in the urban core as was actually the case.

Combining the 22 growth and six dense metros, the GDP gain from greater centrality in the first group, and faster growth in the second group totals $1.22 billion annually. This totals 12.3 percent of their GDP and 5.7 percent of national GDP, estimates that are broadly consistent with the academic literature[63].

Growth at the scale envisioned here is not as outlandish as it might seem. Population and employment in the central area and downtowns of the 22 growth metros would still be generally well below those of the dense metros. Except for Los Angeles, central area populations in the six dense metros would be less than their central area populations in 1950. The constraint on growth is not how many people can live in central areas. Nor is it how much office space can be built downtown. The constraint is how much housing has been built in central areas and the public transportation capacity to get workers to downtown jobs.

The challenge for cities and metro areas pre-pandemic was to accommodate the crowds that wanted to live and work in and near the metropolitan core. The pay-off from the growth that did occur was clearly substantial in greater innovation, productivity and wealth creation. But constraints on growth – namely the lack of new housing

and overreliance on the automobile – meant that job growth and population growth were forced outward toward the far reaches of the metropolis and from bigger metro areas to smaller ones. Pre-pandemic, that was costly. The next question to examine is what and how the pandemic affected this picture. Did Covid-19 fundamentally change the equation that tied innovation, output and wages to size and concentration? Or is the new normal more like the old?

Table 4. Metro area GDP in 2019 and modeled gain with greater downtown/central area jobs and population

See text for methodology and Appendix C for model coefficients. Sources for first 3 columns: Census [1], [8] BEA [7]

	Central area popn as pct of metro	Downtown leading sector jobs as pct of metro	Metro area GDP 2019	Estimated gain from greater centrality/add'l growth	Pct of GDP
Growth metros with relative decentralization of jobs and population (N=22)					
Las Vegas	1%	5%	$ 131,692,941	$ 27,876,287	21%
Tampa	1%	9%	167,780,098	29,430,875	18%
Phoenix	2%	6%	278,657,111	45,433,760	16%
San Antonio	1%	10%	131,718,651	19,884,938	15%
Jacksonville	2%	9%	88,979,218	13,363,431	15%
Oklahoma City	1%	15%	81,647,293	11,947,718	15%
Riverside	5%	3%	190,286,551	27,091,693	14%
Orlando	1%	13%	149,517,211	20,805,854	14%
Dallas	3%	11%	540,375,331	61,433,416	11%
Atlanta	2%	14%	438,598,856	49,612,328	11%
Miami	4%	8%	374,910,437	40,268,422	11%
Sacramento	3%	12%	146,091,166	14,769,892	10%
Houston	4%	14%	505,257,585	36,874,746	7%
Charlotte	3%	27%	184,074,573	13,059,687	7%
Salt Lake City	8%	12%	166,089,406	8,986,827	5%
Indianapolis	4%	27%	148,436,881	8,029,199	5%
Columbus	7%	19%	138,502,066	5,073,702	4%
Nashville	5%	27%	142,709,378	5,179,286	4%
Denver	7%	20%	228,255,939	8,163,054	4%
Austin	7%	19%	163,600,981	5,361,890	3%
Minneapolis	7%	22%	278,695,503	8,422,280	3%
Portland	6%	34%	171,148,835	2,903,432	2%
Total	4%	15%	4,847,026,011	463,972,717	9.6%
Metros with centrality in jobs and population but slower growth (N=6)					
Chicago	8%	37%	720,832,051	166,867,699	23%
Philadelphia	14%	18%	450,455,061	88,966,829	20%
Los Angeles	9%	6%	1,051,367,202	176,176,780	17%
Boston	12%	31%	485,400,401	71,050,793	15%
New York	13%	40%	1,877,863,586	224,955,200	12%
Washington	10%	17%	567,417,585	28,504,605	5%
Total	11%	26%	5,153,335,886	756,521,907	14.9%
Grand Total	7%	20%	10,000,361,897	1,220,494,624	12.3%
U.S. GDP 2019			21,381,000,000		
28 metros' GDP gain as percent of U.S. GDP					**5.7%**

What the Pandemic Changed – and Didn't Change

With remote work allowing people to flee the cities hardest-hit by Covid-19, the pandemic induced a surge in inter-metropolitan migration. Seven metro areas – Boston, Chicago, Los Angeles, New York, San Diego, San Francisco, and Washington – experienced total net out-migration of 2.0 million people from April 2020 to June 2022, according to Census data released earlier this year. For super-star metros, net out-migration doubled from an annual rate of 0.7 percent of their total population pre-pandemic to 1.4 percent during the pandemic. The largest outflows were from the San Francisco and New York metros, as shown in Figure 11.

The biggest recipients of pandemic migration flows were smaller metros, generally ones that offered ready access to beaches, mountains or at least mild winters and plenty of sunshine. At the top of the list were North Port-Sarasota, Cape Coral, Palm Bay, Ocala, and Lakeland in Florida; Boise City, Idaho: Knoxville, Tennessee; Spartanburg, North Carolina; Greenville, South Carolina; Springfield, Missouri; Fayetteville, Arkansas; and Augusta, Tucson, and Tulsa. A total of 1.7 million people moved to smaller metros (not in the 43) that came out ahead in domestic migration during the pandemic. Pandemic in-flows to these metros nearly doubled from the last half of

Figure 11. Metro area net domestic in-migration during the pandemic and change from pre-pandemic

Shown as percent of total metro area population. Pandemic period is April 2020 to June 2022. Pre-pandemic period is prior 27-months.
Source: Census [1]

	Pandemic	Pct. pt. change from pre-pandemic
Growth/tech-oriented		
Austin	4.2%	0.3%
Phoenix	2.7%	-0.6%
Charlotte	2.4%	0.0%
Dallas	2.2%	0.8%
Nashville	2.0%	0.1%
Houston	1.0%	1.0%
Atlanta	1.0%	-0.1%
Raleigh	0.4%	-0.9%
Salt Lake City	0.3%	-0.3%
Portland	-0.3%	-1.1%
Denver	-0.4%	-1.6%
Other growth metros		
Tampa	3.6%	1.0%
Jacksonville	3.3%	0.6%
San Antonio	2.8%	0.7%
Orlando	1.8%	0.6%
Oklahoma City	1.8%	0.6%
Las Vegas	1.7%	-1.7%
Riverside	0.7%	-0.1%
Indianapolis	0.6%	-0.2%
Kansas City	0.0%	-0.4%
Sacramento	-0.2%	-1.1%
Columbus	-0.3%	-0.8%
Minneapolis	-1.1%	-1.3%
Miami	-1.5%	0.5%
San Diego	-1.8%	-0.7%
Super-star		
Seattle	-1.4%	-1.7%
Washington	-2.1%	-1.1%
Boston	-2.1%	-1.0%
Los Angeles	-3.2%	-1.1%
New York	-3.6%	-1.4%
San Francisco	-5.0%	-3.0%
Slow growth metros		
Cincinnati	-0.2%	-0.3%
Pittsburgh	-0.3%	0.0%
Buffalo	-0.4%	0.0%
Providence	-0.5%	0.0%
Philadelphia	-0.5%	0.0%
St. Louis	-0.7%	0.0%
Cleveland	-0.7%	-0.1%
Baltimore	-0.9%	-0.1%
Detroit	-1.2%	-0.3%
Milwaukee	-1.4%	-0.5%
Chicago	-2.5%	-0.6%
New Orleans	-2.5%	-1.6%

the 2010s and were four times larger during the pandemic than in the first half of that decade.[64]

Among the 43 metros, the biggest in-flows went to a combination of tech-oriented metros like Austin, Phoenix, Charlotte, and Dallas, and other growth metros, particularly in Florida. Behind these flows was, most simply, the matter of housing costs. Freddie Mac, the government-sponsored purchaser of mortgage-backed securities, found that in the first year of the pandemic homebuyers generally moved to less-expensive housing markets as compared to where they were living. The moving pairs often aligned with headlines about coastal to inland and Frostbelt to Sunbelt migration. The pairs also often-times involved moves to less-expensive neighboring metros like Los Angeles to Riverside, Boston to Worcester, New York to Poughkeepsie, San Jose to San Francisco, and Dallas to Houston. Whether close-by or distant, the recipient metros offered less-expensive housing – on average, they had $144,000 lower median home prices.[65]

Although inter-metropolitan migration increased during the pandemic, so much of it went to smaller metros (and non-metropolitan areas) that there was at most a modest uptick in migration to the Sunbelt metros examined in this report. Houston and Tampa saw increases in in-migration flows during the pandemic that amounted to 1.0 percent of their populations and Dallas and San Antonio of 0.8 percent and 0.7 percent, respectively. Notably, half the tech-oriented metros experienced declines in the number of people moving from elsewhere in the country.

Migration levels that barely budged, combined with increases in deaths due to Covid-19, meant that population growth slackened during the pandemic compared with the previous decade in nearly all of the 43 metros, although growth rates were still a healthy 2 percent or more for most of the growth metros. The fastest-growing metros pre-Covid, like Austin, Orlando, Raleigh, and Dallas, were among the fastest-growing during the pandemic. On the other hand, Denver, Portland, San Diego, Miami and Minneapolis experienced significant slowing of population growth. (See Figure 12.)

Among super-star metros, increased international migration in 2022, which had dropped sharply in 2021 and was on a downward trajectory before that, helped off-set some of the population losses from out-migration. Nevertheless, population declined by 3.5 percent in San Francisco, 2.6 percent in New York, 2.5 percent in Los Angeles, and 1.8 percent in Chicago between April 2020 and June 2022. These were a reversal of rising population in these metros in the 2010s. On the other hand, despite significant out-migration, Seattle and Washington metro populations were little-changed during the pandemic.

These migration and population data show the immediate effects of the pandemic, but also tend to be variable year-to-year depending on immediate events. It is important to look at a broader set of metrics that encompass housing, jobs, and wages, which are important in their own right as well as set the table for whether and where people decide to move. I will start with data on housing construction, a key to meeting the demands of growth in the country's largest cities and metro areas.

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A four-way metro area typology

Prior to the arrival of Covid-19, there was clearly evident a group of generally mid-size metros that were growing rapidly, attracting tech companies and tech talent, and taking on characteristics of the super-stars in output, wages, and urban amenities. Based on growth in leading sector jobs, this group included Austin, which more than doubled the number of leading-sector jobs between 2002 and 2019, Raleigh, Salt Lake City, and Nashville (75 percent increase in each), Charlotte (71 percent), Dallas (58 percent), Portland (47 percent), Houston (46 percent), and Phoenix (43 percent). Although with smaller percentage increases, Denver and Atlanta also added large numbers of high-paying leading sector jobs.

These relatively tech-oriented metros received further attention during the pandemic as being major recipients of domestic migrants and jobs. How exactly they were affected by the pandemic in contrast to other metros that had grown quickly pre-pandemic, and in contrast to super-star metros, is thus of interest. To aid in the analysis, the graphics in this section group the eleven growing tech-oriented metros, other growth-oriented metros (based on population increase of 7 percent or more from 2010 to 2020), super-stars, and remaining slower-growing metros. It should be emphasized that the groupings inevitably have a certain arbitrary quality (San Diego and Minneapolis fit uneasily with Tampa and Orlando, for example) but are at least a useful way to organize data for these 43 metros.

Figure 12. Metro area population change during the pandemic and change from pre-pandemic

Pandemic period is April 2020 to June 2022. Change from pre-pandemic is based on population growth rate from 2010 to 2020. Source: Census [1] [2]

	Pandemic	Pct. pt. change from pre-pandemic
Growth/tech-oriented		
Austin	6.0%	-0.6%
Raleigh	4.1%	-0.7%
Dallas	4.0%	-0.2%
Charlotte	3.6%	-0.3%
Phoenix	3.5%	0.2%
Houston	3.1%	-1.2%
Nashville	2.9%	-1.5%
Salt Lake City	2.4%	-1.5%
Atlanta	2.2%	-1.1%
Denver	0.7%	-2.7%
Portland	0.2%	-2.3%
Other growth metros		
Jacksonville	4.0%	0.1%
San Antonio	3.8%	-0.3%
Tampa	3.6%	0.6%
Orlando	3.4%	-1.8%
Las Vegas	2.5%	-0.9%
Oklahoma City	2.4%	-0.6%
Riverside	1.5%	-0.5%
Indianapolis	1.5%	-1.1%
Sacramento	0.8%	-1.7%
Kansas City	0.8%	-1.2%
Columbus	0.7%	-1.7%
Minneapolis	0.1%	-2.2%
Miami	0.0%	-2.2%
San Diego	-0.7%	-2.1%
Super-star		
Seattle	0.4%	-3.2%
Washington	-0.2%	-3.0%
Boston	-0.8%	-2.7%
Los Angeles	-2.5%	-3.1%
New York	-2.6%	-4.0%
San Francisco	-3.5%	-5.5%
Slow growth metros		
Cincinnati	0.4%	-0.9%
Philadelphia	-0.1%	-1.1%
Providence	-0.2%	-1.2%
Baltimore	-0.3%	-1.4%
Buffalo	-0.5%	-1.1%
St. Louis	-0.7%	-0.9%
Pittsburgh	-0.9%	-1.1%
Milwaukee	-0.9%	-1.2%
Cleveland	-1.0%	-1.2%
Detroit	-1.1%	-1.6%
Chicago	-1.8%	-2.2%
New Orleans	-2.0%	-3.5%

Housing starts

Every month, the Census Bureau releases results from a survey of building permits issued by local governments around the country. These data are most often mined to track the economic cycle and specifically the fortunes of the construction industry. Intuitively, one would expect to see a close relationship between housing starts and population growth since the latter is dependent on completion of new units. In practice, population changes estimated from housing starts (which include both single-family and multi-family housing) match decennial counts to within one or two percentage points at the metro level in the 2000-10 and 2010-20 decades. Also, they match within a fraction of a percentage point when metros are aggregated, as I will do below. Compared with intercensal population estimates issued by the Census Bureau, housing starts do about as well in anticipating changes decade to decade in decennial Census population and housing totals.

Housing start data also have the advantage of being very timely, released monthly within a few weeks of the end of each month. They are also geographically detailed, showing housing activity by city and town. Moreover, they are a forward indicator since there is a lag of about a year between the issuance of a housing permit and the finished units going on the market. Finally, in some sense housing starts tell us what we most want to know – the capacity of cities and metro areas to grow, irrespective of ups-and-downs induced by the pandemic and short-term economic conditions.

Figure 13. Housing Starts as a Percentage of Total Housing Units, 2008 to April 2023

Broken line shows trendline for 2013-19 projected to April 2023 Source: Census [10]

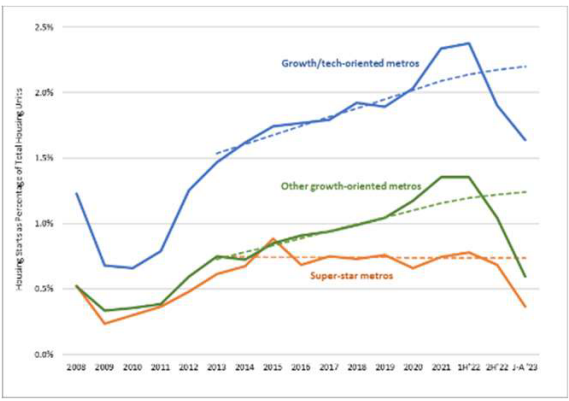


Figure 13 shows housing starts from the low point of the late-2000s housing bust through April 2023. I use 2013 to 2019 as the pre-pandemic baseline, a period of consistent growth after the trough of construction activity from 2009 to 2011 and a surge in 2012.

Housing activity trended upward in the growing tech metros throughout the baseline period, from 1.3 percent (new units relative to the total housing stock) in 2013 to 1.9 percent in 2019. Other growth metros added housing units at a rate of 0.8 percent in 2013, rising to 1.0 percent in 2019. The figure for super-star metros was around 0.7 percent throughout the period. Super-stars were thus growing more slowly pre-pandemic than growth metros, and the gap widened from 2013 to 2019.

As the pandemic hit in early 2020, there was a brief drop in housing activity in some super-star metros. Then, as people spending more time at home wanted more space, construction activity boomed everywhere (with the exceptions of San Francisco and Portland). The boom lasted until mid-2022 when builders to cut back on starting new housing in anticipation of falling demand due to rising interest rates.

At the peak of the pandemic housing boom, growing tech metros were adding housing at a faster rate than the pre-pandemic trendline would predict. The same was true for other growth metros, although to a lesser magnitude. Super-star metro housing construction stayed at about pre-pandemic levels.

Figure 14. Housing starts during the pandemic and change from pre-pandemic

Shown as percent of total housing units. Pandemic period is April 2020 to June 2022. Pre-pandemic period is prior 27 months. Source: Census [10]

	Pandemic	Pct. pt. change from pre-pandemic
Growth/tech-oriented		
Austin	14.5%	4.1%
Salt Lake City	8.9%	1.6%
Nashville	8.8%	1.1%
Houston	7.3%	1.4%
Raleigh	6.9%	1.5%
Dallas	6.8%	0.3%
Charlotte	6.2%	0.4%
Phoenix	5.9%	1.7%
Denver	4.9%	0.3%
Atlanta	4.8%	0.2%
Portland	3.6%	-0.9%
Other growth metros		
Orlando	6.9%	0.4%
San Antonio	6.7%	2.3%
Jacksonville	6.0%	1.9%
Tampa	5.0%	0.8%
Las Vegas	4.5%	0.2%
Indianapolis	4.0%	1.0%
Columbus	3.6%	0.9%
Minneapolis	3.5%	0.0%
Sacramento	3.3%	0.8%
Kansas City	3.3%	0.7%
Oklahoma City	3.2%	0.5%
Miami	2.5%	0.2%
San Diego	2.1%	0.0%
Riverside	1.8%	-0.6%
Super-star		
Seattle	4.8%	-0.3%
Washington	2.5%	-0.3%
New York	2.1%	0.1%
Boston	1.9%	0.2%
San Francisco	1.9%	-0.9%
Los Angeles	1.6%	-0.1%
Slow growth metros		
Philadelphia	2.0%	0.7%
Baltimore	2.0%	-0.9%
Chicago	1.1%	-0.2%

Looking at 2020 to 2022 as a whole, growing tech metros added to their housing stock at an annual rate of 2.1 percent, slightly above the 1.9 percent rate of the three years before the pandemic. Similarly, other growth metros added housing at a rate of 1.2 percent annually, a tick above the 1.1 percent pre-pandemic rate. Super-stars and slow growth metros were essentially flat.

The picture for individual metros generally mirrors results for these four groups with the exception of Austin, where housing starts increased from 10.5 percent of the housing stock pre-pandemic to 14.5 percent during the pandemic. (See Figure 14.) The difference of 4.1 percentage points comes to a total of 42,000 units, 5 percent of the total housing stock at the start of the pandemic.

Quite in contrast to migration flows and population changes, these data show a great deal of continuity between pandemic and pre-pandemic levels of housing construction. To the extent that expansion of the housing stock is the primary constraint on population growth, these data suggest that growth-oriented metros will continue to outpace super-star metros to a similar extent as was the case pre-pandemic. The main exceptions are Austin, San Antonio and Jacksonville where pandemic-era housing starts exceeded pre-pandemic rates.

Intra-metro growth

While there was much attention to inter-metropolitan population shifts during the pandemic, intra-metro area shifts were also significant and affected metro areas across the board.

Most affected, perhaps not surprisingly, were super-star metros. In the 2010s, the central cities of super-star metros accounted for 31 percent of their overall population growth. During the pandemic, as both central cities and suburbs lost population, the declines were greater in central cities, which accounted for 57 percent of super-star metro area population declines. [1, 3]

Among growing tech-oriented metros, prior to the pandemic central cities accounted for 24 percent of metro area growth. During the pandemic, that figure dropped to 4 percent. In other growth metros, population growth also shifted outward; central cities went from accounting for 31 percent of their metro-wide growth in the 2010s versus 14 percent during the pandemic.

These population shifts are important but they also appear likely to be transitory. Central city population losses slowed dramatically in the second year of the pandemic; in the super-star cities, population declines were one-third as much in the second year as in the first year. Moreover, cities like Seattle, Washington, Atlanta, Portland, and Nashville that had lost population in the first year, gained population in the second year. It is thus useful to look at housing start data as a likely gauge of longer-term trends.

Figure 15 shows the proportion of housing starts that were in the central city during the pandemic and the change from the 2017 to 2019 baseline period. What is of interest here is whether the proportion changed during the pandemic. In general, the answer is no; the share of metro area housing starts in the central city changed by no more than a few percentage points in most metros. A few metros are notable as exceptions. The proportion of housing starts in the central city dropped by double-digits in Portland and San Francisco during the pandemic.

Conversely, Philadelphia, New York, Baltimore, Nashville and Raleigh saw double-digit increases in the central city share of housing starts. The overall picture is of fluctuation in both directions rather than systematic inward or outward shift in housing starts.

As noted earlier, housing starts do not necessarily translate into population change. But with housing prices and rents still well above pre-pandemic levels, it seems clear that there is continuing demand for housing in both central cities and their suburbs. As happened after the overbuilding during the 2000s housing bubble, it seems likely that over time whatever housing is built will be sold or rented. The magnitude of population gain may fall short of the increase in housing stock given the desire for more space and privacy.[66] But on the whole, it seems highly likely that increases in housing units will over time come close to being mirrored in population gains.

Figure 15. Proportion of housing starts in central city during the pandemic and change from pre-pandemic

Pandemic period is 2020 to 2022. Pre-pandemic period is 2017 to 2019. Source: Census [10]

	Pandemic	Pct. pt. change from pre-pandemic
Growth/tech-oriented		
Nashville	56%	11%
Charlotte	53%	-6%
Austin	45%	-4%
Denver	34%	-8%
Phoenix	31%	1%
Raleigh	30%	10%
Houston	24%	-1%
Portland	21%	-22%
Salt Lake City	14%	4%
Atlanta	13%	-1%
Dallas	12%	-1%
Other growth metros		
Jacksonville	84%	0%
Oklahoma City	69%	4%
San Antonio	60%	2%
Columbus	57%	5%
San Diego	55%	0%
Sacramento	29%	-6%
Tampa	22%	-3%
Miami	20%	-3%
Minneapolis	19%	-2%
Indianapolis	19%	-6%
Orlando	16%	5%
Riverside	6%	0%
Super-star		
Los Angeles	47%	-1%
New York	36%	17%
Seattle	34%	-1%
Washington	32%	4%
San Francisco	20%	-12%
Boston	18%	-2%
Slow growth metros		
Philadelphia	55%	26%
Chicago	37%	-8%
Detroit	20%	4%
Cincinnati	16%	-3%
Pittsburgh	16%	0%
Baltimore	14%	14%

Jobs

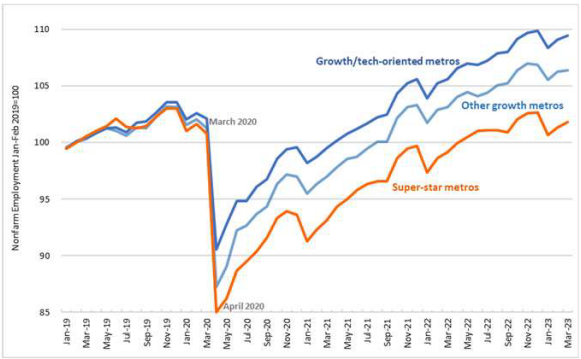
The federal government publishes monthly employment data so we can look directly at how the pandemic affected job growth across metro areas and across counties within metros. Figure 16 shows monthly employment since January 2019 for the two groups of growth metros and for super-star metros. As with population, super-star metros experienced large employment losses as the pandemic hit in Spring 2020. Employment also plummeted in growth metros but less severely than in the super-stars. Since the bottom of April 2020, all three groups experienced steady job growth aside from seasonal fluctuations. Growing tech metros were the first to reach pre-pandemic job levels in July 2021, followed by other growth metros in January 2022, and super-stars in January 2023. (Not shown in the figure, slow growth metros experienced the same drop as the super-stars, recovered slightly more quickly in 2020, and reached pre-pandemic job levels in February 2023.)

In growing tech metros, jobs increased 6.6 percent from the first quarter of 2020 (just before the pandemic hit) to the first quarter of 2023, compared with 7.9 percent over the prior three years. The difference of 1.3 percentage points is about a half-years' worth of job growth given a pre-pandemic annual growth rate of 2.5 percent, a remarkably small difference given the impact of the Covid in the spring of 2020. Other growth metros lost about a years' worth of job growth. Super-stars and slow growth metros lost three years of job growth.

A few metros outperformed these averages. They included Austin, Dallas, and Tampa, which each added roughly 2 percent more jobs from early 2020 to early 2023 than in the prior three years. (See Figure 17.)

Figure 16. Nonfarm employment, Jan. 2019 to March 2023

Indexed to Jan.-March 2019=100. Source: BLS [6]



By the end of the pandemic, job growth had largely resumed pre-pandemic patterns. Over the most recent 12 months, employment increased 4.9 percent in growing tech metros compared with 4.1 percent in the super-stars. This gap of 0.8 percentage points is slightly smaller than 1.0 percentage point gap before the pandemic when jobs grew at an annual rate of 2.5 percent in growing tech metros and 1.5 percent in super-star metros. In other growth metros, jobs increased 4.5 percent in the last 12 months compared with 2.1 percent pre-pandemic; in slow growth metros the figures were 3.0 percent and 0.9 percent.

Wages

Wages grew rapidly during the pandemic, led by tech and other knowledge-economy sectors. The highest increases in leading sector wages during the pandemic were in Seattle, Miami, Austin, Phoenix and Las Vegas, a mix that includes both tech-oriented and other growth metros. (See Figure 18.) Dallas and Houston gained leading sector jobs relatively rapidly but had relatively slow increases in leading sector salaries. Other growth metros with rapid growth in leading sector jobs, including Jacksonville and Orlando, had fairly average increases in leading sector salaries.

Figure 17. Nonfarm employment change during the pandemic and change from pre-pandemic

Pandemic period is change from 1Q'20 to 1Q'23. Pre-pandemic change is for 2016 to 2019. Source: BLS [6]

	Pandemic	Pct. pt. change from pre-pandemic
Growth/tech-oriented		
Austin	14.0%	2.3%
Dallas	9.7%	1.6%
Nashville	8.8%	-1.2%
Salt Lake City	8.3%	-0.8%
Raleigh	7.6%	0.1%
Phoenix	6.1%	-4.0%
Charlotte	5.8%	-1.9%
Atlanta	5.3%	-1.7%
Houston	4.2%	-1.4%
Denver	2.3%	-4.9%
Portland	1.3%	-5.4%
Other growth metros		
Jacksonville	9.2%	0.9%
Tampa	8.7%	1.7%
Orlando	6.5%	-3.5%
San Antonio	6.5%	0.5%
Las Vegas	6.0%	-3.2%
Indianapolis	5.7%	1.0%
Riverside	5.2%	-5.6%
Sacramento	4.2%	-3.3%
Miami	4.0%	-1.5%
San Diego	3.5%	-2.2%
Oklahoma City	3.4%	-1.5%
Kansas City	2.7%	-0.2%
Columbus	2.4%	-2.3%
Minneapolis	-1.6%	-5.3%
Super-star		
Seattle	1.8%	-5.4%
San Francisco	0.3%	-6.2%
Los Angeles	0.2%	-4.1%
New York	0.0%	-4.4%
Boston	-0.3%	-4.7%
Washington	-0.5%	-4.6%
Slow growth metros		
Cincinnati	2.7%	-1.0%
Philadelphia	2.4%	-1.6%
St. Louis	0.8%	-1.5%
Chicago	-0.2%	-2.5%
Detroit	-1.0%	-4.4%
Providence	-1.1%	-3.3%
Baltimore	-1.9%	-4.9%
Pittsburgh	-2.2%	-4.8%
Cleveland	-2.2%	-4.5%
Buffalo	-2.3%	-3.3%
Milwaukee	-2.7%	-4.0%
New Orleans	-3.9%	-5.5%

Figure 18. Wage growth in leading sectors during the pandemic and change from pre-pandemic

Pandemic period is change from 2019 to 2022. Pre-pandemic period is change from 2016 to 2019. Source: BLS [5]

	Pandemic	Pct. pt. change from pre-pandemic
Growth/tech-oriented		
Austin	27%	11%
Phoenix	24%	14%
Salt Lake City	24%	4%
Denver	22%	7%
Nashville	21%	7%
Atlanta	20%	8%
Raleigh	20%	3%
Charlotte	19%	12%
Portland	18%	6%
Dallas	18%	7%
Houston	13%	3%
Other growth metros		
Miami	29%	18%
Las Vegas	24%	17%
San Diego	21%	10%
Tampa	21%	10%
Indianapolis	21%	11%
Jacksonville	20%	9%
Orlando	20%	8%
Sacramento	20%	9%
San Antonio	18%	8%
Columbus	17%	7%
Riverside	17%	6%
Kansas City	17%	7%
Minneapolis	15%	4%
Oklahoma City	14%	2%
Super-star		
Seattle	29%	5%
San Francisco	20%	3%
Boston	19%	3%
New York	18%	9%
Washington	16%	6%
Los Angeles	16%	2%
Slow growth metros		
Pittsburgh	19%	9%
Cleveland	18%	9%
Buffalo	18%	8%
Chicago	17%	7%
Providence	17%	13%
Milwaukee	17%	7%
New Orleans	16%	9%
Philadelphia	15%	2%
Cincinnati	15%	6%
Baltimore	15%	2%
St. Louis	15%	3%
Detroit	14%	5%

Housing costs

As people spent their workdays and much of their leisure time at home, everybody wanted more space. Spurred also by then-falling interest rates, the resulting run-up in housing prices cut across every metro area, including metros which had seen little or no price appreciation in decades. This section examines the pandemic-era increases in housing prices together with an important longer-term shift in price trends between growth-oriented and super-star metros. Data is from the real-estate firm Zillow, which publishes monthly average housing prices going back to 2000. Throughout this section, housing prices are shown relative to median household income, a common way of measuring housing affordability. It should be noted that interest rates also matter a great deal in determining affordability, but the price-to-income ratio suffices for comparing across metro areas in a given year.

In the immediate context of the pandemic, the magnitude of rising housing prices was strongly related to pandemic-era migration flows and population, job, and wage growth. Six of the top seven metros in pandemic-era price appreciation were significant recipients of domestic migration. Nearly all in the top one-half in price appreciation were growth-oriented metros. (See Figure 19.) Statistically, the strongest relationship was with overall job growth and wage growth in leading sectors. Figure 20 shows this relationship, with housing price appreciation on the vertical axis

Figure 19. Housing price increases, 2019 to 2022

Change in the ratio of average house price to metro area household income between 2019 and 2022. Sources: Zillow [11], Census [1] [2]

Growth/tech-oriented	
Austin	54%
Salt Lake City	50%
Charlotte	47%
Nashville	46%
Raleigh	44%
Phoenix	42%
Dallas	35%
Atlanta	30%
Denver	26%
Houston	24%
Portland	15%
Other growth metros	
Tampa	45%
San Diego	37%
Riverside	37%
Miami	37%
Las Vegas	36%
Orlando	36%
Indianapolis	34%
Jacksonville	31%
Oklahoma City	28%
San Antonio	25%
Kansas City	25%
Sacramento	25%
Columbus	21%
Minneapolis	18%
Super-star	
Seattle	32%
San Francisco	28%
Los Angeles	21%
Boston	16%
Washington	15%
New York	12%
Slow growth metros	
Buffalo	32%
Providence	31%
Cincinnati	23%
Milwaukee	22%
Baltimore	22%
Cleveland	20%
St. Louis	19%
Philadelphia	18%
New Orleans	18%
Pittsburgh	16%
Detroit	15%
Chicago	15%

and the sum of percentile increases in jobs and wages on the horizontal axis. Austin is set apart from other metros with the largest increases in both housing prices and jobs and wages. It is followed by Salt Lake City, Nashville, Tampa, Phoenix, Miami, Charlotte, and Raleigh. Super-star metros, which had the lowest increases in job and wage measures, also had relatively small housing price appreciation.

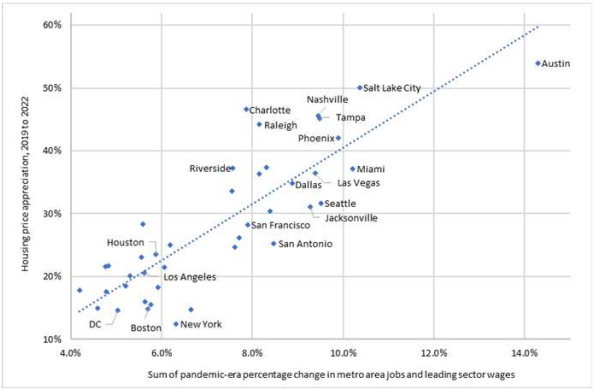
The graphic reinforces a central theme in this report: job growth and the knowledge economy bring many benefits, but also risks. The central risk today is escalating housing prices, pushed upward by the inward pull of knowledge economy feedback loops and the desire for more living space in an era of widespread remote work.

The specifics metro-to-metro is shown in Figure 21 (for the suburban housing market) and Figure 22 (for central area housing prices). I have separated these because suburban and central areas are distinct housing markets with somewhat different dynamics. Figures for suburban housing prices are for suburbs developed in the 1950s and later. While post-1950s suburbs contain a mix of housing stock in size, location, price, and other features, housing prices generally increase or decrease by very close to the same percentage in newer and older bands of suburban development and in higher and lower price brackets. Changes in the overall average housing price for post-1950 suburbs thus reflect what is happening across suburban sub-markets and serve the purpose of tracking suburban housing costs.

Figure 21 shows the suburban price-to-income ratio in each metro for 2012, 2019 and 2022 to capture the run-up in housing prices both before and during the pandemic. To highlight the movement of metro area groups across this period, super-star metros (plus San Diego) and slow growth metros are shown on the left with yellow and gray shading respectively.

Figure 20. Pandemic-era housing price appreciation and job and wage growth

Housing price appreciation is from Figure 19; percentile change in jobs and wages are from Figures 17 and 18, shown here at annualized rates.



Growth-oriented metros are shown on the right, with tech-oriented in a darker shade of green. Each column is sorted by the price-to-income ratio for all metros in that year.

As one would expect, the three coastal California metros are at the top of the list throughout the period. However, the super-star metros of Washington and Boston move down somewhat in the price listing between 2012 and 2022. Slow growth metros like Baltimore, Philadelphia, and Cleveland that had relatively high suburban housing prices in 2012 also move down in relative price. In 2022, they and all the other slow growing metros were in the bottom half of the price rankings. Conversely, while most growth-oriented metros were in the lower half of the listing in 2012, by 2022 most were in the upper half.

The wide gap between super-star and other metros evident in 2012 thus considerably narrowed by 2022 for many of the growth-oriented metros. A way to look at this is to compare housing costs in the super-stars with the ten most expensive growth-oriented metros. In the last decade, the difference in suburban housing prices between these two groups fell from the super-star metros being 78 percent more expensive in 2012 to a difference of 45 percent in 2022.

As housing prices in growth metros rose, the housing affordability advantages long associated with the exploding metropolis largely disappeared. For decades, escalating housing prices were closely associated with inward-growing super-star metros while metros expanding outwards remained relatively affordable. By 2022, this was more the exception than the rule. Salt Lake City, Austin, Phoenix, Las Vegas, Jacksonville, and Charlotte, for example, were all in the top half of housing prices despite half or more of their growth in the 2010s being concentrated in the outer band of suburbs. With these metros growing in the center city and the older suburbs as well as well as near the periphery, housing prices escalated rapidly.

The pandemic-era run-up in housing prices affected the suburbs considerably more than the metropolitan core. In New York and San Francisco, housing prices in the central area rose by less than 5 percent while suburban prices increased by about one-third between 2019 and 2022. The differences were smaller elsewhere, but still notable with gaps of over 20 percentage points in Atlanta, Portland, Houston, Dallas, and San Diego and over 15 percentage points in Charlotte, Austin, Sacramento, and Minneapolis.

As in the suburbs, central area price appreciation is directly related to population growth. In the case of central areas, which are by nature a fixed land area, the relationship is with cumulative population growth since 1980. Figure 22 presents the house price ratio in the same format as Figure 21; it also shows cumulative growth rates since 1980 (see the gray boxes). Central areas with the highest housing prices in 2012, 2019 and 2022 tended to have grown in population at a rate of 5 percent or more per decade since 1980. Conversely, central areas that lost population since 1980 tended to move toward the bottom of the ranking of central area housing costs. The result was that as central area population grew in more and more metros, the gap in central area housing prices between the super-stars and the ten most expensive (non-super star) growth-oriented metros dropped by more than half, declining from 47 percent in 2012 to 21 percent in 2022.

The super stars are still more expensive, but the consequences of growth are now being felt in both city and suburb across a wide swath of metropolitan areas. There is now less and less difference between super-star metros, long known for well-paying jobs that came at the cost of exorbitant housing costs, and fast-growing Sunbelt metropolises which had long kept housing affordable by expanding outward.

Figure 21. Suburban housing prices, 2012, 2019 and 2022

Figures are the ratio between average post-1950 suburban housing price and median metro area household income. Sources: Zillow [11], Census [1] [2]

Housing price to HH income, 2012		Housing price to HH income, 2019		Housing price to HH income, 2022	
Los Angeles	8.8	San Francisco	10.4	San Francisco	14.2
San Francisco	8.4	Los Angeles	10.0	Los Angeles	12.6
San Diego	7.1	San Diego	8.2	San Diego	11.4
New York	6.3	Seattle	5.9	Seattle	8.3
Boston	4.7		5.9		7.8
Baltimore	4.5	New York	5.8		7.8
Philadelphia	4.4		5.7	New York	7.5
Seattle	4.4		5.4		7.0
Washington	4.3		5.1		7.0
	4.2		5.1		7.0
Cleveland	4.2	Boston	4.9		6.8
	4.1		4.7		6.5
	3.9		4.7		6.5
	3.9		4.7		6.3
	3.8		4.6		6.2
	3.8		4.5		6.1
New Orleans	3.8		4.5	Boston	6.1
	3.7	Washington	4.4		5.8
Milwaukee	3.7		4.4		5.7
Pittsburgh	3.6	Baltimore	4.2		5.7
Chicago	3.6	Philadelphia	4.2		5.7
	3.6		4.1		5.5
	3.6		3.9		5.4
	3.3	Detroit	3.9	Washington	5.2
	3.3		3.9	Baltimore	5.1
St. Louis	3.3	Cleveland	3.9	Philadelphia	5.0
	3.3		3.9		5.0
	3.1	Milwaukee	3.9		4.6
Cincinnati	3.1		3.8	Cleveland	4.6
	3.0		3.7	Milwaukee	4.6
	3.0		3.7	Detroit	4.5
Detroit	3.0		3.7		4.5
	3.0	Chicago	3.7	Chicago	4.3
	3.0	Pittsburgh	3.6		4.3
	2.9	New Orleans	3.6		4.3
	2.9		3.5	New Orleans	4.3
	2.9		3.5	Pittsburgh	4.2
	2.8		3.4	Cincinnati	3.9
	2.8	St. Louis	3.3	St. Louis	3.9
	2.8	Cincinnati	3.2		3.9
	2.6		2.7		3.5

Figure 21. Suburban housing prices, 2012, 2019 and 2022

Figures are the ratio between average post-1950 suburban housing price and median metro area household income. Sources: Zillow [11], Census [1] [2]

Housing price to HH income, 2012		Housing price to HH income, 2019		Housing price to HH income, 2022	
	8.8		10.4		14.2
	8.4		10.0		12.6
	7.1		8.2		11.4
	6.3		5.9		8.3
	4.7	Portland	5.9	Salt Lake City	7.8
	4.5		5.8	Riverside	7.8
	4.4	Riverside	5.7		7.5
	4.4	Sacramento	5.4	Portland	7.0
	4.3	Denver	5.1	Austin	7.0
Portland	4.2	Miami	5.1	Miami	7.0
	4.2		4.9	Sacramento	6.8
Riverside	4.1	Jacksonville	4.7	Denver	6.5
Austin	3.9	Columbus	4.7	Nashville	6.5
Denver	3.9	Salt Lake City	4.7	Phoenix	6.3
Sacramento	3.8	Las Vegas	4.6	Las Vegas	6.2
Miami	3.8	Austin	4.5	Jacksonville	6.1
	3.8	Phoenix	4.5		6.1
Nashville	3.7		4.4	Charlotte	5.8
	3.7	Nashville	4.4	Tampa	5.7
	3.6		4.2	Columbus	5.7
	3.6		4.2	Orlando	5.7
Raleigh	3.6	Orlando	4.1	Raleigh	5.5
Salt Lake City	3.6	Tampa	3.9	Dallas	5.4
Phoenix	3.3		3.9		5.2
Jacksonville	3.3	Dallas	3.9		5.1
	3.3		3.9		5.0
Charlotte	3.3	Charlotte	3.9	Atlanta	5.0
Kansas City	3.1		3.9	Indianapolis	4.6
	3.1	Raleigh	3.8		4.6
Minneapolis	3.0	Atlanta	3.7		4.6
San Antonio	3.0	San Antonio	3.7		4.5
	3.0	Minneapolis	3.7	Minneapolis	4.5
Dallas	3.0		3.7		4.3
Orlando	3.0		3.6	Kansas City	4.3
Indianapolis	2.9		3.6	Houston	4.3
Tampa	2.9	Kansas City	3.5		4.3
Atlanta	2.9	Indianapolis	3.5		4.2
Columbus	2.8	Houston	3.4		3.9
Oklahoma City	2.8		3.3		3.9
Houston	2.8		3.2	San Antonio	3.9
Las Vegas	2.6	Oklahoma City	2.7	Oklahoma City	3.5

Figure 22. Central area housing prices, 2012, 2019, 2022

See notes to Figure 21. Percentages in grayare for metros with central area population growth rate of at least 15 percent from 1980 to 2010 (first panel) and 20 percent from 1980 to 2020 (second and third panels). Sources: Zillow [11], Census [1] [2]

Housing Price/HH Income, 2012		Popn. change 1980-2010
New York	14.0	9%
Los Angeles	11.2	19%
San Francisco	10.0	17%
San Diego	6.7	65%
Boston	6.3	24%
Portland	6.3	29%
Washington	6.1	16%
Seattle	6.1	37%
Houston	5.7	25%
Sacramento	5.5	4%
Austin	5.4	16%
New Orleans	5.3	-48%
Miami	5.1	13%
Chicago	5.1	-5%
Denver	4.9	4%
Charlotte	4.6	19%
Nashville	4.5	-12%
Tampa	4.4	7%
Dallas	4.2	27%
Salt Lake City	4.2	10%
Riverside	4.0	47%
Raleigh	3.2	5%
St. Louis	3.2	14%
Orlando	3.2	-7%
Cincinnati	3.0	-30%
Oklahoma City	2.9	-4%
Pittsburgh	2.8	-28%
Atlanta	2.8	35%
Phoenix	2.7	-5%
San Antonio	2.7	-3%
Philadelphia	2.6	-15%
Minneapolis	2.6	12%
Kansas City	2.3	-25%
Cleveland	2.2	-24%
Milwaukee	2.2	2%
Columbus	1.9	-9%
Indianapolis	1.9	-25%
Baltimore	1.8	-24%
Jacksonville	1.8	17%
Las Vegas	1.7	-11%
Detroit	1.5	-37%

Housing Price/HH Income, 2019		Popn. change 1980-2020
New York	14.8	22%
Los Angeles	14.4	23%
San Francisco	11.5	31%
Boston	8.1	37%
Seattle	8.0	86%
Portland	7.8	65%
San Diego	7.2	97%
Sacramento	7.0	25%
Washington	6.7	39%
Houston	6.6	50%
Tampa	6.6	68%
Austin	6.5	43%
Denver	6.2	35%
Miami	5.9	34%
Dallas	5.7	49%
New Orleans	5.6	-43%
Riverside	5.6	50%
Nashville	5.5	20%
Charlotte	5.4	79%
Chicago	5.3	8%
Salt Lake City	5.3	19%
Columbus	5.0	6%
Phoenix	4.5	6%
Orlando	4.3	22%
Atlanta	4.1	84%
San Antonio	3.9	2%
Raleigh	3.9	20%
Oklahoma City	3.8	6%
Las Vegas	3.7	-5%
Pittsburgh	3.6	-26%
Minneapolis	3.4	36%
Cincinnati	3.3	-24%
Philadelphia	3.2	-8%
St. Louis	3.1	30%
Jacksonville	3.0	25%
Indianapolis	2.9	-13%
Detroit	2.9	-33%
Kansas City	2.7	-6%
Milwaukee	2.5	4%
Cleveland	2.2	-21%
Baltimore	1.9	-29%

Housing Price/HH Income, 2022		Popn. change 1980-2020
Los Angeles	15.5	23%
New York	14.7	22%
San Francisco	12.7	31%
Austin	9.2	43%
Tampa	9.1	68%
Seattle	8.8	86%
San Diego	8.8	97%
Salt Lake City	8.3	19%
Boston	8.3	37%
Portland	7.7	65%
Riverside	7.7	50%
Sacramento	7.7	25%
Nashville	7.6	20%
Miami	7.4	34%
Denver	7.2	35%
Charlotte	7.1	79%
Houston	7.0	50%
Washington	7.0	39%
Dallas	6.8	49%
New Orleans	6.2	-43%
Phoenix	6.1	6%
Columbus	5.7	6%
Orlando	5.5	22%
Chicago	5.5	8%
Raleigh	5.4	20%
Las Vegas	5.1	-5%
Atlanta	4.6	84%
San Antonio	4.6	2%
Oklahoma City	4.5	6%
Pittsburgh	4.0	-26%
Jacksonville	3.8	25%
Cincinnati	3.8	-24%
Indianapolis	3.7	-13%
Minneapolis	3.5	36%
St. Louis	3.5	30%
Philadelphia	3.3	-8%
Detroit	3.3	-33%
Kansas City	3.2	-6%
Milwaukee	3.0	4%
Cleveland	2.4	-21%
Baltimore	2.3	-29%

Overall metro-level effects of the pandemic

Clearly, the pandemic had very disparate effects across metro areas. Some metros experienced precipitous declines in population and jobs; a few others experienced surges. All experienced increases in housing prices, but the magnitude varied greatly. To put all of this into an overall picture, Figure 23 recaps the differences between what happened during the pandemic and the pre-pandemic trendline for population, migration, housing starts, and metro area jobs. This gives a reasonably good picture of the quite different effects of the pandemic across metro areas.

The biggest "winner" was clearly Austin, which experienced a surge in jobs and housing starts, an uptick in domestic migration, and less slowing of population growth than most metros. Tampa, Jacksonville, San Antonio, Dallas and (to a modest extent) Indianapolis also experienced a pandemic boost in growth. On the other hand, in Sunbelt metros like Atlanta, Charlotte, Nashville, Miami, and Orlando, the pandemic had an overall slowing effect on pre-pandemic growth rates. The metros most negatively affected were the six super-star metros together with New Orleans, Portland, Denver, and Minneapolis.

It should be emphasized that the figures are for the change in trendlines comparing the pandemic and pre-pandemic. New York, for example, had bigger declines in each of the four indicators than Seattle, but Seattle had a greater slowdown in job growth, housing starts and domestic migration.

Where metro areas stand economically coming out of the pandemic

To provide a picture of how metros are faring economically coming out of the pandemic, Figure 24 summarizes job and wage growth rates in the past year. The six metros that experienced a pandemic "boost" (marked in red) have also done well in job and wage growth coming out of the pandemic. Houston, Nashville, Miami, and Orlando are also near the top on economic measures. Among super-star metros, Seattle, New York, Los Angeles, and San Francisco all have job growth of 4 percent or more, above pre-pandemic rates. But in contrast to growth metros, their wages are stagnant or declining.

In the larger picture, despite setbacks in job and wage growth, the super-star metros retain their considerable advantages rooted in size and concentration. Table 5 shows that in 2022 the super-stars still top the list in economic performance as measured by GDP per job and leading sector wages. There is, however, some re-sorting of the urban hierarchy just below the super-stars. Over the last decade, Austin moved up a remarkable 11 slots, from twentieth to ninth in the rankings based on these economic measures. Portland and Miami moved up by six and Raleigh by three, putting these three metros in the top 20. Further down the list, Salt Lake City moved up by eight, Buffalo by four, Jacksonville and Cleveland by three.

Austin and Jacksonville were among the metros receiving a "boost" in jobs and wages from the pandemic. That the others were not illustrates the fundamental importance of longer-term economic and spatial development in the reordering of the urban hierarchy.

Figure 23. Who gained and who lost during the pandemic

Difference between pre-pandemic trendline and pandemic change. See column for percentage point change from pre-pandemic in Figures 11, 12, 14 and 17.

	Popula-tion	Domestic migration	Housing starts	Metro jobs	4 indicators averaged
Growth/tech-oriented					
Austin	-0.6%	0.3%	4.1%	2.3%	1.5%
Dallas	-0.2%	0.8%	0.3%	1.6%	0.6%
Raleigh	-0.7%	-0.9%	1.5%	0.1%	0.0%
Houston	-1.2%	1.0%	1.4%	-1.4%	0.0%
Salt Lake City	-1.5%	-0.3%	1.6%	-0.8%	-0.2%
Nashville	-1.5%	0.1%	1.1%	-1.2%	-0.4%
Charlotte	-0.3%	0.0%	0.4%	-1.9%	-0.4%
Atlanta	-1.1%	-0.1%	0.2%	-1.7%	-0.7%
Phoenix	0.2%	-0.6%	1.7%	-4.0%	-0.7%
Denver	-2.7%	-1.6%	0.3%	-4.9%	-2.2%
Portland	-2.3%	-1.1%	-0.9%	-5.4%	-2.4%
Other growth metros					
Tampa	0.6%	1.0%	0.8%	1.7%	1.1%
Jacksonville	0.1%	0.6%	1.9%	0.9%	0.9%
San Antonio	-0.3%	0.7%	2.3%	0.5%	0.8%
Indianapolis	-1.1%	-0.2%	1.0%	1.0%	0.2%
Kansas City	-1.2%	-0.4%	0.7%	-0.2%	-0.3%
Oklahoma City	-0.6%	0.6%	0.5%	-1.5%	-0.3%
Miami	-2.2%	0.5%	0.2%	-1.5%	-0.8%
Columbus	-1.7%	-0.8%	0.9%	-2.3%	-1.0%
Orlando	-1.8%	0.6%	0.4%	-3.5%	-1.1%
San Diego	-2.1%	-0.7%	0.0%	-2.2%	-1.3%
Sacramento	-1.7%	-1.1%	0.8%	-3.3%	-1.3%
Las Vegas	-0.9%	-1.7%	0.2%	-3.2%	-1.4%
Riverside	-0.5%	-0.1%	-0.6%	-5.6%	-1.7%
Minneapolis	-2.2%	-1.3%	0.0%	-5.3%	-2.2%
Super-star					
Boston	-2.7%	-1.0%	0.2%	-4.7%	-2.1%
Los Angeles	-3.1%	-1.1%	-0.1%	-4.1%	-2.1%
Washington	-3.0%	-1.1%	-0.3%	-4.6%	-2.2%
New York	-4.0%	-1.4%	0.1%	-4.4%	-2.4%
Seattle	-3.2%	-1.7%	-0.3%	-5.4%	-2.7%
San Francisco	-5.5%	-3.0%	-0.9%	-6.2%	-3.9%
Slow growth metros					
Cincinnati	-0.9%	-0.3%	0.2%	-1.0%	-0.5%
Philadelphia	-1.1%	0.0%	0.7%	-1.6%	-0.5%
St. Louis	-0.9%	0.0%	-0.3%	-1.5%	-0.7%
Buffalo	-1.1%	0.0%	-0.1%	-3.3%	-1.1%
Providence	-1.2%	0.0%	0.0%	-3.3%	-1.1%
Chicago	-2.2%	-0.6%	-0.2%	-2.5%	-1.4%
Pittsburgh	-1.1%	0.0%	0.1%	-4.8%	-1.4%
Cleveland	-1.2%	-0.1%	0.1%	-4.5%	-1.5%
Milwaukee	-1.2%	-0.5%	-0.1%	-4.0%	-1.5%
Detroit	-1.6%	-0.3%	0.0%	-4.4%	-1.6%
Baltimore	-1.4%	-0.1%	-0.9%	-4.9%	-1.8%
New Orleans	-3.5%	-1.6%	0.4%	-5.5%	-2.6%

Figure 24. Job and wage growth coming out of the pandemic

Change in jobs and wages over the past year (12-months ending March 2023 for jobs and calendar year 2022 for wages) compared with a year earlier. Data are annual rate of change. Metros that experienced a pandemic "boost" are highlighted in red. Sources: BLS [6] [5]

	Total jobs	Leading sector jobs	Wages, all industries	Wages, leading sectors	Average of current growth rates
Growth/tech-oriented					
Austin	7.5%	10.1%	4.8%	4.6%	6.7%
Dallas	6.1%	8.1%	5.2%	5.7%	6.3%
Houston	5.3%	6.2%	5.7%	6.0%	5.8%
Nashville	6.1%	7.5%	5.7%	3.9%	5.8%
Salt Lake City	3.6%	3.2%	5.7%	9.5%	5.5%
Charlotte	4.2%	4.7%	5.8%	6.4%	5.2%
Atlanta	4.5%	4.3%	5.1%	6.3%	5.1%
Raleigh	4.5%	7.5%	3.7%	2.9%	4.7%
Denver	3.2%	3.6%	5.3%	4.7%	4.2%
Phoenix	3.7%	3.0%	4.7%	4.5%	4.0%
Portland	4.0%	4.7%	2.5%	-3.0%	2.1%
Other growth metros					
Jacksonville	5.1%	7.1%	6.9%	6.8%	6.5%
Miami	4.8%	6.5%	6.1%	6.6%	6.0%
Indianapolis	4.1%	4.7%	5.9%	8.4%	5.8%
Orlando	7.3%	8.5%	3.7%	3.4%	5.7%
Tampa	5.3%	6.4%	5.4%	5.4%	5.6%
San Antonio	5.1%	5.5%	5.1%	5.6%	5.3%
Las Vegas	7.6%	8.5%	4.2%	0.1%	5.1%
Oklahoma City	3.7%	4.3%	5.5%	3.7%	4.3%
Sacramento	3.8%	4.0%	3.0%	4.6%	3.8%
Columbus	2.6%	2.0%	4.4%	4.0%	3.3%
Riverside	3.6%	3.9%	3.3%	2.2%	3.2%
San Diego	5.1%	4.5%	1.3%	1.0%	3.0%
Minneapolis	2.4%	0.2%	3.3%	3.5%	2.4%
Kansas City	3.2%	2.9%	3.9%	-2.6%	1.9%
Super-star					
Seattle	4.2%	5.5%	-0.4%	2.2%	2.9%
Washington	2.5%	1.6%	2.3%	3.7%	2.5%
Boston	3.2%	3.2%	1.7%	1.8%	2.5%
New York	4.8%	4.5%	0.6%	-0.1%	2.4%
Los Angeles	4.1%	3.5%	1.0%	-1.7%	1.7%
San Francisco	4.5%	3.6%	-9.8%	-8.6%	-2.6%
Slow growth metros					
Philadelphia	4.3%	4.1%	3.2%	3.6%	3.8%
Buffalo	2.6%	3.5%	3.9%	4.6%	3.7%
Cincinnati	3.1%	4.3%	3.3%	n.a.	3.6%
New Orleans	2.6%	1.8%	4.6%	4.8%	3.4%
St. Louis	2.7%	3.3%	4.6%	2.9%	3.4%
Pittsburgh	2.4%	3.6%	3.0%	3.6%	3.2%
Chicago	3.4%	3.1%	2.9%	3.1%	3.1%
Providence	2.7%	2.7%	3.3%	2.6%	2.8%
Milwaukee	1.5%	0.3%	4.6%	4.6%	2.8%
Detroit	3.0%	1.3%	3.3%	3.3%	2.7%
Cleveland	1.6%	-0.5%	4.0%	3.1%	2.1%
Baltimore	1.5%	0.7%	1.9%	0.1%	1.1%

Table 5. Metro areas ranked by economic performance, 2012 and 2022

Sum of GDP/job and average salary for leading economic sectors. Green shading highlights metros that moved up three or more in the ranking from 2012 to 2022. Data is not available for Cincinnati and St. Louis.
Sources: BLS [5] [6], BEA [7]

	2012	2022	Rank 2012	Rank 2022	change
San Francisco	313,696	530,184	1	1	0
Seattle	245,048	407,619	3	2	+ 1
New York	274,928	381,133	2	3	- 1
Boston	243,982	362,084	4	4	0
Washington	241,028	319,266	5	5	0
Los Angeles	217,821	303,447	7	6	+ 1
San Diego	214,061	297,842	9	7	+ 2
Houston	224,522	293,727	6	8	- 2
Austin	185,607	291,153	20	9	+ 11
Philadelphia	216,776	286,945	8	10	- 2
Chicago	208,632	286,409	10	11	- 1
Denver	200,371	286,387	12	12	0
Raleigh	193,261	280,561	16	13	+ 3
Charlotte	203,086	278,585	11	14	- 3
Minneapolis	194,118	274,736	15	15	0
Atlanta	193,206	273,906	17	16	+ 1
Dallas	190,256	268,163	18	17	+ 1
Baltimore	196,212	268,085	13	18	- 5
Portland	178,005	267,035	25	19	+ 6
Miami	176,712	262,519	26	20	+ 6
Providence	195,816	261,597	14	21	- 7
Pittsburgh	179,312	260,589	24	22	+ 2
Nashville	182,923	256,649	23	23	0
Sacramento	183,257	249,518	22	24	- 2
Detroit	184,231	248,059	21	25	- 4
Cleveland	170,844	240,296	29	26	+ 3
Kansas City	173,985	239,346	27	27	0
New Orleans	188,853	236,173	19	28	- 9
Salt Lake City	157,861	235,964	38	29	+ 9
Indianapolis	173,625	234,038	28	30	- 2
Columbus	166,766	233,937	31	31	0
Phoenix	166,595	232,055	32	32	0
Milwaukee	166,937	230,883	30	33	- 3
Jacksonville	159,649	228,355	37	34	+ 3
Buffalo	156,364	228,013	39	35	+ 4
San Antonio	160,589	227,537	36	36	0
Tampa	163,607	227,140	33	37	- 4
Las Vegas	163,040	217,629	34	38	- 4
Oklahoma City	162,192	213,313	35	39	- 4
Orlando	149,254	210,804	41	40	+ 1
Riverside	152,413	195,938	40	41	- 1

Conclusion

At one level, the pandemic re-invigorated tendencies evident throughout American history of de-concentration, decentralization and dispersion. The main movements were from central cities to suburbia and from larger, more expensive, mostly coastal metros to Sunbelt and other inland locales. The starkest evidence was in the net out-migration of 2 million residents from seven big, mostly coastal metros, led by San Francisco, New York, and Los Angeles, and the arrival of nearly one million domestic migrants in 13 of the metros examined in this report, led by Dallas, Austin, Phoenix, and Tampa. Perhaps even more impressively, smaller metros (not among the 43 examined in this report) that had net in-migration during the pandemic gained a total of 1.7 million domestic migrants, mostly on the appeal of ocean, sun, and mountains together with less expensive housing.

Equally, however, the pandemic underscored the strength and appeal of dense urban centers. After steep drops in population and jobs in Spring 2020, much is looking up for the hardest-hit metros. Population declines slowed in the second year of the pandemic, with smaller outflows and increased foreign immigration. By early this year, they had reached pre-pandemic employment totals, and in the past year gained jobs faster than pre-pandemic, including jobs in finance, tech, business services and other leading economic sectors that had propelled their pre-pandemic rise to the top of the urban hierarchy. Wage growth slowed, which may be helpful for firms' competitiveness but may also undercut the attraction of these cities to potential employees.

Sunbelt metros that pre-pandemic were at least several steps up the ladder of the knowledge-based economy, most notably Austin, Dallas, Houston, and Nashville, were among the best performing metros in population, jobs, housing starts, and wages during and coming out of the pandemic. Their pull had much in common with the super-star metros in their mix of knowledge-economy jobs, top-notch universities, and deep pools of educated and highly skilled workers.

And after much speculation about remote work permanently displacing white collar employees from the office, hybrid schedules largely replaced fully remote arrangements as both employers and employees concluded that a few days at home and a few days in the office was the best way to mesh the advantages of in-person interaction with the flexibility offered by remote work.[67] Some who moved far away to be "fully" remote found themselves becoming a new variant of the "super commuter," taking pre-dawn flights to another time zone and renting a second apartment to spend face-to-face time with colleagues and clients. And recently, tech giants who earlier embraced fully-remote work arrangements are now calling workers back to the office.[68]

Ironically, then, a pandemic which first compelled people to put distance between each other ended up showcasing the pull of in-person interaction and exchange that is the great strength of dynamic, dense urban environments. This, more than statistics on domestic migration or population or employment, was the most important "evidence" to emerge from the pandemic about the future of U.S. cities and metro areas.

Before the pandemic, the pressures and forces acting on the metro areas examined in this report all pointed inward: faster population growth in and near the metropolitan center, the centripetal pull of the knowledge

economy, rising land values on the urban fringe[69] and geographic barriers to expansion on the metropolitan edge. The pandemic did not fundamentally change any of this. Whether in housing or transportation, the heart of the matter going forward is making more intensive use of land in and near the metropolitan center. That means adding denser housing, substituting travel by bus and train for reliance on the automobile, making urban centers safer and more conducive to traveling by foot and by bike, and enlarging the public realm. Rather than making city-building processes obsolete, the pandemic made them more important, and in more places.

For both the nation's leading metros and for the country as a whole, the stakes of getting this right are enormous. The urban revival of the last four decades has demonstrated to all the economic benefits of density, concentration, size, and economic diversity. But the pattern has been to constantly push out from the most successful urban centers to the next tier – from San Francisco to Seattle, from Seattle to Austin, from Austin to San Antonio and Spokane.[70] One major consequence is to spread the crisis in affordable housing from a few super-stars to a broader swath of metros. A second involves the foregone economic output that by my estimates totals 12.2 percent of the GDP of 28 metro areas modeled and 5.7 of national GDP – the additional GDP that would come from greater centrality in 22 fast-growing but relatively decentralized metros and faster growth in six denser but relatively slower-growing metros. Moreover, the benefits of big-city wealth creation would be spread more equitably if housing were affordable not just to the apex of knowledge workers, but to people of all educational backgrounds and occupational specializations – as was the case up until about a decade ago.[71]

For cities and metros hard-hit by the pandemic and its aftermath, the first order of business has been to address budget shortfalls, crime, and homelessness, which together pose a threat to public order and raise the specter of an "urban doom loop." As they make progress in these areas,[72] they also need to find new uses for empty office buildings, fill vacant storefronts, and ensure that public transportation is maintained as the lifeblood of the urban circulation system. Beyond these vital immediate issues, the pandemic in some respects improved their prospects. They are still more expensive than the next tier of cities with which they compete, but the gap has shrunk by roughly half in central area and suburban housing costs as compared with a decade ago. Office vacancies are causing rents to fall, and many businesses once priced out of super-star office markets may consider moving in. And for better or worse, overcrowding will not be an issue for years to come on the New York City subway, Washington Metro or Bay Area BART trains. All of these reduce the disadvantages in costs and crowdedness of super-star metros, while they retain their core strengths of size, density, economic sophistication and diversity, and global connectivity.

For metros growing rapidly on the fruits of the knowledge economy, the question is how to accommodate the inward-focused pressures of growth that success in that economy brings. Their situation is different from most of the super-star metros in that their leading sector jobs are mostly miles from downtown. That has long had the benefit of bringing jobs closer to employees living near the urbanized edge. Companies replicated to some degree the advantages of downtown densities by clustering with other companies in related lines of businessAs a

strategy for growth, this works until it doesn't. As workers and firms flock to increasingly rich ecosystems of talent, skill, capital, and inventiveness, demands on housing, highways, and transit systems also intensify. At some point, suburban sub-centers will bump against the limits of how many cars can fit on the highway and how many people can be housed close enough to workplaces. Silicon Valley offers a cautionary tale of what happens with virtuous circles outside the big downtown. Housing prices skyrocketed and highways congealed with traffic. To cope, tech giants hired bus companies to bring workers from San Francisco. They set up large operations in the downtowns of super-star cities already well-served by transit or, in Google's case, began work on an expansive campus abutting a new BART station and commuter rail hub next to downtown San Jose.

Many of the growth-oriented metros recognize that transit and downtown jobs are keys to their future and are building new rail lines and investing in rapid bus systems to make that happen. But in both transport and housing they are turning a very big ship that was programmed for growth on the periphery rather than in the center. The last three years showed no hint of recalibration; growth in jobs and housing starts were no more focused inward during the pandemic than before, reinforcing rather than relieving dependence on the private car.

Moreover, in many metros an urge for dilution accompanies visions of dense, dynamic downtowns. Plans for downtown development combine tall buildings with sufficient parking to give everyone a "choice" in how to get around. Light rail systems are expanded into the far suburbs on the promise of spurring suburban development. Slow and circuitous downtown streetcar routes are touted more as lures for tourists than modes of transport for residents. Far less money or effort is put into building out high-frequency city bus systems even though they are the backbone of commutation to downtown jobs in all but the biggest metro areas and can be expanded far more quickly than rail and at less expense.[73]

Coming to grips with the post-pandemic city and metro area, then, is a question of fully coming to grips with what is necessary to become more urban. I have focused on the economic and spatial elements, which I think are central shaping forces. But there is equally the matter of politics, social relations, and what as a final point I would like to highlight as problem-solving, trust-building and learning processes.

I was struck by a recent review of 67 studies on the pandemic-era effects of remote working.[74] The review found that remote work was by itself not necessarily a good thing or a bad thing for employee productivity, performance or satisfaction. The authors emphasized the importance of careful attention to supporting the mental, physical, and social functioning of employees. Workers who received the support and guidance they needed and felt a sense of autonomy and that they mattered did well. Those who felt isolated, distrusted, and infringed upon fared poorly. The central takeaway was that what mattered to outcomes was not the "it" of being remote versus in-office, but the day-to-day details of the "how." Getting the details right, in turn, required openness, trust, and respect.

During the pandemic there was no alternative to the intermediation of technology, but there is a reason that both bosses and workers express a desire to spend time together. The CEO of an artificial intelligence

company remarked, "We don't invent rockets that land themselves by people working on Zoom calls once a week. We have to get together in a room and get on whiteboards and fail and fail and fail until you succeed."[75] An IT manager hired to supervise programmers in India said, "I can share my screen with them, but I can't, in real time, sit with them while they're making the mistakes and show them where they're making the mistakes."[76] A marketing director at an electronic recycler points out that overhearing co-workers as they make sales calls helps him pick up tips on what works and what doesn't.[77] Similarly, seeing who is talking to whom in the office helps workers map out internal company networks and plot where to find information and how to influence decision-making.[78] Then there is the role of simple silence. MIT professor Jared Curhan, who studies how breakthroughs happen in negotiations, says that a silent pause in the middle of an intensive back-and-forth can "convey that you're truly considering what the other person just said." Pauses allow "everyone to stop and think, 'Maybe there is another way we can get this done.'"[79] Hammering out difficult issues, picking up on subtle visual cues, learning by overhearing, "hearing" the unsaid, finding a new path into an unknown – all depend on nuances and subtleties far more likely to be perceived and acted on face-to-face than through computer screens.

The importance of these dynamics is probably intuitive to anyone who has spent much time in complex organizations. The same skills, I would suggest, are key to the public processes of trust-building, learning and problem-solving that must underpin making cities and metro areas more urban. My own experience in urban transportation is full of examples. Gaining community support for building out bus, bike, and pedestrian networks is a process of agency staff learning where best to actually lay the concrete and put down the markings. It is also a process of community activists learning what they can expect in a planning process, whether they will be listened to and feel like they matter, and whether when problems arise the agency will come back and fix them. In housing – rightly a centerpiece of attention today – I would expect similar dynamics to apply, whether to address fears about luxury apartments displacing affordable housing or to penetrate the complexities of zoning and building codes. I was struck by the emphasis of city staff in Vancouver, BC, perhaps the leading example in North America of becoming a denser, more transit-oriented city, on the need to develop "a deep understanding of the impact that a greater height and building massing and volume has on a smaller, more gentle, lower existing form of development," and then locating "particular spots; unique sites where an insertion of a, let's say, a six-story building could go." The former staffer, an architect and urban designer named Ralph Segal, added, "It's hard work. You have to be very observant."[80]

Whatever the exact context, one can see how close attention, careful listening, respectful back-and-forth, mutual understanding and trust matter not just as fuel for a virtuous economic circle but also for adding to the thread count of dense urban environments. William Appleman Williams wrote in 1961 that history can be "a way of learning" and the means to "become meaningful actors in making history."[81] The processes of making cities more urban can be a "way of learning" no less than going far back in history. In this way, it would seem that the ripest fruit that might harvested from the pandemic is what was learned through Zoom and Slack – to work at trust, respect, and openness, so as

to make a future that is at once more urban, more urbane, and more inclusive.

Data Sources

Data sources referenced in figures and tables are listed below.

[1] U.S. Census Bureau, Decennial Census. Population and housing counts used in the maps and various tables are primarily from the decennial Census. Except for certain historical data otherwise noted, census data are downloaded from the excellent NHGIS site.[82] Median household income used to calculate the ratio of housing prices to household income is based on the decennial Census or ACS.

[2] U.S. Census Bureau, American Community Survey. ACS is an ongoing survey that collects data on demographic characteristics, employment, income, housing, and other topics from a national sample. It replaced the decennial Census long-form questionnaire in 2010. Data are available annually for states, counties, and cities; a compilation for five-year periods provides data at the census tract level. Data are most readily available at the NHGIS website[83] and also at https://data.census.gov.

[3] U.S. Census Bureau, Intercensal population, housing, and migration estimates. In addition to the decennial Census, the Census Bureau produces annual population estimates and components of change, e.g., births, deaths, and migration. County estimates for 2020 to 2022 are available on the Census Bureau website.[84]

[4] U.S. Census Bureau, County Business Patterns. CBP is published annually and contains detailed economic data by industry sector broken down by state, metro area (CBSA), county and zip code. It includes business establishments with paid employees and reports the number of employees and payroll. It generally excludes government employees. I use CBP for wage data through 2020, the latest year available. Data are available on the Census Bureau website;[85] data for 1946 to 1974 is available from this source.[86]

[5] Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW). This source is similar to County Business Patterns, but available quarterly and with less of a delay than the annual CBP. It has employment and wages only for employees covered by unemployment insurance, resulting in a some differences compared with CBP results for jobs and wages. I use QCEW for recent wage data and in Table 5; comparisons with earlier years use QCEW for both recent and earlier data. It should be noted that both CBP and QCEW suppress some sector-level data for confidentiality reasons; in compiling salaries for leading sectors I have used the sectors available for each metro. Data are available on the BLS website.[87]

[6] Bureau of Labor Statistics, Nonfarm Employment. This is a different data series than CBP or QCEW. It is based on a monthly survey of 122,000 businesses and government agencies nationwide and thus includes both public and private sector jobs. It reports employment by state and metro area (CBSA). All jobs data are from this source. Data are available on the BLS website.[88]

[7] Bureau of Economic Analysis, Gross Domestic Product by Metro Area. GDP is a comprehensive measure of economic activity covering goods and services produced nationally and at the state, county and metro area (CBSA) levels. It is used to measure trends in economic output and compare across geographic areas. I use metro area GDP for 2020 and earlier from this source. The 2022 data underlying results in Table 5 are

estimated based on published 2021 metro area results adjusted for statewide change from 2021 to 2022. Data are available on the BEA website.[89]

[8] LEHD Origin-Destination Employment Statistics (LODES). The Census Bureau's LEHD program links various survey and administrative data on jobs, businesses, and workers. An interactive website allows users to analyze a number of workforce dynamics including job flows, e.g., from outlying cities and counties into a central city or central area, and employment by industry sector. The online tool is available here[90]. I used LODES 2002 and 2019 metro area and downtown employment (2019 is the latest year available). The number of downtown jobs is based on LODES 2019 jobs that are in census tracts within a two-mile radius of the center of the downtown business district. This generally includes a substantially larger geographic area than the core business district, but provides a reasonable comparison across cities of downtown area jobs. (Note that LODES tract-level data permits a more precise delineation of the downtown area than CBP zip code data.)

[9] Census Transportation Planning Program (CTPP). CTPP is also a Census Bureau product, based (originally) on the decennial Census long-form questionnaire and since 2010 on the American Community Survey. It provides detailed commuting data including travel mode and travel time at a very fine-grained level called Travel Analysis Zones (TAZs) designed specifically for transportation analysis. Downtown TAZs are much smaller than downtown census tracts. For the purpose of computing downtown commute modes and travel times, I used the area of dense employment in the downtown business district to reflect commute patterns for the core downtown area. The latest available data are for 2012-16, which, while somewhat aging, likely measure pre-pandemic mode shares and commute times with reasonable accuracy. (See table in Appendix D.) CTPP is funded by state Departments of Transportation and the data is housed on the AASHTO website[91].

[10] U.S. Census Bureau, Building Permits Survey. BPS is a monthly survey of housing permits issued by local jurisdictions for new privately-owned residential construction. Data are available monthly at the state, metro area (CBSA), county, and city level from the Census Bureau website[92]. Since housing permits (commonly referred to as housing starts) are reported by city and town, it is not possible to assign housing starts precisely to each decadal band of suburbanization that I discuss in the text. To analyze the geographic distribution of housing starts within each metro area, I classified each city/town as central city, "outer suburb," or in between. "Outer suburbs" are those where a substantial (20 percent) part of the jurisdiction became "urbanized" based on the 200 housing unit per square mile threshold in 1990 or later. This produces a similar result to my identification of post-2000 suburban development at the census block group level. Also note that my counting of housing starts in the outer band of new suburbs includes the area just outside the 2020 urbanized block groups so as to include housing activity that will further expand the metro area in the current decade.

[11] Zillow Home Value Index. Zillow publishes monthly data on home values, based on the typical value for homes in the 35th to 65th percentile range. Data are available at the state, county, city, and zip code level going back to 2000. I use this data in the analysis of housing

prices, generally as a ratio of house price to household income based on the decennial Census. (For 1980 housing prices I use the self-reported decennial Census data.) Zillow data are available on the Zillow website.[33]

Appendix A. Metro Area and Central Area Population by Decade

Metro Area Population

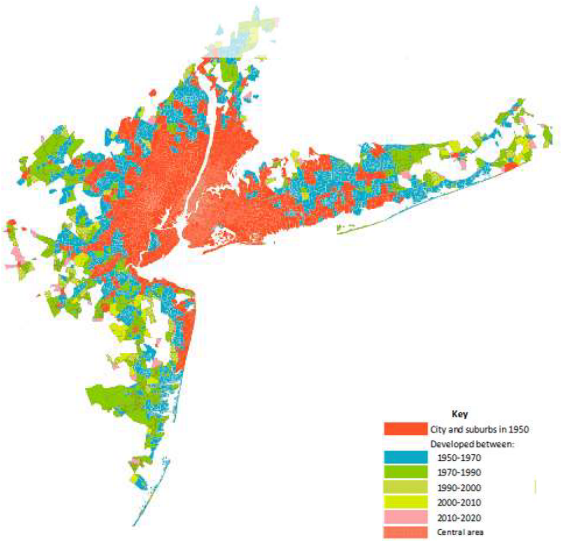
Metro	1950	1960	1970	1980	1990	2000	2010	2020
New York	12,872,257	14,192,109	16,683,263	15,742,952	16,228,704	17,662,524	18,212,201	19,433,038
Los Angeles	4,226,357	6,603,420	8,374,914	9,545,526	11,621,463	12,773,287	13,229,165	13,555,967
Chicago	5,251,400	6,204,707	6,995,136	7,252,551	7,434,318	8,194,576	8,486,658	8,604,067
Dallas	874,084	1,336,651	1,893,124	2,406,651	3,413,634	4,443,784	5,554,078	6,458,507
San Francisco	2,183,277	3,016,416	3,843,328	4,237,679	4,963,824	5,549,156	5,836,387	6,347,138
Houston	741,976	1,130,837	1,640,670	2,463,846	3,103,367	3,919,491	5,117,490	6,019,045
Miami	572,792	1,017,293	2,086,848	3,069,932	3,954,751	4,901,830	5,455,769	6,012,209
Philadelphia	3,552,829	4,072,510	4,766,514	4,653,316	4,837,916	5,092,141	5,371,465	5,620,707
Washington	1,283,753	1,808,405	2,547,134	2,696,267	3,399,633	3,936,010	4,590,060	5,119,785
Atlanta	554,926	777,167	1,151,707	1,510,448	2,361,238	3,403,027	4,437,157	5,104,929
Boston	2,576,168	2,747,155	3,214,045	3,387,945	3,778,744	4,043,976	4,234,651	4,592,544
Phoenix	244,433	484,784	846,401	1,393,597	2,043,270	2,980,710	3,778,900	4,284,746
Detroit	2,821,559	3,527,708	3,989,089	3,818,105	3,739,536	3,846,559	3,676,166	3,740,841
Seattle	1,029,375	1,415,728	1,642,855	1,879,813	2,300,412	2,740,618	3,155,943	3,666,523
San Diego	447,764	811,878	1,114,542	1,610,212	2,287,423	2,571,518	2,853,773	3,042,289
Minneapolis	1,028,819	1,304,425	1,637,386	1,687,458	2,051,978	2,373,529	2,604,862	2,866,018
Tampa	295,140	621,945	867,137	1,318,586	1,796,633	2,090,890	2,451,416	2,766,593
Denver	494,549	776,789	1,035,088	1,317,194	1,544,373	2,018,286	2,345,087	2,674,603
Baltimore	1,179,880	1,449,232	1,738,315	1,787,692	1,944,370	2,046,565	2,156,179	2,258,065
St. Louis	1,492,677	1,718,483	2,005,332	1,945,337	2,049,937	2,103,799	2,165,669	2,168,484
Salt Lake City	329,446	481,428	661,868	927,887	1,220,582	1,562,503	1,906,741	2,166,078
Orlando	85,779	209,561	346,244	581,170	974,121	1,338,231	1,761,389	2,120,346
Las Vegas	28,251	71,241	224,571	385,244	689,656	1,301,582	1,845,485	2,105,455
Portland	526,520	660,856	815,341	1,048,002	1,222,818	1,575,831	1,841,510	2,084,332
Riverside	169,428	384,421	531,454	706,370	1,204,622	1,468,662	1,866,280	1,992,093
Charlotte	313,559	370,544	530,135	558,958	817,847	1,119,097	1,635,181	1,956,850
Cleveland	1,471,390	1,834,780	2,100,515	1,977,376	1,928,331	1,983,015	1,939,393	1,950,394
San Antonio	415,020	610,755	740,683	916,197	1,147,119	1,352,120	1,706,402	1,937,006
Sacramento	232,001	447,973	629,288	793,858	1,144,967	1,401,799	1,711,080	1,892,046
Pittsburgh	1,729,267	1,834,248	1,888,999	1,777,614	1,737,772	1,700,405	1,668,748	1,688,983
Kansas City	764,474	985,023	1,085,230	1,114,931	1,243,100	1,386,250	1,554,495	1,679,559
Cincinnati	881,689	1,042,009	1,198,669	1,280,968	1,360,445	1,483,649	1,578,926	1,662,043
Austin	140,029	170,154	225,733	357,847	604,239	914,214	1,301,883	1,629,103
Indianapolis	539,863	677,405	860,701	856,853	964,688	1,172,345	1,426,321	1,607,293
Columbus	449,282	617,882	778,661	825,078	964,388	1,146,102	1,336,120	1,526,320
Raleigh	160,771	165,548	250,074	347,881	523,151	782,588	1,185,561	1,431,252
Milwaukee	820,848	1,074,080	1,178,300	1,163,273	1,231,625	1,277,494	1,323,298	1,328,116
Nashville	275,213	352,849	432,075	544,950	655,308	838,326	1,044,638	1,220,516
Providence	784,638	808,216	931,662	977,963	1,084,559	1,126,935	1,131,964	1,187,454
Jacksonville	229,793	295,999	445,954	520,820	705,960	857,196	1,009,987	1,139,607
Buffalo	936,167	1,104,975	1,406,222	1,023,548	1,003,580	971,928	950,868	981,295
New Orleans	648,677	822,802	934,288	1,157,427	1,046,058	1,046,135	865,074	919,860
Oklahoma City	270,862	368,026	486,165	556,098	651,699	723,607	822,863	909,287

Central Area Population

Metro	Land area (sq. miles)	1950	1960	1970	1980	1990	2000	2010	2020
New York	38.0	2,781,016	2,496,463	2,350,922	2,067,028	2,082,955	2,191,437	2,260,006	2,513,806
Los Angeles	72.3	855,960	813,119	839,276	964,486	1,134,739	1,159,996	1,152,288	1,182,039
San Francisco	40.6	794,678	740,734	707,255	660,656	696,258	737,267	772,997	865,202
Philadelphia	35.1	1,338,319	1,156,250	1,016,865	827,017	748,463	698,805	701,372	759,068
Chicago	33.8	1,059,626	868,253	736,693	598,180	558,933	565,922	568,655	645,562
Boston	23.6	607,807	500,756	435,662	398,820	442,468	462,552	493,307	546,650
Washington	28.3	513,402	450,137	409,016	354,222	361,711	368,256	411,212	492,048
Seattle	23.3	208,969	184,178	161,152	154,509	164,941	187,217	211,556	287,325
Houston	34.4	192,389	180,828	184,667	177,701	170,595	191,560	221,950	266,098
Miami	14.0	140,088	159,412	179,136	176,058	171,268	168,380	198,728	235,622
Baltimore	14.0	492,774	413,357	345,158	283,347	277,614	230,169	214,044	201,707
Minneapolis	17.2	251,189	201,219	165,609	146,175	144,395	156,781	164,030	198,688
Denver	17.5	196,140	176,249	163,688	134,578	119,729	137,445	139,796	181,742
Salt Lake City	22.8	162,714	160,810	150,998	137,899	135,733	149,147	151,301	163,564
Dallas	22.7	133,479	122,647	119,872	109,299	116,035	137,940	138,624	163,080
Pittsburgh	18.7	406,099	334,670	263,257	211,290	177,276	162,442	152,471	155,438
Portland	11.4	122,435	98,918	86,263	78,426	79,315	85,542	101,516	129,134
Austin	16.2	91,382	90,119	88,766	84,378	82,881	89,743	97,770	120,872
Atlanta	11.2	159,612	135,989	81,859	59,706	60,108	70,500	80,515	109,735
Milwaukee	9.7	218,428	176,359	129,186	104,061	114,044	104,121	105,696	107,712
Columbus	12.9	185,511	170,378	128,687	101,727	99,475	93,757	92,113	107,497
Riverside	14.8	30,194	56,788	62,298	63,610	84,034	87,365	93,484	95,654
San Diego	4.9	50,801	44,043	37,918	39,736	51,542	53,690	65,716	78,371
Phoenix	15.4	98,457	87,237	80,840	70,590	66,963	76,048	67,064	74,997
Cincinnati	9.5	201,528	163,364	111,135	85,560	78,068	66,897	60,059	65,327
Buffalo	7.6	155,572	133,455	110,956	82,453	76,134	69,059	62,244	65,317
Detroit	13.6	333,583	224,097	156,551	96,999	79,095	72,974	60,776	64,975
Nashville	10.6	96,409	77,749	60,221	52,308	42,504	43,069	45,837	62,595
New Orleans	7.9	183,165	167,752	128,412	105,152	78,244	77,847	55,062	59,759
Indianapolis	11.7	151,322	132,381	98,282	65,390	58,764	56,751	48,872	57,106
Sacramento	7.3	72,805	64,587	45,598	44,464	48,488	47,863	46,084	55,396
Charlotte	10.0	48,772	59,823	37,833	28,732	27,601	27,539	34,188	51,542
Cleveland	11.3	153,759	126,519	93,309	60,720	49,898	48,879	46,160	47,957
St. Louis	6.4	103,792	67,434	47,455	31,581	33,181	27,669	36,149	41,122
Kansas City	6.4	110,906	76,351	53,743	38,085	30,765	27,990	28,447	35,789
Raleigh	5.5	32,030	30,904	28,689	25,285	27,212	23,084	26,497	30,447
Providence	2.4	46,994	33,103	25,563	22,457	24,401	26,737	27,517	29,648
Orlando	5.4	25,817	35,512	26,753	23,984	21,689	19,873	22,209	29,146
San Antonio	6.3	55,787	50,940	35,315	28,188	29,341	29,356	27,476	28,870
Tampa	3.8	26,406	33,378	20,503	16,461	14,813	14,215	17,610	27,597
Las Vegas	5.2	5,720	7,946	14,236	18,879	23,211	25,434	16,807	17,953
Jacksonville	4.1	27,401	29,870	16,614	13,968	15,834	13,740	16,368	17,450
Oklahoma City	3.3	37,799	28,919	16,445	9,154	8,436	8,764	8,769	9,702

Appendix B. Additional Maps of Metro Area Development

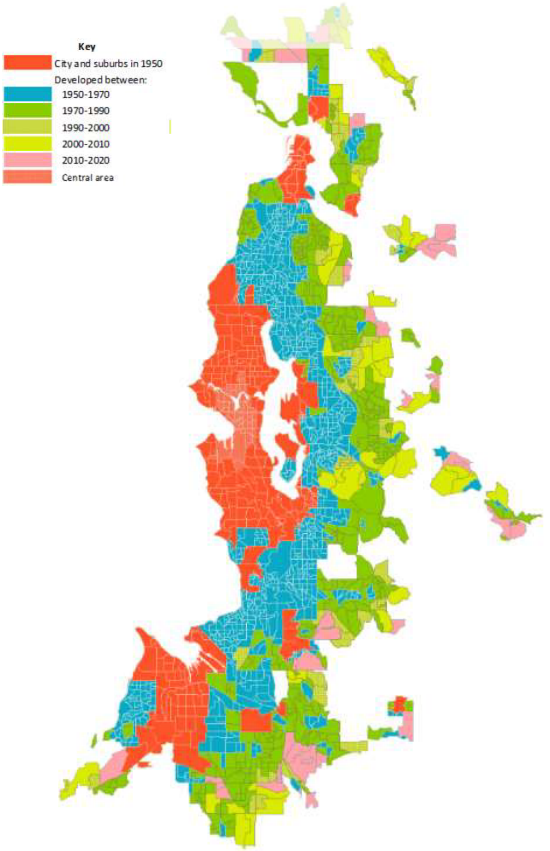
New York



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	1,488	834,761	1,517,848	(1,640,463)	(108,978)	1,026,615	281,212	1,063,092
1950-60	356	381,410	344,463	13,041	7,010	34,880	16,208	18,913
1960-70	742	87,384	407,608	373,036	302,373	132,964	65,664	63,028
1970-80	440	17,396	72,977	184,944	(9,077)	69,641	44,469	33,259
1980-90	291		87,470	20,776	110,525	68,367	36,561	19,113
1990-2000	136			8,306	7,842	46,931	21,145	5,192
2000-10	131				(1,135)	11,546	31,990	18,240
2010-20	52					3,781	7,123	53,228
Total	1,176	1,320,951	2,430,367	(1,040,360)	308,560	1,394,726	504,372	1,274,065

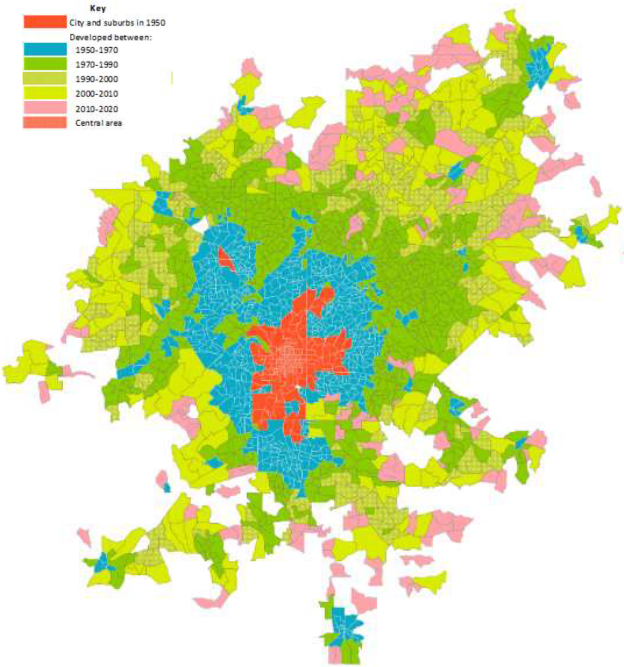
Seattle



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	278	252,675	(69,586)	(55,725)	(11,257)	106,664	86,384	221,762
1950-60	114	98,705	68,746	39,980	69,284	50,105	44,386	74,076
1960-70	221	33,762	147,987	133,423	180,792	106,804	66,450	107,704
1970-80	134	11,863	28,226	64,694	20,128	52,887	49,464	55,741
1980-90	135		19,993	17,863	101,194	58,223	37,597	41,241
1990-2000	68			6,424	10,251	37,123	29,048	20,081
2000-10	114				(4,481)	13,699	64,616	34,549
2010-20	40					3,488	3,758	41,454
Total	1,176	397,004	195,366	206,659	365,910	428,992	381,701	596,608

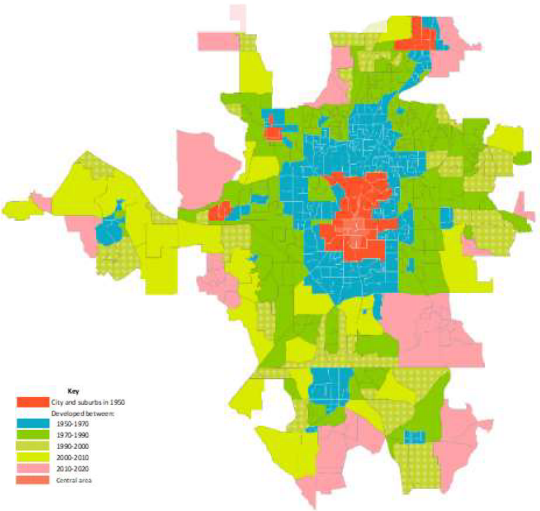
Atlanta



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	136	38,381	(7,813)	(109,174)	(32,064)	35,761	(5,023)	85,257
1950-60	133	147,219	115,511	35,348	23,530	62,611	(28,402)	28,728
1960-70	341	54,213	166,021	151,938	180,885	115,233	45,950	82,539
1970-80	301	16,683	55,715	178,617	157,657	119,974	64,218	69,403
1980-90	500		26,621	73,201	386,551	259,041	142,465	118,996
1990-2000	478			43,624	51,414	310,067	232,479	108,765
2000-10	743				38,601	116,718	316,866	174,084
2010-20	228					22,428	44,920	160,608
Total	1,176	256,497	356,055	373,555	806,573	1,041,833	813,474	828,380

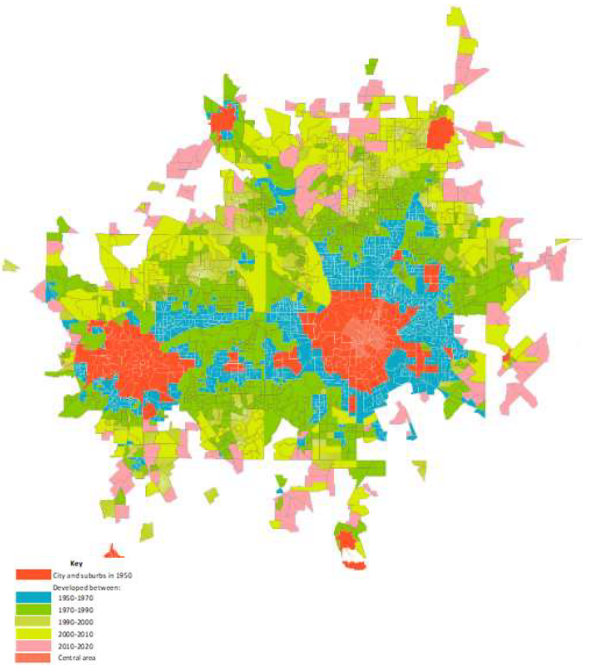
Orlando



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	41	38,830	17,632	(1,278)	1,035	(2,688)	46	13,947
1950-60	54	73,908	25,150	30,454	26,243	14,018	6,369	24,433
1960-70	111	8,789	71,971	98,811	102,746	57,782	29,797	53,209
1970-80	97	7,621	12,160	81,843	80,247	68,195	36,790	43,696
1980-90	145		9,779	8,164	149,491	89,588	59,740	66,718
1990-2000	146			5,800	19,138	102,046	127,246	69,365
2000-10	209				10,563	27,803	103,288	87,590
2010-20	137					3,195	22,840	104,158
Total	1,176	129,147	136,692	223,794	389,463	359,939	386,116	463,115

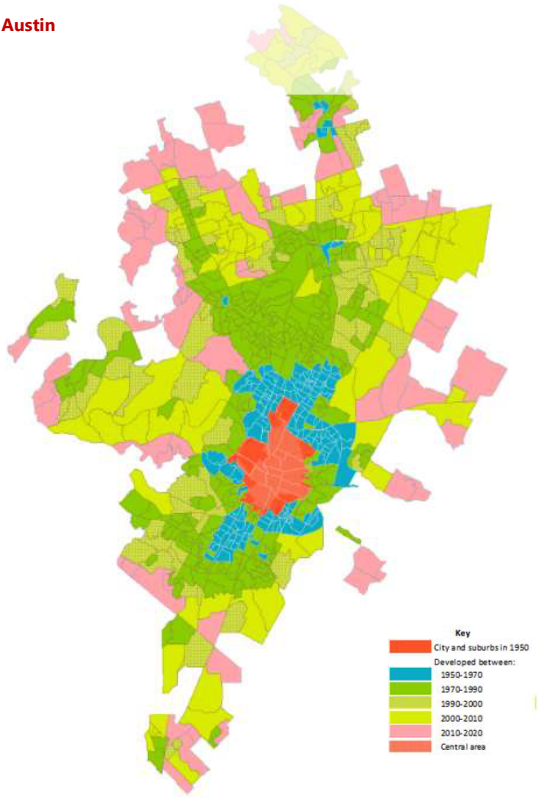
Dallas



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	280	147,727	70,693	(102,073)	2,183	109,556	(2,957)	90,217
1950-60	197	273,599	216,981	27,801	56,377	94,414	26,365	56,051
1960-70	218	29,537	213,300	201,031	254,605	94,181	4,327	66,273
1970-80	283	21,816	52,910	297,537	186,012	151,427	98,349	112,377
1980-90	337		20,148	31,758	423,490	279,450	149,005	110,871
1990-2000	220			14,474	24,076	239,699	220,767	79,635
2000-10	482				0	47,294	503,474	389,004
2010-20	318					16,888	61,545	295,525
Total	1,176	472,679	574,032	470,528	946,743	1,032,909	1,060,876	1,199,954

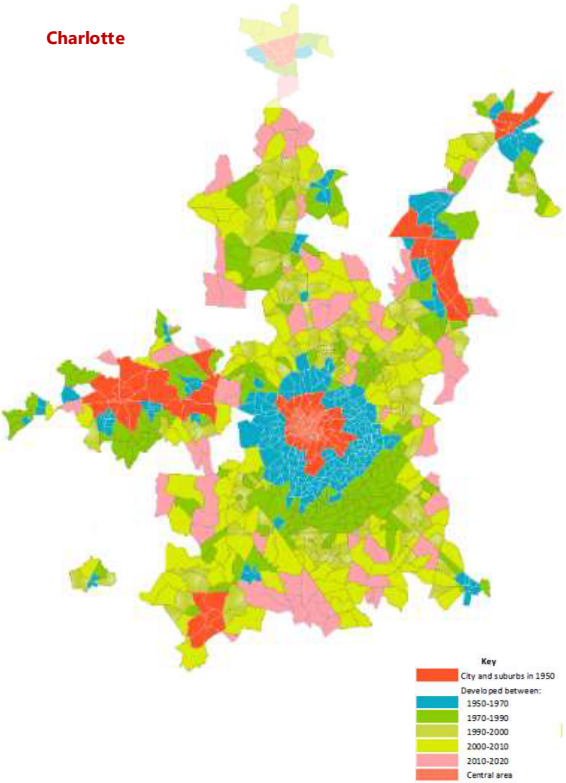
Austin



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	33	2,908	11,738	(12,921)	(4,655)	10,673	8,734	34,877
1950-60	16	23,499	12,138	4,689	2,625	9,299	(4,694)	4,020
1960-70	41	6,520	22,084	80,674	44,281	34,650	2,433	6,744
1970-80	52	672	1,814	56,330	44,939	44,195	26,829	25,648
1980-90	106		7,870	9,906	138,958	90,559	31,862	28,361
1990-2000	119			9,394	7,664	95,102	109,090	71,590
2000-10	215				1,696	23,514	168,229	155,980
2010-20	188					16,539	34,807	103,742
Total	1,176	33,598	55,643	148,073	235,508	324,531	377,292	430,962

Charlotte



Growth in population and land area by decade, 1950-2020

When developed	Land area	Population change by decade						
		1950-60	1960-70	1970-80	1980-90	1990-2000	2000-10	2010-20
Pre-1950	160	13,385	21,513	(44,187)	(3,446)	7,156	5,612	48,071
1950-60	36	32,343	28,400	8,011	8,901	10,999	4,077	8,868
1960-70	148	18,413	50,022	37,076	74,632	25,294	29,622	27,759
1970-80	38	(707)	5,736	2,065	(768)	10,891	5,713	5,471
1980-90	206		11,771	23,922	118,388	74,532	58,568	47,879
1990-2000	194			17,636	9,657	115,859	109,304	47,610
2000-10	351				2,738	36,838	192,894	136,011
2010-20	188					10,844	30,247	86,765
Total	1,176	63,436	117,442	44,522	210,101	292,413	436,038	408,434

Appendix C. Regression Model

Regression coefficients for GDP per job for 28 metro areas (results shown in Table 5.)

Variable	Coefficients	Standard Error	P-value	Fit
(Intercept)	4.700	0.055	0.000	
Log of downtown leading sector jobs	0.043	0.019	0.031	
Log of central area population	0.048	0.016	0.005	
				Adjusted R^2 = .71
				F-Statistic = 34.69
				Significance F = 0.000 (6.1 x 10-8)

Interpretation of coefficients:

- 10 percent increase in downtown leading sector jobs produces a 0.43 percent increase in GDP/job
- 10 percent increase in central area population produces a 0.48 percent increase in GDP/job

The resulting GDP/job is multiplied by the number of jobs in the metro area to derive metro area GDP.

Appendix D. Supplemental Tables

Bus and Rail Commute Shares to Downtown Jobs, 2012-16

Sources: [9], [8]

Metro	Ratio rail to bus	Rail	Bus	Total transit commute share	Downtown jobs (2-mile radius)
Super-star metros					
New York	5.6	68%	12%	81%	1,523,290
Boston	3.9	44%	11%	56%	423,081
Chicago	3.3	48%	15%	63%	697,926
Washington	3.1	37%	12%	49%	470,135
San Francisco	1.6	32%	20%	54%	514,071
All others					
Philadelphia	1.9	35%	18%	53%	296,971
Dallas	1.7	8%	4%	12%	209,184
Salt Lake City	1.6	10%	7%	17%	84,763
Atlanta	0.9	8%	9%	17%	208,754
Los Angeles	0.8	10%	13%	23%	372,123
Baltimore	0.7	8%	12%	20%	167,114
Sacramento	0.6	5%	9%	14%	126,815
Charlotte	0.6	4%	7%	11%	163,114
Miami	0.6	6%	11%	18%	130,463
Denver	0.5	8%	15%	23%	211,273
St. Louis	0.5	3%	6%	9%	84,245
Portland	0.5	9%	18%	26%	176,920
Orlando	0.4	1%	2%	2%	112,224
San Diego	0.3	3%	10%	13%	93,159
Austin	0.2	1%	6%	7%	168,375
Nashville	0.1	1%	6%	7%	176,368
Phoenix	0.1	1%	10%	12%	118,786
Minneapolis	0.1	3%	29%	32%	185,128
Seattle	0.1	4%	35%	42%	283,944
Detroit	0.04	0.2%	5%	6%	115,498
Houston	0.04	1%	18%	19%	205,813

Note that several metros have expanded rail services since data were collected and so rail percentages will be somewhat higher in some places.

Geographic distribution of leading sector job growth, 2002 to 2019

Shaded cells highlight concentration of growth in each metro. Source: [8]

	Distance from center of downtown business district					
	Downtown (0-2 miles)	2-8 miles	8-14 miles	14-20 miles	Beyond 20 miles	Total
Growth/tech-oriented						
Portland	**32%**	10%	**43%**	11%	3%	100%
Charlotte	**22%**	**20%**	**22%**	**29%**	7%	100%
Raleigh	9%	**25%**	**49%**	16%	1%	100%
Austin	14%	**24%**	**36%**	17%	9%	100%
Nashville	28%	10%	**25%**	**24%**	13%	100%
Denver	9%	12%	**32%**	**33%**	13%	100%
Atlanta	11%	3%	**32%**	0%	**54%**	100%
Phoenix	2%	0%	23%	**43%**	**32%**	100%
Dallas	6%	2%	12%	**35%**	**45%**	100%
Houston	14%	11%	14%	23%	**38%**	100%
Salt Lake City	3%	11%	21%	20%	**46%**	100%
Other growth-oriented						
Indianapolis	**32%**	0%	**33%**	27%	7%	100%
Minneapolis	**24%**	14%	10%	**43%**	9%	100%
Columbus	19%	0%	**45%**	**31%**	5%	100%
Las Vegas	0%	0%	**91%**	9%	0%	100%
San Antonio	0%	10%	**62%**	17%	10%	100%
Jacksonville	0%	0%	**45%**	**31%**	24%	100%
Tampa	7%	16%	**37%**	**41%**	0%	100%
Oklahoma City	9%	0%	**34%**	**50%**	7%	100%
Orlando	6%	23%	**31%**	25%	15%	100%
San Diego	9%	0%	21%	**38%**	**32%**	100%
Riverside	0%	0%	29%	**37%**	**34%**	100%
Miami	8%	2%	18%	16%	**56%**	100%
Sacramento	0%	0%	9%	8%	**83%**	100%
Super-star metros						
New York	**66%**	**30%**	4%	0%	0%	100%
San Francisco	**65%**	9%	6%	0%	20%	100%
Boston	**49%**	26%	11%	10%	4%	100%
Seattle	23%	14%	**41%**	14%	8%	100%
Los Angeles	0%	6%	**73%**	4%	17%	100%
Washington	20%	24%	0%	8%	**48%**	100%
Selected slow growth						
Chicago	**71%**	19%	0%	0%	9%	100%
Philadelphia	13%	2%	4%	30%	**50%**	100%

San Francisco is for CBSA (does not include most of Silicon Valley)

Data for Phoenix is for 2002 to 2012; for Washington is for 2010 to 2019 (earlier data not available)

St. Louis	**35%**	2%	**30%**	14%	19%	100%
Baltimore	0%	9%	24%	**62%**	5%	100%

Endnotes

[1] Thomas B. Edsall, "How a 'Golden Era for Large Cities' Might Be Turning Into an 'Urban Doom Loop,'" *The New York Times*, November 30, 2022, sec. Opinion, https://www.nytimes.com/2022/11/30/opinion/covid-pandemic-cities-future.html.

[2] Stijn Van Nieuwerburgh, "The Remote Work Revolution: Impact on Real Estate Values and the Urban Environment: 2023 AREUEA Presidential Address," *Real Estate Economics* 51, no. 1 (December 2022): 7–48.

[3] Josh Mitchell, "Red States Are Winning the Post-Pandemic Economy," *Wall Street Journal*, July 5, 2022.

[4] John Leland, "The Prophet of Urban Doom Says New York Still Has a Chance," *The New York Times*, February 8, 2023.

[5] Thomas B. Edsall, "The Era of Urban Supremacy Is Over," *The New York Times*, March 15, 2023.

[6] Richard Florida, "Why Downtown Won't Die," *Bloomberg.Com*, August 17, 2022.

[7] Simon Newton Dexter North, *A Century of Population Growth from the First Census of the United States to the Twelfth, 1790-1900* (Government Printing Office, 1909), 15.

[8] U.S. Census Bureau, "Redefining Urban Areas Following the 2020 Census," The United States Census Bureau, 2023, https://www.census.gov/newsroom/blogs/random-samplings/2022/12/redefining-urban-areas-following-2020-census.html.

[9] For example, Tomer and Chapple define close-in neighborhoods city-by-city; Baum-Snow uses a 4 kilometer radius, Kolko uses 2 and 5 mile radii, and Birch relies on local knowledge and experience and field checks. All of these produce a more tightly-defined set of downtown neighborhoods relative to my definition of central area. Adie Tomer and Lara Fishbane, "Big City Downtowns Are Booming, but Can Their Momentum Outlast the Coronavirus?" (Brookings Institution, May 2020); Karen Chapple et al., "The Death of Downtown?," *UC Berkeley Research Brief*, June 2022; Nathaniel Baum-Snow and Daniel Hartley, "Accounting for Central Neighborhood Change, 1980–2010," *Journal of Urban Economics* 117 (2020): 103228; Jed Kolko, "Job Location, Neighborhood Change, and Gentrification," *Public Policy Institute of California*, 2009; Eugenie L Birch, *Who Lives Downtown* (Brookings Institution, Metropolitan Policy Program Washington, DC, 2005); Eugenie Ladner Birch, "Having a Longer View on Downtown Living," *Journal of the American Planning Association* 68, no. 1 (March 31, 2002): 5–21.

[10] It was reprinted in the book, William H. Whyte, *The Exploding Metropolis* (Doubleday, 1958).

[11] Jon C. Teaford, *The Metropolitan Revolution: The Rise of Post-Urban America*, Columbia Histories of Modern American Life (Columbia University Press, 2006); H.J. Gans, *The Levittowners: Ways of Life and Politics in a New Suburban Community* A Vintage Book (Vintage Books, 1967); Personal experience accords with the reported appeal of early post-war suburbs. In 1960, my family moved into a 1,050 square foot house in suburban Cleveland. The house was built on a concrete slab

with gravel driveway and an unfinished second floor. Forty percent of the population in the census tract was under age 18; the figure was likely higher in our 1950s subdivision on the south edge of town. There were few trees and the backyards had no fences, allowing the neighborhood kids to run until exhausted from one backyard to the next. We walked or biked to school and to ballfields next to the Ohio Turnpike and a water tower (and under heavy electrical wires). Today, the water tower, electrical wires and two ballfields are still there. Next to them are now rows of townhouses off a series of cul de sacs. The townhouses have small courtyards, not backyards. Only a driveway and garage door face the street. The under-18 Census statistic is from U.S. Census Bureau, "U.S. Census of Population and Housing: 1960" (U.S. Government Printing Office, 1962), page 36 (the tract is BE-0002).

[12] Quoted in Teaford, *The Metropolitan Revolution: The Rise of Post-Urban America*, 87.

[13] Gans, The Levittowners: Ways of Life and Politics in a New Suburban Community, 6.

[14] Kyle Shelton, *Power Moves: Transportation, Politics, and Development in Houston* (University of Texas Press, 2018), 64.

[15] Houston Chronicle, "Memorial Bend Builders Push Big Program," September 25, 1955, http://www.houstonmod.org/memorialbend/bend_hcart6.jpg.

[16] Teaford, *The Metropolitan Revolution: The Rise of Post-Urban America*, 74.

[17] Quoted in Robert Bruegmann, *Sprawl: A Compact History*, Chicago Studies in American Politics Series (University of Chicago Press, 2006), 220.

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[19] From 1990 and 2000 Census 5% samples, generated using "IPUMS Online Data Analysis System," n.d., https://usa.ipums.org/usa/sda/.

[20] Bumsoo Lee, "'Edge' or 'Edgeless' Cities? Urban Spatial Structure in US Metropolitan Areas, 1980 to 2000," *Journal of Regional Science* 47, no. 3 (2007): 494.

[21] Bumsoo Lee and Peter Gordon, "Urban Spatial Structure and Economic Growth in US Metropolitan Areas," in 46th Annual Meetings of the Western Regional Science Association, at Newport Beach, CA, 2007, 141.

[22] Lee and Gordon, "Urban Spatial Structure and Economic Growth in US Metropolitan Areas."

[23] Joel Garreau, *Edge City: Life on the New Frontier* (Doubleday, 1991).

[24] Robert E. Lang, *Edgeless Cities: Exploring the Elusive Metropolis*, James A. Johnson Metro Series (Brookings Institution Press, 2003).

[25] James Bessen, Learning by Doing: The Real Connection Between Innovation, Wages, and Wealth (Yale University Press, 2015), 53–57.

[26] Teaford, *The Metropolitan Revolution: The Rise of Post-Urban America*, 112–64; Richard Rothstein, *The Color of Law: A Forgotten History of How Our Government Segregated America* (Liveright Publishing, 2017); J. Anthony Lukas, *Common Ground: A Turbulent Decade in the Lives of Three American Families*, Vintage (Knopf Doubleday Publishing Group, 2012); Mike Davis, *City of Quartz: Excavating the Future in Los Angeles* (Verso Books, 2019), 204–35; Kyle Shelton, *Power Moves: Transportation,*

71–90; Paul Clemens, *Made in Detroit: A Memoir* (Knopf Doubleday Publishing Group, 2006).

[27] See Pred for a concise overview of nineteenth century growth dynamics. See Cronon for the role of competition among railroads and Great Lakes ships in Chicago's rise to pre-eminence in the country's mid-section. Allan R. Pred, *City-Systems in Advanced Economies* (New York: John Wiley & Sons, 1977), 94–97; William Cronon, *Nature's Metropolis: Chicago and the Great West* (W. W. Norton, 2009), 85–90, 233–35.

[28] Quoted in Robert A. Beauregard, *Voices of Decline: The Postwar Fate of U.S. Cities* (Routledge, 2003), 76.

[29] Steven Manson et al., "IPUMS National Historical Geographic Information System: Version 16.0 [Dataset]" (Minneapolis, MN: IPUMS., 2021), https://www.nhgis.org/.

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[31] See Kerwin Kofi Charles, Erik Hurst, and Mariel Schwartz, "The Transformation of Manufacturing and the Decline in US Employment," *NBER Macroeconomics Annual* 33, no. 1 (2019): 307–72; David H Autor, David Dorn, and Gordon H Hanson, "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," *American Economic Review* 103, no. 6 (2013): 2121–68; Katelynn Harris, "Forty Years of Falling Manufacturing Employment: Beyond the Numbers: U.S. Bureau of Labor Statistics," n.d.

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[34] Quoted in Beauregard, *Voices of Decline: The Postwar Fate of U.S. Cities*, 218.

[35] Quoted in Teaford, *The Metropolitan Revolution: The Rise of Post-Urban America*, 166.

[36] For a discussion of these developments, see Peter J. Taylor and Ben Derudder, *World City Network: A Global Urban Analysis* (Routledge, 2016), 19–27.

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[42] Jacobs, 51.

[43] Jacobs, 51–53.

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Silver, an Inventor of Post-It Notes, Is Dead at 80," *The New York Times*, May 13, 2021, sec. Business.

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[46] Jacobs, 59.

[47] Enrico Moretti, *The New Geography of Jobs* (Houghton Mifflin Harcourt, 2012), 141.

[48] Nayak and Ketteringham, "3M's Post-It Notes: A Managed or Accidental Innovation"; Sandomir, "Spencer Silver, an Inventor of Post-It Notes, Is Dead at 80."

[49] Tony Hey and Gyuri Pápay, *The Computing Universe: A Journey through a Revolution* (Cambridge University Press, 2014), 162; Walter Isaacson, *Steve Jobs* (Little, Brown, 2011), 95–99.

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[51] Steve Lohr, "It Started With a Jolt: How New York Became a Tech Town," *The New York Times*, February 22, 2019.

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[53] Michael Storper emphasizes the importance of cross-fertilization between industry sectors in creating new work. He describes this cross-fertilization as the "transposition of skills and capacities from one major domain of activity to another" and focuses directly on how it creates whole new fields like biotechnology. He writes, "Transposition necessarily involves bridging between existing networks, as when venture capitalists who are accustomed to working in the information technology world begin to act as angel investors in biotechnology and the life-sciences-driven parts of the economy." Michael Storper, *Keys to the City: How Economics, Institutions, Social Interaction, and Politics Shape Development* (Princeton University Press, 2013), 151; Storper also emphasizes the central role of "generalized trust" in bridging between existing networks, i.e., a set of values and expectations shared across networks that allow "different tightly bounded groups" (professional, social, ethnic, or otherwise) "to be willing to deal with one another" and work toward undefined but potentially mutually beneficial ends. Michael Storper et al., *The Rise and Fall of Urban Economies: Lessons from San Francisco and Los Angeles*, Innovation and Technology in the World Economy (Stanford University Press, 2015), 189; For a discussion of skills matching, see Moretti, *The New Geography of Jobs*; And for a discussion of the centrality of experimentation and face-to-face interaction in innovation, see Bessen, *Learning by Doing: The Real Connection Between Innovation, Wages, and Wealth*

[54] Luís MA Bettencourt et al., "Growth, Innovation, Scaling, and the Pace of Life in Cities," *Proceedings of the National Academy of Sciences* 104,

[55] Two-thirds of U.S. jobs are in the local service sector involving goods and services locally produced and locally consumed. As Enrico Moretti notes, "they are the effect, not the cause, of economic growth." Growth is driven primarily by the export of locally produced goods and services, which produce the earnings for both consumption and investment. Moretti, *The New Geography of Jobs*, 12–13.

[56] The Utilities sector also has a high average wage ($125,200 in 2020) but by its nature does not produce tradeable services that can be exported from the metro area. The next-highest average salaries are in wholesale trade ($82,400) and manufacturing ($68,800). The largest other sectors are health care and social assistance with an average salary of $55,500, retail trade ($32,300), and accommodation & food services ($18,300 average salary in 2020). Data are available at U.S. Census Bureau, "County Business Patterns Data."

[57] This term was coined in 2006 by economists Joseph Gyourko and Christopher Mayer. They defined super-stars as having high demand for housing but inadequate construction to keep up, with the result of sky-high housing prices. The original calculations for the period 1980 to 2000 identified super-stars as including San Jose, Boston, San Francisco, and Philadelphia, the suburbs of New York (at the time classified as separate metropolitan statistical areas), Santa Cruz, Oakland, and Detroit. Over time, the term "super-star" came to mean cities that had high housing costs (true to the original formulation of the term) combined with the attractiveness of high wages and a wide menu of urban amenities. Despite their high cost of living, super-star metros appealed particularly strongly to young, urban-minded professionals attracted to their well-paying jobs and wide variety of urban amenities. I use the term in this common usage, e.g., cities that boomed and as a result, also became in expense and crowdedness, the victims of their own success. Joseph Gyourko, Christopher Mayer, and Todd Sinai, "Superstar Cities,*American Economic Journal: Economic Policy*5, no. 4 (2013): 18, 51–52.

[58] See Appendix D bus/rail split for metros that have significant rail services. AASHTO, "Census Data for Transportation Planning Applications (CTPP)," 2023, https://www.transportation.org/.

[59] Parking Reform Network, "Parking Lot Map," Parking Reform Network, March 15, 2023, https://parkingreform.org/resources/parking-lot-map/.

[60] See table in Appendix D for geographic distribution of job growth since 2002. U.S. Bureau of the Census, "LEHD Origin-Destination Employment Statistics (LODES)," 2023, https://onthemap.ces.census.gov/.

[61] Chad Shearer, Jennifer Vey, and Joanne Kim, "Where Jobs Are Concentrating and Why It Matters to Cities and Regions," October 2019, 17, 20.

[62] The Brookings study analyzed 110 U.S. metros areas. It excluded "a small handful" of "extreme outliers" that have both large, dense downtowns and high economic output, a group that included New York, Boston, San Francisco, and San Jose. Tracy Hadden Loh et al., "Mapping America's Activity Centers: The Building Blocks of Prosperous, Equitable, and Sustainable Regions" (Brookings Institution, October 20, 2022).

[63] The academic literature comes to a range of conclusions on the effects of housing undersupply due to restrictive land use regulations on economic output but there is a widespread view that the effects are

be 3.7 percent higher if housing regulations in New York, San Jose, and San Francisco, the three most-productive metro areas in the U.S., were changed to that in the median U.S. city. Duranton and Puga estimate an 8.2 percent gain in real U.S. income from relaxing planning regulations in the three most productive U.S. cities. Albouy et. al. estimate that limits on urban growth lead to the largest U.S. cities being undersized by about one-third, with a cost to national GDP of 3.8 percent to 6.8 percent depending on the impact of agglomeration economies, level of congestion, heterogeneity in amenities across cities, and federal tax policy. Notably, Albouy also cautions that "the optimal distribution of population must balance both the tradeoff between agglomeration and congestion inside each city (intensive margin) and the tradeoff between overfilling productive cities and creating new, less productive cities (extensive margin)." As a result, GDP gains do not necessarily translate into overall well-being or standard of living of individuals depending on the effects of growth on housing prices, commutes, and congestion. Duranton makes a similar point. See also discussion in Glaeser and Gyourko. Chang-Tai Hsieh and Enrico Moretti, "Housing Constraints and Spatial Misallocation," *American Economic Journal: Macroeconomics* 11, no. 2 (April 2019): 25–26; David Albouy et al., "The Optimal Distribution of Population across Cities," *Journal of Urban Economics* 110 (2019): 28–31; Gilles Duranton and Diego Puga, "Urban Growth and Its Aggregate Implications" (National Bureau of Economic Research, 2019), 38–44; Edward Glaeser and Joseph Gyourko, "The Economic Implications of Housing Supply," *Journal of Economic Perspectives* 32, no. 1 (2018): 3–30.

[64] Smaller metros (not among the 43) had net in-migration of 1.7 million from April 1, 2020 to June 30, 2022, according to Census estimates. In addition, what in Census Bureau parlance are classified as "non-metropolitan" areas – metros under 50,000 population and rural areas – gained over 30,000 domestic migrants after having been net losers pre-pandemic. It is worth noting that smaller metros which were havens for domestic migration during the pandemic had been gaining steam pre-pandemic. Total in-migration for this group rose from 180,000 annually in the early 2010s to 400,000 annually in the second half of the decade, and then to 780,000 during the pandemic. In-migration metros among the 43 had been ahead of these smaller in-migration metros in the early 2010s by a ratio of 1.7 to one. The two drew about even in the second half of the decade. During the pandemic, in-migration to the smaller gainer metros outpaced that to the larger gainers by 1.8 to one. U.S. Census Bureau, "County Population Totals and Components of Change: 2020-2022," Census.gov, n.d., https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html; U.S. Census Bureau, "County Population Totals: 2010-2020," Census.gov, n.d., https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-counties-total.html.

[65] Sam Khater and Kristine Yao, "In Pursuit of Affordable Housing: The Migration of Homebuyers within the U.S.—Before and After the Pandemic," FreddieMac, June 22, 2022, https://www.freddiemac.com/research/insight/20220622-pursuit-affordable-housing-migration-homebuyers-within.

[66] Ozimek and Carlson found that a surge in housing demand from the

in metros with significant out-migration. Adam Ozimek and Eric Carlson, "Remote Work and Household Formation," *Economic Innovation Group*, 2023.

[67] See Jose Maria Barrero et al., "Benchmarking SWAA Estimates of the Prevalence of Working From Home," 2023, https://wfhresearch.com/wp-content/uploads/2023/05/WFHResearch_updates_May2023.pdf; Peter Grant, "The Return to the Office Has Stalled," *Wall Street Journal*, May 17, 2023.

[68] Gretchen Tarrant, "The Math Behind the New Super Commute," *Wall Street Journal*, March 18, 2023; Katherine Bindley, "Tech, an Early Booster of Remote Work, Wants People Back in the Office," *Wall Street Journal*, June 11, 2023.

[69] See Konrad Putzier, "The U.S. Is Running Short of Land for Housing," *Wall Street Journal*, November 25, 2022; Linda Qiu, "Farmland Values Hit Record Highs, Pricing Out Farmers," *The New York Times*, November 13, 2022.

[70] See John Egan, "Austin-San Antonio Is the 'next Great U.S. Metroplex,' Says Mayor Adler in Final Address," August 29, 2022; Conor Dougherty, "The Next Affordable City Is Already Too Expensive," *The New York Times*, February 20, 2022.

[71] David H. Autor, "Work of the Past, Work of the Future," *AEA Papers and Proceedings* 109 (May 2019): 1–32; Rebecca Diamond and Enrico Moretti, "Where Is Standard of Living the Highest? Local Prices and the Geography of Consumption," Working Paper (National Bureau of Economic Research, January 2023); Moretti, *The New Geography of Jobs*.

[72] Zusha Elinson, "Homicides Are Falling in Major American Cities," *Wall Street Journal*, June 8, 2023.

[73] Based on interviews with suburban elected officials, business leaders, and local residents, Robert Lang showed that light rail systems are valued for spurring real estate development and giving them a competitive advantage over neighboring suburbs and exurbs. Their support has been key to regional financing of metropolitan light rail systems, often through sales taxes, whereas they have little interest in financing bus systems that are vital to central city commuters. Likewise for streetcar systems that tend to be seen as boons for development and tourism more than commutation. Robert E. Lang and Jennifer B. LeFurgy, *Boomburbs: The Rise of America's Accidental Cities*, James A. Johnson Metro Series (Brookings Institution Press, 2007), 83, 150.

[74] Clara De Vincenzi et al., "Consequences of COVID-19 on Employees in Remote Working: Challenges, Risks and Opportunities An Evidence-Based Literature Review," *International Journal of Environmental Research and Public Health* 19, no. 18 (2022).

[75] Emma Goldberg, "A Full Return to the Office? Does 'Never' Work for You?," *The New York Times*, June 9, 2022.

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[77] Alina Dizik, "The Benefits of Eavesdropping on Office Conversations," *Wall Street Journal*, June 10, 2023.

[78] Dizik.

[79] Heidi Mitchell, "How to Use Silence in Business Meetings," *Wall Street Journal*, May 2, 2022, sec. Business.

[80] Kerry Gold, "Generation Density: Past Planners Speak out on Urban Development," *Vancouver Globe and Mail*, July 1, 2022.
[81] William A. Williams, *The Contours of American History* (Quadrangle Books, 1961), 19, 477.
[82] See Manson et al., "IPUMS National Historical Geographic Information System: Version 16.0 [Dataset]."

[83] See Manson et al.

[84] U.S. Census Bureau, "County Population Totals and Components of Change."
[85] U.S. Census Bureau, "County Business Patterns Data."
[86] Fabian Eckert et al., "The Early County Business Pattern Files: 1946-1974" (National Bureau of Economic Research, 2022), https://www.nber.org/system/files/working_papers/w30578/w30578.pdf.
[87] U.S. Bureau of Labor Statistics, "Quarterly Census of Employment and Wages: U.S. Bureau of Labor Statistics," 2023, https://www.bls.gov/cew/.
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