Economic Insights



NOV 2026

How Transportation Shapes American Cities

Metro areas that grew in different eras still reflect the transportation technology of their time.

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Changes in transportation technology fundamentally alter urban land use patterns. By reducing the per-mile cost of travel, new and faster transportation technologies encourage expansion into lower-cost peripheral land and facilitate suburbanization. The built environment, however, is slow to adapt to new transportation technologies. Housing stock, infrastructure networks, and land use arrangements tend to endure, embedding historical development patterns into the modern urban landscape. As a result, metro areas that experienced rapid growth under different transportation regimes often exhibit distinct spatial structures.

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This article examines how the timing of a metropolitan area's growth interacts with transportation technology to shape long-term development patterns. We discuss how metro areas that expanded during different eras—whether dominated by walking, rail, or automobiles—continue to reflect those origins. We also explore the central role of the highway system in accelerating suburban development in the mid- to late 20th century. We find that many old metro areas have maintained their dense urban core, reflecting the enduring influence of earlier development patterns. We conclude by considering the extent to which these trends have moderated in recent decades, and how future changes in technology may shape the urban form.

Transportation Shapes Metro Areas

One of the largest and most transformative changes in American transportation was the construction of the Interstate Highway System beginning in 1956. By 1980, the system's 42,000 miles of limited-access highways connected virtually every major U.S. metropolitan area, delivering near-simultaneous transportation improvements to metro areas regardless of size or development stage. Metro areas of 50,000 people received interstate connections alongside those with millions, and newly built freeways cut indiscriminately through established urban landscapes as well as undeveloped land.

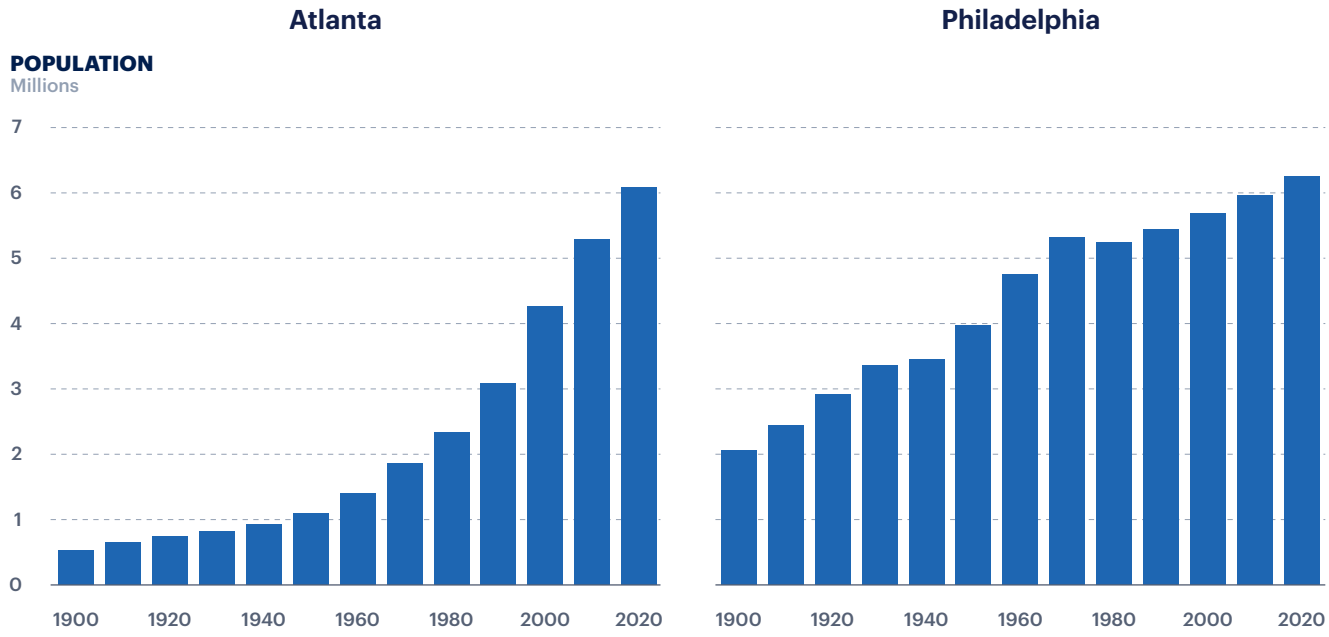
Depending on an urban area's stage of development, infrastructure investment produces strikingly different outcomes. Consider Philadelphia and Atlanta. Despite experiencing their major growth booms at different times, their populations eventually converged. In 1950, Philadelphia's metropolitan population of 4 million dwarfed Atlanta's 1.1 million (Figure 1). Today, these two metro areas have nearly identical populations of just over 6 million. Yet their urban forms remain distinct, reflecting the transportation technologies that shaped each urban area's development. Philadelphia's urban core had largely taken shape before the interstate era, whereas Atlanta's development occurred predominantly in the age of the automobile.

According to the monocentric city model used in urban economics, when transportation technology improves and travel times decline, households can access cheaper land farther from the center while maintaining reasonable travel times.[1] Consequently, urban development tends to spread outward. In this way, transportation technology fundamentally shapes where people choose to live and determines the spatial distribution of population density within metropolitan areas. This model explains how the Interstate Highway System fundamentally changed the urban landscape.[2] By reducing travel times, freeway development drove population movement away from urban cores, extended urban fringes, and increased metropolitan land area. The result was a decentralized urban population.

These developments contributed to downtown population loss in many metro areas, particularly old ones.[3] For each freeway running through a city's center, downtown population either declined or grew more slowly than in the expanding suburbs. This decline in downtown population reflected not only improved transportation access to suburbs but also the negative effects freeways imposed on nearby

FIGURE 1

Metropolitan Population, Atlanta and Philadelphia, 1900–2020



Source: Schroeder et al. (2026)

Note: Metropolitan boundaries standardized to 2020 definitions used by IPUMS.

neighborhoods through reduced quality of life.[4] But freeway development is also associated with substantial increases in metrowide employment and population.[5] This partially explains why some metro areas grew faster than others during this period.

Despite decades of suburbs vastly outpacing downtowns in population growth following construction of the Interstate Highway System, urban forms persist. Philadelphia and Atlanta illustrate this durability: Philadelphia maintains a dense urban core with concentrated population and employment, whereas Atlanta's residents and jobs are dispersed across a much wider metropolitan area. This persistence stems from multiple sources of durability. Once constructed, the built environment (such as transportation infrastructure, housing, and commercial buildings) remains in place for decades. The built environment's durability also creates asymmetric adjustment patterns: Metro areas experiencing population growth have the potential to add new housing to meet demand whereas areas experiencing population loss are more likely to adjust through falling prices (which keep demand and population stable) rather than by rapidly demolishing housing.[6] Cultural norms and social expectations also endure, as patterns of daily life, commuting behavior, and neighborhood preferences become embedded in an urban area's identity.

Comparing Old and New Metro Areas

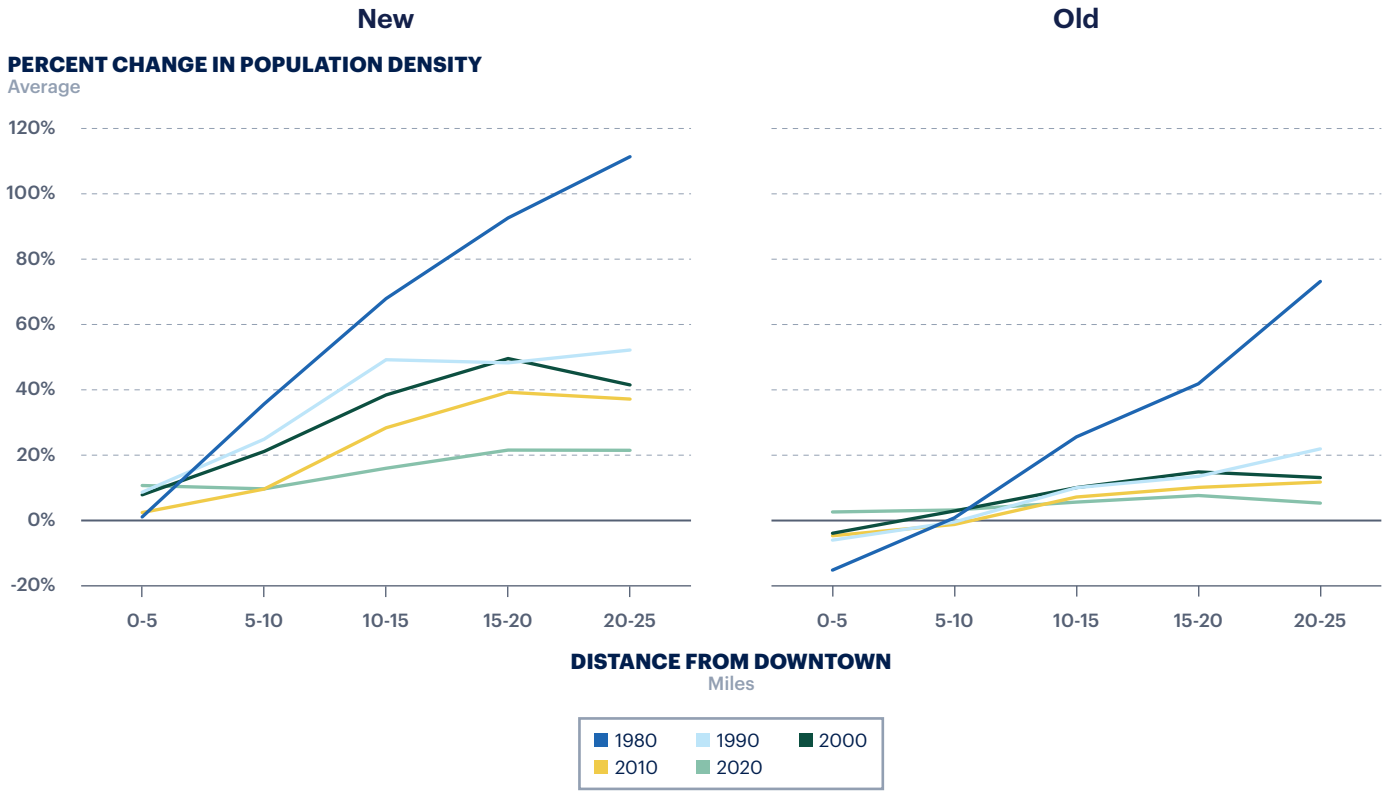
Metro areas that grow in different eras should exhibit distinct development patterns that persist over time. To see whether this is true, and to look for signs of change in recent years, we analyzed population data from 50 major U.S. metropolitan areas.[7] We classified 25 metropolitan areas that developed before

1950 as "old" and 25 that developed after as "new." This approach allows us to compare the evolution of metro areas that experienced their primary growth in different eras. We divided each metropolitan area into 5-mile rings radiating outward from the city center. We then tracked population changes within each ring for each decade from 1970 to 2020. This allows us to see whether growth occurred close to downtown or in the outer suburbs, and how these patterns differed over time between old and new metro areas.

We found both similarities and differences in how old and new metro areas have developed over the past 50 years. From 1980 to 2010, new metro areas experienced growth that pushed steadily outward from their centers, with the geographic footprint of these metro areas expanding substantially. This pattern of outward expansion reflects the fact that new metro areas experienced most of their growth after construction began on the Interstate Highway System. Unlike old metro areas, which had already developed dense cores oriented around walking and rail transit, new metro areas were largely undeveloped when the automobile became dominant. The growth of new metro areas was therefore organized around

FIGURE 2

Percent Change in Population Density Over the Previous Decade (Average for Old and New Metro Areas) by Distance to Downtown in Miles, 1980–2020



Source: Schroeder et al. (2026)

Note: We classified MSAs in the top 50 percent of 1950 population as "old" and all remaining MSAs as "new." We then selected the 25 most populous old MSAs and the 25 most populous new MSAs as of 2020, resulting in 50 MSAs that rank among the 60 most populous metropolitan areas today.

highway access from the outset, with residential neighborhoods, commercial centers, and employment distributed in ways that assumed automobile travel.

Old metro areas followed a different trajectory. Like new metro areas, old metro areas saw sustained growth beyond their centers; neighborhoods well past 10 miles from downtown grew steadily from 1970 onward. But their urban cores experienced a prolonged decline. From 1970 to 1980, central city population fell. Through the 1980s and 1990s, areas within 5 miles of downtown showed minimal or negative growth (Figure 2). Only after 2000 did these neighborhoods begin to recover, posting moderate growth for the first time in decades.

This pattern of downtown decline and suburban expansion reflects a fundamental adjustment process. Old metro areas had built dense downtowns with compact layouts and narrow streets designed for walking and streetcar travel. As households shifted to automobile commuting, these urban forms became mismatched with travel patterns. Implementation of the Interstate Highway System accelerated this adjustment, making suburban locations more accessible while highways carved through established downtown neighborhoods.

Despite decades of shifting population, the fundamental differences in spatial structure between old and new metro areas have endured (Figure 3). Compared with new metro areas, old metro areas—despite their decline in downtown population—retained significantly more densely populated downtowns. This was a legacy of their development when compact, walkable neighborhoods were concentrated around transit hubs. Relative to old metro areas, new metro areas exhibited higher density in their suburban rings, the product of decades of automobile-oriented growth that distributed population more evenly across the metropolitan area. At nearly every distance from their city center, the population densities of 2020 broadly mirrored those of 1970. The structures that served downtown residents in 1970 largely persist today, even in metro areas that experienced substantial population loss in their cores.

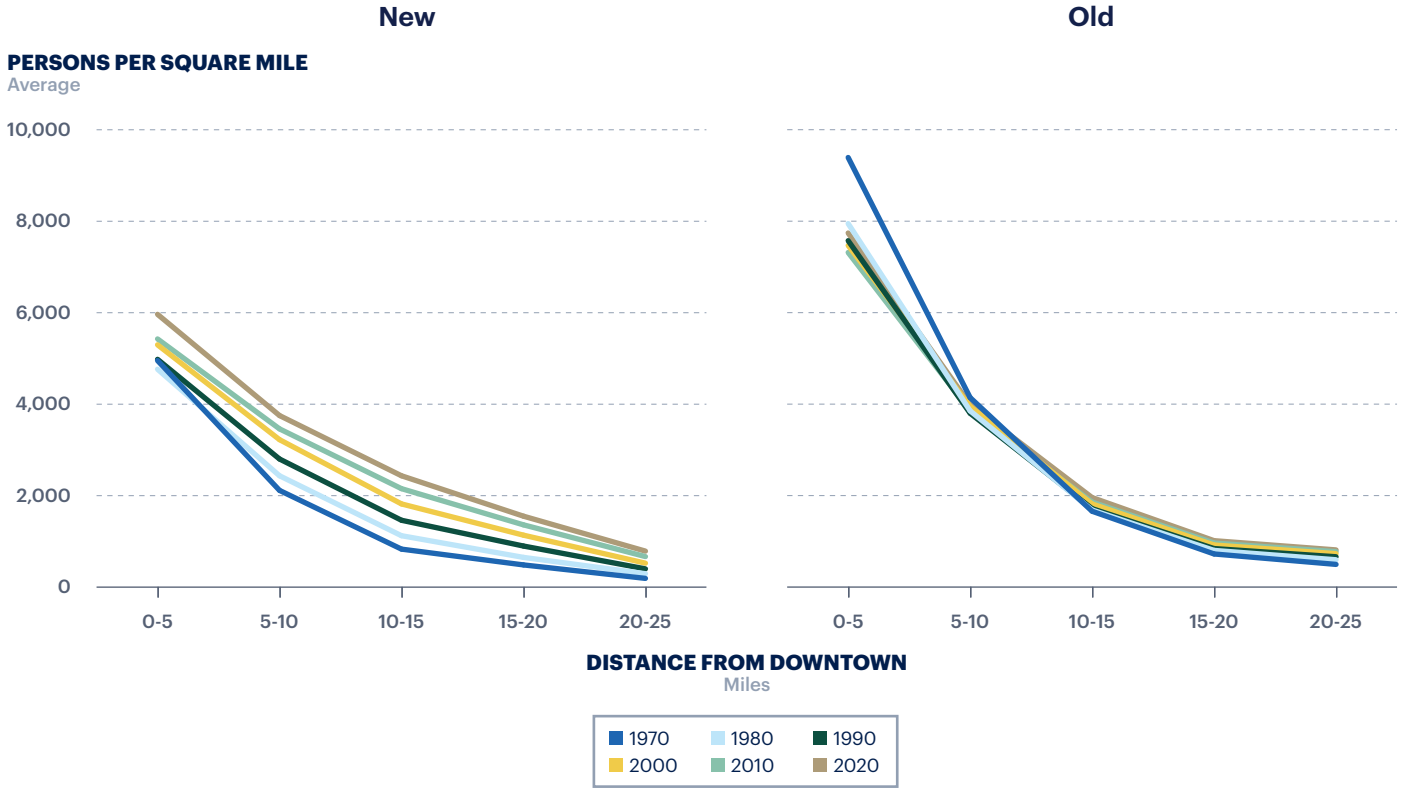
The trajectories of growth did not undo these persistent differences. New metro areas experienced a steady population increase in their centers from 1970 to 2020, even as their suburbs grew faster. Old metro areas saw their downtowns decline through the 1970s, 1980s, and 1990s before rebounding after 2000. Despite these different paths, the underlying urban structure—denser cores in old cities, more populous suburbs in new cities—remained intact. This persistence reflects the durability of the built environment: Housing stock endures for decades, which allows metro areas to grow quickly but contract only slowly.

Urban Revitalization and Stabilization

In recent decades, a new trend has emerged. Although the decades following the Federal-Aid Highway Act of 1956 were characterized by urban decay and population loss in old cities, the turn of the century marked a return to urban growth. Moreover, the two decades after 2000 brought about a convergence of development trends between new and old metro areas. Downtowns, once shedding population in old

FIGURE 3

Persons per Square Mile (Average for Old and New Metro Areas) by Distance to Downtown, 1970–2020



Source: Schroeder et al. (2026)

Note: We classified MSAs in the top 50 percent of 1950 population as "old" and all remaining MSAs as "new." We then selected the 25 most populous old MSAs and the 25 most populous new MSAs as of 2020, resulting in 50 MSAs that rank among the 60 most populous metropolitan areas today.

cities as residents moved to newly developed suburbs, are now growing faster than anywhere else.

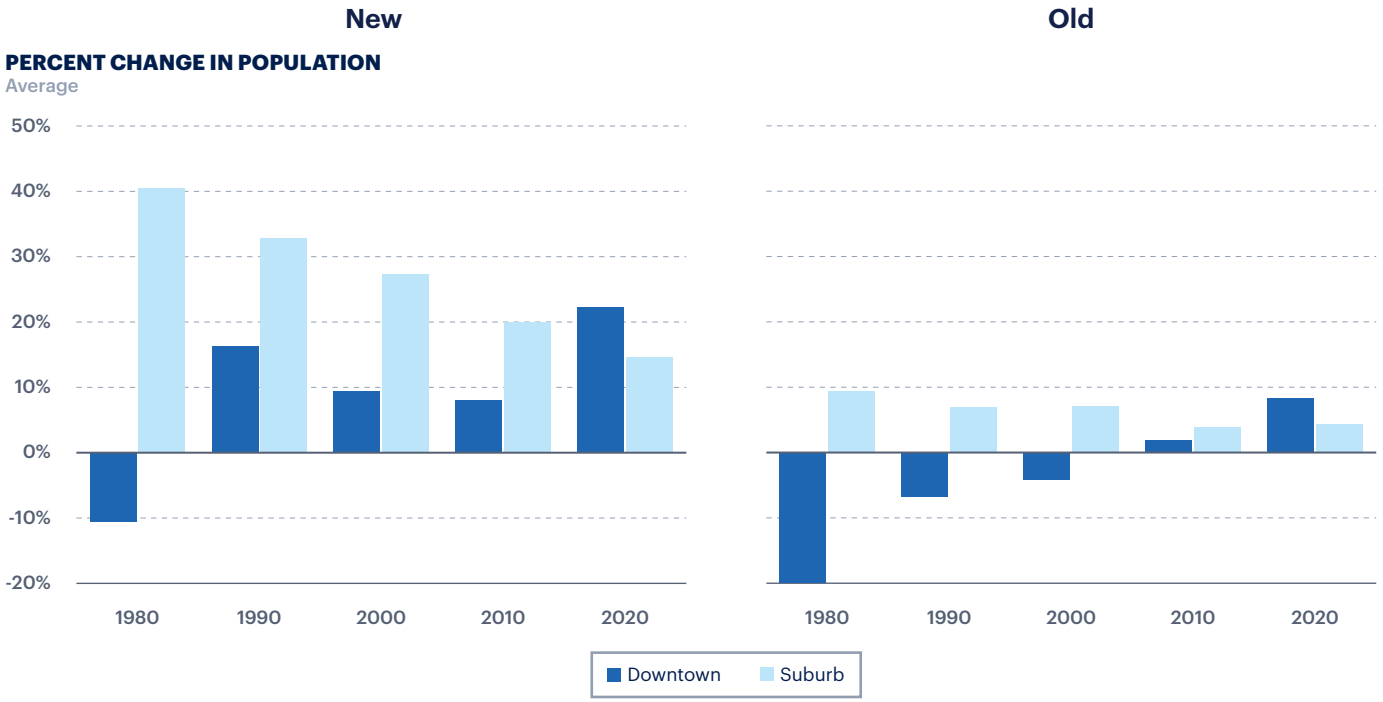
Recent research has documented this striking break in metropolitan growth trends around 2000.[8] Increased preferences for urban amenities, combined with rising earnings and delayed household formation among college graduates, is driving the return to city centers. However, this growth pattern occurs primarily in the nation's largest metropolitan areas.

We find evidence of this downtown revival in our data. For the first time in five decades, downtowns—defined for this analysis as areas within 2 miles of a city center—are growing at a faster rate than suburbs. From 2000 to 2010, downtown growth accelerated in both old and new metro areas, although suburbs still grew faster on average. By 2010 to 2020, downtowns had overtaken suburbs as the fastest-growing areas across our sample of metropolitan areas (Figure 4).

A factor other than shifting preferences for urban amenities likely played an important role in this downtown revival. The convergence of growth patterns between downtowns and suburbs may reflect growth reaching a new equilibrium after decades of adjustment to the Interstate Highway System. The

FIGURE 4

Percent Change in Population (Average for Old and New Metro Areas), 1980–2020



Source: Schroeder et al. (2026)

Note: We classified MSAs in the top 50 percent of 1950 population as "old" and all remaining MSAs as "new." We then selected the 25 most populous old MSAs and the 25 most populous new MSAs as of 2020, resulting in 50 MSAs that rank among the 60 most populous metropolitan areas today.

dramatic suburban expansion of the late 20th century represented a fundamental restructuring of urban form in response to dramatically reduced transportation costs. By the 2000s, this adjustment process may have run its course, with growth settling into more balanced patterns as the initial shock of highway construction played out.

Conclusion

Despite dramatic population shifts over the past 50 years, the spatial structures of American metro areas have proven remarkably durable, with urban form continuing to reflect the transportation technologies dominant during each urban area's period of rapid growth. After decades of downtown decline relative to expanding suburbs, recent years have brought a downtown revival, with growth patterns between urban cores and suburbs converging for the first time in generations.

New technologies may once again be reshaping metro areas. The rise of telecommuting has reduced the need for workers to live near their jobs, potentially enabling households to move farther from city centers while maintaining employment connections. If the logic of the monocentric city model holds, reduced commuting requirements should flatten price gradients as the distance from downtown becomes

less important, allowing development to spread more evenly across metropolitan areas. Preliminary evidence from the post-COVID era suggests that this transformation may already be underway. Price gradients have flattened and downtown activity has decreased, primarily in the nation's largest cities.[9] Meanwhile, the average distance between residences and employers has increased dramatically.[10] Just as the automobile and interstate highways reconfigured urban form in the 20th century, remote work may enable another transformation in how and where households choose to live. Yet if history is any guide, the spatial patterns established today will endure for generations, long after the conditions that created them have vanished.

Notes

1 Brinkman (2017) discusses these determinates of urban spatial patterns.

2 Baum-Snow (2007) found that aggregate increases in transportation speeds via the nationwide implementation of the Interstate Highway System led to outwardly expanding development patterns in metropolitan areas.

3 Despite this decline in downtown population, overall population continued to grow modestly in most metropolitan areas.

4 See Brinkman and Lin (2024) for more on negative effects.

5 See Duranton and Turner (2012).

6 See Glaeser and Gyourko (2005).

7 We assembled historical Census population data for more than 150 metropolitan statistical areas (MSAs), standardizing boundaries to 2020 definitions and constructing the total population for both 1950 and 2020. We classified MSAs in the top 50 percent of 1950 population as "old" and all remaining MSAs as "new." We then selected the 25 most populous old MSAs and the 25 most populous new MSAs as of 2020, resulting in 50 MSAs that rank among the 60 most populous metropolitan areas today. Data provided by IPUMS NHGIS, University of Minnesota (https://www.nhgis.org/).

8 See Baum-Snow and Hartley (2020), Couture and Handbury (2017), and Lin (2017).

9 See Monte et al. (2023) and Ramani et al. (2024).

10 See Akan et al. (2025).

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