



Not All Rush Hours Are the Same

Why are commute times for Black workers longer than those of White workers, especially in Philadelphia?

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Access to employment is a key determinant of labor supply, wages, and free time. Workers with access to job-dense labor markets are more likely to find and keep jobs that are a good fit, to earn more, and to spend less time commuting when working. Because access to jobs is so important, inequality in commuting outcomes may help explain overall inequality in welfare.

According to research co-conducted by one of the authors of this article, nationally there are racial inequalities in commuting, and these inequalities are concentrated in large, segregated cities with mass transit systems.¹ Greater Philadelphia is one such city: It is the nation's seventh-largest metropolitan area, one of the nation's most segregated urban areas, and has many transit users.² And indeed, despite some convergence in commute times since 1980, Black commuters in Greater Philadelphia commuted 34 minutes more per week on average than White commuters as of 2019. In this article, we report the results of our research on racialized differences in commuting outcomes for Greater Philadelphia and explain the context and drivers that likely play a role in perpetuating these differences.

Framework and Data

Prior research tells us that the commute time for any individual is shaped by three factors: residential location, workplace, and travel speed. Home and work locations together determine the distance workers must travel, whereas speed dictates how long it takes to travel that distance.³

Unfortunately, few data sources report these factors in conjunction with race. We therefore combine several data sources that collectively tell us how each factor contributes to racial differences in commute times, and how these differences interact with other urban patterns. This is an important first step for designing policies that increase access.

To understand the overall difference in commute times by race and its evolution, we use data from the census (in 1980, 1990, and 2000) and the American Community Survey (from 2005 to 2019). This combined data set includes information on commute time and mode, demographics (including race), and many other characteristics of individual commuters. However, it provides only coarse residential location and very limited information about the place of work, so we use demographics (such as level of education and number of children)

See *Working from Home.*

and industry as rough proxies for home and work locations.⁴ We end our analysis in 2019 because the pandemic greatly altered commuting patterns, and workers may still be adjusting to new work-from-home arrangements.

To see commuters' locations more precisely, we turn to two other data sets. Brown University's Longitudinal Tract Database reports tract-level averages of demographics, as well as commute time and mode.⁵ We also use the Delaware Valley Regional Planning Commission's 2012–2013 Household Travel Survey for the Delaware Valley region, which provides detailed data on the locations and motivations for all trips (not just commutes) taken by a sample of about 20,000 households, along with details about each trip (specifically, time, distance, speed, mode, cost, and purpose).

Overall Differences and Trends

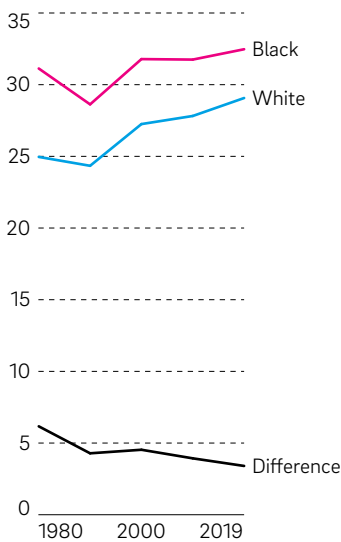
In 2019, the average one-way commute for a White commuter in Philadelphia was 29.1 minutes, versus 32.5 minutes for a Black commuter (Figure 1).⁶ This means that, over the course of a week, a Black worker spends on average 34 more minutes commuting than the typical White worker.

FIGURE 1

On Average, White Philadelphians Have a Shorter Commute

Over the course of a week, a typical Black worker spends 34 more minutes commuting from home to work.

Average commute time from home to work, in minutes and by race, Greater Philadelphia, 1980–2019



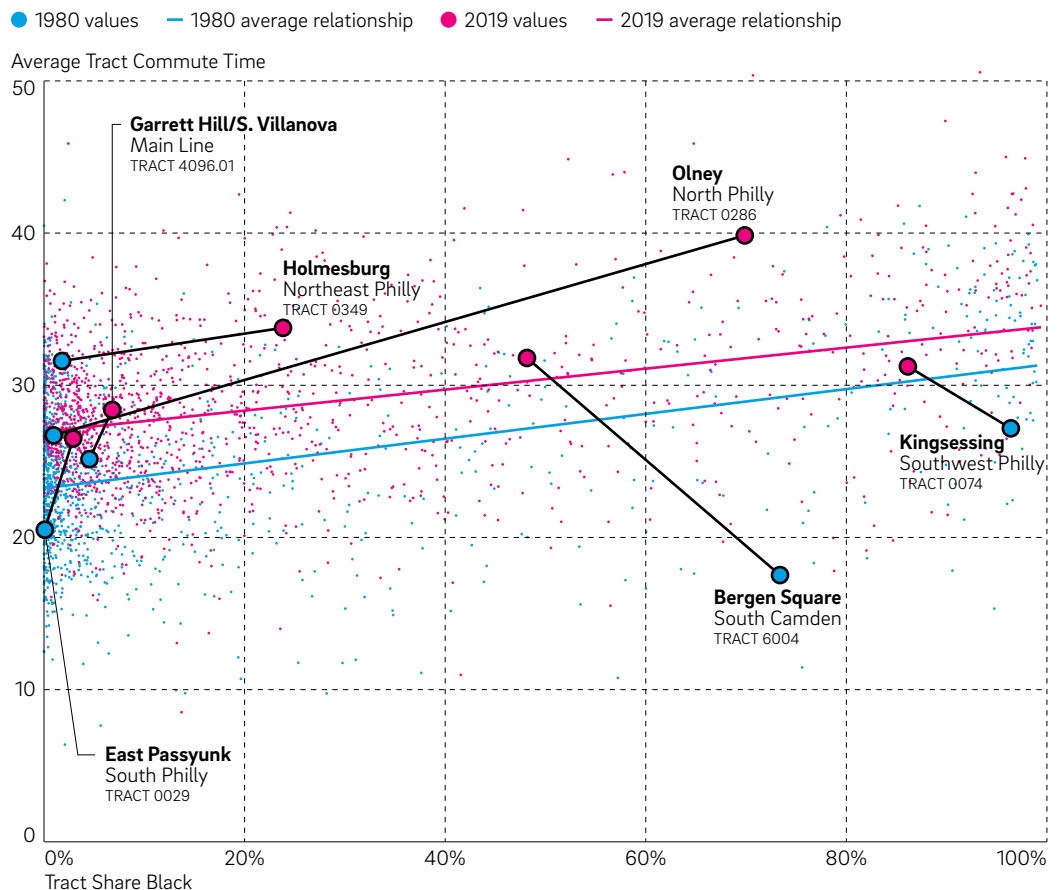
Data Sources: U.S. Census and American Community Survey.

Note: We use "2019" to refer to data combining all data from the 2012–2019 data set.

FIGURE 2

The Larger the Share of Black Residents, the Longer the Commute

This relationship has been relatively stable even as commutes have lengthened since 1980. Average commute time from home to work in minutes and percent of residents who are Black, by census tract, Greater Philadelphia, 1980 and 2019



Data Sources: U.S. Census, American Community Survey, and Longitudinal Change Database.

This difference, while substantial, has declined over the last 40 years. In 1980, the average commute for a White worker was 25.0 minutes, whereas it was 31.1 minutes for a Black commuter. This aggregates to about an additional hour spent commuting each week for Black workers in 1980.

These aggregate differences reflect spatial factors. Many of the neighborhoods with the longest average commutes are also home to substantial Black populations (Figure 2). This relationship holds on average: Longer average commute times from a neighborhood are associated with a higher proportion of Black residents in that neighborhood. The average commute for workers residing in a tract with no Black residents is seven to eight minutes shorter than for workers living in a tract with all Black residents. The data also show that commutes in 1980 were three to five minutes shorter on average than commutes in 2019, both for tracts with few Black residents and for tracts with many Black residents. This highlights the stability of the neighborhood-level relationship between race and commute time in Philadelphia.

Explaining These Differences

To find out why White commuters in Philadelphia have shorter commutes than Black commuters, we estimate a linear regression model of commute times, and we include many control variables to see if factors other than race can explain the overall differences.⁷ (Linear regression is a statistical technique that uses a line to estimate the value of an outcome—in this case, commute time—based on some characteristic—in this case, race; control variables are the other characteristics that may influence that relationship.) This technique decomposes the difference in commute times into two parts: One that can be explained by factors that we observe, and another that cannot be explained by these factors.

We classify our many control variables into four thematic categories based on how they connect to our framework.

The first category is county of residence, which directly corresponds to residential location.

The second category is commute mode, which is an important determinant of

travel speed: Walking is slower than transit or driving, and transit is often slower than driving.

The third category is personal and family characteristics (such as sex, age, level of education, household type, and number of children). These characteristics are likely to influence residential location (for example, households with children often prefer to live in different places than those without), but they can also influence workplace factors (for example, those with a college degree often work in different places than those with only a high school diploma) or speed of commute (households with children may drop them off at school while commuting, decreasing the speed of their commute).

The fourth category is job characteristics, including income, industry, and occupation. These characteristics are a proxy for factors that determine workplace location, as industries and occupations tend to concentrate together.

After we account (that is, control) for these factors, the additional commute time of Black workers falls from 16 percent to 11 percent in 2019. Put differently, all the factors that we observe together explain only a bit less than one-third of the total 16 percent difference in commute times. Among the factors that we observe, commute mode (which determines speed) is the most important, explaining nearly half of the total difference in 2019 (Figure 3). County of residence explains about one-fifth of the difference. Accounting for job factors and personal and family characteristics, however, actually decreases the difference. This means that, on average, Black workers hold jobs and have (nonrace) personal and family characteristics that are typically correlated with shorter commutes. This suggests that differences in where people live and how they get to work are what's most important for understanding commuting differences by race.

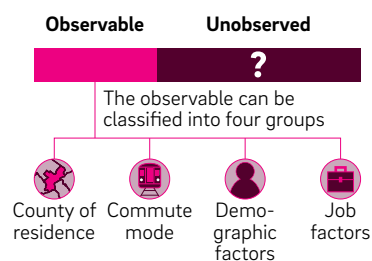
More than two-thirds of the difference in commute times is not explained by differences in mode, residential county, or the other factors we observe in our data. This unexplained difference is sometimes interpreted as a measure of discrimination. However, it may instead reflect differences in other, unobserved factors; compensation for other workplace

or residential attributes; or selection into employment. (Notably, we only observe commute times for people who are in the labor force and employed—that is, who select into employment. If a lack of access causes potential Black workers to be unable to find work, this could bias our results. However, one recent paper finds little evidence that selection drives differences in observed commute times.)⁸ Discrimination could also play an

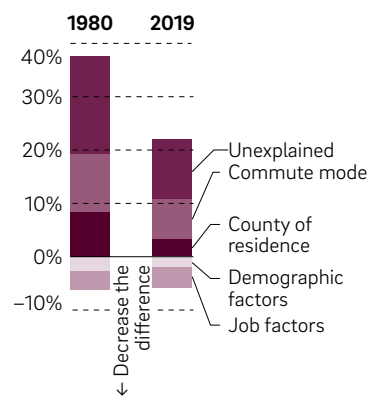
FIGURE 3

How We Analyze the Data

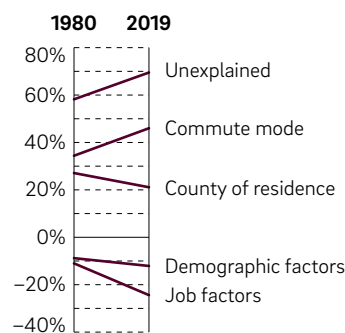
We can explain the differences through both observable and unobserved factors.



How do those groups of factors explain the differences in both 1980 and 2019?



And how has the influence of each factor changed over time as a share of each year's racialized difference?



Data Sources: U.S. Census and American Community Survey.

upstream role in determining a commuter’s observed characteristics (such as their industry or level of education).⁹ Regardless, our analysis describes how the racialization of different channels might create racialized differences in commuting outcomes, rather than saying precisely how much of this difference is directly due to discrimination.

How much has the influence of these factors changed since 1980? Residential county was more important in 1980, when it explained 27 percent of the (larger) difference in commute times. This likely reflects the higher level of residential segregation in 1980. All other factors were proportionately less important in 1980. However, all the observable characteristics together made a bigger impact in 1980, when they accounted for two-fifths of the total 31 percent longer commute time of Black workers. Nonetheless, three-fifths of the difference cannot be explained by these observed controls even in 1980. Other, unobserved variables must also contribute to the persistent, racialized differences in commute times.

We also report how much of the overall decline in Black workers’ longer commutes is explained by changes in these characteristics. County of residence explains about 34 percent of this partial convergence between commute times for White and Black workers, whereas transit mode explains only about 22 percent. The other observed characteristics do not contribute much to the decline, so unobserved factors are also behind a large part (46 percent) of the decline.

These results suggest that although residential location and commute mode are quite important, other factors collectively play an even larger role. One factor might be the spatial configuration of workplace locations with respect to residential locations. The combination of these two factors

determines the length of the commute, which cannot be studied using the above data.

To get directly at whether commute time differences are caused by differences in either distance commuted or speed, we turn to the Delaware Valley Regional Planning Commission’s 2012–2013 data. According to this data, Black commuters on average travel shorter distances but at a slower speed (Figure 4). If we ignore differences in travel mode, commutes by Black workers are 26 percent shorter in distance than those by White workers, but they are 43 percent slower. Accounting for travel mode makes these differences smaller, but not by much.¹⁰ So, although the distance traveled by Black workers between their residences and jobs is smaller, the slower speeds greatly increase total commute times. And this is not just for commutes—differences are even more pronounced among all trips.¹¹

These results highlight that speed is a first-order determinant of differences in commuting outcomes, and the slower average speed of Black commuters is not just a function of the mode of commute. This suggests that, even when we compare people who use the same mode, Black commuters are driving in places that have slower speeds on average, or are served by transit that provides less access or has slower service.

Where Differences Are Larger

Accounting for commute mode and income explains some of the partial convergence in commute times since 1980, but people of different races still have different experiences even if they use the same mode or have the same income. All the results so far differentiate people only by race and so may mask more diverse experiences.

FIGURE 4

Black Commuters on Average Travel Shorter Distances but at a Slower Speed

The slower speed greatly increases commute times for Black workers.

Average travel distance, time, and speed for all trips and work commutes, by race, Greater Philadelphia, 2012–2013

○ All-trips ● Commutes ● Black ● White

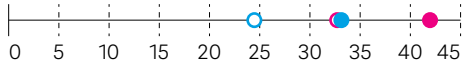
Average Travel Distance

Mean distance, miles



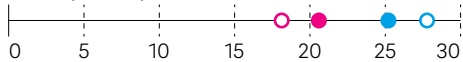
Average Travel Time

Mean time, minutes



Average Travel Speed

Mean speed, mph



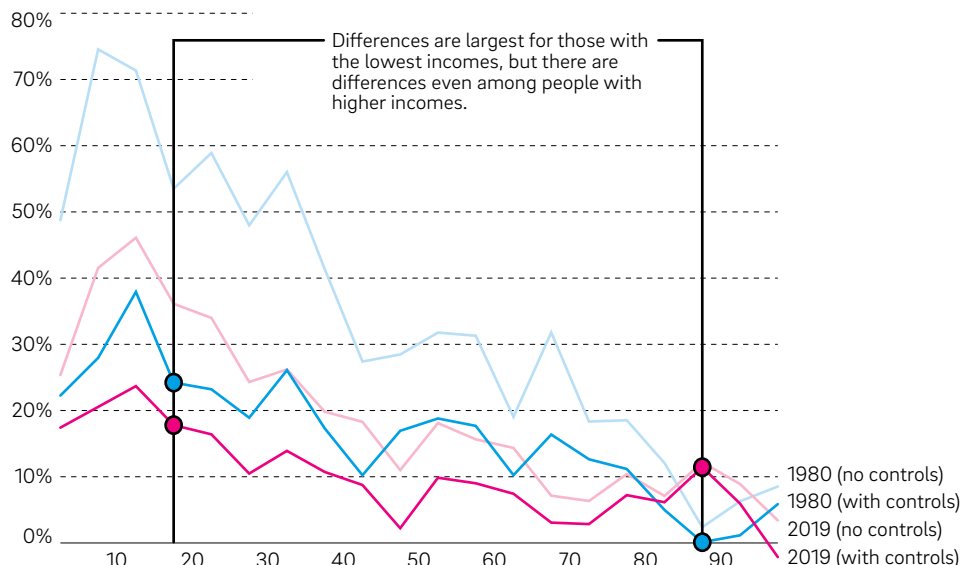
Data Source: Delaware Valley Regional Planning Commission’s 2012–2013 Household Travel Survey for the Delaware Valley Region.

FIGURE 5

Commute Times for Black and White Workers Are Most Different for Lower-Income Workers

This is true even after controlling for variables other than race.

Racialized difference in commute times, with and without controls, by income centile, Greater Philadelphia, 1980 and 2019

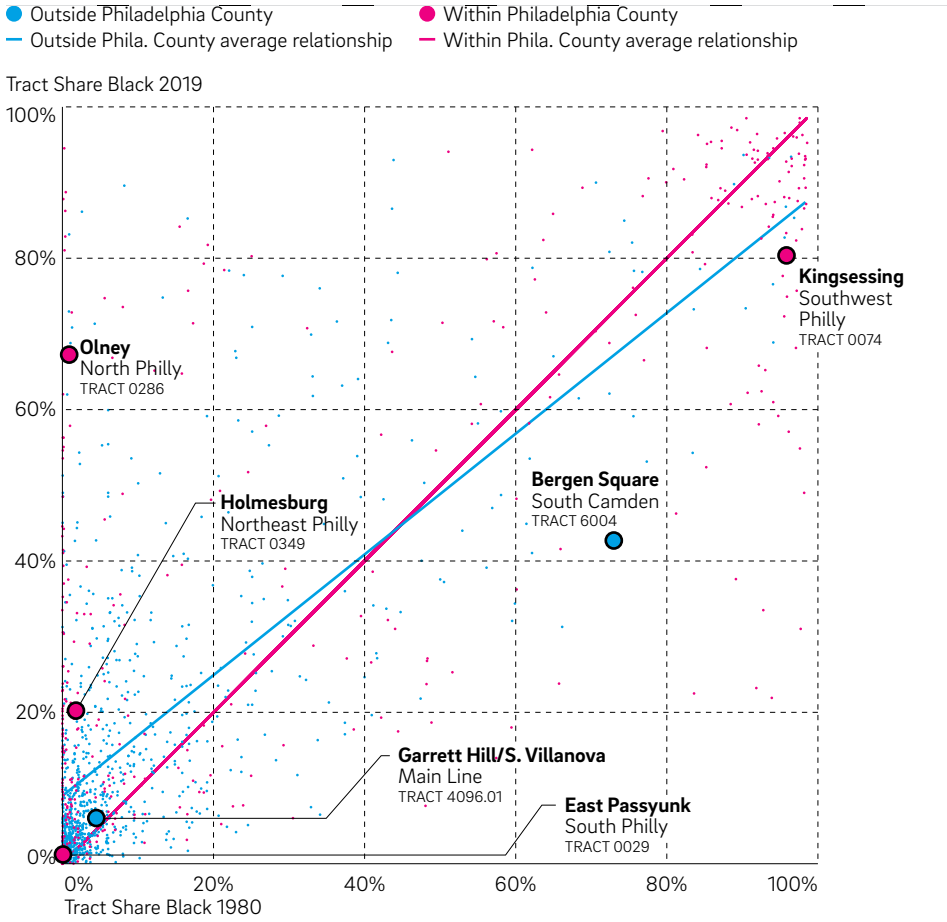


Data Sources: U.S. Census and American Community Survey.

FIGURE 7

Segregation Is Persistent

Segregation is higher in the City of Philadelphia than in the rest of the region. Relationship between a census tract's share of Black residents in 1980 and in 2019, Greater Philadelphia



Data Sources: u.s. Census and American Community Survey.

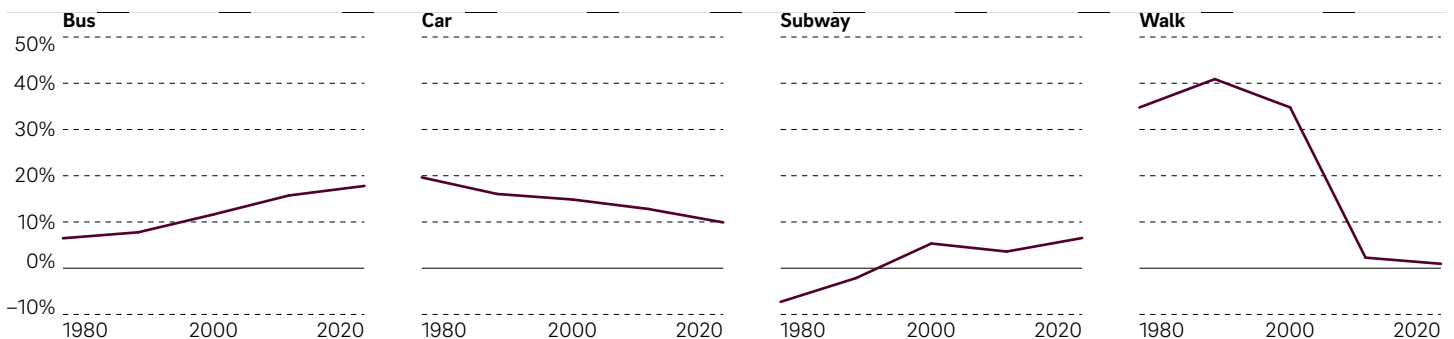
Commuter times for Black and White workers are most different among low-income workers (Figure 5). Among those with earnings in the bottom fifth of the income distribution in 2019, Black workers had commutes that were about 40 percent longer than White workers' commutes. Even after accounting for the observed characteristics described above, the lower-income Black workers' commutes were 20 percent longer than those of their White counterparts. And this reflects a substantial improvement since 1980, when the difference was 65 percent before accounting for observed characteristics, and 30 percent after. However, the differences were much smaller for higher-income workers in both 1980 and 2019.

As we saw earlier, transit mode is an important factor in determining commute time. The average commute time among car users was about 11 percent longer for Black drivers in 2019, falling from a difference of 20 percent in 1980 (Figure 6). However, commutes for Black bus and subway riders have been growing longer than the commutes for White bus and subway riders. This trend is worrying because it could represent reduced equity in transit services. On the other hand, there has been substantial convergence in commute times for both Black and White walkers.

FIGURE 6

Transit Mode Is an Important Factor in Determining Commute Time

Black transit riders have seen their commutes grow disproportionately longer. How much longer commutes are for Black workers compared to White workers, percent, by mode of transport, Greater Philadelphia, 1980–2020



Data Sources: u.s. Census and American Community Survey.

Philadelphia vs. the Nation

The racial difference in commute times in Greater Philadelphia as of 2019 is a bit larger than in the nation.¹² Black workers in the U.S. had commutes 5 percent longer than White workers on average, compared to an 11 percent difference in Greater Philadelphia (accounting for observed characteristics). Because the average commute time irrespective of race in Greater

Philadelphia is longer than in the nation, this difference magnifies a larger base, making the absolute difference in minutes even larger than in the U.S.

There has been less convergence in Black and White commute times in Philadelphia than in the U.S. The commute times of Black commuters and White commuters looked more similar in 1980, when the racial difference in commute times was 16 percent in Greater Philadelphia and 13 percent in the U.S. In part, the lower convergence in Philadelphia reflects less convergence in automobile usage by Black and White Philadelphians since 1980. But there is still a noticeable difference when we compare those taking the same commute mode or with similar incomes. In the U.S., the commute times for Black and White drivers have almost converged, with just a 3 percent difference, while in Greater Philadelphia the average commute time is still 10 percent longer for Black drivers than for White drivers. And in both Greater Philadelphia and the U.S., the longer commute times for Black transit riders have not decreased relative to White transit riders since 1980, and those commute times are, by some measures, increasing. As more people drive to work, the remaining population of transit users becomes increasingly low-income and minority.¹³ This helps explain why, in Greater Philadelphia, lower-income Black workers face longer commutes relative to lower-income White workers than in the U.S. as a whole.

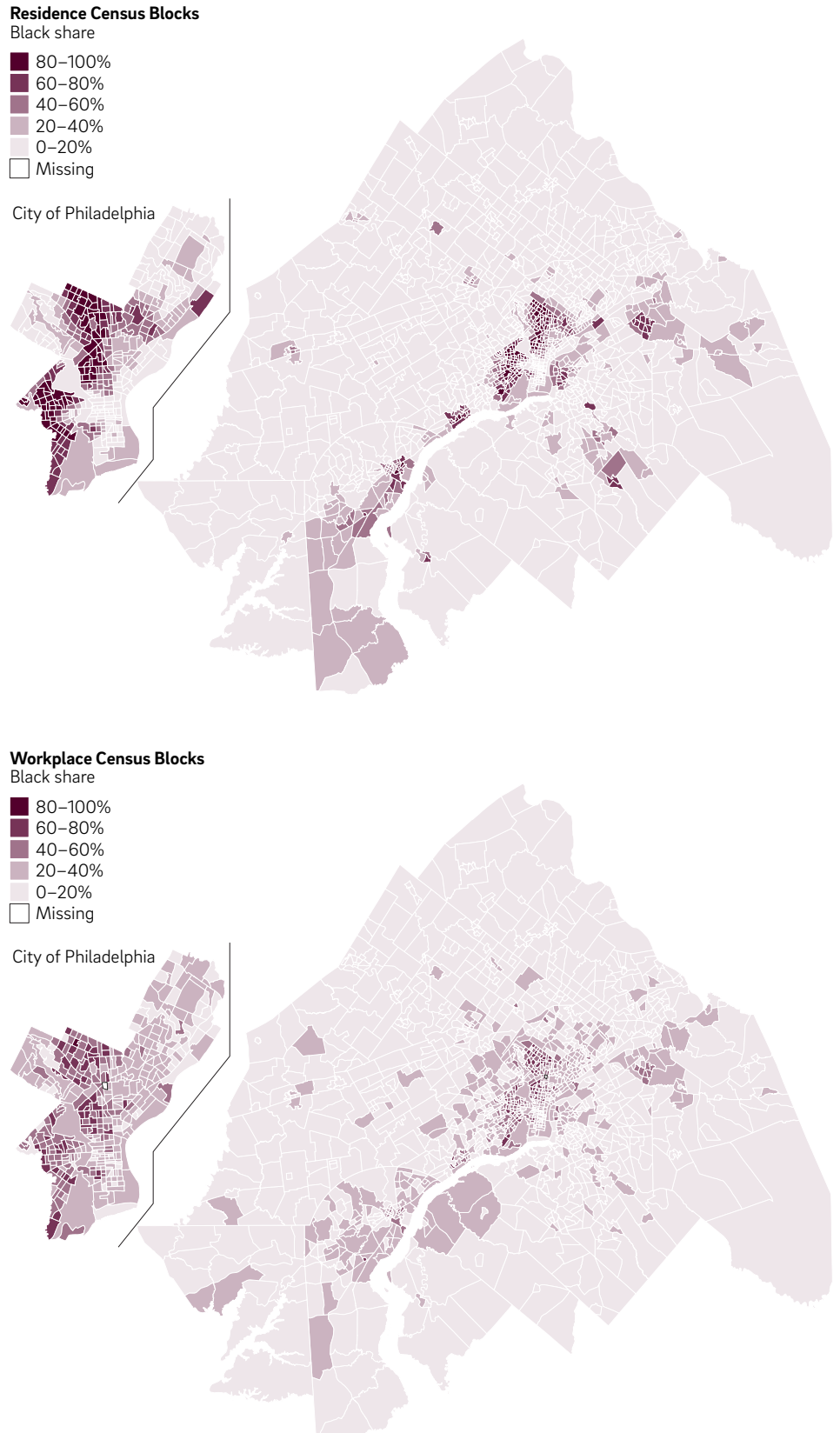
Why Differences Persist in Philadelphia and the Nation

In Philadelphia, three geographic trends influence where people live, where people work, and how fast they travel between the two. First, urban neighborhoods typically evolve quite slowly, so past segregation and discrimination can affect the present. Second, Greater Philadelphia has seen substantial suburbanization in both its residential population and its workplaces, but this has not impacted Black and White workers to the same extent. And third, Greater Philadelphia’s relatively extensive transit system plays an evergreen role in shaping the distribution of population in the region. We consider each of these trends, and how they interact, in detail.

FIGURE 8

Black Employment Is More Dispersed Than Black Residential Locations

This means that some Black workers must “reverse commute” to the suburbs for work. Share of Black residents and jobs held by Black workers, by census block, Greater Philadelphia, 2019



Data Sources: U.S. Census and American Community Survey.

Segregation persists in many U.S. cities despite the passage of the Fair Housing Act 55 years ago. This durable segregation produces barriers to equality in labor market outcomes and so likely relates closely to differences in commuting.¹⁴ Segregation is particularly persistent in Greater Philadelphia: For every additional 10 percent share of Black residents in a neighborhood in 1980, the additional share in 2019 was 8 percent (Figure 7).¹⁵ The data also show higher levels of segregation in the City of Philadelphia than in the rest of the region.¹⁶

Workplace locations, meanwhile, have suburbanized over the past 40 years. In 1980, 35 percent of Greater Philadelphia workers worked in the City of Philadelphia; in 2019, this figure was about 24 percent. And research indicates that job suburbanization in the U.S. generally harmed Black employment prospects because Black households are less likely to move to the suburbs.¹⁷ Compounding this issue, residential locations in Greater Philadelphia have also suburbanized. In 1950, roughly 66 percent of Greater Philadelphia’s population lived in the City of Philadelphia, but that share had fallen to 37 percent by 1980 and was at 28 percent as of 2020.¹⁸ As a result of these changes, Black workers today are relatively more likely to live in the city than White workers, whereas jobs are now relatively more likely to be found in the suburbs.

This wouldn’t be such an important issue if all urban Black workers could easily commute to jobs in the Philadelphia suburbs.¹⁹ But labor market accessibility for Black workers relative to White workers—a major predictor of convergence in commuting

outcomes—barely changed in Greater Philadelphia between 1990 and 2019.²⁰ Black employment locations are more dispersed than Black residential locations, indicating that some Black workers living within the City of Philadelphia have been able to access some suburbanizing jobs (Figure 8), but this requires the ability to “reverse commute” to the suburbs. This is more difficult for lower-income workers, who are less likely to own a car and thus must use Greater Philadelphia’s large legacy transit system, which itself has been the scene of historical racialization.

More generally, transit alters the spatial distribution of income in a city and has historically played a central role in the urbanization of poverty.²¹ If a faster mode of transportation (for example, cars) is principally available only to those with a higher income, lower-income households, which are more likely to be minority, will tend to locate in transit-accessible locations. Although Greater Philadelphia’s transit system permits many city and suburb dwellers to access jobs in the urban core, it was not designed to help lower-income households access more recently suburbanized jobs.

What’s more, transit spending and investment in Greater Philadelphia may itself perpetuate patterns of inequality. From 2007 to 2016, Regional Rail, which was designed to speed suburban access to the urban core, received 38 percent of capital outlays from the Southeastern Pennsylvania Transit Authority (SEPTA), despite supporting 11 percent of ridership (though this

See *Transit and Race in Philadelphia and the Nation.*

Working from Home

The importance of commuting is evolving in response to the work-from-home (WFH) movement induced by the COVID-19 pandemic. About one out of three full-time workdays are now done from home, a figure that has been stable for the last year.²⁹ Workers often elect to work from home because that way, they can spend significantly less time and money commuting. Unfortunately, this working arrangement is not an option for most American workers. Although more workers have been working from home since the pandemic, more than half of Americans do not have a job that can be done virtually.³⁰

Nonminority and more-advantaged workers are more likely to be able to work from home.³¹

Most of the jobs that cannot be done virtually are in manufacturing and services, fields in which Black and other minority workers are overrepresented. In December 2022 and January 2023, about 22 percent of Black households, as opposed to about 29 percent of White households, reported someone in the household working from home or teleworking at least one day per week.³²

Currently, a significantly higher proportion of Black workers rely solely on public transportation. For many metropolitan areas, the expansion in the number of workers moving away from daily commuting has been adverse for public transportation.³³ In most cities, daily ridership of public transit has not

reached prepandemic levels. Transit systems have been forced to close routes and implement less-frequent schedules during peak travel times. This has caused longer travel times and less efficient mobility for commuters, leaving those who do still use transit worse off. This differential exposure to WFH has the potential to lead to larger differences in commuting outcomes by race, particularly if WFH remains a prominent feature of the labor market.

spending was a substantial increase over the 1990s), whereas Philadelphia’s subway, which operates exclusively within the city, received 21 percent of capital outlays while supporting 28 percent of ridership.²² More recently, while SEPTA’s (recently canceled) light-rail extension to King of Prussia, PA, would have improved access to suburban jobs for city dwellers, SEPTA’s past prioritization of this project over urban projects (like extending its subway to the Philadelphia Navy Yard or providing mass transit service to Northeast Philadelphia with a Roosevelt Boulevard subway) suggests that the large racial difference in commute times among transit users could increase in the future.²³ Our analysis underscores that historical inequity is still present. Transit use explains some of the difference in speeds, but even among transit users, Black households face lower speeds on average.


Conclusion: Interpretation and Welfare

We find that Black commuters in Philadelphia face longer commutes than their White counterparts. Although this difference has partially closed since 1980, it is still substantial. Residential patterns play an important role in generating these differences, but commute speed is also very important. Even when comparing commuters using the same mode, Black workers’ trips are substantially slower than White workers’ trips. The racial disparity in commuting outcomes is even larger among lower-income workers and is growing worse for transit riders.

The longer commutes faced by Black workers interact with

other forms of inequality. Although average commute time has increased for all workers over the years, Black workers are not compensated for their longer commute times. Despite legal advances that aim to combat discrimination in the labor market, such as the Civil Rights Act of 1964, the Black-White earnings gap has continued to increase over the past three decades.²⁴ Ultimately, Black workers are likely to spend more time getting to work, they earn less money than their counterparts once they get there, and they face higher housing and transportation expenses.

Constrained economic opportunities and limited access to transportation are associated with the economic depression of Black communities.²⁵ Black workers who drive to work likely spend more to obtain and maintain a car, because Black car purchasers pay higher auto-loan interest rates and are approved for auto loans at lower rates.²⁶ Housing and land prices do not explain differences in commute times in the U.S. because Black households do not pay less for housing as compensation for their longer commutes.²⁷ In fact, Black homeowners on average pay higher mortgage rates, home insurance premiums, and property tax rates than those in comparable neighborhoods.²⁸

Time is an important resource for workers, and time spent commuting cannot be spent on other activities. Continuously depressed economic opportunities coupled with the longer commute times faced by Black workers will continue to stifle economic mobility. Improving access to higher-quality jobs, transportation, and housing are key to improving equity for workers. 

Transit and Race in Philadelphia and the Nation

Since the first railroad tracks were laid down in this country, race and transit have been intertwined. The case underlying the landmark Supreme Court decision *Plessy v. Ferguson* (1896)—which legitimized the “separate but equal” doctrine—was about equitable train access in New Orleans. The Montgomery Bus Boycott, ignited by the defiance of Rosa Parks and led by the Rev. Dr. Martin Luther King Jr. (among others), protested the racial segregation of public transit in Alabama. However, the problem of inequality in transportation access and within the transportation industry has not been constrained to the southern U.S. Well after *Plessy v. Ferguson* but before the Montgomery Bus Boycott, Philadelphia had its own notable struggle integrating employment in its public transportation system.

In August 1944—in the midst of World War II—thousands of White transit workers went on strike to protest the hiring of Black motormen and conductors by the Philadelphia Transportation Company (PTC). During the war, Philadelphia was a major production center for the military, crucially supplying troops with arms and gear.³⁴ The strike, which lasted nearly a week, halted the transit system in Philadelphia. More than 300,000 workers could not commute to work to produce war materials.

To get commuters back to work, the National Guard was deployed to take over the operations of the PTC and quell the civil unrest.³⁵ Under presidential authorization, the National Guard threatened strikers with the removal of their draft deferments if they did not return

to work. That threat proved sufficient to break the strike. The next week, Black workers could begin working in the higher-prestige and public-facing jobs at the PTC that they had been hired for. A year later, there were “over 900 African American drivers and conductors in the PTC system.”³⁶

A direct consequence of the strike was a loss of more than 4 million work-hours of production in the factories that produced everything from “battleships to braid for uniforms” at the height of World War II.³⁷ Had it not been for federal and military intervention, the effects of discrimination within Philadelphia’s public transportation system would have adversely rippled through the country when it needed to be its strongest.

Notes

1 See bunten et al. (2023).

2 For more about segregation in American cities, see Cortright (2020). For more about transit use in American cities, see Burrows et al. (2021), who find that about 9 percent of commuters use transit across the Philadelphia region, and about 26 percent use transit in the City of Philadelphia.

3 We borrow this “spatial mismatch” framework from Kain (1968).

4 This methodology is based on bunten et al. (2023).

5 A tract contains about 4,000 people and roughly corresponds to a neighborhood. For example, the area bounded by Arch Street, Broad Street, the Vine Street Expressway, and 7th Street in Philadelphia is one census tract and roughly corresponds to Chinatown.

6 Throughout this article, we often use 2019 to refer to data combining 2012–2019, and we use “worker” and “commuter” interchangeably.

7 Specifically, the outcome variable is the natural logarithm of commute time, and race is an indicator for whether the respondent identifies as Black. We decompose the contribution of different characteristics to the commute time differential following the approach of Gelbach (2016).

8 bunten et al. (2023) show that, if lack of access to jobs reduces the ability of potential Black workers to find work, this likely means that the reported estimates understate the true differences in commuting.

9 As an example, attending college is typically more affordable if a student comes from a wealthy family, but there are large racial discrepancies in wealth in the U.S. See Kuhn et al. (2020). So, if discrimination plays a role in racial wealth differences, it then reduces the likelihood of obtaining a college degree, which then alters the commute time because different jobs are available to those with and without college degrees. Thus, controlling for college degree “explains” where some of the racial difference in commute times comes from, but it does not rule out unequal treatment through that channel.

10 Controlling for mode, Black workers commute a 22 percent shorter distance than White workers, and these trips are about 33 percent slower.

11 When considering all trips, those by Black travelers are 24 percent shorter in distance and 56 percent slower if we do not account for mode. Thus, their trips take 32 percent longer on average. If we account for mode, trips by Black travelers are 31 percent shorter and 50 percent slower, resulting in trips that are 19 percent longer on average.

12 The average commute time in the U.S. as of 2019 is 26.3 minutes for White workers and 28.5 minutes for Black workers. See bunten et al. (2023).

13 See Lazo and George (2020).

14 See Cutler and Glaeser (1997), Ananat (2011), Boustan (2011), and Chyn et al. (2022).

15 The dissimilarity index, which reflects the relative distribution of different races across geographic areas, is a measure of residential segregation. Higher values indicate higher levels of segregation. The dissimilarity index declined only slightly for Greater Philadelphia during this period, from 0.76 to 0.66. See bunten et al. (2023).

16 Yet, this persistence is not (entirely) destiny. Some neighborhoods where very few Black Philadelphians lived in 1980 now have substantial Black populations (for example, the Olney neighborhood in North Philadelphia).

17 See Miller (2022).

18 See Macrotrends (2023). The rapid suburbanization in Greater Philadelphia was in part due to the City of Philadelphia’s wage and business taxation policies, which reduced within-city employment rates. See Haughwout et al. (2004).

19 In contrast, Black households have substantially suburbanized in the nation as a whole. See Bartik and Mast (2021).

20 Labor market access here is measured as a weighted average of jobs within the Greater Philadelphia area, where the weights decay with distance from residential locations. See bunten et al. (2022).

21 See LeRoy and Sonstelie (1983) and Glaeser et al. (2008). In Philadelphia in particular, the streetcar system and later the subway system drove the dynamics of density and desirability in Philadelphia neighborhoods before the automobile. See Gin and Sonstelie (1992).

22 See Saksa (2017). These numbers do not account for miles traveled per rider, because SEPTA doesn’t track faregate exits. However, we do know that vehicle miles traveled is only about 20 percent higher for regional rail, whereas total ridership is two to three times higher for urban rail.

23 See Fitzgerald (2023).

24 See Daly et al. (2017).

25 See Hu (2021).

26 See Butler et al. (2023).

27 See Glaeser et al. (2008) and bunten et al. (2023).

28 See Aronowitz et al. (2020).

29 See Barrero et al. (2023).

30 See Parker et al. (2022).

31 See Gould and Shierholz (2020) and Asfaw (2022).

32 Authors’ calculations from the Census Household Pulse Survey.

33 See Young et al. (2021).

34 See Temple University Libraries (n.d.).

35 See Winkler (1972).

36 See Sigmond (2011).

37 See Winkler (1972).

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