Of Tracks and Trails: How Accessible Green Spaces Reshape Communities*

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Abstract

Jurisdictions have increasingly prioritized urban greening in areas with historically high urban imperviousness, with the aim of promoting environmental justice and enhancing community well-being. Understanding the long-term impacts of these transformations is important. While they may bring economic benefits, they can also generate concerns on the potential of gentrification and displacement of vulnerable populations. Because green space development is often endogenous, isolating its true impact on neighborhood change can be challenging. To uncover the causal relationship, I exploit the presence of abandoned railroads as a source of exogenous variation in susceptibility to green space development. Using abandoned and active rail and trail spatial data, and drawing on institutional context, I demonstrate that abandoned rail corridors serve as a valid instrument for predicting trail placement. Long-difference estimates show that converting industrial spaces into green amenities leads to significant long-term neighborhood changes. Neighborhoods where trails have been created have experienced a 24% greater increase in median house values, a 8% greater increase in median household income, and a 14.5 percentage point greater increase in the share of white residents compared to developments over time in areas without trails. These findings highlight both the economic benefits and social trade-offs of urban greening.

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1 Introduction

The significance of access to green spaces is deeply embedded into the public consciousness. In the 19th century, as industrialization reshaped urban life, the idea of open spaces and greenery gained momentum among civic authorities who were developing a variety of measures to address public health concerns related to population growth, sanitation, and infectious diseases (Jones 2018). Over time, other forms of green infrastructure—such as community gardens and multi-use trails—have also gained recognition as crucial amenities for residents (Jones et al. 2022).

A wealth of research supports the value of green amenities, showing that they improve physical and mental health (Astell-Burt et al. 2013, Giannico et al. 2024), promote childhood development (Liao et al. 2019), increase community cohesion (Jennings & Bamkole 2019), and enhance public safety (Schertz et al. 2021). Additionally, the impacts of urban heat islands can be particularly alleviated through woody vegetation (Zhou et al. 2011, Martin et al. 2024). However, the existing allocation of these amenities is far from equitable. In the United States, historical practices such as redlining, displacement, and income-based segregation have led to unequal allocation of natural spaces, often favoring predominantly white and more affluent communities (Hsu et al. 2021).

In recognition of both the benefits of accessible green spaces and their historically unequal distribution, many jurisdictions now increasingly highlight green space development as dual-purpose solutions for climate resilience and community revitalization.[1] One emerging strategy to create more green space involves converting post-industrial areas. These sites—such as old rail corridors, abandoned factories, or underused warehouses—are frequently vacant, contaminated, or otherwise not in active use and thus may be less expensive than prime real estate (Cranz 1982). Additionally, these areas are frequently located in lower-income neighborhoods, presenting an opportunity to address environmental injustices by providing

[1]For example, in 2021, 31 mayors of the world's largest cities signed C40 Cities Urban Nature Declaration, pledging to expand, restore and protect urban parks, trees and other natural spaces within their cities.

much-needed recreational and health benefits to historically underserved communities.

However, the transformation of industrial corridors into green spaces poses a paradox. While these projects aim to address environmental justice issues by improving neighborhood well-being and aesthetics, they can inadvertently drive up housing costs and attract wealthier residents, displacing the very communities they were designed to benefit (Wolch et al. 2014, Maantay & Maroko 2018, Asabere & Huffman 2009). Understanding the trade-offs between green space development and its impact on equitable growth is crucial for policymakers seeking to balance sustainability goals with other needs of vulnerable populations.

To date, measuring the contributions of increasing green amenities to neighborhood change is challenging. Green spaces often appear alongside other neighborhood improvements that attract wealthier residents, making it difficult to discern whether observed benefits arise from the green space itself or broader economic shifts.

To address this gap, I use a novel instrument: abandoned rail lines. In the United States, over 100,000 miles of rail lines have been abandoned due to industrial shifts, and more than 25,000 miles have been repurposed as multi-use trails, with an additional 9,000 miles under development (Rails to Trails Conservancy 2025). These paths are typically pedestrian and bicycle corridors physically separated from roadways, designed for recreation and transportation. I use presence of abandoned rail at the census tract level as an instrument to generate exogenous variation in trail creation. Using a long-differences analysis, I combine abandoned and active rail data, trail data, and historical and current census data to estimate the impact of rail trail creation on change in median housing values, change in median household income, and change in the share of white residents. In doing so, I provide large-scale causal evidence on whether and how these environmental improvements reshape the communities they intersect.

I find that areas with new trails experienced a 24% greater increase in median house values, a 8% greater increase in median household income, and a 14.5 percentage point larger increase in the share of white residents compared to areas without trails. These

findings underscore both the economic advantages and the social trade-offs of urban greening, highlighting the need for policies that balance sustainability with equity to ensure that green space development benefits all communities.

This paper contributes to an emerging strand of economics literature on environmental justice. It provides an empirical investigation of the Tiebout (1956) hypothesis, which suggests that individuals sort themselves into neighborhoods offering varying types and levels of amenities. Banzhaf & Walsh (2013) build on that theoretical framework, showing that exogenous improvements to public goods—such as cleaner air—can inadvertently cause low-income residents to move by driving up housing prices, triggering a form of gentrification. Early empirical work on this theme has predominantly focused on pollution and hazardous waste cleanups, documenting how mitigation efforts can reshape residential sorting and sometimes exacerbate segregation (Chay & Greenstone 2005, Kohlhase 1991, Depro et al. 2015, Banzhaf et al. 2019). By contrast, this paper shifts the focus from pollution reduction to a different type of amenity—accessible green space—and investigates whether such projects produce a similar pattern of neighborhood change.

A key contribution of this paper lies in its methodological approach. While pollution abatement or hazardous waste cleanup are often federally directed and can serve directly as exogenous shifts in local environmental quality, park and trail development can be more heavily shaped by local advocacy and political will, making it harder to isolate cause and effect. I address this challenge by exploiting variation in location of abandoned rail lines, in conjunction with 1960s baseline characteristics and county-level fixed effects to account for contemporaneous neighborhood shifts. This strategy not only advances our understanding of green amenities and gentrification at a large scale but also provides a new template for evaluating other equity outcomes of transforming post-industrial areas into green spaces.

Many existing studies on the neighborhood impacts of introducing accessible green space are local in scope, with numerous examples focusing specifically on rail-trail conversions. For instance, Black & Richards (2020) use a difference-in-differences design and find that

the implementation of the High Line, a linear park built in Manhattan on a former New York Central Railroad spur, raised adjacent housing values by 35%. Noonan (2012) similarly examines the case study of the Atlanta Beltline, estimating hedonic price functions based on distance from the Beltline and finding that immediate-term property value increases primarily benefit existing owners who capture these gains as windfalls, while long term impacts are more ambiguous. My paper, by contrast, draws on a broad set of rail-to-trail conversions across the United States. By examining a large-scale, quasi-experimental setting, this study provides broader insights into the dynamics of green space development, isolating its impacts from local idiosyncrasies and offering a more generalizable understanding of neighborhood change.

The rest of the paper proceeds as follows. Section 2 provides background and institutional details of rail trails in the United States. Section 3 discusses data and descriptive statistics. Section 4 presents cross-sectional OLS regression results, while Section 5 presents the results of long-differences regressions using abandoned rail presence as an instrument. Section 6 concludes.

2 Background

2.1 Multi-Use Trails as a Public Amenity

Multi-use trails, also referred to as shared-use paths, greenways, or linear parks, are paths designed for non-motorized users with exclusive right-of-ways and with minimal cross flow by motor vehicles. They are often located along rivers, streams, ridgelines or on historic infrastructure corridors such as canals or railroads, features that shape urban form (Lindsey et al. 2008). Unlike hiking trails in the wilderness, multi-use trails are often designed to link people and places.

These trails offer a wide range of benefits, functioning both as recreational amenities

and as essential components of active transportation networks.[2] Planners advocate for these greenways to improve city landscapes, conserve natural habitats, support biodiversity, and provide opportunities for recreation and fitness. Additionally, they serve to connect communities to each other and to existing public transit infrastructure, reduce emissions in transportation, and reduce road congestion (Keith et al. 2018).

While the concept of greenways can be traced back to the 19th-century parkway and greenbelt movements initiated by Frederick Law Olmsted, it is only in recent decades that multi-use trail networks have seen significant expansion. This resurgence can largely be attributed to shifts in economic and demographic factors that prioritize quality-of-life amenities, heightened public awareness of the health benefits associated with active transportation, and increased policy emphasis on climate resilience and equitable urban development (Lindsey et al. 2008).

Today, many jurisdictions view multi-use trails as tools for economic development. They are seen as catalysts for increasing property values, boosting tourism, and revitalizing historically underserved areas.[3] For this reason, multi-use trails have become integral to contemporary planning objectives around recreation, transportation, and sustainability.

As a reflection of this growing recognition, funding for multi-use trails has increased at both federal and state levels in recent years. Federally, the Transportation Alternatives (TA) program stands as the largest dedicated source of funding for trails and active transportation projects. The 2021 Bipartisan Infrastructure Law authorized an average of $1.44 billion per year over five years for TA projects, including pedestrian and bicycle facilities (Federal Highway Administration 2021). Additionally, the Active Transportation Infrastructure Investment Program, included as part of the Fiscal Year 2023 Omnibus Appropriations, granted $45 million to accelerate local and regional plans to build walking and biking paths and trails to everyday destinations (Federal Highway Administration 2025). Many states

[2]Active transportation is defined as human-powered mobility, such as biking or walking, which is an alternative to motor vehicle based transportation (United States Department of Transportation 2022).

[3]This understanding is based on conversations with representatives from MassTrails and the Rails-to-Trails Conservancy.

have also established their own funding mechanisms for multi-use trail projects. For instance, Massachusetts' MassTrails program provides grants to support recreational trail and shared-use pathway projects across the Commonwealth, focusing on projects that demonstrate critical network connections of regional or statewide significance (MassTrails 2025). Similarly, in 2024, Connecticut awarded $10 million in grants to support the development and improvement of 45 multi-use trails located in towns and cities throughout the state (State of Connecticut 2024). These investments underscore the status of multi-use trails as salient public amenities.

2.2 Heterogeneity in the Benefits of Multi-use Trail Development

Multi-use trails are recognized for their contribution to the sustainability and economic vibrancy of cities, as well as the health of its residents. Recent research underscores the benefits of green spaces, highlighting their role in enhancing physical and mental health (Astell-Burt et al. 2013, Giannico et al. 2024), supporting childhood development (Liao et al. 2019), fostering community cohesion (Jennings & Bamkole 2019), and improving public safety (Schertz et al. 2021).

Economically, multi-use trails represent public goods that can significantly influence local property values and attract private investment. However, such benefits can have uneven distributional impacts. Rising property values around trail developments can generate substantial economic gains for property owners, yet they may also lead to increased housing costs, affordability pressures, and displacement risks for lower-income and historically marginalized residents.

The Atlanta Beltline exemplifies both the potential benefits and challenges of multi-use trail development. Initially proposed in 1999 as a comprehensive strategy to address Atlanta's economic segregation, environmental justice concerns, air pollution, and infrastructure deficiencies, the project aims to transform a 22-mile former railway loop into an interconnected network of pedestrian and bicycle trails, linking 45 neighborhoods across the

city's core (Weber et al. 2017).

Since construction began in 2008, the Beltline has sparked significant economic revitalization, attracting over $9 billion in private development by the end of 2023 (AtlantaBeltline 2024). One example is the Reynoldstown neighborhood, adjacent to the Eastside Trail, where redevelopment has reshaped the area. A former steel mill, sold in 2020, has since been replaced with over 60 new housing units, including condos and townhomes (Atlanta 2025).

However, the Beltline's impact has not been uniformly positive across communities. While the project has stimulated local economies and expanded recreational opportunities, it has also increased housing costs and displacement pressures for lower-income residents. In areas where the Beltline has opened, housing values and rents have surged by as much as 193% and 126%, respectively (Byahut et al. 2020). Immergluck & Balan (2018) find that the increase in median sale price was the highest near the southwest segment, a historically black neighbhorhood of Atlanta.

Thus, while the Beltline is regarded as a success in expanding recreational access and increasing Atlanta's property tax base, its development underscores the heterogeneous effects of multi-use trails. The project highlights the heterogeneous effects of multi-use trail development.

2.3 Rail Trails in the United States

While not all multi-use trails are rail trails, many, like the Atlanta Beltline, are constructed along abandoned railway corridors. At its peak in 1916, the United States rail network spanned over 250,000 miles, serving as the primary mode of freight and passenger transportation (Harnik 2021). Over subsequent decades, however, railroads began to lose their dominant position. Between 1930 and 1960, the rise of air and automobile transportation diverted both freight and passengers away from rail (Gallamore & Meyer 2014). Compounding this shift was the country's transition from coal to oil in the 1960s, which undermined a major segment of rail traffic—particularly in the eastern United States—and led to the

bankruptcy of six major northeastern railroads between 1967 and 1972 (Ferster 2006). Rail abandonment further accelerated after the Staggers Act of 1980, which substantially loosened the restrictions on rail abandonment. As a result, between 1980 and 1990, the rate of rail abandonment by major carriers accelerated to between 4,000 and 8,000 miles per year (Ferster 2006).

There are strong complementarities between abandoned rail corridors and multi-use trails. Rail corridors typically feature gentle gradients, multiple points of access, separation from vehicular traffic, and proximity to nature, providing an ideal foundation for socially inclusive trails that accommodate a diverse range of users. Their linear connectivity is especially valuable for transportation, which is otherwise challenging to achieve in developed spaces. Thus, repurposing inactive rail lines significantly reduces the costs of multi-use trail development, as the existing infrastructure minimizes the need for extensive land acquisition and grading.

The first wave of rail trail conversions emerged in the 1960s. Notable examples include the Elroy-Sparta State Trail in Wisconsin and the Illinois Prairie Path, which were among the pioneering projects to transform defunct rail corridors into recreational trails. However, the rail trail movement didn't gain significant momentum until the 1980s with the passage of the National Trails System Act Amendments of 1983, which introduced the concept of "railbanking." This allowed railroads to transfer unprofitable lines to qualified public or private agencies for interim trail use, while reserving the option to restore rail service in the future [4]. This legal framework made it easier to convert abandoned rail corridors into trails, leading to the creation of over 25,000 miles such trails (Rails to Trails Conservancy 2025).

Figure 1 illustrates the strong relationship between abandoned rail corridors and multi-use trail siting in the Greater Boston Area. Although not every trail follows an abandoned railway and not all abandoned railways are converted to trails, the figure highlights the strong correlation between the two. This observation motivates my use of abandoned rail as a relevant predictor of trail placement. Figure 2 extends Figure 1 by presenting the

[4] In practice, very few disused rail corridors saw rail service start up again.

distribution of rail and trail lines across the contiguous United States. The widespread nature of rail to trail developments allows me to analyze at a large scale the impact of green amenities on surrounding communities, addressing a gap in prior research, which has primarily focused on localized studies.

3 Data and Descriptive Statistics

3.1 Data

To estimate the effect of trail creation on community change, I combine census data with information on abandoned rail, active rail, and multi-use trails across the contiguous United States.

Population and Housing Characteristics. To assess community change, I compare present day population and housing characteristics to 1960 demographic data, a period where there were no officially recognized rail trails. Recent data is sourced from the 2018–2022 5-year American Community Survey (ACS) at the block group and census tract level, while historical data is drawn from the 1960 Decennial Census at the tract level. [5]

The 1960 census tract data covers only major cities, metropolitan areas, and some surrounding regions, rather than the entire United States. Consequently, my analysis focuses on these areas. To reconcile geographic differences between the 1960 and 2020 census units, I created a custom crosswalk that maps 2020 census tracts to 1960 tracts, excluding any 2020 tracts that fall outside the 1960 boundaries. When a 2020 tract overlaps multiple 1960 tracts, each overlap is treated as a separate observation and weighted by the proportion of the 2020 tract's area within the corresponding 1960 tract. Figure 3 shows the distribution of the 1960 census tracts, which defines the geographic scope of my empirical analysis.

Two key outcomes in my analysis are the changes in median house value and median

[5] I use census tracts, as it is the smallest unit of analysis for 1960. In the appendix, I show results of block group to tract mappings.

household income from 1960 to 2020. The 1960 Census reports these figures in predefined categories (e.g., "less than $5,000") rather than as exact values. To estimate the 1960 medians, I first calculate the cumulative frequency of households across the categories to identify which category contains the 50th percentile. I then interpolate within that category by taking a weighted average that reflects the position of the median within the interval. Finally, I log-transform both the 1960 estimates and the 2020 values in my main specifications to reduce skewness, mitigate the influence of outliers, and account for the exponential growth in housing values and incomes over time.

Abandoned and Active Rail. Abandoned rail data comes from Forgotten Lands, Places, and Transit (FRRandP), a crowd-sourced dataset tracking abandoned, disused, and out-of-service railroads. I rely on this database because it provides the most complete coverage of abandoned tracks, including older segments not always documented in official registries. Active rail data is drawn from the North American Rail Network (NARN) Rail Lines dataset, which categorizes rail lines by type of operation. For this analysis, I subset on those categorized as "Main Line," "Major Industrial Line," "Passing Sidings," "Non-Main Line Active Track," and "Yard Tracks."

Multi-Use Trail. The multi-use trail data is sourced from OpenStreetMap (OSM) and filtered to identify paths intended for non-motorized, multi-modal transportation. Specifically, I include paths tagged as highway=cycleway, highway=footway, or highway=path. These tags represent trails primarily designated for cyclists, pedestrians, or general non-car use, respectively. To ensure that the selected trails are truly multi-use, I further filter for paths tagged for both "bicycle" and "foot", confirming they accommodate both cyclists and pedestrians. Additionally, I exclude trails marked for private access, as well as those designated for mountain biking or skiing, since they cater to specific recreational activities rather than general-purpose recreation and transportation. These refinements ensure that the dataset accurately captures accessible, multi-use trails that facilitate biking and walking—key com-

ponents of greenways.

I overlay the lines of abandoned rail lines, active rail lines, and multi-use trails onto a map of the contiguous United States, divided by my 1960-2020 census tract mapping. For each 1960-tract/2020-tract combination, I identify presence and calculate length in miles of abandoned rail, active rail, and multi-use trails, as well as distance in miles from the tract centroid to the nearest rail or trail.

3.2 Descriptive Statistics

Table 1 presents the summary statistics of baseline characteristics using the 1960 census tract data. Table 2 presents the summary statistics of the distribution of rails and trails, as they appear in the present day, according to 1960 census tract boundaries. Column 1 reports summary statistics for all census tracts. Column 2 focuses on census tracts containing present-day abandoned rail lines using the FRRandP data. Column 3 narrows this subset to census tracts with abandoned rail but no presence of trails along the rails, indicating no rail-to-trail conversion in those tracts. Column 4 focuses on census tracts with multi-use trails today, as identified using OSM data. This includes both rail trails and other multi-use trails in the dataset. Finally, Column 5 focuses on census tracts with presently active rail lines, based on NARN data. Tables 3 and 4 show summary statistics for the same variables and areas in 2020, but at the census tract level.

In 1960, the different subsets of census tracts based on the presence of rail and trails exhibit some differences, which become more pronounced by 2020. Columns 2, 3, and 5 of both tables represent areas historically associated with industrial corridors. In 1960, these areas generally had slightly lower education levels and home values compared to other tracts, with the most pronounced differences observed in tracts with active rail lines today.

The racial composition of these areas is fairly consistent across groups in 1960. On average, 88% of the population in all census tracts was white, with tracts containing abandoned rail but no trails having the lowest proportion (88%) and tracts with active rail the highest

(91%).[6] Median household income was also similar across groups, with census tracts containing trails having the highest income ($5.7 thousand), while tracts with abandoned rail but no trails and those with active rail had the lowest ($5.4 thousand). Given the mean income of $5.6 thousand across all tracts, these differences may lack practical significance.

Table 3 reveals that, by contrast, 2020 tracts categorized by whether they contain rail and/or trails exhibit greater divergence in demographic and economic characteristics. Areas with multi-use trails have the highest share of college-educated residents (44%, compared to 37% across all tracts), while areas with active rail have the lowest share (33%). Similarly, both household income and housing values vary significantly by category. Areas with multi-use trails have the highest median household income ($97.5 thousand, 10.7% higher than the average of $88 thousand across all tracts), while areas with abandoned or active rail fall below average ($79–$85.7 thousand). A similar pattern is observed for housing values, where areas with trails have the highest median values ($463.8 thousand, 9.4% above the average of $424.1 thousand), while areas with abandoned or active rail fall below average ($337.5–$400.8 thousand).

Together, Tables 1 to 4 provide descriptive evidence that areas associated with different rail and trail presence have evolved differently over the past 60 years. Areas with multi-use trails show higher levels of education, income, and housing values, while areas with active rail consistently exhibit the lowest economic indicators.

4 Cross-Sectional OLS

4.1 Empirical Strategy

I begin by testing my hypothesis that multi-use trails significantly impact housing and demographic characteristics. To do so, I estimate a cross-sectional model examining how proximity to trails correlates with various housing and population metrics in 2020. The unit of analy-

[6]The percentage of the white population is used to indicate racial composition because, in 1960, census categories grouped people into White, Black, and Other.

sis is the census block group, the most granular level available for that year. The baseline specification is:

$$Y_i = \beta_0 + \beta_1 has_trail_i + \beta_2 (trail \leq 0.5mi)_i + \beta_3 (0.5mi < trail \leq 1mi)_i + \mathbf{\Gamma X_i} + \epsilon_i \quad (1)$$

where Y_i is the outcome variable of interest, which includes median housing value, number of housing units, median household income, and share of white population in census block group i. To address skewness in high-cost and high-density neighborhoods, I log-transform median housing value, number of housing units, and median household income. The variables Has_trail_i, $(Trail \leq 0.5mi)_i$, and $(0.5mi < trail \leq 1mi)_i$ capture whether a trail segment exists in the block group, whether there is a trail within 0.5 miles from the block group, and whether there is a trail between 0.5 and 1 mile from the block group, respectively.

To control for confounding factors, I include a vector $\mathbf{\Gamma X_i}$ of geographical controls (distance from the nearest metropolitan center, whether the block group has active rail and distance indicators from the active rail) and 1960 baseline neighborhood traits (e.g., historical housing and income values and demographic composition). I include county fixed effects for all my specifications. Standard errors are Conley-adjusted with a 2 mile spatial cutoff.

4.2 Results

Table 5 reports the OLS estimates. Consistent with existing literature, Panel (a) columns (1)–(4) demonstrate a positive association between trail proximity and median house values. In my preferred specification with geography and 1960 baseline controls (column 4), having a trail within the census block is associated with a 0.123 log point (13.1%) increase in median house value. Living within 0.5 miles of a trail is linked to a -0.033 log point (-3.4%) increase, and living between 0.5 and 1 mile of a trail is linked to a -0.018 log point (-1.8%) increase in median house value. Because the majority of census blocks containing a trail also lie within

0.5 miles of it, these coefficients can be combined, implying that such locations have median house values are roughly 8.9 to 10.4 percent higher than those without trail access, holding county, geography, and baseline characteristics constant.

Panel (a), columns (5)–(8), indicates that trail accessibility is generally associated with a larger housing supply. In the preferred specification (column 8), having a trail within the census block corresponds to a 0.089 log point increase (9.3%) in the number of housing units. By contrast, proximity to a trail is linked to a small negative effect of -0.024 log points if the census block center is located within 0.5 miles of a trail.

The results of Panel (a) imply a notable preference for locating near trails: if trails were purely indicators of rural or wilderness areas, we might expect fewer housing units. Instead, the positive coefficient on having a trail, combined with the sizeable effect on median house values, points to strong demand for housing in trail-accessible locations, with both higher supply and higher prices coexisting in these areas.

Panel (b), columns (1)–(4), reveal a positive association between trail proximity and median household income. In the preferred specification (column 4), having a trail within the census block is associated with a 0.108 log point (11.4%) increase in median household income. However, proximity to a trail is linked with negative coefficients, with trails located less than 0.5 miles away and between 0.5 and 1 mile away associated with decreases of -0.052 and -0.032 log points, respectively. These findings suggest that while trails are generally an amenity associated with higher-income households, the immediate surroundings of a trail may feature a slightly more mixed demographic composition. Taken together, these findings suggest that having a trail is associated with higher housing supply overall, although the effect diminishes or becomes slightly negative in areas immediately adjacent to the trail.

I observe a similar pattern of the effect of trails on share of the white population as the outcome, as shown in Panel (b), columns (5)–(8). In the preferred specification (column 8), having a trail within the census block is associated with a 2.56 percentage point increase in the share of the white population. However, proximity to a trail is associated with negative,

though noisy, coefficients, with trails located less than 0.5 miles away and between 0.5 and 1 mile away corresponding to decreases of -2.3 percentage points and -0.927 percentage points, respectively. These coefficients are not significant at the 95% confidence interval.

Overall, these cross-sectional results provide an initial indication that areas with trails feature higher house values, more housing units, and elevated income levels, and a greater share of white residents.[7] However, if trails are more likely to be built in already-wealthier locations, these estimates would suffer from omitted variable bias. This motivates the instrumental variables approach that follows, where I use abandoned rail lines to address the endogeneity of trail placement.

5 IV Long Differences

5.1 Empirical Strategy

To generate exogenous variation in trail creation, I use abandoned rail presence as an instrument for multi-use trail presence. Abandoned rail presence can serve as a valid instrument for trail presence if the following conditions hold: (1) it is positively correlated with trail presence (relevance), (2) it cannot cause a reduction in trail presence once assigned (monotonicity), (3) it is effectively as-good-as-randomly distributed across census tracts (independence), and (4) it affects demographic changes solely through the channel of rail trail creation, without any other direct influence (exclusion restriction).

As the United States' network of rail trails has been developing over the past 60 years, I employ a long differences approach to address the issue of staggered trail openings. Specifically, I look at the change in outcome between the present and 1960, before there were any rail trails.

The system of equations to be estimated is:

[7]The levels estimate of these regressions can be found in appendix table A4

$$\Delta Y_{ij} = \pi_0 + \pi_1 \Delta \widehat{has_trail}_{ij} + \gamma \mathbf{X} + \epsilon_{ij} \tag{2}$$

$$\Delta has_trail_{ij} = \alpha_0 + \alpha_1 has_abandoned_{ij} + \rho \mathbf{X} + \omega_{ij} \tag{3}$$

where ΔY_{ij} is the change in the outcome of interest (for example, log median house value) in 2020 census tract i, 1960 census tract j, Δhas_trail_{ij} an indicator for whether multi-use trails were created, and $\mathbf{X}$ is a vector of location controls, including distance to trail, presence and distance to active rail and distance to urban center, as well as 1960s baseline controls. I include county fixed effects for all my specifications. Standard errors are Conley-adjusted with a 2 mile spatial cutoff. When a 2020 tract overlaps multiple 1960 tracts, each overlap is treated as a separate observation and weighted by the proportion of the 2020 tract's area within the corresponding 1960 tract. Income and house values have been adjusted to 2020 dollars for consistency across time.

I assume that there were no multi-use trails in 1960 and treat the observed presence of trails today as representing the total change in trail creation over this period. While the opening date of the first official rail trail in 1964 is well-documented, my dataset does not include historical information on non-rail trails. Nevertheless, I argue that it is reasonable to assume that most of these trails, regardless of their historical origins, were not functioning as the multi-use trails we recognize today.

The Federal-Aid Highway Act of 1956 allocated substantial funding to create the United States' highway system, explicitly excluding bicycles and offering no equivalent support for bikeways due to limited demand. This lack of investment created a feedback loop favoring motor vehicle use and highway expansion, suppressing the development of non-motorized infrastructure. Bicycle use began to use resurge in the United States in the 1960s, coinciding with the opening of the first rail trail (Reid 2017). Thus, although some trails may have existed in other forms prior to this period, their function as accessible green spaces for non-

motorized, multi-use purposes was likely minimal. For these reasons, it is reasonable to treat the current presence of multi-use trails as indicative of the change in trail availability since 1960.

A potential threat to validity arises if abandoned rail corridors are correlated with other factors that affect property values or resident preferences. If the presence of abandoned rail lines raises concerns about safety or attracts activities considered undesirable by the surrounding community, it could directly impact outcomes such as property values and resident demographics. Interviews with urban planners and stakeholders suggest that perceptions of abandoned rail corridors before conversion vary widely.[8] In some instances, nearby property owners view these corridors as minimally consequential "wild land." Still, in some instances, abandoned rail may be valued positively if privacy is highly valued, or negatively if actual or perceived undesirable activity occur on abandoned tracks.

To address potential exclusion restriction violation, in Appendix A, I incorporate a new component to my instrument: the average number of municipalities that each rail segment intersecting a census tract crosses within a 1-mile radius of the census tract centroid. The instrument is based on the assumption that trail creation is more likely when a census tract has an abandoned rail line but less likely when the rail segment intersects multiple municipal boundaries, as increased coordination costs between jurisdictions may hinder development. I show that results are similar.

First stage estimates, shown in Table 6, show that presence of abandoned rail serves as a statistically significant predictor of the change in presence of trail, satisfying relevance. The institutional context, particularly the National Trails System Act Amendments of 1983—which permitted railroads to relinquish responsibility for unprofitable rail lines by transferring them to qualified agencies for interim trail use—provides a strong basis for asserting that monotonicity holds. Because my units of analysis (census tracts groups) are very small, with a median area of approximately 0.8 square miles, the presence of an aban-

[8]Interviews were conducted with the Massachusetts Department of Conservation & Recreation, Massachusetts Department of Transportation, and Rails-to-Trails Conservancy.

doned rail segment within a given tract can be treated as if randomly assigned relative to neighboring tracts without such segments, which should meet the independence assumption once I include relevant fixed effects and controls.

5.2 Results and Discussion

Table 7 presents the two-stage least squares estimates of the relationship between trail creation and neighborhood change. Column 1 indicates that the presence of a new trail is associated with a 0.22 log point increase in median house values, corresponding to 24% higher appreciation than homes in areas without trails, controlling for county, geographic characteristics, and 1960 baseline conditions. Column 2 indicates that the presence of a new trail corresponds to a 0.078 log-point increase in the difference in log median household income, corresponding to 8% relative increase in household income, driven either by shifts in the resident population or inherent economic growth. The measure here is slightly noisy, and is only significant at $p¡0.1$. Finally, Column 3 show that the change in the share of white residents in places with trails were on average 14.5 percentage points higher than places without trails.

Taken together, these results suggest that trail creation is associated with substantial long-term neighborhood change, particularly in housing markets and demographic composition, over the 60-year period from 1960 to 2020. The substantial increase in home values indicates that trails are perceived as desirable amenities, likely driving demand and capitalizing their benefits into property prices. This trend aligns with broader patterns observed in green space developments, where investments in recreational infrastructure contribute to rising property values and, in turn, higher property tax revenues for municipalities.

The relatively modest 8% increase in median household income, however, complicates the narrative. If trail development had primarily driven in-migration of substantially higher-income households, a more pronounced shift in neighborhood income profiles would be expected. The smaller income effect, combined with a significant 14.5 percentage point increase

in the white population share, suggests that demographic turnover may have been driven less by income and more by other characteristics—such as racial sorting or amenity preferences among white households. In other words, new in-migrants may not have been dramatically wealthier, but rather demographically distinct from outgoing residents. This pattern is consistent with early-stage gentrification dynamics, where middle-income white households are among the first to move into transitioning neighborhoods, reshaping racial composition without immediately driving up average incomes.

Alternatively, income gains may have been diluted by the persistence of a substantial share of lower-income residents, particularly renters or long-term homeowners who remained in place. In such cases, rising property values reflect capital gains accruing to homeowners, while median income measures capture slower-moving or more heterogeneous economic change.

Overall, these findings highlight the complex and heterogeneous nature of neighborhood transformation around green infrastructure investments. While this has led to improved economic conditions within these areas, it also aligns with concerns about affordability and the potential sorting of minority groups.

5.3 Robustness Check

To evaluate whether abandoned rail presence violates the exclusion restriction, I test whether it predicts changes in housing values, household income, and racial composition from 1960 to 1970. This period is well suited for a placebo test, as there is no evidence of rail trail conversions outside of the Elroy-Sparta Trail (Wisconsin) and the Illinois Prairie Path (Illinois). Thus, by excluding Wisconsin and Illinois, the 1960–1970 change in outcomes can reasonably be treated as pre-treatment trends.

Table 8 presents the reduced form estimates. Compared to the 1960–2020 results, all coefficient estimates are much smaller in magnitude, suggesting that abandoned rail presence was not strongly associated with neighborhood change in the pre-treatment period. Once

baseline controls are added, abandoned rail presence does not significantly predict changes in housing values or median household income. However, it does significantly predict changes in the share of white residents, suggesting that abandoned rail corridors may have already been associated with demographic shifts before rail-trail conversions occurred.

These findings provide context for interpreting the main results. The lack of a strong pre-treatment relationship between abandoned rail and economic variables (housing values and income) suggests that the estimated 1960–2020 effects are not simply driven by pre-existing trends. However, the significant relationship with racial composition raises the possibility that some of the demographic effects observed in the long-difference estimates could partially reflect pre-existing sorting patterns rather than purely trail-induced changes. This suggests that while the income and housing value estimates are likely unbiased, the demographic estimates should be interpreted with greater caution, as abandoned rail may have influenced neighborhood racial composition even before trail development.

6 Conclusion

As the share of the population residing in cities–where green spaces are relatively scarce–continues to rise, the equitable distribution of green space has become increasingly important. This paper underscores the significance of green spaces as an urban amenity, illustrating how the creation of rail trails can meaningfully alter neighborhood trajectories. By exploiting abandoned rail lines as an instrument, I provide causal estimates demonstrating that trail development is associated with higher housing values, increased household income, and a larger share of white residents in the surrounding area. These findings confirm that while environmental improvements can generate local economic gains, they may also contribute to gentrification pressures.

The question of overall welfare remains open. Homeowners who sell their properties amid rising prices may realize windfall gains, whereas renters and future residents confront rising housing costs. Future research could explore more direct welfare measures to identify which

households reap the gains or bear the burdens of urban greening, as well as how these effects evolve over multiple decades.

By illuminating these distributional nuances, policymakers can design complementary policies that ensure green space investments genuinely foster inclusive growth. In line with "just green enough" approaches, city planners, scholars, and community advocates alike can better align environmental benefits with equitable economic outcomes, minimizing displacement risks and maximizing community well-being.

References

Asabere, P. K. & Huffman, F. E. (2009), 'The relative impacts of trails and greenbelts on home price', The Journal of Real Estate Finance and Economics **38**, 408–419.

Astell-Burt, T., Feng, X. & Kolt, G. S. (2013), 'Mental health benefits of neighbourhood green space are stronger among physically active adults in middle-to-older age: evidence from 260,061 australians.', Preventive medicine **57**(5), 601–606.

Atlanta, U. (2025), 'Photos: How range of dense housing transformed this atlanta block', `https://atlanta.urbanize.city/post/photos-how-dense-reynoldstown-beltline-housing-transformed-atl-block-photos`. Accessed: 20 March 2025.

AtlantaBeltline (2024), 'Securing economic resources to complete the project', `https://beltline.org/learn/progress-planning/research-reports/funding/`. Accessed: 20 March 2025.

Banzhaf, H. S. & Walsh, R. P. (2013), 'Segregation and tiebout sorting: The link between place-based investments and neighborhood tipping', Journal of Urban Economics **74**, 83–98.

Banzhaf, S., Ma, L. & Timmins, C. (2019), 'Environmental justice: The economics of race, place, and pollution', Journal of Economic Perspectives **33**(1), 185–208.

Black, K. J. & Richards, M. (2020), 'Eco-gentrification and who benefits from urban green amenities: Nyc's high line.', Landscape and urban planning **204**, 103900.

Byahut, S., Ghosh, S. & Masilela, C. (2020), 'Urban transformation for sustainable growth and smart living: The case of the atlanta beltline', Smart Living for Smart Cities: Community Study, Ways and Means pp. 73–100.

Chay, K. Y. & Greenstone, M. (2005), 'Does air quality matter? evidence from the housing market', Journal of political Economy **113**(2), 376–424.

Cranz, G. (1982), The politics of park design: A history of urban parks in America, The MIT Press.

Depro, B., Timmins, C. & O'neil, M. (2015), 'White flight and coming to the nuisance: can residential mobility explain environmental injustice?', Journal of the Association of Environmental and resource Economists **2**(3), 439–468.

Federal Highway Administration (2021), 'Fact sheets: Transportation alternatives', `https://www.fhwa.dot.gov/infrastructure-investment-and-jobs-act/ta.cfm`. Accessed: 20 March 2025.

Federal Highway Administration (2025), 'Investing in america: Biden-harris administration announces nearly 45 million in grant awards for connected, active transportation infrastructure projects', `https://highways.dot.gov/newsroom/investing-america-biden-harris-administration-announces-nearly-45-million-grant-awards`.

Ferster, A. C. (2006), 'Rails-to-trails conversions: A review of legal issues', Planning & Environmental Law **58**(9), 3–9.

Gallamore, R. E. & Meyer, J. R. (2014), American railroads: Decline and renaissance in the twentieth century, Harvard University Press.

Giannico, O. V., Sardone, R., Bisceglia, L., Addabbo, F., Pirotti, F., Minerba, S. & Mincuzzi, A. (2024), 'The mortality impacts of greening italy', Nature Communications **15**(1), 10452.

Harnik, P. (2021), From Rails to Trails: The Making of America's Active Transportation Network, U of Nebraska Press.

Hsu, A., Sheriff, G., Chakraborty, T. & Manya, D. (2021), 'Disproportionate exposure to urban heat island intensity across major us cities', Nature communications **12**(1), 2721.

Immergluck, D. & Balan, T. (2018), 'Sustainable for whom? green urban development, environmental gentrification, and the atlanta beltline', Urban geography **39**(4), 546–562.

Jennings, V. & Bamkole, O. (2019), 'The relationship between social cohesion and urban green space: An avenue for health promotion', International journal of environmental research and public health **16**(3), 452.

Jones, K. R. (2018), ''the lungs of the city': Green space, public health and bodily metaphor in the landscape of urban park history', Environment and History **24**(1), 39–58.

Jones, L., Anderson, S., Læssøe, J., Banzhaf, E., Jensen, A., Bird, D. N., Miller, J., Hutchins, M. G., Yang, J., Garrett, J. et al. (2022), 'A typology for urban green infrastructure to guide multifunctional planning of nature-based solutions', Nature-Based Solutions **2**, 100041.

Keith, S. J., Larson, L. R., Shafer, C. S., Hallo, J. C. & Fernandez, M. (2018), 'Greenway use and preferences in diverse urban communities: Implications for trail design and management', Landscape and Urban Planning **172**, 47–59.

Kohlhase, J. E. (1991), 'The impact of toxic waste sites on housing values', Journal of urban Economics **30**(1), 1–26.

Liao, J., Zhang, B., Xia, W., Cao, Z., Zhang, Y., Liang, S., Hu, K., Xu, S. & Li, Y. (2019), 'Residential exposure to green space and early childhood neurodevelopment', Environment international **128**, 70–76.

Lindsey, G., Wilson, J., Anne Yang, J. & Alexa, C. (2008), 'Urban greenways, trail characteristics and trail use: implications for design', Journal of Urban Design **13**(1), 53–79.

Maantay, J. A. & Maroko, A. R. (2018), 'Brownfields to greenfields: Environmental justice versus environmental gentrification', International journal of environmental research and public health **15**(10), 2233.

Martin, G. K., O'Dell, K., Kinney, P. L., Pescador-Jimenez, M., Rojas-Rueda, D., Canales, R. & Anenberg, S. C. (2024), 'Tracking progress toward urban nature targets using landcover and vegetation indices: A global study for the 96 c40 cities', GeoHealth **8**(3), e2023GH000996.

MassTrails (2025), 'Masstrails grants', `https://www.mass.gov/guides/masstrails-grants`. Accessed: 20 March 2025.

Noonan, D. S. (2012), 'Amenities tomorrow', The Political Economy of Environmental Justice p. 170.

Rails to Trails Conservancy (2025), 'National and state trail statistics', `https://www.railstotrails.org/our-work/research-and-information/national-and-state-trail-stats`. Accessed: 12 December 2023.

Reid, C. (2017), 'From victory bikes to rail trails (1940–1969)', Bike Boom: The Unexpected Resurgence of Cycling pp. 51–66.

Schertz, K. E., Saxon, J., Cardenas-Iniguez, C., Bettencourt, L. M., Ding, Y., Hoffmann, H. & Berman, M. G. (2021), 'Neighborhood street activity and greenspace usage uniquely contribute to predicting crime', Npj Urban Sustainability **1**(1), 19.

State of Connecticut (2024), 'Governor lamont announces 10 million in state grants for recreational trails across connecticut', `https://portal.ct.gov/governor/news/press-releases/2024/06-2024/governor-lamont-announces-10-million-in-state-grants-for-recreational-trails`. Accessed: 20 March 2025.

United States Department of Transportation (2022), 'Strategic plan fy 2022-2026', `https://www.transportation.gov/dot-strategic-plan`. Accessed: 2024-12-23.

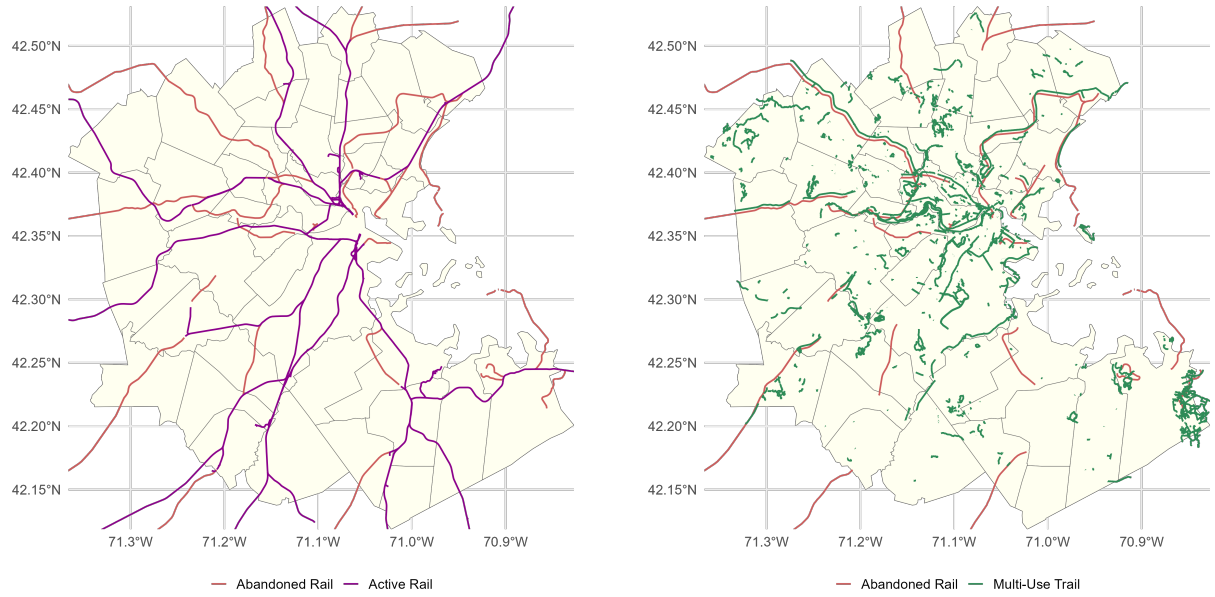
Weber, S., Boley, B. B., Palardy, N. & Gaither, C. J. (2017), 'The impact of urban greenways on residential concerns: Findings from the atlanta beltline trail', Landscape and Urban Planning **167**, 147–156.

Wolch, J. R., Byrne, J. & Newell, J. P. (2014), 'Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'', Landscape and urban planning **125**, 234–244.

Zhou, W., Huang, G. & Cadenasso, M. L. (2011), 'Does spatial configuration matter? understanding the effects of land cover pattern on land surface temperature in urban landscapes.', Landscape and urban planning **102**(1), 54–63.

7 Figures and Tables

7.1 Figures

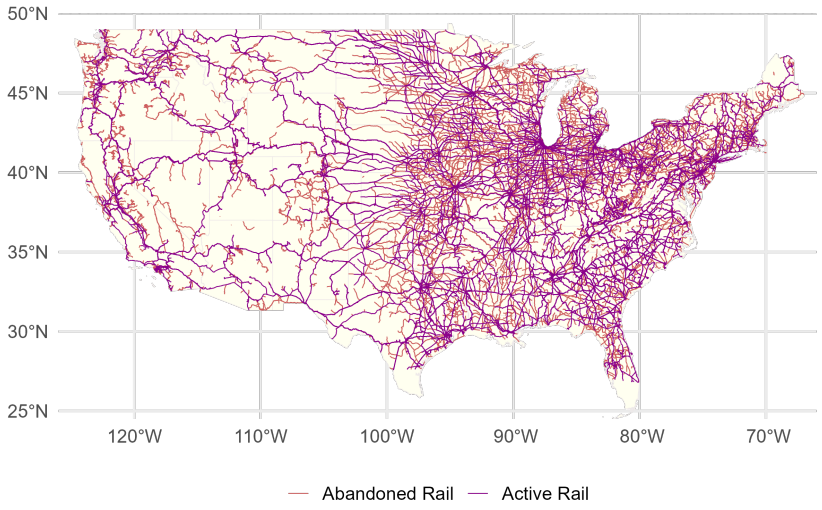


(a) Abandoned and Active Rail

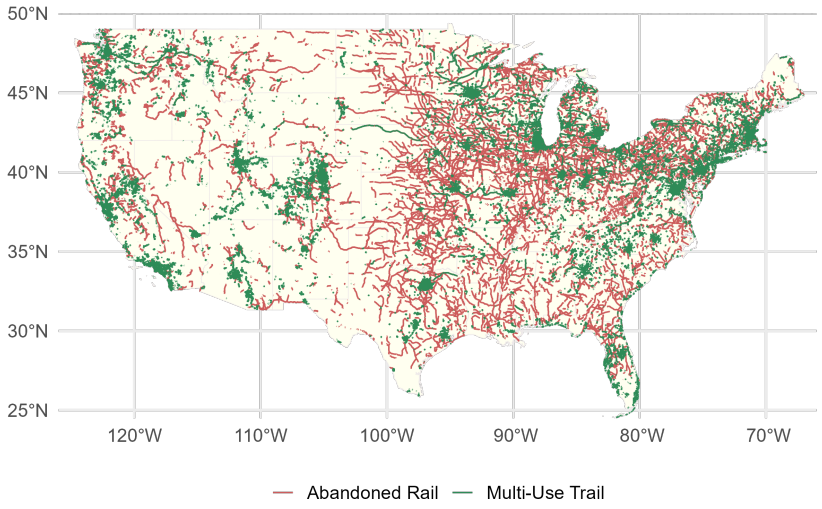
(b) Abandoned Rail and Multi-use Trail

Figure 1: Distribution of Rail Lines and Trails in the Greater Boston

Note: This figure shows the distribution of active and abandoned rail lines and multi-use trails in the Greater Boston Area. Panel (a) shows active and abandoned rail lines. Panel (b) shows abandoned rail lines and overlaid with multi-use trails. For clarity, multi-use trail data has been slightly offset to distinguish overlapping rail and trail lines.



(a) Abandoned and Active Rail



(b) Abandoned Rail and Bike Trail

Figure 2: Distribution of Rail Lines and Trails in the United States

Note: This figure shows the distribution of active and abandoned rail lines and bike trails across the contiguous United States. Panel (a) shows active and abandoned rail lines. Panel (b) shows abandoned rail lines and overlaid with multi-use trails.

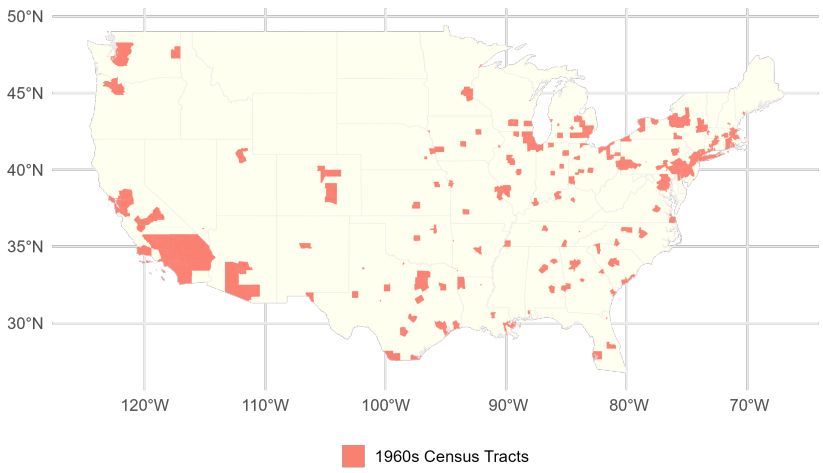


Figure 3: Geographic Scope for Empirical Analysis

Note: This figure illustrates the areas included in my empirical analysis. The pink regions represent 1960s census tracts, which do not cover the entire United States but encompass the largest cities and some surrounding areas. To estimate changes in demographic characteristics associated with the creation of rail trails, the analysis is constrained to these regions.

7.2 Tables

Table 1: Summary Statistics - 1960 Census Tracts

Variable	(1) All Tracts	(2) Has Abandoned Rail	(3) Only Abandoned No Trail	(4) Has Trail	(5) Has Active Rail
N	22,360	8,045	4,602	10,446	9,903
Total Population	4.54	4.68	4.63	4.73	4.69
(1,000)	(2.68)	(2.87)	(2.81)	(2.89)	(2.86)
Population Density	12.10	8.46	10.81	7.15	6.78
(1,000/sq mi)	(19.82)	(17.22)	(21.17)	(13.40)	(11.58)
% HS Education+	63	62	61	66	60
	(17)	(16)	(16)	(17)	(16)
% College Education	18	17	16	20	15
	(14)	(13)	(12)	(14)	(12)
% Employed	95	95	94	95	95
	(4)	(4)	(4)	(4)	(4)
% White	88	90	89	91	88
	(24)	(22)	(23)	(21)	(24)
Median Household Income	5.6	5.5	5.4	5.7	5.4
($1,000)	(2.1)	(2.0)	(1.9)	(2.2)	(1.8)
Median House Value	13.8	13.1	12.9	14.0	12.4
($1,000)	(5.9)	(5.7)	(5.7)	(6.1)	(5.2)

Note: This table presents the means and standard deviations (in parentheses) of various demographic characteristics for 1960 census tracts. Column 1 reports summary statistics for all census tracts in the contiguous United States. Column 2 focuses on census tracts with any amount of abandoned rail. Column 3 focuses on census tracts with abandoned rail but no presence of trails along the rails, indicating no rail-to-trail conversion in those tracts. Column 4 focuses on census tracts with trails, which include both rail-to-trail conversions and other multi-use trails in the dataset. Column 5 focuses on census tracts with present day active rail.

Table 2: Rail and Trail Distribution by 1960 Census Tracts

Variable	(1) All Tracts	(2) Has Abandoned Rail	(3) Only Abandoned No Trail	(4) Has Trail	(5) Has Active Rail
N	22,360	8,049	4,606	10,475	9,905
Length Abandoned (mi)	0.86	2.39	1.87	1.35	1.25
	(3.28)	(5.13)	(4.53)	(4.01)	(4.13)
Length Abandoned No Trail (mi)	0.68	1.90	1.87	0.97	1.02
	(2.95)	(4.68)	(4.53)	(3.46)	(3.73)
Length Trail (mi)	1.66	2.86	1.04	3.56	2.51
	(7.46)	(10.04)	(4.85)	(10.60)	(9.78)
Length Active (mi)	1.72	2.72	2.70	2.35	3.89
	(5.67)	(7.76)	(8.01)	(6.36)	(8.00)
Distance from Abandoned (mi)	3.56	3.32	3.63	3.44	3.84
	(18.72)	(17.75)	(19.33)	(18.29)	(19.92)
Distance from Active (mi)	1.28	1.28	1.23	1.33	1.28
	(1.98)	(2.02)	(1.87)	(2.26)	(2.13)
Distance from Trail (mi)	1.25	1.22	1.26	1.29	1.20
	(4.73)	(4.77)	(5.44)	(4.70)	(4.08)
Abandoned $\leq$ 0.5 mi	0.328	0.331	0.331	0.327	0.329
	(0.469)	(0.471)	(0.471)	(0.469)	(0.470)
Active $\leq$ 0.5 mi	0.399	0.399	0.406	0.402	0.401
	(0.490)	(0.490)	(0.491)	(0.490)	(0.490)
Trail $\leq$ 0.5 mi	0.435	0.434	0.436	0.424	0.433
	(0.496)	(0.496)	(0.496)	(0.494)	(0.496)
0.5 $<$ Abandoned $\leq$ 1 mi	0.212	0.208	0.213	0.213	0.215
	(0.409)	(0.406)	(0.409)	(0.409)	(0.411)
0.5 $<$ Active $\leq$ 1 mi	0.231	0.227	0.229	0.227	0.227
	(0.421)	(0.419)	(0.420)	(0.419)	(0.419)
0.5 $<$ Trail $\leq$ 1 mi	0.261	0.262	0.260	0.267	0.262
	(0.439)	(0.440)	(0.439)	(0.443)	(0.440)

Note: This table presents the means and standard deviations (in parentheses) of the present day distribution of rail and trails for based on 1960 census tract boundaries. Column 1 reports summary statistics for all census tracts in the contiguous United States. Column 2 focuses on census tracts with any amount of abandoned rail. Column 3 focuses on census tracts with abandoned rail but no presence of trails along the rails, indicating no rail-to-trail conversion in those tracts. Column 4 focuses on census tracts with trails, which include both rail-to-trail conversions and other multi-use trails in the dataset. Column 5 focuses on census tracts with present day active rail.

Table 3: Summary Statistics - 2020 Census Tracts

Variable	(1) All Tracts	(2) Has Abandoned Rail	(3) Only Abandoned No Trail	(4) Has Trail	(5) Has Active Rail
N	47,170	11,288	6,642	19,185	14,209
Total Population (1,000)	4.03 (1.77)	3.96 (1.82)	3.92 (1.83)	4.20 (1.87)	3.97 (1.84)
Population Density (1,000/sq mi)	8.28 (15.22)	7.00 (14.42)	8.49 (17.64)	5.88 (10.27)	5.33 (9.44)
% HS Education+	88 (11)	89 (10)	88 (11)	91 (10)	87 (11)
% College Education	37 (22)	37 (22)	34 (21)	44 (22)	33 (21)
% Employed	94 (5)	94 (5)	94 (5)	95 (4)	94 (5)
% White	58 (27)	63 (27)	60 (28)	63 (24)	58 (27)
Median Household Income ($1,000)	88.0 (43.9)	85.7 (43.8)	80.9 (41.3)	97.4 (47.2)	79.0 (39.8)
Median House Value ($1,000)	424.1 (341.7)	400.8 (348.4)	385.3 (349.3)	463.8 (354.2)	337.5 (269.9)

Note: This table presents the means and standard deviations (in parentheses) of various demographic characteristics for 2020 census tracts. Column 1 reports summary statistics for all census tracts in the contiguous United States. Column 2 focuses on census tracts with any amount of abandoned rail. Column 3 focuses on census tracts with abandoned rail but no presence of trails along the rails, indicating no rail-to-trail conversion in those tracts. Column 4 focuses on census tracts with trails, which include both rail-to-trail conversions and other multi-use trails in the dataset. Column 5 focuses on census tracts with present day active rail. Only census block groups located in areas surveyed as part of census tracts in 1960 are included in the summary statistics. See Figure 3 for geographical scope.

Table 4: Rail and Trail Distribution by 2020 Census Tracts

Variable	(1) All Tracts	(2) Has Abandoned Rail	(3) Only Abandoned No Trail	(4) Has Trail	(5) Has Active Rail
N	47,170	11,288	6,642	19,185	14,209
Length Abandoned (mi)	0.41	1.71	1.55	0.63	0.68
	(1.91)	(3.61)	(3.77)	(2.23)	(2.60)
Length Abandoned No Trail (mi)	0.33	1.36	1.55	0.42	0.57
	(1.78)	(3.43)	(3.77)	(1.95)	(2.45)
Length Trail (mi)	0.79	1.29	0.45	1.95	1.00
	(2.32)	(3.00)	(1.97)	(3.31)	(2.56)
Length Active (mi)	0.83	1.60	1.73	1.04	2.74
	(3.52)	(5.73)	(6.39)	(3.80)	(6.00)
Distance from Abandoned (mi)	6.59	0.64	0.72	4.92	4.90
	(25.58)	(1.17)	(1.33)	(20.95)	(21.12)
Distance from Active (mi)	2.17	1.89	1.87	2.04	0.60
	(3.23)	(2.79)	(3.04)	(2.56)	(1.00)
Distance from Trail (mi)	1.71	1.33	1.92	0.46	1.68
	(5.09)	(3.05)	(3.80)	(0.81)	(5.15)
Abandoned $\leq$ 0.5 mi	0.209	0.650	0.629	0.243	0.246
	(0.407)	(0.477)	(0.483)	(0.429)	(0.431)
Active $\leq$ 0.5 mi	0.258	0.331	0.353	0.258	0.657
	(0.438)	(0.471)	(0.478)	(0.438)	(0.475)
Trail $\leq$ 0.5 mi	0.385	0.463	0.269	0.746	0.378
	(0.487)	(0.499)	(0.443)	(0.435)	(0.485)
0.5 $<$ Abandoned $\leq$ 1 mi	0.158	0.199	0.196	0.163	0.174
	(0.365)	(0.399)	(0.397)	(0.369)	(0.380)
0.5 $<$ Active $\leq$ 1 mi	0.193	0.191	0.195	0.188	0.207
	(0.395)	(0.393)	(0.396)	(0.391)	(0.405)
0.5 $<$ Trail $\leq$ 1 mi	0.237	0.221	0.264	0.168	0.226
	(0.425)	(0.415)	(0.441)	(0.374)	(0.418)

Note: This table presents the means and standard deviations (in parentheses) of the present day distribution of rail and trails for based on 2020 census tract boundaries. Column 1 reports summary statistics for all census tracts in the contiguous United States. Column 2 focuses on census tracts with any amount of abandoned rail. Column 3 focuses on census tracts with abandoned rail but no presence of trails along the rails, indicating no rail-to-trail conversion in those tracts. Column 4 focuses on census tracts with trails, which include both rail-to-trail conversions and other multi-use trails in the dataset. Column 5 focuses on census tracts with present day active rail. Only census block groups located in areas surveyed as part of census tracts in 1960 are included in the summary statistics. See Figure 3 for geographical scope.

Table 5: OLS Estimates of Trail Presence on Housing and Population Characteristics

(a) Housing

	Dependent variable:							
	Log Median House Value				Log Number of Housing units			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Has Trail	0.138***	0.150***	0.129***	0.123***	0.048***	0.066***	0.057***	0.089***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.010)	(0.011)	(0.011)	(0.009)
Trail $\leq$ 0.5 mi		−0.024*	0.010	−0.033***		−0.035***	−0.015	−0.024**
		(0.013)	(0.012)	(0.011)		(0.011)	(0.010)	(0.010)
0.5 < Trail $\leq$ 1 mi		−0.008	0.011	−0.018**		−0.007	0.005	−0.0005
		(0.009)	(0.009)	(0.008)		(0.008)	(0.008)	(0.008)
Mean Outcome	$440,223	$440,223	$440,223	$440,223	$581	$581	$581	$581
Observations	111,232	111,232	111,232	110,802	125,661	125,661	125,661	124,703
Adjusted R^2	0.595	0.595	0.614	0.668	0.033	0.033	0.037	0.046

(b) Income and Race

	Dependent variable:							
	Log Median Household Income				Share White (%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Has Trail	0.108***	0.152***	0.118***	0.108***	3.876***	4.557***	2.632***	2.564***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.325)	(0.344)	(0.323)	(0.290)
Trail $\leq$ 0.5 mi		−0.103***	−0.044***	−0.052***		−2.219***	0.828	−0.138
		(0.011)	(0.011)	(0.010)		(0.744)	(0.720)	(0.656)
0.5 < Trail $\leq$ 1 mi		−0.059***	−0.023***	−0.032***		−2.419***	−0.501	−0.927*
		(0.009)	(0.008)	(0.007)		(0.567)	(0.544)	(0.490)
Mean Outcome	$93,503	$93,503	$93,503	$93,503	59%	59%	59%	59%
Observations	116,337	116,337	116,337	115,665	124,456	124,456	124,456	123,634
Adjusted R^2	0.227	0.231	0.283	0.355	0.297	0.298	0.333	0.401
Location FE	County	County	County	County	County	County	County	County
Geography Controls	no	no	yes	yes	no	no	yes	yes
1960 Baseline Controls	no	no	no	yes	no	no	no	yes

Note: This table presents OLS estimates of the relationship between trail presence and various housing and demographic characteristics at the census block group level. Panel (a) reports results for housing-related outcomes. Panel (b) focuses on economic and demographic outcomes. "Has Trail" is an indicator for whether a census block group has a trail, "Trail $\leq$ 0.5 mi" is an indicator for whether the center of the census block group is located within 0.5 miles of a trail, and "0.5 < Trail $\leq$ 1 mi" is an indicator for whether the center of the census block group is located between 0.5 miles and 1 mile of a trail. Geography controls include indicators for whether the census block group contains an active rail and indicators for distance from the active rail. 1960 Baseline Controls include population density, employment rate, share college educated, population foreign born, and historical measures of the outcome variables in 1960. All standard errors are Conley-adjusted with a 2 mile spatial cutoff. *p<0.1; **p<0.05; ***p<0.01.

Table 6: First Stage Predictions of Trail Access

	Dependent variable: Δ Has Trail			
	(1)	(2)	(3)	(4)
Has Abandoned		0.184***	0.177***	0.174***
		(0.009)	(0.009)	(0.008)
Location FE	County	County	County	County
Area Weighted	yes	yes	yes	yes
Geography Controls	no	no	yes	yes
1960 Baseline Controls	no	no	no	yes
Mean Outcome	0.4	0.4	0.4	0.4
F-stat	-	255	237	249
Observations	158,955	158,955	158,535	156,014
Adjusted R^2	0.177	0.198	0.200	0.214

Note: This table presents first-stage estimates of the relationship between abandoned rail presence and multi-use trail presence. "Has Abandoned" indicator for whether a given 1960 tract / 2020 tract combination contains any length of abandoned rail lines. Columns (1) serves as a placebo regression, where the outcome is regressed only on county fixed effects.

Geographic controls include indicators for whether the census tract contains an active rail line and its distance from the 1960 metropolitan center. The 1960 Baseline Controls include population density, the share of the population with a college degree, the share of the population that is foreign-born, and historical measures of the outcome variables of interest from 1960. All standard errors are Conley-adjusted with a 2 mile spatial cutoff, and estimates are weighted by the proportion of each 2020 census tract that overlaps with the corresponding 1960 census tract. *p<0.1; **p<0.05; ***p<0.01.

Table 7: IV Estimates of Trail Presence on Neighborhood Change

	Dependent variable:		
	Δ Log Median House Value	Δ Log Median Household Income	Δ Share White (%)
	(1)	(2)	(3)
Δ Has Trail (Predicted)	0.220***	0.078*	14.461***
	(0.044)	(0.041)	(2.240)
Location FE	County	County	County
Area Weighted	yes	yes	yes
Geography & Baseline Controls	yes	yes	yes
Mean Outcome	$283,012	$26,669	-35%
Observations	149,164	153,245	154,748
Adjusted R^2	0.637	0.437	0.404

Note: This table presents two-stage least squares estimates of the relationship between trail presence and neighborhood changes. Dependent variables: log median house value, log median household income, and share of the white population. The endogenous variable is the change in "has trail," an indicator for whether a given 1960 / 2020 area combination contains a trail. The instrument is whether the unit has an abandoned rail.

Geographic controls include indicators for whether the census block group contains an active rail line and its distance from the 1960 metropolitan center. The 1960 Baseline Controls include population density, the share of the population with a college degree, the share of the population that is foreign-born, and historical measures of the outcome variables of interest from 1960. Standard errors are Conley-adjusted with a 2-mile spatial cutoff. *p<0.1; **p<0.05; ***p<0.01.

Table 8: OLS Estimates of Abandoned Rail Presence on Neighborhood Changes, 1960-1970

	Dependent variable:					
	Δ Log Median House Value		Δ Log Median Household Income		Δ Share White (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
Has Abandoned	0.014***	0.002	0.025***	−0.002	0.700**	0.645**
	(0.003)	(0.004)	(0.005)	(0.003)	(0.292)	(0.294)
Has Active	0.011***	−0.016***	−0.004	−0.008**	0.675***	0.711***
	(0.003)	(0.004)	(0.004)	(0.003)	(0.246)	(0.262)
Location FE	County	County	County	County	County	County
1960 Baseline Controls	no	yes	no	yes	no	yes
Mean Outcome	$1,592	$1,592	$3,095	$3,095	-4%	-4%
Observations	109,167	109,167	118,098	116,476	118,054	116,364
Adjusted R^2	0.258	0.326	0.076	0.490	0.071	0.091

Note: This table presents ordinary least squares estimates of the relationship between abandoned rail presence and changes in log median house value, log median household income, and the share of the white population. Abandoned rail and active rail status are based on whether or not they are abandoned today.

The 1960 Baseline Controls include population density, the share of the population with a college degree, the share of the population that is foreign-born, and historical measures of the outcome variables of interest from 1960. All standard errors are Conley-adjusted with a 2 mile spatial cutoff, and estimates are weighted by the proportion of each 2020 census tract that overlaps with the corresponding 1960 census tract. *p<0.1; **p<0.05; ***p<0.01.

Appendix A Using Boundary Crossings as an Instrument

I refine the instrument by incorporating a new component: the average number of municipalities that each rail segment intersecting a census tract crosses within a 2-mile radius of the census tract centroid. Figure A1 provides a visual representation of this approach.

The instrument is based on the assumption that trail creation is more likely when a census tract has an abandoned rail line but less likely when the rail segment intersects multiple municipal boundaries, as increased coordination costs between jurisdictions may hinder development.

For each census tract, I generate a 1-mile radius buffer from its center to define the segment of any intersecting rail lines. I then calculate the number of municipal boundaries each rail segment crosses. If multiple abandoned rail lines intersect a given census tract, I take the average number of municipal boundaries crossed by these segments. This average reflects the idea that, when multiple abandoned rail lines are present, those crossing fewer jurisdictional boundaries may be easier to develop, thus increasing the likelihood of trail creation. In practice, the vast majority of census tracts only have one rail line crossing it, if any.

This modification introduces additional variation in trail development beyond simply using abandoned rail presence, with the goal of introducing more variation that is plausibly exogenous to neighborhood economic and demographic trends, in order to strengthen the identification strategy.

The updated first-stage equation is:

$$\Delta has_trail_i = \alpha_0 + \alpha_1 has_abandoned_i + \alpha_2 avg_abandoned_intersections_i + \omega_i$$

where, as before, Δhas_trail_i an indicator for whether multi-use trails were created in each census tract unit i, $has_abandoned_i$ an indicator for whether the observation has abandoned rail. I add another predictor of trail creation, $avg_abandoned_intersections_i$ is the average

number of municipal boundaries crossed by the rail lines intersecting tract i within a 2-mile radius.

The first-stage results, using 1960 to tracts, presented in Table A1, compare the new instrument with the boundary intersection (Columns (5) - (7)) with the old instrument with just trail presence (Columns (2) to (4)). These results provide weak consistency with my hypothesis. The presence of abandoned rail is positively associated with trail creation, while the average number of municipal intersections per abandoned rail segment has a negative effect, suggesting that increased jurisdictional complexity reduces the likelihood of trail development. However, the coefficients on intersections are not significant.

The IV estimates, presented in Table A2, are largely consistent with the results of my main analysis, though the estimates have increased slightly across the board. Column 1 indicates that the presence of a new trail is associated with a 0.239 log point increase in median house values, corresponding to 27% higher appreciation than homes in areas without trails, controlling for county, geographic characteristics, and 1960 baseline conditions. Column 2 indicates that the presence of a new trail corresponds to a 0.096 log-point increase in the difference in log median household income, corresponding to 10% relative increase in household income, now significant at p¡0.05. Finally, Column 3 show that the change in the share of white residents in places with trails were on average 15 percentage points higher than places without trails.

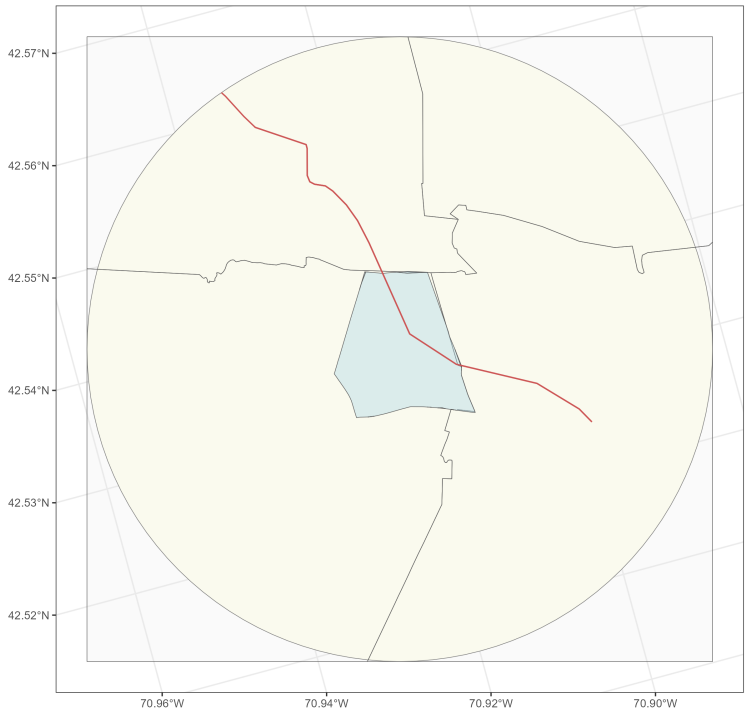


Figure A1: Municipal Boundary Intersection Instrument

Note: This figure provides a visual representation of the instrument. The blue shape represents a census tract, while the red line indicates a rail line intersecting the tract. The tan circle denotes a 1-mile buffer from the tract's center, which is used to define the segment of the intersecting rail line. Gray shapes outline municipal boundaries, and in this example, the rail segment crosses three municipalities. The instrument is based on the assumption that trail creation is more likely when a census tract has an abandoned rail line but less likely when the rail segment intersects multiple municipal boundaries, as increased coordination costs between jurisdictions may hinder development.

Table A1: Comparison of First Stage with Old and New Instrument

	Dependent variable:						
	Δ Has Trail						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Has Abandoned		0.184***	0.177***	0.138***	0.197***	0.188***	0.181***
		(0.009)	(0.009)	(0.008)	(0.011)	(0.012)	(0.011)
Average Municipality Intersection					−0.012	−0.010	−0.007
					(0.008)	(0.008)	(0.008)
Location FE	County	County	County	County	County	County	County
Area Weighted	yes	yes	yes	yes	yes	yes	yes
Geography Controls	no	no	yes	yes	no	yes	yes
1960 Baseline Controls	no	no	no	yes	no	no	yes
Mean Outcome	0.4	0.4	0.4	0.4	0.4	0.4	0.4
F-stat	-	255	237	116	165	149	154
Observations	158,955	158,955	158,535	41,440	158,955	158,535	156,014
Adjusted R^2	0.177	0.198	0.200	0.210	0.198	0.200	0.214

Note: This table presents first-stage estimates of the relationship between abandoned rail presence and multi-use trail presence. 'Has Abandoned" indicator for whether a given 1960 tract / 2020 tract combination contains any length of abandoned rail lines. Average Municipality Intersections represents the average number of municipalities that each rail segment intersecting a census tract crosses within a 1-mile radius of the census tract centroid. Columns (1) serves as a placebo regressions, where the outcome is regressed only on county fixed effects.

Geographic controls include indicators for whether the census tract contains an active rail line and its distance from the 1960 metropolitan center. The 1960 Baseline Controls include population density, the share of the population with a college degree, the share of the population that is foreign-born, and historical measures of the outcome variables of interest from 1960. All standard errors are Conley-adjusted with a 2 mile spatial cutoff, and estimates are weighted by the proportion of each 2020 census tract that overlaps with the corresponding 1960 census tract. *p<0.1; **p<0.05; ***p<0.01.

Table A2: IV Estimates of Trail Presence on Neighborhood Change (With Municipality Boundary Intersection)

	Dependent variable:		
	Δ Log Median House Value	Δ Log Median Household Income	Δ Share White (%)
	(2)	(4)	(6)
Δ Has Trail (Predicted)	0.239***	0.096**	15.057***
	(0.044)	(0.040)	(2.233)
Location FE	County	County	County
Area Weighted	yes	yes	yes
Geography & Baseline Controls	yes	yes	yes
Mean Outcome	$283,012	$26,669	-35%
Observations	149,164	153,245	154,748
Adjusted R^2	0.636	0.437	0.401

Note: This table includes additional specifications incorporating the number of municipal boundaries in the instrument. Dependent variables: log median house value, log median household income, and share of the white population. Standard errors are Conley-adjusted with a 2-mile spatial cutoff. *p<0.1; **p<0.05; ***p<0.01.

Appendix B Additional Tables and Figures

Table A3: Summary Statistics - 2020 Census Block Group

Variable	(1) All Tracts	(2) Has Abandoned Rail	(3) Only Abandoned No Trail	(4) Has Trail	(5) Has Active Rail
N	128,112	44,513	29,917	68,005	54,804
Total Population (1,000)	1.42 (0.76)	1.46 (0.79)	1.47 (0.78)	1.51 (0.80)	1.49 (0.81)
Population Density (1,000/sq mi)	9.89 (20.55)	6.85 (15.22)	7.76 (17.64)	6.56 (13.11)	5.75 (10.42)
% HS Education+	88 (12)	90 (11)	90 (12)	91 (11)	89 (12)
% College Education	38 (24)	39 (23)	39 (23)	42 (23)	36 (22)
% Employed	94 (7)	95 (6)	95 (6)	95 (6)	94 (7)
% White	59 (28)	64 (27)	63 (27)	63 (26)	61 (28)
Median Household Income ($1,000)	93.4 (50.1)	98.6 (49.8)	98.0 (49.9)	102.2 (50.9)	93.2 (47.3)
Median House Value ($1,000)	437.0 (362.9)	418.5 (331.1)	426.5 (344.7)	456.2 (347.0)	373.5 (275.4)
Length Abandoned (mi)	0.15 (1.01)	0.37 (1.44)	0.30 (1.28)	0.17 (1.02)	0.18 (1.04)
Length Abandoned No Trail (mi)	0.13 (0.97)	0.30 (1.38)	0.27 (1.25)	0.13 (0.95)	0.15 (1.00)
Length Trail (mi)	0.30 (1.57)	0.45 (1.76)	0.36 (1.55)	0.48 (1.85)	0.38 (1.52)
Length Active (mi)	0.25 (1.32)	0.32 (1.49)	0.27 (1.11)	0.23 (1.15)	0.43 (1.56)

Note: This table presents the means and standard deviations (in parentheses) of various demographic characteristics for 2020 census block groups, grouped according to the categories of their corresponding 1960 census tracts. Column 1 reports summary statistics for all census tracts in the contiguous United States. Column 2 focuses on census tracts with any amount of abandoned rail. Column 3 focuses on census tracts with abandoned rail but no presence of trails along the rails, indicating no rail-to-trail conversion in those tracts. Column 4 focuses on census tracts with trails, which include both rail-to-trail conversions and other multi-use trails in the dataset. Column 5 focuses on census tracts with present day active rail. Only census block groups located in areas recognized as census tracts in 1960 are included in the summary statistics. See Figure 3 for geographical scope.

Table A4: OLS Estimates of Trail Presence on Housing and Population Characteristics (Levels)

(a) Housing

	Dependent variable:							
	Median House Value ($)				Number of Housing units			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Has Trail	67,970***	25,280***	23,107***	41,220***	69***	85***	73***	73***
	(2,770)	(3,257)	(3,237)	(2,814)	(2)	(3)	(3)	(3)
Trail $\leq$ 0.5 mi		88,526***	90,915***	27,934***		−33***	−19***	−23***
		(3,587)	(3,575)	(3,092)		(3)	(3)	(2)
0.5 < Trail $\leq$ 1 mi		51,870***	53,192***	13,990***		−19***	−11***	−8***
		(2,889)	(2,880)	(2,483)		(2)	(2)	(2)
Mean Outcome	436,996	436,996	436,996	436,996	582	582	582	582
Observations	113,570	113,570	113,570	113,133	128,112	128,112	128,112	127,144
Adjusted R^2	0.345	0.353	0.364	0.504	0.034	0.036	0.044	0.058

(b) Income

	Dependent variable:			
	Median Household Income ($)			
	(1)	(2)	(3)	(4)
Has Trail	14,061***	14,945***	12,370***	12,099***
	(408)	(463)	(453)	(424)
Trail $\leq$ 0.5 mi		−1,632***	2,324***	−1,731***
		(492)	(490)	(450)
0.5 < Trail $\leq$ 1 mi		−432	2,106***	−1,318***
		(433)	(429)	(393)
Mean Outcome	93,414	93,414	93,414	93,414
Observations	118,697	118,697	118,697	118,016
Adjusted R^2	0.128	0.129	0.167	0.271
Location FE	County	County	County	County
Geography Controls	no	no	yes	yes
1960 Baseline Controls	no	no	no	yes

Note: This table presents OLS estimates of the relationship between trail presence and various housing and demographic characteristics. Panel (a) reports results for housing-related outcomes. Panel (b) focuses on economic and demographic outcomes. "Has Trail" is an indicator for whether a census block group has a trail, "Trail $\leq$ 0.5 mi" is an indicator for whether the center of the census block group is located within 0.5 miles of a trail, and "0.5 < Trail $\leq$ 1 mi" is an indicator for whether the center of the census block group is located between 0.5 miles and 1 mile of a trail. Geography controls include indicators for whether the census block group contains an active rail and indicators for distance from the active rail. 1960 Baseline Controls include population density, employment rate, share college educated, population foreign born, and historical measures of the outcome variables in 1960. *p<0.1; **p<0.05; ***p<0.01.