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PPOL 563: Data Visualization

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Policy Brief: Infrastructure and Inequality in U.S. Counties

Executive Summary

Infrastructure funding is both a source of political division and social mobility. Public transit and affordable housing, when done right, improve the lives of low-income residents. Yet exclusionary zoning restricts the expansion of public transit and affordable housing into affluent communities, concentrating poverty in urban and rural areas. All this despite the benefits of low-income residents moving to high-income neighborhoods. To best fight inequality in the US, policymakers must construct multi-family, affordable housing, provide low-income housing vouchers, increase the number of public transit stations, and improve "last-mile" transportation to and from transit hubs, all in suburban counties.

Current Context

Few divisions in the US society are as stark as the urban-rural divide and income gap. In this policy brief, I will assess the intersection between these divisions and the importance of access to adequate housing and transportation in combatting income inequality. This builds on my work with Dr. Schuetz at Brookings (Schuetz & Ring, 2021), exploring the impact of spatial mismatch between public transit, jobs, and housing on income and inequality.

Public transit promotes social mobility. Physical access to job-rich areas is a significant factor in one's employment (Sanchez, 1999), yet there exists a public transit-car access gap in which more low-wage jobs are accessible by car than public transit (Boarnet et al, 2017). Furthermore, improvements in transit efficiency in high-demand areas, expanded access, and new public transit methods for low-demand regions can help public transit better serve low-income workers (Giuliano, 2005).

Housing also provides social mobility. Take the 1967 case allowing high-density affordable housing within the suburb of Mount Laurel. This spawned the Mount Laurel Doctrine, which holds that the construction of affordable housing in suburban areas has positive, long-term impacts on low-income residents (Massey, 2012). Similarly, the Moving to Opportunity program demonstrated how providing low-income, inner-city residents the ability to move to high-income suburban neighborhoods has positive impacts on them and their children (Souza, 2010).

This was the motivation for the Fixing America's Surface Transportation (FAST) Act of 2015, which closed this spatial mismatch by adding residential development around transit stations ("Fixing America's Transportation Act", 2015). Today, the Biden Administration's Build Back Better agenda continues to emphasize the importance of transportation and affordable housing for low-wage workers.

Analysis

Transit, housing, and population data were gathered from the Census's American Community Survey (ACS), Census New Residential Construction (NRC), and the Bureau of Transportation Statistics' (BTS)

Intermodal Passenger Connectivity Database (IPCD). Observations are at the county-year level except for transit data, which represents the current year. Urban, suburban, and rural are defined using the National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme. There are 1,981 rural, 1,099 suburban, and 68 urban counties representing 45, 178, and 100 million people. One county, Oglala Lakota in South Dakota, is missing. Mean and median for key variables are shown in Table 1.

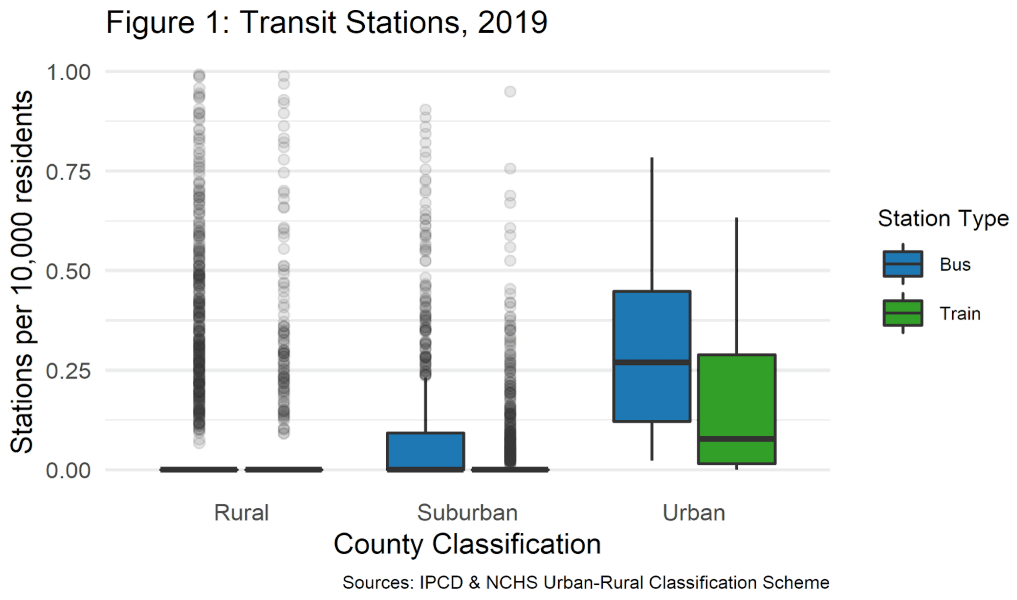
Table 1: Measures of Centrality

	Income	Inequality (Gini)	Bus Stops	Train Stations	Single-Family Units	Multi-Family Units
Mean	~54,000	0.45	7	3	284	158
Median	~52,000	0.44	1	0	38	0

Public transit information does not include efficiency, cost, or coverage, making it impossible to differentiate between hubs meant for commuters and otherwise. Housing data represents units, not buildings, permitted. Inequality is the Gini Index, which compares how different an income distribution is from perfect equality, with 1 being perfect inequality. Finally, income is not adjusted by cost of living.

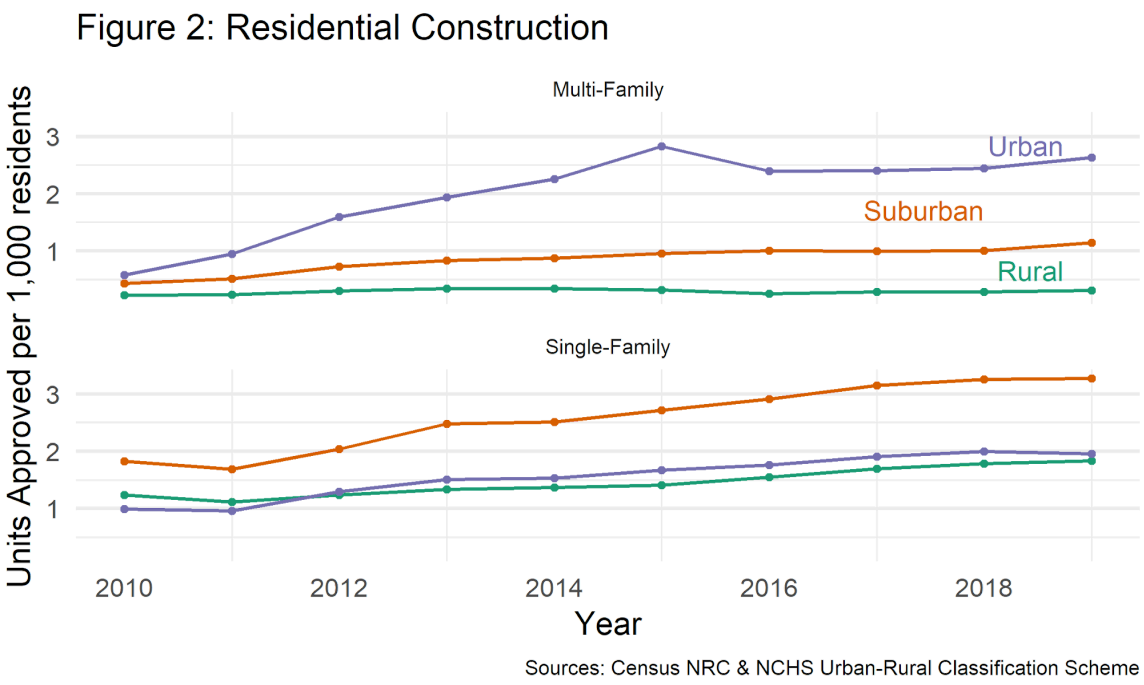
Key Findings

First, access to public transit increases as population density increases. As expected, public transit access to suburban areas is generally low, with most rural and suburban counties not having public transit at all. Finally, note that in Figure 1 around 100 high-transit access outlier counties were cropped out.



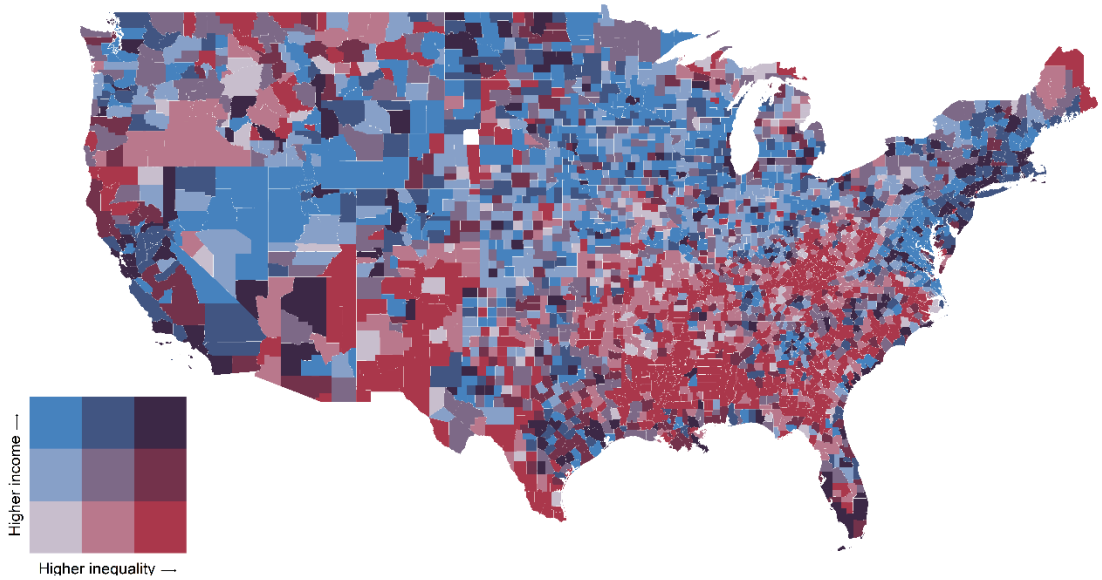
Second, disparities exist in residential construction by urban-suburban-rural county classification. Rural counties see little construction at all, while urban counties see intense multi-family development. Suburban counties permit few but perhaps a growing number of multi-family homes, possibly representing urbanization. Regardless, suburban counties still permit around twice as many single-family

homes per capita. Thus, we can see continued development of housing in suburban counties which is inaccessible for low-income earners, and the concentration of affordable housing in urban counties.



Third, income has risen steadily for all counties, while inequality plateaued around 2016. Income and income change generally followed population density, with incomes increasing by $13,500, $10,000, and $8,500 for urban, suburban, and rural counties from 2010 to 2019. Inequality is highest in urban counties, with rural and suburban counties having similar inequality levels at around 0.04 less than urban counties. In Figure 3, there is also a stark North-South income divide, and noticeable inequality in urban and coastal areas generally.

Figure 3: United States Income & Inequality
Counties, 2019



Source: Census 5-Year ACS Data

Finally, it is important to note a few null results. For housing, no relationship was noticed between residential construction and changes in income, though these effects may be lagged or present within subgroups of counties (a phenomenon known as Simpson's Paradox). Similarly, no visible relationship was present between increased transit stops and inequality or income.

Discussion and Recommendations

Investment in infrastructure is a key component of any economic plan. To reduce inequality, infrastructure policy must concentrate on building and connecting affordable housing to jobs centers. Such policies much also overcome exclusionary zoning, historical preservation laws, and the political clout of wealthy, suburban communities. Optimal infrastructure polices would thus involve funding the following, particularly in suburban counties:

1. Multi-family, affordable homes
2. Low-income housing vouchers
3. Additional public transit hubs
4. "Last-mile" transportation to and from public transit hubs

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