RESEARCH REPORT

In Search of Equitable Transit Operations

Examining Public Transportation Funding and Service across the United States

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Executive Summary

Public transportation offers residents of cities, towns, and villages throughout the United States access to jobs, schools, and other essential resources at an affordable cost and with low impacts on the environment. But funding for bus and train services is not evenly distributed. In this report, I examine the current allocation of public funds for transit operations—the money required to pay for the energy and labor needed to run services. Building off a proposal from advocates to expand federal transit operations funding by $20 billion a year,[1] I then explore whether such a program would improve access.

This analysis demonstrates the following:

- While operations support for transit is appropriately weighted toward communities with high densities and low car use, it is also biased toward places with higher household incomes and lower poverty rates. This means that higher-income towns and cities benefit from better public transportation access than their lower-income peers—even though the latter communities need affordable mobility options just as much or more.

- Local funding support for transit operations is heavily correlated with local household incomes—the result of dependence on locally generated tax revenues. State funding support is weighted toward states where more residents have liberal ideological views and Democrats control the government. Both state and local funding is higher in larger communities. Federal funding support, on the other hand, has no political leanings and is redistributive in that it funds smaller and lower-income communities at higher levels. Today, half of national transit operations is funded by allocations from state and local governments, while just 7 percent is covered by federal investment. Most aid from Washington is dedicated to capital expenditures such as new bus purchases or rail lines. Reliance on state and local funding to keep trains and buses running is reinforcing existing inequalities between communities.

- A new federal transit operations support program could redress these inequities. If the US Congress created an equity-focused formula to allocate $20 billion in new grants annually—that is, a roughly 40 percent increase in operations spending—transit funds for the *typical community* would more than double. This allocation would allow local leaders to expand bus and train service, or create new service, in ways that improve access for residents. It would also reduce differences nationwide, ensuring that people who live in smaller and lower-income communities have equally good access to transit.

In Search of Equitable Transit Operations

The COVID-19 pandemic made painfully clear the importance of public transportation services to American cities, suburbs, towns, and rural areas—as well as to their most essential workers. Even as white-collar workers stayed at home, people providing essential functions, such as hospital staff and garbage collectors, continued to commute, and many relied on transit to do so. Those who rode trains, buses, and paratransit during the pandemic were less likely to have cars and more often got by on low incomes.[2] As the United States charts its postpandemic path, will transit agencies improve services adequately to guarantee good options for both essential and white-collar workers?

In this report, I examine two key questions and use several example communities to illustrate national trends. First, how does funding for transit, and the transit service provided, vary between communities in the United States? I investigate whether specific local characteristics are associated with that variation, finding that higher-income and more populous communities currently benefit from more state and local support, which account for the majority of transit operations funding. Federal support, however, is more equitably distributed.

Second, could a new federal operations funding program fill the gap, ensuring adequate service in communities large and small, irrespective of local fiscal capacity? Inspired by proposals to dedicate $20 billion in annual funding for transit operations as a mechanism to improve transit nationwide, I show how the national government could design a formula program to promote equitable outcomes, eventually remedying many current challenges faced by lower-income communities. To conduct this research, I collected and examined publicly available data, using descriptive and regression analysis to compare funding and service levels between the communities in which most Americans live.

Background

In the United States, most rural communities and small towns have limited access to transit service, and even metropolitan areas lag behind their peers abroad in connectivity to jobs by transit (Wu et al. 2021). The benefits of investment in public transportation often exceed their costs, even in rural places; it has been demonstrated, for instance, to expand local economies through indirect impacts on job creation and sales (Li and Joh 2017; Pasha et al. 2020). Good bus and train service can reduce carbon

emissions, improve air quality, and expand economic development possibilities (Ferrell 2015). Unfortunately, previous research has indicated that transit service is not distributed evenly—in fact, communities where inhabitants have lower incomes and communities with more people of color are likely to have lower-quality transit service than cities and towns where white people and wealthier people predominate (McKenzie 2013).[3]

In his campaign for president, Joe Biden promoted federal government support to fund excellent, sustainable transit service for communities across the country.[4] And in 2020, Congress passed legislation that directed tens of billions of dollars to continue the provision of transit services nationwide.[5] Yet existing federal programs provide limited assistance for *operational* transit needs, such as driver labor and fuel costs, focusing instead on *capital* expenditures, such as new rail lines and bus purchases. This funding gap can be partly attributed to a historic failure to integrate transportation and land-use choices (CRS 2021; Freemark 2021). Most of the limited federal operational funds available are reserved for smaller agencies and smaller communities. Local and state governments that desire better transit must make up the shortfall (Pula, Shinkle, and Rall 2015). As of 2019, of the roughly $53 billion in revenue allocated to transit operations nationally, 27 percent is supported by local government funds, 23 percent by state government funds, and 7 percent by federal funds; the remainder is covered by dedicated taxes, fares, fees, and other assorted revenues.[6]

Relying on local and state revenues to fund transit operations raises concerns. It seems logical that parts of the United States with weaker economies have less fiscal wherewithal to fund effective public transportation—even when their residents may have more need to use those transit options. Given the disproportionate use of transit by people of color and families with low incomes, local and state officials with more interest in promoting equity may be more likely to fund transit than local and state officials who do not. And planning for transportation investment varies dramatically based on local ideological preferences, which do not always benefit the minority (Freemark, Hudson, and Zhao 2020). Finally, if federal support for transit were to be expanded, the question stands as to whether the federal government might simply extend the use of existing programmatic structures or whether it would be better to use some other approach to distribute funds.

As such, there is a need not only to understand the current distribution of transit funding throughout the country, but also to identify whether the federal government, through congressional action, could improve transit service for all while improving social equity.

Data and Methods

To answer my two key questions, I collected and collated publicly available data on communities throughout the United States that provide public transportation services. The environments I study encompass areas the US Census Bureau classifies as either urban clusters or urbanized areas: villages, towns, and cities, plus surrounding developed areas. As of 2010, more than 80 percent of the US population lived in such communities, which I collectively refer to as urban areas.[7] Urban clusters encompass between 2,500 and 50,000 individuals. Urbanized areas are larger. The 2,455 counties containing, or contained in, urban areas were home to 98.4 percent of the country's population. In other words, almost all US residents live in an area defined as an urban cluster, an urbanized area, or a county with an urban area. An example of the latter condition would be a person who lives on a farm in a county with a town center.[8]

For each urban cluster and urbanized area I studied, I collected data from the 2015 to 2019 American Community Survey from the US Census Bureau, including demographic information (population, population density, race and ethnicity, transportation mode taken to work, education levels, and income) and information about housing conditions (rent, tenure, and number of units in each building). To represent statewide political conditions, I collected data on the ideological views of state residents (of the major state for each area) as defined by Tausanovitch and Warshaw, as well as data on partisan control of each state government.[9]

I then collected 2019 data from the National Transit Database on service (transit vehicle revenue miles, vehicle revenue hours, and, where data were available, directional route miles) and funding (operating and capital funding from all levels of government) on all public transportation agencies across the United States. I assigned each agency to its respective urban cluster and urbanized area, finding that transit agencies were operating in 435 of the urban areas. The population of these areas represented about 69 percent of the national population; the population of the counties in which these urban areas are located represented 84.3 percent of the national population. A few agencies operated outside of urban areas, but these accounted for only 1 percent of national transit vehicle revenue hours and only about 5 percent of national transit commuters. As such, I excluded the latter agencies from the analysis.[10]

For each area with transit service, I documented general characteristics descriptively. In appendix table A.1, I illustrate the distribution of demographic and transit service data. I conducted multivariate regressions to explain different levels of support for transit service in areas throughout the nation. In regressions, I chose to use only a limited number of covariates to avoid multicollinearity and used

robust standard errors.[11] I also selected several example communities to illustrate the national trends, but these should not be understood as representative of the national distribution.

Regional Differences in Transit Service and Funding

Transit operations funding and service provision vary dramatically across communities in the United States. While the median urban area spends about $55 per capita to run trains and buses every year (using taxes, fees, fares, and intergovernmental transfers), the bottom quarter of areas spends less than $33 per resident—and the top quarter spends more than $100 (appendix table A.1). In terms of service provision, similar variations mean residents in some cities benefit from *much* more daily service than others.

Consider two urban areas with roughly 50,000 residents, both small towns surrounded by farms and natural areas, and illustrative of national differences: Hinesville, Georgia, in the southeast part of that state, and Stroudsburg, Pennsylvania, in the heart of the Pocono Mountains. In Hinesville, only three transit buses are on hand, and they provide only two miles per capita of service over the course of *the entire year*. Stroudsburg's nine buses, on the other hand, provide 14 times as much annual service per capita. The Pennsylvania communities including Stroudsburg and its suburbs spend more to provide that higher level of service: $109 per resident per year compared with just $16 in the Georgia communities.

In table 1, I compare communities nationwide by characteristics including their per capita state and local operating funds, federal operating funds, and vehicle revenue miles. (In appendix tables A.2 through A.6, I then analyze how such characteristics interact through multiple regressions.)

TABLE 1

State and Local Operating Funding Is Weighted toward Communities with Higher Incomes; Federal Support Is Not

Key differences explaining levels of transit operations funding and service per capita, by urban area

	State and Local Operating Funds		Federal Operating Funds		Vehicle Revenue Miles	
	Bottom 25%	Top 25%	Bottom 25%	Top 25%	Bottom 25%	Top 25%
Demographics						
Population	$32	$70 ***	$21	$14 ***	14	14 **
Population density	$21	$72 ***	$17	$20 **	12	16 ***
Non-Hispanic white share	$53	$31	$16	$21	13	14
Hispanic or Latino share	$32	$49	$20	$17	13	13
Non-Hispanic Black share	$40	$37	$21	$13 ***	13	10
Non-Hispanic Asian share	$22	$74 ***	$16	$18	10	17 ***
Share of people with at least a bachelor's degree	$26	$69 ***	$16	$18	11	17 ***
Share earning below the FPL	$55	$33	$17	$20 ***	13	14
Median household income	$26	$66 ***	$18	$17	12	15 ***
Share earning below $30,000	$63	$29 ***	$16	$18	16	12 ***
Travel						
Share of commuters who drove alone	$78	$20 ***	$24	$14 ***	18	10 ***
Share of commuters using transit	$14	$87 ***	$14	$20 ***	10	18 ***
Share of commuters biking or walking	$24	$67 ***	$13	$25 ***	9	18 ***
Housing						
Homeownership rate	$53	$33 ***	$23	$13 ***	17	11 ***
Share of housing built before 1970	$29	$55 ***	$13	$21 ***	10	14 ***
Share of housing that is single-family units	$67	$32 ***	$22	$15 ***	18	11 ***
Median rent	$25	$71 ***	$16	$17	11	15 ***
State ideology (lower: > liberal)	$71	$20 ***	$19	$15	17	9 ***

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; US Department of Transportation, National Transit Database Estimates, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; and American Community Survey estimates by county and urbanized area, 2015–19.

Notes: FPL = federal poverty level. *N* = 435. An example for interpretation: The average urban area in the most-populous 25 percent of urban areas in the analysis (above the third quartile) receives $70 per capita from state and local governments to run transit, compared with just $32 per capita for the average urban area in the least-populous 25 percent of urban areas. This difference is statistically significant. The difference between the bottom and top 25 percent is significant at *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$ using Mann-Whitney-Wilcoxon tests, owing to the nonnormal distribution of the data. T-tests of means find similar results.

Areas that are more populous, have higher population densities, have a higher share of Asian residents, are more educated, are higher income, have fewer drivers and more transit users, have a higher renter share of households, have older buildings, have higher rents, and have more liberal residents receive more per capita local and state operating funds. After I control for other variables, state contributions are higher for areas with more Black residents, with fewer single-family housing units, and with older housing (appendix table A.4). Local contributions for operations are higher for communities that have more higher-income households (appendix table A.5).
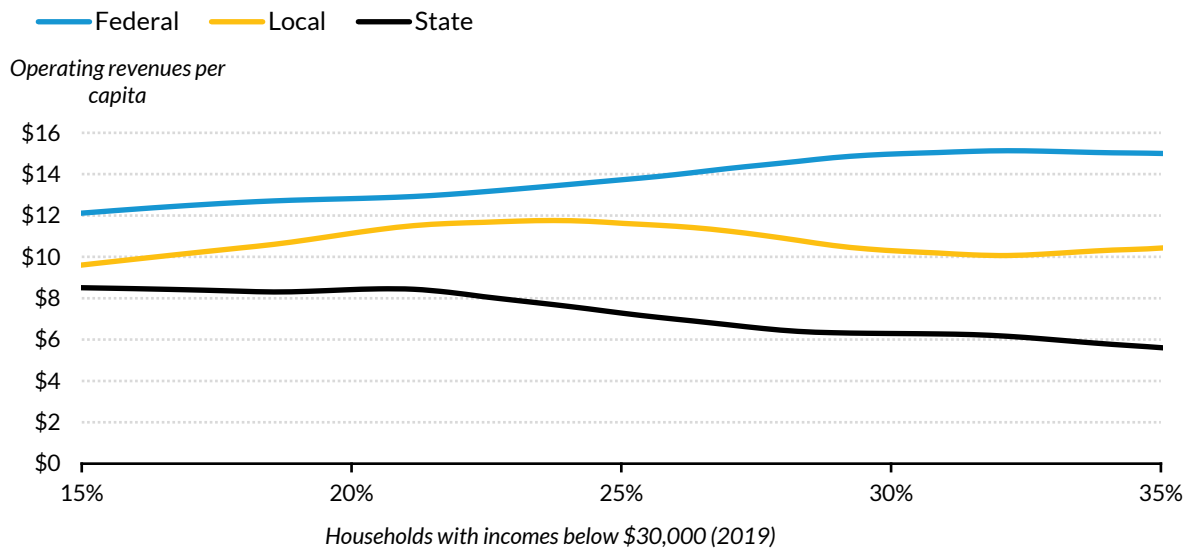

Reliance on state and local funding for transit may reinforce already-existing inequities between urban areas, allowing wealthy communities to fund better transit, even as communities with fewer resources cannot raise the taxes to do so.

Indeed, as the share of households with low incomes increases, state support declines; federal transit support does not work in the same way (figure 1). The federal government provides more per capita support to smaller urban regions and those with higher levels of poverty, and there is not a significant difference in household income between communities with the most and the least transit operating support. The finding that federal support is weighted toward communities with more lower-income households is reaffirmed by regression results (appendix table A.3).

FIGURE 1

State Support Is Lower for the Most Vulnerable Urban Areas, while Federal Support Is Higher

Transit operating support per capita from each level of government, by community household income

Operating revenues per capita

Households with incomes below $30,000 (2019)

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Source: Author's calculations based on US Department of Transportation, National Transit Database Estimates, 2019, and American Community Survey estimates by county and urbanized area, 2015–19.

Notes: Showing loess best-fit lines for each datapoint. Figure excludes the urban areas in the bottom and top 10 percent of the distribution in share of households with low incomes.

Together, these findings indicate that reliance on local funding for transit may reinforce already-existing inequities between urban areas, allowing wealthier communities to fund better transit, even as communities with fewer resources cannot raise the property, sales, or other taxes to do so. On the other hand, federal support—funded by debt financing, gas taxes, and income taxes from across the nation—currently plays a redistributive role and has historically proved vital for communities that are not part of large metropolitan areas, which have been the focus of most transit investment in the United States.

These differences play out not only in the types of small communities I profiled above, but also in larger cities throughout the country. We can illustrate these national trends again by considering example urban areas. Compare the Detroit and San Francisco areas, in which resided more than 3.5 million people in 2019. In Detroit, where more than 15 percent of residents live below the federal poverty level and more than one-quarter of households earn less than $30,000 a year, transit services are only funded at about $81 per capita annually—enough to support 10 miles of bus service per resident. In San Francisco, on the other hand, almost 10 times the annual funds are available for transit per resident, allowing the area to support almost five times as many transit vehicle miles. While each region now benefits from a similar level of federal operating support (about $25 million annually), the

San Francisco region spends more than 10 times as much of its local revenues on transit operations—and receives more than three times as much state support for those services. These areas exemplify differences nationwide.

Based on this analysis and the regression models (appendix tables A.2 through A.6), several key explanations stand out as helping explain differing support for transit operations between urban areas:

- Overall, more operating funds are provided in communities primed for transit—places with higher population density, a lower share of people driving to work, an older building pattern, and fewer single-family homes.

- Transit operations support from state governments is weighted toward communities with a higher share of Black residents, located in states with more liberal residents and Democratic party control. Support for transit from local governments increases in line with higher household incomes, indicating that communities where residents have lower household incomes have more difficulty funding transit.

- The federal government focuses its transit operations support on smaller (often more rural) communities and communities with a smaller Black population share. If anything, its support is weighted away from higher-income communities and those with lower poverty levels.

- These explanations related to funding translate mainly into differences in service provision, though the variation is not as large as in the funding comparisons.

Benefits of an Increased Federal Role

The current federal transit operations support program serves primarily as a gap filler for communities, allowing small transit providers to spend federal funds not only on capital investments, but also on revenue for day-to-day transit runs. In doing so, federal operating support, according to the above analysis, does achieve positive outcomes in terms of aiding lower-income areas and ensuring them access to more transportation options.

A larger federal transit operations support program could do more. Federal funding would not only increase the equitability of transit service and make it possible to add transit to mobility-deficient communities, but also improve service in areas that have already successfully attracted riders. Some advocates have recently proposed a $20 billion transit operations program to be distributed nationally. Assuming other sources remain steady, this funding infusion would increase total US operations funding

to about $73 billion annually, a 38 percent increase. The proposal would increase the federal share of total operations costs from 7 percent to 33 percent.[12]

A $20 billion new federal transit operations program could not only increase transit service nationwide, but also play a major role in increasing equitable access to mobility.

Such an operations support program would require Congress to develop a formula to allocate the new funds. As part of this research, I analyzed the distributional impacts of three funding approaches:

- current federal funding

- expanding the current funding formulas with an additional $20 billion in support

- a new equity-focused formula for allocating the additional $20 billion

I considered several possibilities for a new funding formula, all with the goal of equitable fund distribution. In the formula I analyze, 15 percent of the program ($3 billion) could be distributed proportionately to transit systems based on current ridership. Each agency would receive a share of funds equivalent to its share of national ridership, rewarding agencies that have attracted riders.[13]

The other, larger portion of the proposed program ($17 billion) could be distributed proportionately to counties nationwide based on their respective number of households living with annual incomes below $30,000—a measure closely correlated (better than 70 percent) with the share of the population living below the federal poverty level, the median household income, per capita income, and the share of adults who are employed. This program would be designed much like the community development block grant, ensuring that villages, towns, and cities throughout the nation—and even rural areas—get the opportunity to reinforce their local transit programs or start new ones.[14]

Such an expanded federal transit program would, first, increase overall transit funding. It would spur an increase in transit operations revenues in the typical area evaluated from $55 per capita today to $123, a more than 120 percent increase. But it could also increase the distributional equity of such funds. In table 2, I compare communities in terms of (1) current per capita operations funds; (2) potential future per capita operations funds under an expanded federal program, using *existing* formulas; and (3) potential future per capita operations funds under a federal program with equity-focused formulas.

An Expanded Federal Transit Operations Program Could Reduce Racial and Income Disparities in Transit Funding

Per capita operating support under current and potential transit funding programs, by urban area

| | CURRENT FUNDING | | $20 BILLION IN EXPANDED FUNDING | | | |
| | (1) | | (2) Current Formulas | | (3) Equity-Based Formulas | |
	Bottom 25%	Top 25%	Bottom 25%	Top 25%	Bottom 25%	Top 25%
Demographics						
Population	$71	$133 ***	$183	$205	$145	$193 ***
Population density	$54	$143 ***	$142	$247 ***	$128	$200 ***
Non-Hispanic white share	$98	$77	$179	$189	$161	$151
Hispanic or Latino share	$76	$100	$181	$192	$155	$157 *
Non-Hispanic Black share	$92	$67 ***	$203	$136 ***	$154	$139
Non-Hispanic Asian share	$54	$147 ***	$139	$243 ***	$131	$206 ***
Share of people with at least a bachelor's degree	$55	$146 ***	$140	$243 ***	$128	$208 ***
Share of people below the FPL	$116	$74	$205	$181	$166	$157 ***
Median household income	$58	$140 ***	$154	$231 ***	$144	$189
Share of households earning below $30,000	$136	$65 ***	$219	$161 **	$183	$151
Travel						
Share of commuters driving alone	$159	$46 ***	$286	$119 ***	$224	$118 ***
Share of commuters using transit	$36	$168 ***	$112	$273 ***	$106	$234 ***
Share of commuters biking or walking	$50	$142 ***	$119	$273 ***	$112	$215 ***
Housing						
Homeownership rate	$110	$66 ***	$231	$136 ***	$184	$128 ***
Share of housing built before 1970	$60	$110 ***	$131	$218 ***	$119	$187 ***
Share of housing that is single-family units	$136	$63 ***	$254	$139 ***	$208	$127 ***
Median rent	$56	$143 ***	$142	$233 ***	$138	$192
State ideology (lower: > liberal)	$139	$49 ***	$237	$130 ***	$195	$119 ***

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; US Department of Transportation, National Transit Database Estimates, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; and American Community Survey estimates by county and urbanized area, 2015–19.

Notes: "Current funding" (1) is current per capita operations funds; "current formulas" (2) is potential future per capita operations funds under an expanded federal program, using existing formulas; and "equity-based formulas" (3) is potential future per capita operations funds under a federal program with equity-focused formulas. FPL = federal poverty level. N = 435. An example for interpretation: The 25 percent of areas with the highest household incomes would have significantly more per capita transit operations funding by expanding current formulas than the 25 percent of areas with the lowest incomes ($231 versus $154); this difference is not statistically significant using an equity-based formula. The difference between the bottom and top 25 percent is significant at *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$ using Mann-Whitney-Wilcoxon tests, owing to the nonnormal distribution of data. T-tests of means find similar results.

Transit service funding is currently inequitably distributed. Communities with fewer Black residents and more higher-income households have significantly higher funding for transit than their peers. But a new operations program following the new formulas I described above (table 2) would eliminate many such disparities. The new formulas would be particularly effective in ensuring that there is no significant difference in an area's transit funding based on its share of Black residents and that those areas with many low-income families have funding roughly on par with higher-income areas. Though such formulas would produce a significant difference in operations funding between areas based on poverty rate, this difference is nominally small.

I illustrate this comparison in terms of how communities of different shares of low-income households would be affected in figure 2. This reaffirms that the current distribution of transit operations funding is inequitable. Communities with high shares of households with low incomes have fewer per capita transit operating funds available than those with much lower shares of low-income households. An expansion of the federal program, following the current formulas, would improve the situation to some degree (and also improve transit)—but leave this inequity in place overall. On the other hand, using the new formulas sketched out above, urban areas with high levels of low-income households would have on average much more funding than their low-poverty counterparts. This indicates that the federal government has a realistic opportunity to alter its transit funding formulas to promote more equitable transit access.

FIGURE 2

The Most Vulnerable Areas Have the Least Operations Funding; a New Program Could Give Them the Most

Total transit operating support per capita, by community household income
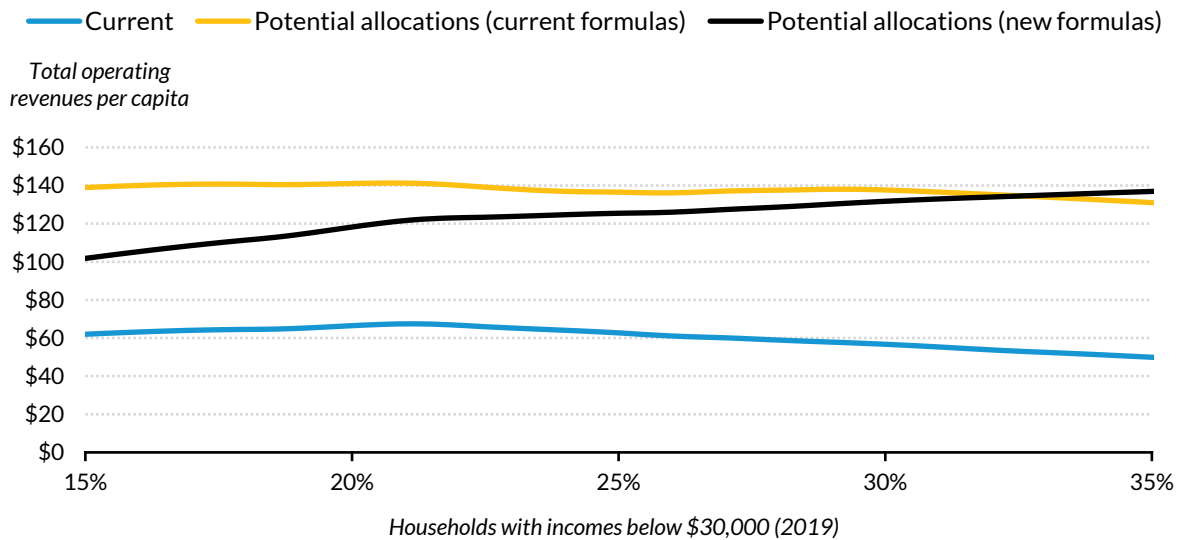
Households with incomes below $30,000 (2019)

Source: Author's calculations based on US Department of Transportation, National Transit Database Estimates, 2019, and American Community Survey estimates by county and urban area, 2015–19.

Notes: "Current" is current per capita operations funds; "potential allocations (current formulas)" is potential future per capita operations funds under an expanded federal program, using existing formulas; and "potential allocations (new formulas)" is potential future per capita operations funds under a federal program with equity-focused formulas. Showing loess best-fit lines for each datapoint. Excludes the urban areas in the bottom and top 10 percent of the distribution in terms of share of households with low incomes.

For the communities I profiled above as illustrative examples, an expanded transit program could be a lifeline, targeting the communities most in need and with the most room to grow (table 3). Hinesville, Georgia, for example, would see an almost quadrupling of funds for transit—compared with a 54 percent increase for Stroudsburg, Pennsylvania, which already has moderate transit service in place. Both would end up with much more money for transit. Expanded operations support would allow both areas to extend current routes, run buses more frequently, and improve reliability.

At the larger scale, the Detroit area would receive almost double the funding for transit, allowing it to massively expand service for its population. Not that places like San Francisco would be left behind— that region would see a 10 percent increase with new formulas. Such a federal program could also spur counties throughout the country that currently do not offer transit service to do so. If distribution of funds were ensured nationwide, counties that have not yet been able to raise local or state funds to

support their transit networks, many of them rural, would receive an infusion. Because of the freedom offered by federal support, they would be able to develop service plans that meet their local needs best.

TABLE 3

Equitable Federal Transit Support Could Focus Investment in Communities with the Least Funds for Transit

Current and potential future transit support across four US areas

Area	Population (2019)	Current transit funding and service per capita	Funding and service under expanded federal support
Hinesville, GA	50,056	$16 in operating expenditures; 2 miles of transit service	$77 in operating expenditures; up to 367% increase in service
East Stroudsburg, PA	54,413	$109 in operating expenditures; 28 miles of transit service	$168 in operating expenditures; up to 54% increase in service
Detroit, MI	3,741,499	$70 in operating expenditures; 10 miles of transit service	$148 in operating expenditures; up to 82% increase in service
San Francisco–Oakland, CA	3,534,282	$711 in operating expenditures; 46 miles of transit service	$843 in operating expenditures; up to 10% increase in service

Source: Author's calculations based on US Department of Transportation, National Transit Database Estimates, 2019, and American Community Survey estimates by county and urban area, 2015–19.

Conclusions

Current funding for transit services throughout the United States is inequitable and inadequate despite the importance of public transportation during the COVID-19 pandemic—especially for low-income people and people of color. Because many rural communities and high-poverty cities depend on support from state and local governments, their transit systems are unable to fund bus and train service at the level they need. As such, access to mobility is unfairly limited. Communities such as Detroit and Hinesville cannot offer their residents the quality of transit they deserve.

A new federal transit operations support program could play an important role in filling that gap. First, it could more than double funding for public transportation in communities nationwide. This would allow communities to offer more options on more routes, and in so doing, increase economic development, spur new job creation, and respond to the climate emergency. Second—especially if the new funding allocation formulas were used—the program would help reduce inequality, ensuring that more communities, regardless of underlying wealth, could provide transit options that meet local desires.

For such a program to be effective, however, the federal government would have to require that state and local governments not simply replace their current transit funding with the new federal support; it must be additive, not a replacement. In addition, communities must take the task of providing transit more seriously. This may require many rural communities that do not currently have public transportation to create new services and develop new partnerships with nonprofit and private providers. Support from the US Department of Transportation could be essential in building capacity and aiding communities that want to expand mobility options for all.

Appendix. Demographic and Transit Service Data and Regression Analyses

Urban-Area Characteristics by Quartile

	Minimum	First quartile	Median	Third quartile	Maximum
Population	28,802	78,420	144,834	347,201	18,750,806
Population density per square mile	805	1,544	1,987	2,585	7,224
Non-Hispanic white share	3.5%	53.1%	67.6%	78.2%	93.8%
Hispanic or Latino share	1.1%	4.9%	9.2%	19.5%	95.4%
Non-Hispanic Black share	0.3%	3.3%	8.3%	16.6%	71.3%
Non-Hispanic Asian share	0.4%	1.5%	2.6%	4.7%	45.1%
Share of commuters who drove alone	43.6%	77.3%	80.6%	82.8%	88.8%
Share of commuters who took transit	0.0%	0.6%	1.1%	2.1%	32.6%
Share of commuters who walk or bike	0.5%	1.7%	2.6%	4.1%	27.6%
Share of people ages 25+ with at least a bachelor's degree	7.6%	22.6%	29.4%	37.5%	73.2%
Share of people below the federal poverty level	4.7%	11.8%	15.1%	18.6%	30.7%
Median household income	$36,623	$48,556	$54,854	$64,246	$127,403
Share of households earning below $30,000	10.1%	21.8%	26.4%	31.5%	41.9%
Median rent	$631	$813	$919	$1,103	$2,288
Homeownership rate	31.0%	56.3%	61.1%	65.0%	81.5%
Share of housing that is single-family units	38.0%	63.7%	69.1%	73.0%	88.4%
Share of housing built before 1980	9.6%	42.6%	53.4%	65.6%	88.5%
State ideology score[a]	−0.93	−0.13	0.04	0.14	0.33
Transit operating expenditures	$194,734	$3,441,394	$7,744,743	$25,981,025	$16,124,372,350
Per capita operating funds	$2	$33	$55	$100	$905
Per capita local operating funds	$0	$4	$10	$23	$256
Per capita state operating funds	$0	$1	$6	$19	$315
Per capita federal operating funds	$0	$9	$15	$20	$208
Transit capital expenditures	$0	$358,800	$1,514,766	$6,081,103	$7,406,284,277
Per capita transit vehicle revenue miles	0	6	10	15	128

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; US Department of Transportation, National Transit Database Estimates, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; and American Community Survey estimates by county and urbanized area, 2015–19.

Note: *N* = 435. Includes all urban clusters and urbanized areas with transit service.

[a] State ideology score is calculated on a −1 to 1 basis, with −1 meaning most liberal and 1 meaning most conservative.

Urban Areas with Higher Population Densities, Fewer Commuters Who Drive to Work Alone, Higher Household Incomes, Older Housing, and Fewer Single-Family Homes Fund Transit Service at Higher Levels

Per capita operating expenditures overall

	All Urban Areas		Incorporating State Partisanship[a]	
	Model 1	Model 2	Model 3	Model 4
Population density	0.01 (0.01) *	0.02 (0.01) **	0.02 (0.01) **	0.02 (0.01) **
Non-Hispanic white share	13.16 (27.23)	31.18 (29.09)	11.42 (28.93)	7.35 (28.80)
Non-Hispanic Black share	80.67 (39.64) **	99.72 (39.73) **	78.55 (42.21) *	80.55 (42.06) *
Share of commuters who drove alone	−679.67 (125.08) ***	−641.64 (125.41) ***	−616.59 (161.01) ***	−594.44 (159.29) ***
Median household income (log)	89.69 (23.33) ***	70.29 (24.08) ***	70.65 (28.70) **	68.10 (27.97) **
Share of housing that is single-family units	−150.66 (53.16) ***	−139.19 (54.72) **	−246.37 (49.60) ***	−247.54 (50.08) ***
Share of housing built before 1970	153.30 (21.34) ***	131.11 (24.81) ***	132.99 (29.10) ***	139.65 (28.87) ***
State ideology score[b]		−59.22 (31.63) *		
Republican governing control			−8.06 (10.92)	249.46 (132.24) *
State partisan ideological score				−123.37 (63.68) *
Intercept	−390.55 (251.93)	−221.75 (254.36)	−159.57 (310.78)	−276.61 (325.96)
Adjusted R^2	0.47	0.48	0.51	0.52
n	435	435	316	316

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; US Department of Transportation, National Transit Database Estimates, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; and American Community Survey estimates by county and urbanized area, 2015–19.

 Notes: Robust standard errors shown in parentheses.

[a] Does not include states with divided partisan control.

[b] State ideology score is calculated on a −1 to 1 basis, with −1 meaning most liberal and 1 meaning most conservative.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Federal Support for Transit Operations Is More Even Than Overall Operations Support, but Less Focused in Communities with Higher Shares of Black Residents

Per capita federally funded operating expenditures

	All Urban Areas		Incorporating State Partisanship[a]	
	Model 1	Model 2	Model 3	Model 4
Population density	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Non-Hispanic white share	−1.56 (5.43)	0.07 (5.65)	0.95 (6.21)	1.46 (6.30)
Non-Hispanic Black share	−20.37 (7.23) ***	−18.64 (7.15) ***	−22.39 (8.09) ***	−22.64 (8.14) ***
Share of commuters who drove alone	−42.02 (20.24) **	−38.58 (19.69) *	−36.38 (22.26)	−39.16 (22.62) *
Median household income (log)	−5.74 (4.06)	−7.5 (4.62)	−11.78 (5.73) **	−11.46 (5.69) **
Share of housing that is single-family units	−33.75 (14.43) **	−32.71 (14.14) **	−41.67 (19.12) **	−41.53 (18.96) **
Share of housing built before 1970	13.68 (4.67) ***	11.67 (4.86) **	14.83 (5.58) ***	14.00 (5.56) **
State ideology score[b]		−5.36 (5.40)		
Republican governing control			−3.74 (3.14)	−36.06 (25.58)
State partisan ideological score				15.48 (11.62)
Intercept	133.68 (49.45) ***	148.96 (55.38) ***	200.65 (69.34) ***	215.34 (73.44) ***
Adjusted R^2	0.12	0.12	0.15	0.15
n	435	435	316	316

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; US Department of Transportation, National Transit Database Estimates, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; and American Community Survey estimates by county and urbanized area, 2015–19.

Notes: Robust standard errors shown in parentheses.

[a] Does not include states with divided partisan control.

[b] State ideology score is calculated on a −1 to 1 basis, with −1 meaning most liberal and 1 meaning most conservative.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

State Transit Operating Support Is Higher in States with More Liberal Residents and with Democratic Party Control of Government

Per capita state-funded operating expenditures

	All Urban Areas		Incorporating State Partisanship[a]	
	Model 1	Model 2	Model 3	Model 4
Population density	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Non-Hispanic white share	9.74 (11.38)	29.22 (11.74) **	9.21 (10.11)	9.77 (10.40)
Non-Hispanic Black share	34.40 (20.62) *	55.00 (21.13) ***	42.21 (15.15) ***	41.94 (15.11) ***
Share of commuters who drove alone	−215.91 (47.08) ***	−174.78 (46.02) ***	−111.30 (60.38) *	−114.30 (60.72) *
Median household income (log)	24.31 (9.91) **	3.33 (9.93)	5.81 (10.16)	6.15 (9.95)
Share of housing that is single-family units	−40.91 (23.10) *	−28.50 (21.88)	−81.24 (24.31) ***	−81.09 (24.29) ***
Share of housing built before 1970	70.98 (10.44) ***	46.98 (10.26) ***	35.00 (11.05) ***	34.10 (11.41) ***
State ideology score[b]		−64.04 (10.33) ***		
Republican governing control			−19.43 (4.72) ***	−54.39 (50.49)
State partisan ideological score				16.75 (23.16)
Intercept	−98.70 (113.69)	83.85 (112.80)	74.33 (126.95)	90.21 (138.77)
Adjusted R^2	0.29	0.35	0.36	0.36
n	435	435	316	316

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; US Department of Transportation, National Transit Database Estimates, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; and American Community Survey estimates by county and urbanized area, 2015–19.

Notes: Robust standard errors shown in parentheses.

[a] Does not include states with divided partisan control.

[b] State ideology score is calculated on a −1 to 1 basis, with −1 meaning most liberal and 1 meaning most conservative.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Local Transit Operating Support Is Heavily Influenced by Local Incomes, and Local Governments May Also Be Filling a Gap in State Funding; States with Republican Control Have Higher Local Transit Funding

Per capita locally funded operating expenditures

	All Urban Areas		Incorporating State Partisanship[a]	
	Model 1	Model 2	Model 3	Model 4
Population density	0.01 (0.00) ***	0.01 (0.00) ***	0.01 (0.00) **	0.01 (0.00) **
Non-Hispanic white share	−21.7 (19.21)	−27.28 (19.52)	−27.54 (21.20)	−29.08 (21.12)
Non-Hispanic Black share	30.85 (19.71)	24.94 (20.68)	11.19 (21.29)	11.95 (21.31)
Share of commuters who drove alone	−97.51 (38.37) **	−109.3 (38.60) ***	−131.28 (49.23) ***	−122.9 (47.72) **
Median household income (log)	29.03 (9.04) ***	35.05 (10.43) ***	40.33 (13.06) ***	39.36 (12.88) ***
Share of housing that is single-family units	−49.19 (18.67) ***	−52.75 (18.70) ***	−58.70 (24.99) **	−59.14 (24.99) **
Share of housing built before 1970	26.84 (9.47) ***	33.72 (11.44) ***	45.65 (13.02) ***	48.17 (12.96) ***
State ideology score[b]		18.36 (15.91)		
Republican governing control			11.67 (5.63) **	109.05 (75.56)
State partisan ideological score				−46.65 (36.67)
Intercept	−210.99 (94.86) **	−263.32 (107.39) **	−309.76 (138.21) **	−354.02 (142.08) **
Adjusted R^2	0.27	0.27	0.28	0.29
n	435	435	316	316

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; US Department of Transportation, National Transit Database Estimates, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; and American Community Survey estimates by county and urbanized area, 2015–19.

Notes: Robust standard errors shown in parentheses.

[a] Does not include states with divided partisan control.

[b] State ideology score is calculated on a −1 to 1 basis, with −1 meaning most liberal and 1 meaning most conservative.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Transit Service Provided Is Higher in Urban Areas Located in States with More Liberal Populations and Democratic Control

Per capita transit vehicle revenue miles

	All Urban Areas		Incorporating State Partisanship[a]	
	Model 1	Model 2	Model 3	Model 4
Population density	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Non-Hispanic white share	−3.67 (4.35)	−0.06 (4.02)	−1.29 (4.30)	−1.46 (4.39)
Non-Hispanic Black share	−6.32 (5.83)	−2.5 (5.39)	−5.95 (5.38)	−5.87 (5.38)
Share of commuters who drove alone	−57.44 (9.47) ***	−49.81 (9.92) ***	−41.18 (11.63) ***	−40.29 (11.59) ***
Median household income (log)	2.99 (2.88)	−0.90 (3.40)	−2.19 (3.81)	−2.30 (3.72)
Share of housing that is single-family units	−21.18 (8.57) **	−18.88 (8.39) **	−30.59 (10.79) ***	−30.64 (10.78) ***
Share of housing built before 1970	9.86 (2.63) ***	5.41 (3.18) *	5.05 (3.50)	5.32 (3.52)
State ideology score[b]		−11.88 (4.52) ***		
Republican governing control			−4.86 (2.33) **	5.42 (21.48)
State partisan ideological score				−4.92 (10.01)
Intercept	39.25 (33.09)	73.12 (37.56) *	92.02 (43.47) **	87.34 (48.60) *
Adjusted R^2	0.14	0.16	0.17	0.17
n	435	435	316	316

Source: Author's calculations based on National Conference of State Legislatures, State and Legislative Partisan Composition, 2019; Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013; US Department of Transportation, National Transit Database Estimates, 2019; and American Community Survey estimates by county and urbanized area, 2015–19.

Notes: Robust standard errors shown in parentheses.

[a] Does not include states with divided partisan control.

[b] State ideology score is calculated on a −1 to 1 basis, with −1 meaning most liberal and 1 meaning most conservative.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Notes

1. See, for example, Ben Fried and Steven Higashide, "Needed: A Federal Program to Boost Transit Service," *Streets blog*, April 22, 2021, https://usa.streetsblog.org/2021/04/22/envisioning-a-federal-program-to-increase-transit-service/.

2. Chris McCahill, "Transit is Essential for Essential Workers," State Smart Transportation Initiative blog, December 8, 2020, https://ssti.us/2020/12/08/transit-is-essential-for-essential-workers/.

3. Yonah Freemark, "What Would Providing Every City with High-Quality, Zero-Emissions Public Transportation Look Like?," *Urban Wire* (blog), Urban Institute, November 20, 2020, https://www.urban.org/urban-wire/what-would-providing-every-city-high-quality-zero-emissions-public-transportation-look.

4. "Envisioning a Federal Program to Increase Transit Service," TransitCenter blog, April 19, 2021, https://transitcenter.org/envisioning-a-federal-program-to-increase-transit-service/.

5. US Department of Transportation, "US Transportation Secretary Pete Buttigieg Announces $30.5 Billion to Help the Nation's Public Transportation Systems Respond to COVID-19," press release, March 29, 2021, https://www.transportation.gov/briefing-room/us-transportation-secretary-pete-buttigieg-announces-305-billion-help-nations-public.

6. Despite the federal government contributing relatively little to transit operations nationally ($3.7 billion in 2019, compared with $14.2 billion from local governments and $12.1 billion from state governments), its influence is spread across urban areas. As such, the *median* urban area in the dataset received $2.2 million in federal support for transit operations, compared with $1.4 million in local funds and $0.9 million in state funds. (The *mean* urban area, on the other hand, receives $8.6 million in federal operating support, compared with $32.7 million in local support and $27.7 million in state support.)

7. US Census, "2010 Census Urban and Rural Classification and Urban Area Criteria," 2019, https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html.

8. I downloaded data and used the codebooks provided by the National Historical Geographic Information System to create a data dictionary. I then assigned census data to both the urbanized areas and counties identified in the National Transit Database. To identify population density, I converted square meters (the standard measurement in Census data) to square miles. I then used only land area (excluding water area) as the basis for examining the data.

9. Chris Tausanovitch and Christopher Warshaw, "State-Level Preference Estimates," 2013, https://americanideologyproject.com/. Other variables that may be of interest but that I do not study include population-weighted density, employment concentration, and historical patterns of population change.

10. For each transit agency, I first culled to those with active status in the National Transit Database and excluded agencies in US territories. I then identified whether the transit agency was in an urbanized area or outside of an urban area, as classified by the National Transit Database. For each urbanized area, I identified its official Census name, as well as its Census code. For each agency with a city noted, I identified its Census name, as well as its Census code. Some agencies were not associated with an incorporated city. For all agencies, I identified the county where it was located.

   To identify revenues by transit agency, I identified total revenues; revenues from fares and fees (including from nontransit sources, such as advertising and tolls); revenues from federal, state, and local sources; and revenues from dedicated taxes. I only included information about the annual total, not the typical peak or day-of-week differences. Data on directional route miles, which I do not study because information is limited, are collected by

agency, but this is only required for full reporters, largely the biggest transit systems. Full reporters account for 86.6 percent of national vehicle revenue miles and 83.2 percent of reported national directional route miles.

[11] In regressions, I excluded from combination any two variables correlated at 0.5 or above (or −0.5 or below). As such, for example, I did not simultaneously test both the share of the population that was non-Hispanic white and the share that was white (correlated at −0.77), or the share of people ages 25 years or older with at least a bachelor's degree and per capita income (correlated at 0.67).

[12] Note that an increase in transit operations may require additional transit capital funding, such as to purchase buses, to pay for bus stops, and the like. However, I do not account for those potential costs in this analysis. As an example of advocates supporting the $20 billion federal transit funding proposal, see Ben Fried and Steven Higashide, "Needed: A Federal Program to Boost Transit Service," *Streetsblog*, April 22, 2021, https://usa.streetsblog.org/2021/04/22/envisioning-a-federal-program-to-increase-transit-service/.

[13] To calculate the distribution of the $3 billion in funds dedicated for urban areas with high ridership, I used data on transit commuters to work from the 2015–19 American Community Survey. (Data on transit ridership are not available for all agencies in the National Transit Database.) The formula-assigned funding by urban area is the number of transit commuters per area divided by the national total of transit commuters, multiplied by $3 billion. I did not make provisions for administrative funds to cover the costs of maintaining the program.

[14] To calculate the distribution of the $17 billion in funds dedicated for communities with high levels of low-income residents, I used data from the 2015–19 American Community Survey on household income level. The formula-assigned funding by urban area is the number of households with incomes below $30,000 divided by the national total of such households, multiplied by $17 billion. A formula allocation using county data would result in the same outcomes. I did not make provisions for administrative funds to cover costs of maintaining the program.

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