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Transit Access and Zero-Vehicle Households

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"Zero-vehicle households live in neighborhoods well-served by bus and rail service ... However, that transit service frequently falls short on connecting households to ample job opportunities."

Findings

An analysis of data from the American Community Survey and 371 transit providers in the nation's 100 largest metropolitan areas reveals that:

- **In the nation's largest metropolitan areas, 7.5 million households do not have access to a private automobile.** A majority of these zero-vehicle households live in cities and earn lower incomes. Conversely, households with vehicles tend to live in suburbs and earn middle or higher incomes. The unique locational and income characteristics of zero-vehicle households reinforce their need for strong transit service.
- **Over 90 percent of zero-vehicle households in large metropolitan areas live in neighborhoods with access to transit service of some kind.** This greatly exceeds the 68 percent coverage rate for households with a vehicle, suggesting transit service aligns with households who rely on it most. However, some 700,000 zero-vehicle households in the 100 largest metro areas lack access to transit.
- **The typical metropolitan household without a vehicle can reach over 40 percent of metro-wide jobs via transit within 90 minutes, exceeding the 29 percent transit access share for households with a vehicle.** The tendency of zero-vehicle households to live in cities contributes to their above-average access to jobs via transit. Unfortunately, limited job access via transit in most metropolitan areas leaves many jobs out of reach for zero-vehicle households.

Millions of zero-vehicle households live in areas well served by transit. Yet hundreds of thousands of zero-vehicle households live out of transit's reach, particularly in the South and in the suburbs. And those with transit access still cannot reach a majority of jobs in metro areas within 90 minutes. Based on these trends, leaders must recognize these households' unique mobility needs and aim to improve job accessibility through sound policy.

Introduction

Americans possess a well-documented dependency on the automobile—and nowhere is that clearer than in how Americans travel to work. Over three-quarters of commuters drive alone to work, with another 10 percent carpooling.[1] Considering that Americans registered over 133 million private and commercial vehicles in 2009, it makes sense that so many people would drive.[2] However, there remain over 10 million American households who do not own a private vehicle.[3]

Not only do these households live without access to a personal vehicle, but these zero-vehicle households also must commute in an employment environment particularly unsuited to their travel options.[4] The United States added over 655,000 roadway lane miles since 1980, leading to the rapid decentralization of housing and jobs.[5] Such decentralization leaves a zero-vehicle

household's most likely travel modes—transit, walking, and biking—at a structural disadvantage due to ever-growing distances between locations.[6]

For some, not owning a vehicle represents a lifestyle choice. Such individuals may live in locations where car ownership is particularly expensive or impractical, and there are plentiful transportation alternatives for accessing jobs and meeting other household needs. As explained below, however, census data imply that the majority of these zero-vehicle households face economic constraints to automobile ownership. Not only are cars themselves expensive, but households with lower incomes may also face higher costs for f nancing a car. Used cars offer a cheaper sticker price but tend to incur higher annual operating costs.[7] Not owning a car may impart further economic disadvantage as well, as workers with cars work more hours per week than those without cars, enabling them to earn higher incomes.[8]

Based on these environmental and economic disadvantages, public policy has a responsibility to improve transportation accessibility for zero-vehicle households. First, it should ensure that people who are most constrained in their transportation choices—low-income zero-vehicle households—have access to viable transportation options. Second, it should expand transportation options for all households, including those who can afford a car but choose not to, because of the attendant environmental and economic benef ts.

To meet these responsibilities, policymakers need a strong understanding of zero-vehicle households' geographic distribution and demographic characteristics. That understanding should inform the response of metropolitan transit systems to these households' transportation needs. Brookings' "Missed Opportunity" report found that large metropolitan areas face a transit paradox. Transit agencies offer at least basic f xed-route transit service to a majority of their working-age population, but those same services fall short on connecting workers to jobs. Do zero-vehicle households face this same paradox?

This brief begins by prof ling zero-vehicle households: who they are, what they earn, and where they live. Next, using a comprehensive "supply side" transportation model, the brief examines how many zero-vehicle households have an opportunity to use transit and if that service helps them reach metropolitan job opportunities. It concludes with a discussion of the implications for public policy.

Methodology

This brief combines detailed data on household demographics, transit systems, and employment to determine the accessibility of jobs via transit within and across the country's 100 largest metropolitan areas—as def ned by the U.S. Off ce of Management and Budget in 2008 and based on Census Bureau population estimates for that year.

Besides the demographic analysis in Finding A—which primarily uses American Community Survey data—this brief utilizes the same data sources and nearly all of the same methodological specif cations as Brookings' "Missed Opportunity" report. To get a complete understanding of that report's methodology, please read that report's Appendix 1 (PDF). The exceptions to those specif cations are:

Origin Unit: While Missed Opportunity measured neighborhoods by the number of residents aged 18 to 64, this brief measures neighborhoods by the number of households with and without a vehicle. This switch from population to household statistics means that each report's results are not comparable to one another.

Exclusion of Combined Access: This brief does not include a combination of the coverage and job access statistics, instead focusing on individual rankings within the two statistics.

Finally, a note about the transit agencies included in this analysis. The model requires specif c service times to measure access between origins and destinations—meaning only f xed route transit meets this criterion. In turn, this requirement excludes alternative transit, such as on-demand service and private jitneys, from the analysis. Innovative carpooling programs, like slugging, are also excluded. There is no question that these travel modes offer a viable alternative to f xed route transit and private automobiles—and statistics show that people do use the services.[9] Future analyses could measure the additional accessibility benef ts these services offer to zero-vehicle households.

Findings

A. In the nation's largest metropolitan areas 7.5 million households do not have access to a private automobile.

Households without access to a personal vehicle, referred to here as zero-vehicle households, are a clear minority across the country's 100 largest metropolitan areas—but still form a large group. They make up 10 percent of all households in those large metropolitan areas, equaling 7.5 million households.[10]

The majority of these zero-vehicle households live in just a handful of metropolitan areas. New York is the clear leader with 28.0 percent of the 100 metropolitan areas' zero-vehicle households. The next largest share belongs to Chicago, followed by Los Angeles, Philadelphia, and Boston. Overall, just seven metropolitan areas host over half of all 100 metro areas' zero-vehicle households (Table 1).

Table 1. Zero-Vehicle Households, by Metropolitan Area, 2010

Metropolitan Area	Zero-Vehicle Households	100 Metropolitan Area Share
New York-Northern New Jersey-Long Island, NY-NJ-PA	2,093,861	28.0%
Chicago-Naperville-Joliet, IL-IN-WI	399,927	5.3%
Los Angeles-Long Beach-Santa Ana, CA	358,705	4.8%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	310,583	4.1%
Boston-Cambridge-Quincy, MA-NH	223,207	3.0%
San Francisco-Oakland-Fremont, CA	195,997	2.6%
Washington-Arlington-Alexandria, DC-VA-MD-WV	193,558	2.6%
Total of Other 93 Metro Areas	**3,714,076**	**49.6%**
Average of Other 93 Metro Areas	**39,936**	**0.5%**

Source: Brookings Institution analysis of Nielsen Pop-Facts 2010 data

Whether in New York or Provo, the metro with the smallest share of zero-vehicle households, the 7.5 million zero-vehicle households differ in several respects from households with access to a personal vehicle.

First, a majority of zero-vehicle households live in cities: 61.7 percent of all zero-vehicle households live in the 132 primary cities of the 100 largest metropolitan areas.[11] This is more than double the 28.5 percent city-living share of households with a vehicle. Conf rmed in the "Missed Opportunity" report, these city locations help put zero-vehicle households in the optimal place to use transit's hub-and-spoke designs.

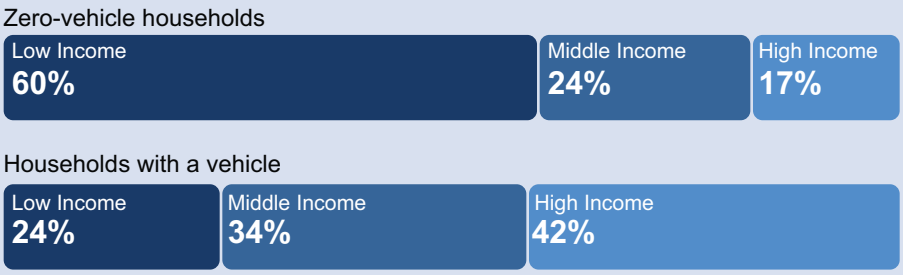
These metro areas' commuting statistics reinforce this locational advantage—59.7 percent of zero-vehicle households in the city use mass transportation as their commuting mode. This dwarfs the 25.4 percent transit share for zero-vehicle households in the suburbs. This implies that three-quarters of zero-vehicle households in the suburbs need an alternative mode to get to work. Invariably these households borrow someone else's car and drive alone (31.1 percent share) or carpool with someone else (30.2 percent share).

Second, a similar majority of zero-vehicle households have lower incomes. Throughout the 100 metropolitan areas, 59.8 percent of zero-vehicle households have incomes below 80 percent of the median income for their metro area. The share is essentially the same across cities (59.8 percent) and suburbs (59.7 percent). By comparison, only 23.9 percent of households with a vehicle are low income.

These household income shares are consistent across nearly all metropolitan areas. In only three of the 100 metro areas do less than half of zero-vehicle households fall into the low-income category: New York, Lakeland, and Oxnard.

While large shares of zero-vehicle households live in cities and earn low incomes, racial prof les are relatively consistent across the three largest racial categories. Whites constitute the highest share of all

Figure 1. Share of Zero-Vehicle Households in Top 100 Metropolitan Areas, by Income



Source: Brookings Institution analysis of Nielsen Pop-Facts 2010 and 2008 American Community Survey data

zero-vehicle households (36.4 percent), but Hispanics (27.7 percent) and blacks (25.3 percent) are not far behind. Zero-vehicle households truly stretch across all racial lines.

B. Over 90 percent of zero-vehicle households in large metropolitan areas live in neighborhoods with access to transit service of some kind.

Across the country's 100 largest metropolitan areas, zero-vehicle households tend to congregate in cities and earn relatively low incomes. This puts them in a unique position to take advantage of mass transit, on account of both density and transit route conf gurations. This f nding examines transit coverage, or the share of a metro area's households living in communities served by transit.

Over 90 percent of zero-vehicle households live in neighborhoods with transit coverage. This suggests that zero-vehicle households do align their settlement locations with transit provision, and that transit agencies align their routes to serve these households.[12]

A major reason the zero-vehicle coverage rate exceeds 90 percent is that some of the metro areas with the highest share of zero-vehicle households also have the highest coverage rates. New York is the best example: It houses over one-quarter of all zero-vehicle households in the 100 largest metro areas, and 98.7 percent of those households live in neighborhoods with transit service. Another seven metro areas are home to at least 2 percent of all 100 metro areas' zero-vehicle households, and at least 90 percent of their zero-vehicle households live in transit-covered neighborhoods.

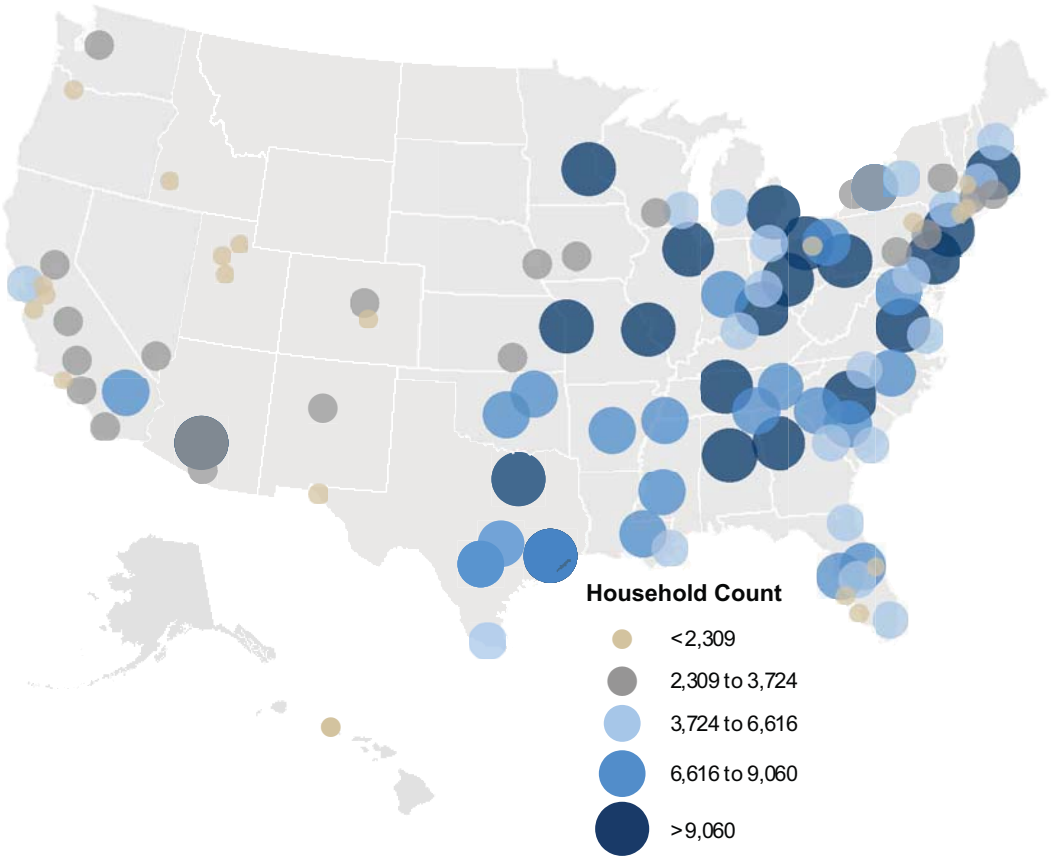
In contrast, certain metropolitan areas have startlingly low coverage rates for their zero-vehicle households. Greenville is the only metro area in which more than half of zero-vehicle households live in neighborhoods without transit coverage. Another eight metro areas fall below 60 percent coverage for zero-vehicle households. The only silver lining is that most of the nine worst metropolitan performers have small zero-vehicle household populations, minimizing their impact on overall metropolitan access (Map 1).

However, some metro areas with subpar coverage of zero-vehicle households leave large numbers unserved. Atlanta, Dallas, and Houston all offer lower transit coverage rates and each house over 1 percent of all 100-metro zero-vehicle households. Together those three metro areas leave over 100,000 zero-vehicle households without access to transit. Across all 100 metro areas, 700,000 households lack access to both private vehicles and transit in their neighborhoods.

Regional statistics reinforce the disparities between strong and weak metropolitan performers, although the variation is more muted. The coverage rate for zero-vehicle households is highest in Northeastern metro areas, (96.2 percent), followed closely by those in the West (94.8 percent) and Midwest (87.1 percent). Even Southern metros (79.7 percent) perform well relative to transit coverage for households with vehicles (Table 2).

Coverage rates for zero-vehicle households are even higher in cities. Across the 100 largest metro areas, 99.2 percent of zero-vehicle households in cities live near transit, versus only 58.0 percent in the suburbs. Transit coverage rates for zero-vehicle households exceeded 90 percent in 95 of the 100 largest metro

Map 1. Zero-Vehicle Households without Access to Transit, by Quintile, 100 Metropolitan Areas



Source: Brookings Institution analysis of transit agency and Nielsen Pop-Facts 2010 data

Table 2. Transit Coverage Rates, Zero-Vehicle Households and Households with a Vehicle, 2010

Region	Zero-vehicle Households	Coverage Rate	Households with a Vehicle	Coverage Rate
All 100 Metro Areas	**7,489,914**	**90.7%**	**67,509,647**	**68.0%**
Northeast	1,216,810	87.1%	13,229,895	62.7%
Midwest	3,193,042	96.2%	13,649,556	73.8%
South	1,718,383	79.7%	23,335,523	55.4%
West	1,361,679	94.8%	17,294,673	84.4%

Source: Brookings Institution analysis of transit agency and Nielsen Pop-Facts 2010 data

areas' cities; the lowest was 74 percent in Cape Coral, FL. Conversely, in only 16 metro areas did at least 90 percent of suburban zero-vehicle households live in neighborhoods with coverage. In 31 metro areas, more than half of suburban zero-vehicle households live in neighborhoods without coverage, affecting a total of 263,000 households without vehicles.

Notwithstanding relatively low transit coverage for zero-vehicle households in some metro areas, most areas do much better on behalf of those mobility-constrained households than they do for the population at large. In Richmond, 68.4 percent of zero-vehicle households enjoy transit coverage, versus 31.2 percent of households with a vehicle. In another six metro areas, at least 30 percentage points separate coverage rates between the two household groups: Portland ME, Poughkeepsie, Indianapolis, Chattanooga, Atlanta,

and Birmingham. All seven offer sub-50 percent coverage for their households with a vehicle, suggesting that they are optimizing service provision for households who may need transit the most. Large coverage differences also characterize the suburbs of Baltimore, Boston, Philadelphia, and Chicago, in which strong commuter rail and bus systems help make suburban living possible without a car.

C. The typical metropolitan household without a vehicle can reach over 40 percent of metro-wide jobs via transit within 90 minutes, exceeding the 29 percent transit access share for households with a vehicle.

Beyond offering basic service, one of transit's principal functions is to get commuters to work. This section measures transit's ability to perform that accessibility function within an allotted time threshold.

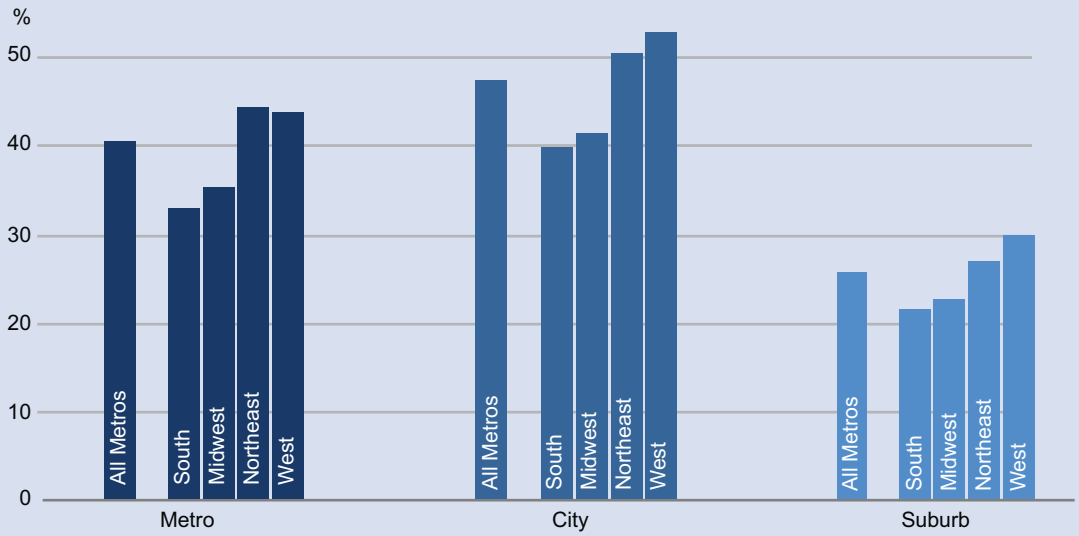
Across all neighborhoods served by some form of transit in the 100 largest metro areas, the typical zero-vehicle household can reach 40.6 percent of metropolitan jobs within 90 minutes of travel time.

While 40.6 percent of jobs may not sound like an especially large share, it easily exceeds the 28.6 percent of jobs reached by the typical household with a vehicle. A major reason for this difference is the concentration of zero-vehicle households in cities: 61.7 percent of all zero-vehicle households live in cities, nearly double the rate for households with a vehicle. City-based households stand to benef t from the hub-and-spoke design found in most metropolitan transit systems, where transit lines converge in downtowns and offer these households access to multiple metropolitan destinations. Cities' higher densities also enable access to more jobs within shorter distances.

Accessibility statistics within metro areas reinforce the importance of zero-vehicle households' location for job access. Zero-vehicle households in cities can reach on average 47.4 percent of metropolitan jobs, exceeding the 25.8 percent average for their suburban counterparts. These rates exceed those for households with a vehicle, both in the city (39.3 percent) and in the suburbs (21.4 percent).

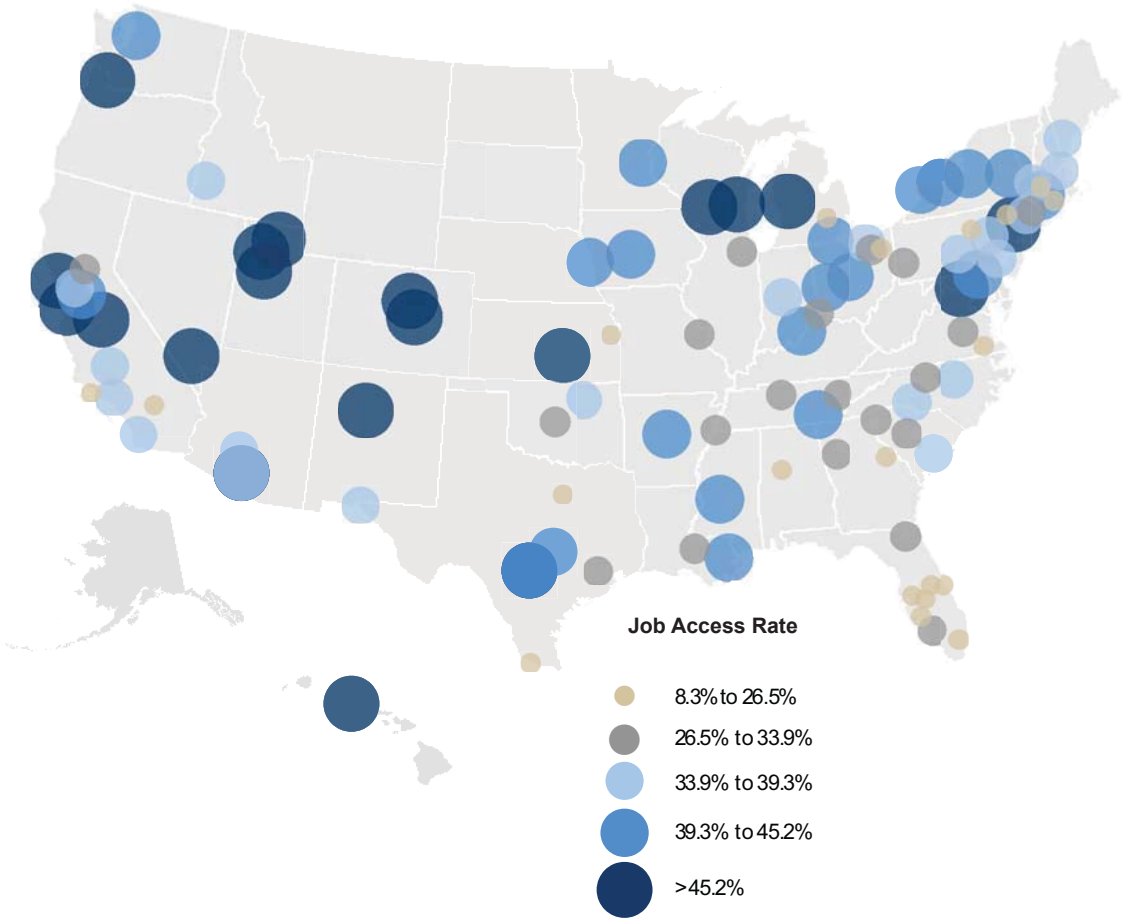
Much like coverage statistics, job access varies across the four regions. Northeastern metro areas lead the way with 44.4 percent access for zero-vehicle households, followed by Western (43.7 percent) and Midwestern (35.4 percent) metro areas. Southern metros (33.1 percent) continue to perform worst across both coverage and job access for these households. Figure 2 also shows that each region's city accessibility rate nearly doubles its suburban accessibility rate.

Figure 2. Average Share of Jobs Accessible in 90 Minutes via Transit for Zero-Vehicle Households, by Region, 100 Metropolitan Areas



Source: Brookings Institution analysis of transit agency, Nielsen Pop-Facts 2010, and Nielsen Business-Facts data

Map 2. Share of Jobs Accessible on Average in 90 Minutes via Transit, Zero-Vehicle Households in 100 Metropolitan Areas



Source: Brookings Institution analysis of transit agency, Nielsen Pop-Facts 2010, and Nielsen Business-Facts data

Several Western metro areas stand out in providing high job access via transit for zero-vehicle households. Honolulu is the best performer out of all 100 metro areas—and the only metro to break 70 percent average job access—followed by Salt Lake City, Tucson, and San Jose. In all, 13 of the 20 best job access levels for zero-vehicle households belong to Western metros. Some of the country's largest metropolitan areas are also top performers. New York, Washington, and San Francisco all rank among the top 20. And since these three metro areas house 33 percent of all zero-vehicle households, they also positively inf uence the aggregate 100-metro performance.

At the other end of the spectrum, Southern metros dominate the list of lowest job access levels. Eleven (11) of the 20 worst performing metros are in the South, including six of the eight largest Florida metros. Some of the country's largest metropolitan areas outside the South also register lower job access levels: Detroit, Riverside, and Kansas City all rank among the bottom 20. Especially troubling are large metros like Dallas and Houston that underperform in both transit coverage and job access for zero-vehicle households.

Finally, how a metro area performs on job access for zero-vehicle households generally ref ects how it performs on job access for households with vehicles. Nine metro areas rank in the top 10 on job access via transit for both zero-vehicle households and households with vehicles, while the 10 bottom-ranked metro areas are the same for both groups. In addition, in only seven metropolitan areas does the job access rank change by at least 20 spots between zero-vehicle households and households with vehicles.

Conclusion

This analysis reinforces the transit paradox first uncovered in the "Missed Opportunity" report. Zero-vehicle households live in neighborhoods well-served by bus and rail service, and transit agencies align their routes to serve neighborhoods with zero-vehicle households. However, that transit service frequently falls short on connecting households to ample job opportunities, even though job access is better for zero-vehicle households than other households. And while transit reaches the majority of these mobility-constrained households, it still leaves 700,000 without access to transit. These households without coverage are then forced to either borrow a car or carpool to reach jobs too far to reach by foot or bike.

Beyond accessibility, the characteristics of zero-vehicle households are remarkably similar across selected demographic categories. Over 60 percent of zero-vehicle households live in cities, and a similar share qualify as low income. In particular, these low-income households may have difficulties purchasing and maintaining their own automobiles, making transportation alternatives that much more important.

These findings mean that policymakers must pay special attention to zero-vehicle households' transportation accessibility. Transit agencies should continue to address the coverage gaps in their systems, whether through fixed routes or alternatives like demand-response services. Simultaneously, routes should reflect job growth in the suburbs and assist households in reaching these opportunities. But transit agencies cannot alone tackle the needs of these households. Land-use planners should begin to concentrate future development in locations accessible from core cities.

Finally, these findings should serve as a wake-up call for those metropolitan areas with the troublesome combination of large-scale housing and job decentralization, large swaths of uncovered neighborhoods, and low levels of job access for zero-vehicle households. This group includes some of the largest metropolitan areas like Dallas and Atlanta, but also smaller metropolitan areas like Birmingham and Greenville. These metro areas will require a significant change in direction to enable households who need transit most—whether in cities or suburbs—to connect to opportunities throughout their region.

Appendix. Zero-Vehicle Household Demographic and Transit Metrics

	Zero-Vehicle Households: Basics			Coverage Rate				Job Access Rate			
Metropolitan Area	Total Households	Low-Income Share	Households without Coverage	Metro	Rank	City	Suburb	Metro	Rank	City	Suburb
Akron, OH	19,255	80.9%	2,134	88.9%	*35*	99.8%	74.7%	31.3%	*70*	38.5%	17.6%
Albany-Schenectady-Troy, NY	30,563	74.5%	3,429	88.8%	*36*	100.0%	84.6%	43.5%	*25*	56.3%	37.5%
Albuquerque, NM	21,109	61.7%	3,204	84.8%	*50*	99.8%	50.9%	59.3%	*8*	62.6%	40.6%
Allentown-Bethlehem-Easton, PA-NJ	24,212	66.1%	3,601	85.1%	*48*	100.0%	78.1%	33.9%	*60*	45.6%	25.9%
Atlanta-Sandy Springs-Marietta, GA	119,638	62.6%	37,634	68.5%	*82*	100.0%	52.8%	27.7%	*79*	34.2%	21.5%
Augusta-Richmond County, GA-SC	14,860	71.2%	6,254	57.9%	*93*	86.9%	29.8%	19.8%	*91*	24.1%	3.2%
Austin-Round Rock, TX	34,659	62.5%	8,637	75.1%	*74*	97.1%	22.9%	45.2%	*21*	48.3%	14.6%
Bakersfield, CA	18,791	54.6%	2,531	86.5%	*44*	99.9%	77.5%	38.3%	*44*	48.4%	27.7%
Baltimore-Towson, MD	114,325	71.1%	6,118	94.6%	*20*	100.0%	85.1%	42.0%	*32*	50.3%	23.7%
Baton Rouge, LA	19,286	73.6%	9,019	53.2%	*97*	96.3%	14.6%	31.7%	*67*	33.6%	20.4%
Birmingham-Hoover, AL	28,929	70.3%	10,862	62.5%	*89*	97.9%	32.7%	26.1%	*84*	29.4%	17.6%
Boise City-Nampa, ID	8,882	56.5%	2,264	74.5%	*75*	99.9%	50.9%	38.0%	*46*	48.9%	18.1%
Boston-Cambridge-Quincy, MA-NH	223,207	58.1%	15,461	93.1%	*25*	100.0%	87.6%	38.1%	*45*	48.5%	28.5%
Bradenton-Sarasota-Venice, FL	17,196	70.7%	2,079	87.9%	*39*	100.0%	86.5%	26.5%	*81*	24.3%	26.8%
Bridgeport-Stamford-Norwalk, CT	27,287	70.1%	1,279	95.3%	*18*	100.0%	88.3%	36.8%	*49*	40.7%	29.9%
Buffalo-Niagara Falls, NY	56,732	67.0%	2,626	95.4%	*17*	100.0%	89.3%	42.0%	*31*	53.0%	25.6%
Cape Coral-Fort Myers, FL	14,642	69.3%	2,009	86.3%	*45*	74.0%	88.7%	26.8%	*80*	19.9%	27.9%
Charleston-North Charleston-Summerville, SC	19,439	75.3%	3,929	79.8%	*63*	97.9%	71.7%	38.4%	*43*	45.7%	32.8%
Charlotte-Gastonia-Concord, NC-SC	38,736	74.7%	14,068	63.7%	*87*	96.7%	25.2%	35.0%	*56*	40.7%	9.3%
Chattanooga, TN-GA	14,479	68.1%	6,699	53.7%	*96*	88.9%	3.2%	42.1%	*30*	42.4%	30.7%
Chicago-Naperville-Joliet, IL-IN-WI	399,927	63.1%	17,952	95.5%	*15*	100.0%	85.5%	33.2%	*64*	39.2%	16.7%
Cincinnati-Middletown, OH-KY-IN	72,187	70.9%	15,374	78.7%	*66*	100.0%	62.0%	33.9%	*61*	40.0%	25.7%
Cleveland-Elyria-Mentor, OH	85,641	63.1%	10,497	87.7%	*41*	100.0%	76.2%	37.6%	*48*	45.1%	28.2%
Colorado Springs, CO	11,650	74.2%	1,800	84.5%	*53*	90.1%	61.7%	48.9%	*16*	52.5%	26.9%
Columbia, SC	17,950	70.9%	7,522	58.1%	*92*	98.4%	38.4%	31.6%	*68*	36.6%	25.3%
Columbus, OH	48,923	78.1%	10,616	78.3%	*70*	98.1%	41.9%	41.2%	*34*	43.4%	30.4%
Dallas-Fort Worth-Arlington, TX	115,648	73.7%	33,326	71.2%	*79*	90.7%	41.1%	22.0%	*90*	23.5%	16.8%
Dayton, OH	25,786	69.3%	4,002	84.5%	*54*	99.8%	71.1%	42.1%	*29*	51.5%	30.4%
Denver-Aurora, CO	68,523	69.4%	2,724	96.0%	*12*	99.7%	89.2%	60.9%	*7*	67.9%	46.6%
Des Moines-West Des Moines, IA	11,827	75.2%	2,311	80.5%	*61*	98.6%	49.3%	43.9%	*24*	45.2%	39.2%
Detroit-Warren-Livonia, MI	135,979	66.0%	20,582	84.9%	*49*	99.9%	70.7%	26.2%	*83*	32.2%	18.1%
El Paso, TX	21,194	64.6%	465	97.8%	*6*	99.2%	84.0%	39.0%	*42*	40.4%	3.6%
Fresno, CA	26,343	71.2%	3,210	87.8%	*40*	98.3%	70.6%	62.4%	*6*	63.4%	56.9%
Grand Rapids-Wyoming, MI	18,506	66.8%	5,153	72.2%	*78*	100.0%	44.1%	50.1%	*14*	52.9%	43.6%

Appendix. Zero-Vehicle Household Demographic and Transit Metrics (cont.)

	Zero-Vehicle Households: Basics			Coverage Rate				Job Access Rate			
Metropolitan Area	Total Households	Low-Income Share	Households without Coverage	Metro	*Rank*	City	Suburb	Metro	*Rank*	City	Suburb
Greensboro-High Point, NC	19,309	75.8%	6,616	65.7%	*86*	94.8%	11.6%	30.1%	*74*	30.3%	21.9%
Greenville-Mauldin-Easley, SC	15,505	64.8%	8,391	45.9%	*100*	97.9%	32.8%	33.3%	*63*	39.6%	28.4%
Harrisburg-Carlisle, PA	16,238	83.6%	3,624	77.7%	*72*	100.0%	64.8%	35.7%	*53*	44.4%	28.0%
Hartford-West Hartford-East Hartford, CT	39,649	72.8%	3,664	90.8%	*31*	100.0%	84.9%	39.4%	*40*	52.7%	29.1%
Honolulu, HI	30,793	69.1%	230	99.3%	*1*	99.7%	97.8%	74.5%	*1*	83.0%	47.1%
Houston-Sugar Land-Baytown, TX	122,517	73.2%	32,630	73.4%	*77*	97.7%	27.1%	32.5%	*66*	35.2%	12.8%
Indianapolis-Carmel, IN	35,784	72.3%	7,939	77.8%	*71*	97.4%	22.6%	39.3%	*41*	40.0%	30.1%
Jackson, MS	13,674	85.0%	6,771	50.5%	*99*	98.3%	2.3%	40.6%	*36*	40.8%	29.6%
Jacksonville, FL	33,534	57.4%	6,130	81.7%	*58*	89.4%	55.3%	30.4%	*72*	33.5%	7.2%
Kansas City, MO-KS	46,443	69.5%	11,171	75.9%	*73*	95.5%	50.4%	24.2%	*87*	28.5%	11.6%
Knoxville, TN	16,607	56.8%	8,180	50.7%	*98*	97.3%	6.9%	29.1%	*76*	29.6%	22.5%
Lakeland-Winter Haven, FL	14,271	49.4%	4,650	67.4%	*84*	91.4%	59.5%	23.0%	*88*	34.0%	17.2%
Las Vegas-Paradise, NV	50,601	61.6%	2,928	94.2%	*22*	97.8%	92.3%	58.6%	*9*	65.3%	54.7%
Little Rock-North Little Rock-Conway, AR	17,278	77.7%	6,724	61.1%	*91*	92.2%	38.5%	42.4%	*28*	46.4%	35.5%
Los Angeles-Long Beach-Santa Ana, CA	358,705	68.2%	3,248	99.1%	*2*	99.9%	98.1%	36.0%	*52*	44.9%	24.7%
Louisville-Jefferson County, KY-IN	40,631	74.4%	6,345	84.4%	*55*	97.3%	42.9%	43.4%	*26*	45.4%	27.4%
Madison, WI	14,723	78.3%	2,979	79.8%	*64*	99.8%	38.6%	63.6%	*5*	65.5%	53.4%
McAllen-Edinburg-Mission, TX	17,136	67.0%	6,263	63.5%	*88*	98.7%	56.7%	15.3%	*97*	31.4%	5.8%
Memphis, TN-MS-AR	40,098	69.9%	7,947	80.2%	*62*	99.1%	22.0%	32.8%	*65*	35.0%	3.4%
Miami-Fort Lauderdale-Pompano Beach, FL	177,048	63.4%	5,020	97.2%	*8*	100.0%	96.2%	19.7%	*92*	29.1%	16.4%
Milwaukee-Waukesha-West Allis, WI	58,324	71.4%	5,380	90.8%	*30*	100.0%	68.8%	54.3%	*11*	57.7%	42.3%
Minneapolis-St. Paul-Bloomington, MN-WI	89,111	69.4%	9,242	89.6%	*33*	100.0%	76.9%	40.0%	*39*	47.2%	28.4%
Modesto, CA	10,184	56.5%	453	95.6%	*14*	100.0%	91.9%	41.1%	*35*	56.2%	26.7%
Nashville-Davidson--Murfreesboro--Franklin, TN	33,003	63.5%	14,595	55.8%	*94*	92.3%	6.6%	33.6%	*62*	34.8%	6.3%
New Haven-Milford, CT	34,746	71.2%	1,757	94.9%	*19*	100.0%	91.8%	30.9%	*71*	45.1%	21.0%
New Orleans-Metairie-Kenner, LA	43,699	65.1%	5,817	86.7%	*43*	99.8%	67.1%	44.5%	*22*	49.7%	32.9%
New York-Northern New Jersey-Long Island, NY-NJ-PA	2,093,861	49.6%	27,957	98.7%	*3*	99.9%	92.5%	48.8%	*17*	51.9%	31.8%
Ogden-Clearf eld, UT	6,770	74.8%	374	94.5%	*21*	100.0%	89.8%	48.6%	*18*	52.6%	44.8%
Oklahoma City, OK	25,718	73.8%	7,935	69.1%	*81*	87.0%	42.3%	27.9%	*78*	33.3%	9.4%
Omaha-Council Bluffs, NE-IA	21,140	70.3%	3,103	85.3%	*47*	98.8%	52.4%	40.1%	*38*	42.9%	27.2%
Orlando-Kissimmee, FL	39,661	59.6%	8,360	78.9%	*65*	99.8%	73.0%	19.6%	*93*	31.3%	15.1%
Oxnard-Thousand Oaks-Ventura, CA	10,200	48.7%	935	90.8%	*29*	97.4%	82.1%	25.1%	*85*	30.7%	15.7%
Palm Bay-Melbourne-Titusville, FL	10,782	60.5%	1,878	82.6%	*56*	90.0%	81.4%	8.3%	*100*	6.1%	8.7%

Appendix. Zero-Vehicle Household Demographic and Transit Metrics (cont.)

	Zero-Vehicle Households: Basics			Coverage Rate				Job Access Rate			
Metropolitan Area	Total Households	Low-Income Share	Households without Coverage	Metro	*Rank*	City	Suburb	Metro	*Rank*	City	Suburb
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	310,583	68.2%	14,222	95.4%	*16*	100.0%	87.2%	35.7%	*54*	43.1%	20.2%
Phoenix-Mesa-Scottsdale, AZ	92,741	59.5%	17,686	80.9%	*60*	97.8%	54.9%	34.0%	*59*	37.6%	23.9%
Pittsburgh, PA	109,355	65.6%	11,982	89.0%	*34*	100.0%	83.5%	28.1%	*77*	39.9%	20.4%
Portland-South Portland-Biddeford, ME	13,882	66.1%	4,201	69.7%	*80*	100.0%	48.8%	34.1%	*58*	42.2%	19.5%
Portland-Vancouver-Beaverton, OR-WA	67,937	65.4%	2,309	96.6%	*10*	100.0%	91.9%	51.1%	*13*	61.9%	34.4%
Poughkeepsie-Newburgh-Middletown, NY	18,003	67.3%	3,845	78.6%	*67*	100.0%	74.9%	9.1%	*98*	13.9%	7.4%
Providence-New Bedford-Fall River, RI-MA	57,619	65.3%	3,724	93.5%	*23*	100.0%	91.8%	23.0%	*89*	42.6%	17.1%
Provo-Orem, UT	4,576	55.0%	703	84.6%	*52*	95.3%	77.6%	54.9%	*10*	64.7%	46.6%
Raleigh-Cary, NC	20,490	80.6%	7,912	61.4%	*90*	95.5%	24.9%	36.5%	*50*	41.3%	15.8%
Richmond, VA	33,838	66.6%	10,695	68.4%	*83*	100.0%	38.4%	29.5%	*75*	33.7%	19.1%
Riverside-San Bernardino-Ontario, CA	65,862	57.8%	8,096	87.7%	*42*	99.7%	84.2%	9.0%	*99*	15.2%	6.7%
Rochester, NY	38,033	75.1%	8,204	78.4%	*69*	100.0%	52.5%	43.3%	*27*	50.3%	27.1%
Sacramento--Arden-Arcade--Roseville, CA	48,764	61.8%	3,695	92.4%	*26*	99.0%	87.5%	30.2%	*73*	37.5%	23.8%
St. Louis, MO-IL	81,721	62.5%	14,528	82.2%	*57*	100.0%	70.9%	31.4%	*69*	39.5%	24.1%
Salt Lake City, UT	20,098	77.3%	671	96.7%	*9*	100.0%	93.9%	67.6%	*2*	71.8%	63.9%
San Antonio, TX	56,899	68.8%	8,725	84.7%	*51*	99.5%	26.5%	47.1%	*19*	47.6%	39.4%
San Diego-Carlsbad-San Marcos, CA	67,715	64.7%	2,752	95.9%	*13*	97.8%	93.7%	37.8%	*47*	48.6%	23.9%
San Francisco-Oakland-Fremont, CA	195,997	58.2%	3,759	98.1%	*5*	99.9%	94.2%	49.1%	*15*	55.6%	33.1%
San Jose-Sunnyvale-Santa Clara, CA	31,853	52.9%	573	98.2%	*4*	99.4%	95.8%	64.0%	*4*	72.1%	47.6%
Scranton--Wilkes-Barre, PA	22,737	71.0%	1,887	91.7%	*27*	96.5%	90.4%	26.4%	*82*	27.7%	26.0%
Seattle-Tacoma-Bellevue, WA	95,793	69.8%	2,614	97.3%	*7*	100.0%	93.6%	44.4%	*23*	54.1%	30.4%
Springf eld, MA	28,539	65.1%	1,946	93.2%	*24*	100.0%	88.8%	34.7%	*57*	45.6%	26.0%
Stockton, CA	15,368	64.7%	1,336	91.3%	*28*	100.0%	79.8%	36.5%	*51*	44.0%	23.6%
Syracuse, NY	26,626	76.6%	3,809	85.7%	*46*	100.0%	67.9%	41.6%	*33*	49.0%	27.4%
Tampa-St. Petersburg-Clearwater, FL	76,505	65.2%	9,060	88.2%	*38*	98.4%	81.1%	18.5%	*94*	24.2%	13.6%
Toledo, OH	21,556	75.3%	4,013	81.4%	*59*	100.0%	33.0%	40.5%	*37*	42.8%	21.8%
Tucson, AZ	32,424	64.4%	3,336	89.7%	*32*	99.6%	60.8%	66.5%	*3*	70.1%	48.9%
Tulsa, OK	23,314	59.3%	7,631	67.3%	*85*	97.2%	17.9%	35.5%	*55*	37.8%	11.4%
Virginia Beach-Norfolk-Newport News, VA-NC	42,327	73.5%	4,850	88.5%	*37*	96.9%	75.8%	18.3%	*95*	21.3%	12.3%
Washington-Arlington-Alexandria, DC-VA-MD-WV	193,558	68.8%	6,927	96.4%	*11*	100.0%	91.6%	52.6%	*12*	62.2%	38.1%
Wichita, KS	13,439	69.8%	2,889	78.5%	*68*	98.7%	11.2%	45.7%	*20*	46.6%	19.5%
Worcester, MA	21,170	64.2%	5,414	74.4%	*76*	99.3%	53.2%	24.9%	*86*	34.4%	7.5%
Youngstown-Warren-Boardman, OH-PA	16,538	57.4%	7,348	55.6%	*95*	100.0%	38.4%	15.7%	*96*	22.0%	9.0%

Source: Brookings Institution analysis of transit agency, 2008 American Community Survey, Nielsen Pop-Facts 2010, and Nielsen Business-Facts data

Endnotes

1. Source: 2009 Single-year American Community Survey Estimates (ACS).
2. Source: Off ce of Highway Policy Information, "Highway Statistics 2009," Federal Highway Administration, Table MV-1.
3. Source: 2009 Single-year American Community Survey Estimates (ACS).
4. The def nition of a zero-vehicle household is from the American Community Survey 2008 Subject Def nitions (PDF):"The data on vehicles available were obtained from Housing Question 9 in the 2008 American Community Survey. The question was asked at occupied housing units. These data show the number of passenger cars, vans, and pickup or panel trucks of one-ton capacity or less kept at home and available for the use of household members. Vehicles rented or leased for one month or more, company vehicles, and police and government vehicles are included if kept at home and used for non-business purposes. Dismantled or immobile vehicles are excluded. Vehicles kept at home but used only for business purposes also are excluded.
5. Source: Off ce of Highway Policy Information, "Highway Statistics 2009," Federal Highway Administration, Chart VMT-421.
6. Elizabeth Kneebone, "Job Sprawl Revisited: The Changing Geography of Metropolitan Employment" (Washington: Brookings, 2009).
7. Financing Source: Matt Fellowes, "From Poverty, Opportunity: Putting the Market to Work for Working Families" (Washington: Brookings, 2006). Used Car Source: Multiple *Consumer Reports* pieces examine the difference in costs amongst vehicle age; see "Carrying Costs vs. Operational Costs" from August 2008 and "Used-Car Reliability" from April 2011.
8. Steven Raphael and Lorien Rice, "Car Ownership, Employment, and Earnings," *Journal of Urban Economics*, Volume 52, Issue 1.
9. According to the 2009 National Transit Database, agencies reported over 131 million unlinked passenger trips on demand response and vanpool services in 2009.
10. Source: Brookings analysis of Nielsen Pop-Facts 2010 Database.
11. Source: 2008 Single-year American Community Survey Estimates (ACS). This brief uses 2008 ACS data because of previously-approved analysis from the 2008 ACS internal f les at the U.S. Census Bureau. For more information see the State of Metropolitan America report.
12. Previous research f nds that low-income people may also move to neighborhoods served by transit at higher rates than other groups, especially since so many zero-vehicle households are also low income. Edward L. Glaeser, Matthew E. Kahn, and Jordan Rappaport, "Why Do the Poor Live in Cities?" (Cambridge, MA: Harvard Institute of Economic Research, Harvard University, April 2000).

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