

**How do car donation programs effect travel, income, and healthcare
access among poor families?**

Center for Transportation, Environment, and Community Health
Final Report



by
Nicholas J. Klein

June 1, 2020

DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. This document is disseminated in the interest of information exchange. The report is funded, partially or entirely, by a grant from the U.S. Department of Transportation's University Transportation Centers Program. However, the U.S. Government assumes no liability for the contents or use thereof.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle How do car donation programs effect travel, income, and healthcare access among poor families?		5. Report Date June 1, 2020	
		6. Performing Organization Code	
7. Author(s) Nicholas, J. Klein (0000-0002-7596-6147)		8. Performing Organization Report No.	
9. Performing Organization Name and Address Department of City and Regional Planning Cornell University Ithaca, New York, 14853		10. Work Unit No.	
		11. Contract or Grant No. 69A3551747119	
12. Sponsoring Agency Name and Address U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590		13. Type of Report and Period Covered Final Report 10/01/2018 – 03/31/2020	
		14. Sponsoring Agency Code US-DOT	
15. Supplementary Notes			
16. Abstract What happens when you give poor families a car? For decades, scholars have suggested that giving poor families cars can help them move up the economic ladder, yet these programs have rarely been studied. My research will study changes in poor families' lives when they receive a car from the largest vehicle donation program in the country. I interviewed 30 individuals living in Maryland and Virginia who received a subsidized car. Having a car eased their daily travel and allowed them to transition to better-paying jobs, helped them move to neighborhoods with more opportunities, improved their access to healthcare, and enabled them and their children to participate more fully in school-related activities. I also situate the subsidized cars within interviewees' mobility history. Most had owned cars before, and subsidized car ownership programs offer low-income consumers a safe alternative to a risky and expensive market for used cars.			
17. Key Words Transportation, automobile ownership, healthcare, poverty, economic mobility		18. Distribution Statement Public Access	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No of Pages	22. Price

INTRODUCTION

How do the lives of low-income families change when they receive a subsidized automobile? Previous research has documented that having access to a car is associated with varied benefits, from higher earnings and better employment outcomes to access to better healthcare and moving to neighborhoods with greater opportunities (Blumenberg and Pierce, 2014; Jeon et al., 2018; Syed et al., 2013). And for several decades, transportation scholars have advocated for increasing car ownership among low-income households as a tool for economic and social mobility (King et al., 2019; e.g., O'Regan and Quigley, 2000; Pendall et al., 2016). While nonprofit organizations and local government initiatives have sprung up to make car ownership more affordable for low-income households, researchers have rarely studied these programs (c.f. Brabo et al., 2003; Lucas and Nicholson, 2003). My research addresses this gap through rich descriptions of the varied ways that low-income family's lives changed after receiving a subsidized vehicle.

The findings from 30 interviews with individuals who received a subsidized personal vehicle from a nonprofit organization reveal how acquiring a car changed their lives and the lives of their families. The interviewees all received vehicles from the largest and most established vehicle access program in the country, Vehicles for Change (VFC). As expected, interviewees' travel behavior changed dramatically. Transitioning from using public transit and relying on others for rides to driving significantly decreased commuting times and eased travel for essential nonwork trips. Beyond the travel changes, access to a car led to important opportunities for economic and social mobility. Interviewees explained how having a car helped them move up the economic ladder. It also enabled them to move and expand their and their children's opportunities for education and enrichment.

The following section describes the relevant literature on car access and economic and social mobility. After that, I briefly describe the nonprofit organization I worked with, Vehicles for Change, and the data collection and analysis process. Then I describe the main findings from the interviews focusing on how their travel behavior changed, the opportunities they could access, and situating the cars they received within their mobility history. I conclude with a discussion of the implications for research and policy.

CAR ACCESS AND ECONOMIC AND SOCIAL MOBILITY

Car ownership and economic status are closely tied in the United States. Poor households, on average, own fewer cars, make fewer trips, and travel shorter distances compared with more affluent households (Santos et al., 2011). In 2017, the 14.7 percent of U.S. households in poverty accounted for 42.6 percent of carless households (Ruggles et al., 2019). These lower rates of car ownership are largely due to a lack of resources rather than to choosing a car-free lifestyle (Brown, 2017; Mitra and Saphores, 2017). Poor households' grasp on car ownership is also weaker than that of more affluent households, and as a result, poor households cycle in and out of car ownership at much higher rates (Klein and Smart, 2017).

For poor households, having or acquiring a car is associated with better economic outcomes. When poor households have or gain a car, household members are more likely

to be or become employed, keep their jobs, increase their earnings, work more hours, and leave welfare programs (Baum, 2009; Blumenberg and Pierce, 2016; Cervero et al., 2002; Gurley and Bruce, 2005; Ong, 2002; Raphael and Rice, 2002; Smart and Blumenberg, 2014; Smart and Klein, 2018). Underlying much of this research is the fact that in all but the neighborhoods with the very best transit service, having a car means you can more quickly and easily access more jobs and other opportunities than by transit or other modes of transportation (Grengs, 2010; Kawabata and Shen, 2007; Shen, 2001). For people who work night shifts or part-time workers who travel at off-peak hours, when transit service is less frequent, the accessibility benefits from cars are even greater. These geographic challenges are compounded by a shift of poor and minority populations to the suburbs where access to jobs is limited without a car and by increasing gentrification in urban neighborhoods with good transit service (Allard, 2017; Bischoff and Reardon, 2014; McLafferty and Preston, 2019). All of this suggests that carless households are increasingly disadvantaged in American society (King et al., 2019).

The divide between car-owning and carless households extends beyond employment and earnings. Carless households are more likely to miss and delay medical care (Syed et al., 2013). Having a car increases school choice (Teske et al., 2009). Children in households without cars are less likely to participate in school activities, leading to lower educational attainment, less likelihood of being employed, and lower earnings later in life (Ralph, 2018). Members of households without cars also have fewer choices when shopping for groceries and less flexibility in what they buy and how often they shop (Clifton, 2004; Widener, 2017). Given that women are responsible for a larger share of nonwork household responsibilities, women may benefit more than men when a household gains a car (Blumenberg, 2016).

Access to a car also shapes residential mobility. Several studies by the U.S. Department of Housing and Urban Development's Moving to Opportunity experiment have found that having a car was an important factor enabling low-income households to move to low-poverty neighborhoods (Blumenberg and Pierce, 2017; Briggs et al., 2010; Dawkins et al., 2015; Jeon et al., 2018). Conversely, those without a car faced much more limited choices in where they could move (Rosenblatt and DeLuca, 2012).

Given the benefits of car ownership, scholars have suggested increasing access to car ownership among the poor so that they can take advantage of the documented benefits (Blumenberg, 2016; Briggs et al., 2010; Fletcher et al., 2010; Jeon et al., 2018; King et al., 2019; Pendall et al., 2016). One approach to increasing auto ownership is to subsidize it among poor households through car donation programs. Other approaches to lower the costs of car ownership are direct grants and loans for car purchases and car repair, individual development accounts, and low-cost insurance (Goldberg, 2001; Ward and Savage, 2007).

Although subsidized car ownership programs exist throughout the U.S., research on them is limited. Lucas and Nicholson (2003) analyzed data from 34 individuals who received cars from the Good News Garage in Burlington, Vermont. The authors focused on the effect on incomes and found that car recipients' incomes increased roughly \$125 per month after they received their vehicles. Brabo et al. (2003) surveyed 34 individuals who

received cars through the JumpStart program in Wisconsin and found positive effects on earnings, employment outcomes, credit scores, and school opportunities for children.

VEHICLES FOR CHANGE

To understand how individuals' lives were altered when they obtained a subsidized car, I interviewed individuals who received cars from Vehicles for Change. Based outside of Baltimore, Maryland, VFC has provided more than 6,000 cars, trucks, and minivans to low-income households throughout Maryland and Virginia (and recently Detroit, Michigan) since 1999.

To receive a car from VFC, applicants need a referral from a social service agency or nonprofit organization that identifies and screens potential candidates. If the applicant meets the agency's criteria—typically income and work requirements—they are put into the queue to obtain a vehicle. VFC then interviews the individual so it can match them with a car that suits their needs (e.g., larger vehicles for larger households).

The cars VFC distributes mostly come from donations. When VFC receives a donated vehicle, the staff at the VFC Full Circle Auto Repair and Training Program (an ex-offender education initiative) examines the vehicle for value to ensure that it will be roadworthy. VFC's goal for donated cars is that they will continue to function for at least two years or 24,000 miles after the individual receives the car. Most cars the organization distributes are less than twelve years old and have fewer than 150,000 miles on the odometer. If the car is too new, is too old, or will not last, VFC sells the car through its used car dealership.

VFC partners with a local bank to offer short-term loans to help recipients pay for the vehicles. It does not require a down payment. The cars cost recipients between \$850 and \$950, which most recipients remit in monthly payments of \$50 to \$100 (in the past, the cost of vehicles has ranged from \$600 to \$1,200). Recipients also pay for tax, registration, and title, and provide proof that they are insured. The cars also come with six months of free maintenance at VFC's garage.

DATA COLLECTION

During fall 2018, I interviewed 30 individuals who received cars from VFC to understand how obtaining cars changes individuals' lives. Staff at VFC assisted with recruiting interviewees from the database of vehicle recipients, with an oversample of people who received their vehicles more than five years earlier (before 2013). A nonprofit in Baltimore that partners with VFC also sent a recruitment email to a small number of recipients of cars through VFC who obtained their cars in the past two years (I recruited five of the interviewees through this organization).

I conducted the interviews in person when possible, and over the phone when not. I conducted 14 in-person interviews at the VFC office in Halethorpe, Maryland, and three at the office of a partner nonprofit in Fairfax, Virginia. I recorded each interview and had them transcribed. After each interview, I gave or sent the participant a \$75 gift card for their time.

The interviews followed a semistructured interview protocol and lasted between 15 and 60 minutes. I began each interview asking the participant to tell me about receiving the car from VFC. The interview proceeded from there with questions about how their travel behavior and lives changes after they acquired a car.

I also asked participants to fill out a short survey. Two phone interviewees did not complete the survey. The 28 interviewees who filled out the survey received cars from VFC between 2002 and 2017, and nine still had their VFC cars at the time of the interview (Table 1). The interviewees all lived in Maryland or Virginia at the time of the interview (Figure 1) and were 24 to 58 years old; the median age was 39. Twenty-one interviewees identified as black, and 21 identified as female. Seven had a household income below \$20,000 in 2017, ten made between \$20,000 and \$40,000, and ten reported making above \$40,000 (one person did not report their income). Twenty-one had one or more children in their households, and thirteen reported that they were the only adult in their households.

Table 1 Interview participants

	Pseudonym	Age	Gender	Race/Ethnicity	Year received VFC car
1	Andrew	52	Male	Other	2010
2	Christina	39	Female	White	2008
3	Cheryl	41	Female	White	2009
4	Craig	40	Male	White	2017
5	David	25	Male	Black/White/Native Amer.	2017
6	Donna	32	Female	Black	2015
7	Michelle	45	Female	Black	2015
8	Denise	55	Female	Black	2013
9	Gloria	50	Female	Black	2014
10	Irene	58	Female	Black	2010
11	Jacob	39	Male	Latino/White	2015
12	Jessica	39	Female	Black	2012
13	Kristen	32	Female	Black	2013
14	Lyla	25	Female	Black	2017
15	Tori	34	Female	Black	2014
16	Oscar	33	Male	Black	2017*
17	Peyton	33	Female	Black	2012
18	Peter	48	Male	Black	2006
19	Grace	38	Female	Latino/Native Amer.	2002
20	Aaliyah	42	Female	Black	2012
21	Aaron	NA	NA	NA	2012*
22	Ray	24	Male	Black	2012
23	Charlotte	26	Female	Black	2013
24	Kate	NA	NA	NA	2011
25	Tina	38	Female	Black	2013

	Pseudonym	Age	Gender	Race/Ethnicity	Year received VFC car
26	Tara	32	Female	Black	2010
27	Robin	49	Female	Black	2014
28	Tracy	44	Female	White	2011
29	Taylor	32	Female	Black	2014
30	Tyra	32	Female	Black	2013

* Data from the interview rather than the survey.

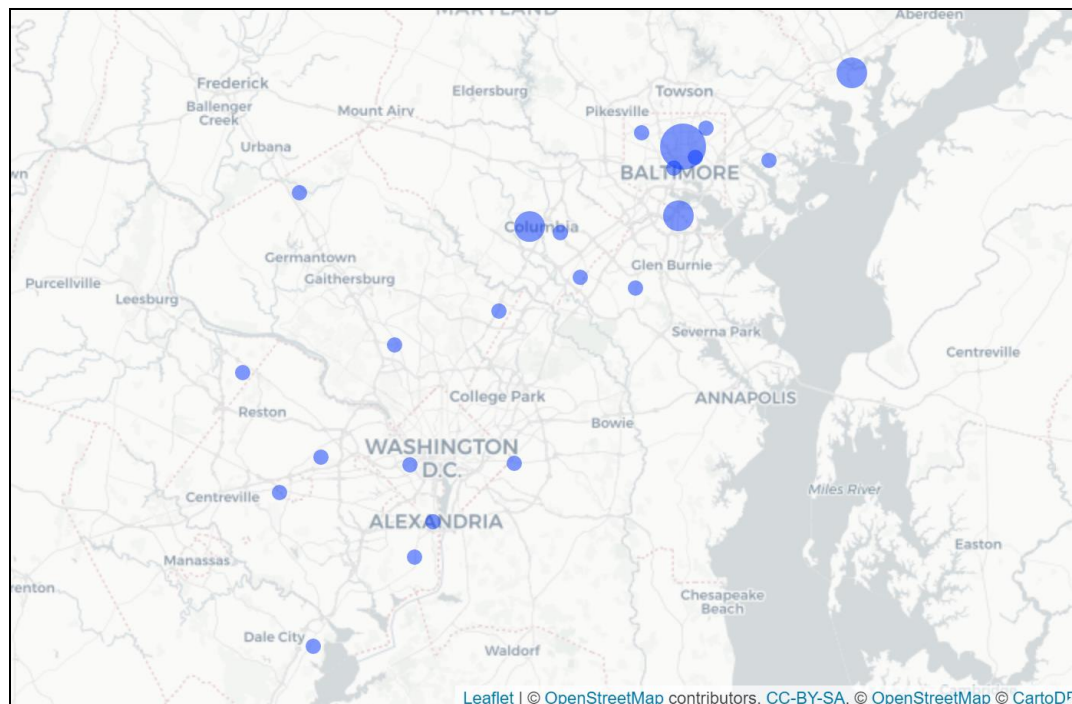


Figure 1 Interviewee home locations, by ZIP Code (n=28)

To code the transcripts, I used a combination of deductive and inductive codes. Before starting the coding process, I created a set of codes drawn from the literature and memos I wrote after each interview. I then coded the transcripts with the help of several research assistants using MAXQDA, adding inductive codes that we identified during the analysis.

I acknowledge several limitations to my research. I may misattribute the positive changes in recipients' lives to the effects of receiving a car. Because VFC works with social service agencies as intermediaries, almost everyone I interviewed was receiving other services at the same time. I cannot separate the independent effect of having a car from the other assistance they received. The individuals who received a car from VFC might also be different from those who did not, and this may bias the results. Recipients of subsidized vehicles who had positive experiences with Vehicles for Change may have self-selected to participate in my interviews. Finally, interviewees may have omitted the negative experiences to tell me what they thought I wanted to hear (though I did specifically ask about the problems and challenges they had with the cars).

FINDINGS

The following describes how interviewees' travel behavior changed, the opportunities they had when they received a car VFC, and then situates the car they received from VFC within their longer car ownership history.

How their daily travel changed

Before receiving a car from VFC, interviewees most often used public transportation. Twenty-seven out of 30 respondents talked about using buses, subways, or light rail. Almost all interviewees combined transit with other modes: borrowing cars; getting rides from family, friends, and neighbors; taxis; ride-hail services (e.g., Uber and Lyft); and walking and bicycling. In addition, they had to forgo trips when they could not borrow a car, when they did not want to burden others by asking for a ride, or when public transit was not convenient or timely. As Tracy said, "Before I got the car, it was really complicated ... If I didn't have a car, I didn't go. Or if I couldn't arrange a ride, we didn't go. That was just my life without a car. It was much harder." Others mentioned skipping family gatherings, school and church events, and their children's extracurricular activities because they could not easily get there and back. Once they had their VFC cars, most interviewees drove for most trips.

Public transportation

When I asked interviewees to tell me about a trip they made before and after they received a car, they gave examples of complicated transit journeys that took one to three hours becoming trips that they could make in 10 to 45 minutes in a car. Long travel times on transit stemmed from a combination of having to escort their children to school, transferring between transit routes, and infrequent buses. Taylor described her commute, which required several transfers, as going "from Peter to Paul, to John, to Jacob, the Jingleheimer Schmidt's." She added, "I couldn't cut it down unless I had a vehicle." Beyond the long travel times and transfers, others talked about how infrequent transit service meant that "you got to make a choice if you want to be super early somewhere sometime or super late, which one" (Oscar).

Traveling on transit in bad weather with children was a common frustration for parents. These challenges were physically unpleasant and emotionally wrenching, and the burdens largely fell to women (Taylor et al., 2015). Donna said that traveling on transit alone in bad weather was manageable: "It's like, 'Okay, I can thug it out.'" But when she had kids, "looking at your babies freezing" waiting for the bus, led her to take driving lessons and subsequently acquire a car from VFC. Similarly, Kate described a breaking point that led her to apply for a car from VFC. She recalled, "I said, 'Enough is enough,' the day when I got caught in a really bad storm with my daughter. We were drenched wet. I was like tears rolling down my eyes like, 'This just can't be it.'"

For these and other interviewees, having a car was tied in with their view of themselves as parents. Access to a car enabled practices they associated with "good mothering" (e.g. Dowling, 2000). For Donna and Kate, "good mothering" meant that their children were no longer suffering in inclement weather waiting for public transit. Aaliyah said that when she was carless, "I felt less than" her daughter's father (with whom she did not live). Once she obtained the car from VFC, "it made me an equal co-parent" and "gave

me more confidence as a parent, as a mother.” Charlotte also mentioned her children as a motivation for getting a car from VFC: “The car for me wasn’t ‘Oh we have these outings’ or ‘I have to go out on the weekends.’ No, it was just to provide better care for my kids.”

Acquiring a car meant quality-of-life improvements for the entire family. Two examples are that children could sleep longer in the morning, and parents had more time with them in the evening. Before acquiring a car, Donna had to wake her children “up at 5:00 just to get everybody ready” to arrive at school on time. Breakfast was rushed: “I’m like, ‘Kids, hit the granola bar. Let’s roll.’” Once they had the car, her kids were able to sleep until 7, and Donna arrived home two hours earlier and could “cook dinner, help my kids with their homework, give the baby a bath.” Research has suggested that longer commutes to school are associated with less sleep (Voulgaris et al., 2019), and my interviewees used the time their cars helped them save for sleep and other important family activities.

Interviewees’ discussions of public transit were not all doom and gloom. For example, those who had lived in places with high-quality public transit recalled fewer problems. Irene said that when she lived in Washington, DC, “public transportation is not an issue ... [you can] go anywhere on the train and the bus.” A few interviewees also spoke positively about taking transit with their children for leisure trips to the zoo or elsewhere.

Getting rides, borrowing cars, taking taxi and ride-hail trips

Borrowing cars and getting rides from friends, family, and neighbors was common among interviewees before they received cars from VFC. Twenty-six of the interviewees mentioned borrowing cars or getting rides, and six did so regularly to commute, chauffeur their children to school, or both, consistent with other research that has found that carless households often use cars (Lovejoy and Handy, 2008; Pucher and Renne, 2003). The twenty interviewees who mentioned occasionally borrowing cars or getting rides tended to limit how often they asked to borrow a car or for a ride, even if they offered some money for gas or the ride. Kristen said that she felt “awkward continuously having to ask people ... you don't even want to [ask] anymore at a certain point.” Asking for a ride had its own challenges, as Tracy pointed out, saying, “You really had to do it at somebody else's time and convenience because you're asking for a favor, which could be a day or so after when you wanted to go to the grocery store.” Others talked about being uncomfortable, feeling like a burden, and inconveniencing others when they had to ask for a car or a ride. Irene put it a little differently, saying that

“It was good to have people that you could depend on, but it's a lot better not having to depend on anybody for a ride to take care of your business, to take care of the things that you needed to take care of.”

For parents with small children, even borrowing cars or getting rides could be a challenge if they were traveling with a car seat, stroller, or both.

Interviewees used taxis and ride-hailing services when borrowing a car or asking for a ride was not an option. Most limited their use of these modes because of the cost. For example, they used them when coming home from the grocery store, when the weather was bad, and for healthcare-related trips.

Shopping

Without a car, interviewees felt limited in when, how, and where they could shop. Carrying groceries on foot or transit is physically challenging; it limits which stores people can patronize and what they can purchase in a single trip (see also Clifton, 2004). Interviewees who took the bus were restricted by the service schedule. Jessica said, “We had to be on a time limit because we had an hour to shop and do everything, because the next bus came exactly in that hour.”

Having a car allowed people to shop less frequently, shop at hours when transit does not run, and shop at certain kind of stores that were otherwise not easily accessible. For Oscar, whose family is vegan, “we can't just walk to the carry-out or to the gas station or go grab a chicken box.” They needed a car to reach specialty grocery stores.

Interviewees could reduce their expenses after acquiring a car by comparison shopping and avoiding paying for rides home with their groceries. Peyton was able to quantify her savings. Before she receiving a car from VFC, she had to budget \$250 for food but “with the car I saved. I spent a good 160-something going to three different stores versus just dealing with one.” Grace was also able to compare prices at different stores, carry more groceries on each trip, and shop less often. Instead of shopping “every couple of days,” she went one or two weeks between shopping trips.

Accessing health care

Having a car also made a difference in interviewees’ ability to access health care. Having a car reduced the amount of time people spent traveling. Charlotte described how before she had her car, if she had to take her twins to the doctor, the trip was so time-consuming that they might miss an entire day of school. The car “made it to where I could take them to school just a little bit later and not have to worry about their education suffering.” Time spent traveling to and from doctor’s appointments and follow-up visits can quickly multiply, especially for parents of children with special needs. Grace, whose son was diagnosed with attention deficit hyperactivity disorder, was able to take him to weekly appointments that “help with his coping skills” in class. What would have been a 90-minute bus trip took 25 minutes in the car.

Without a car, accessing medical care could be stressful. Michelle talked about catching a ride to the doctor, only to find the doctor was running late, meaning her ride had to wait longer for her. Michelle referred to this as a “stress that we carry just trying to get the support that we need.” Charlotte described another type of stress: the anxiety she felt taking the bus to pick up her sick daughter at school. She said, “You just feel like you cannot get to your child fast enough.” She went on to contrast those feelings with a time her primary care physician said her daughter needed to go to the hospital. After the doctor offered to call an ambulance, Charlotte said, “That was the best feeling, to say, ‘No, I have my own transportation, we’re going now.’” She not only saved money but also felt that she could take care of her daughter.

Having a car gave interviewees more choices for medical care, enabling them to select doctors with more flexible hours, more expertise, and lower fees. For example, after Kate got a car, she started going to an urgent care center, which was farther from her home but

much cheaper than the nearby emergency room. She said, “Even though I'm paying more in gas, I'm paying less in medical expenses, which is much better.” Before she had a car, Jessica was not satisfied with the medical care her family was receiving. She felt that her doctor “didn't really pay attention to what we were saying.” With a car, she said, “I could venture out and get to a better doctor.”

Once they had a car, interviewees more proactive in seeking out medical care and less likely to miss doctors' appointments, as suggested in the literature (Syed et al., 2013). Irene's experience sums up many of the ways that having a car improved healthcare for interviewees. Irene was able to go to the doctor on her lunch break, which “I would never been able to do that if I had had to catch the bus.” She subsequently was diagnosed with Type 2 diabetes and began attending training sessions at a nearby hospital to learn how to manage her condition. She summed up the experience by saying,

“If I had not had that vehicle and been able to go to the doctor and keep my regular appointments ... I probably would not have been as proactive with my health.”

Irene's story cuts across many of the ways that improved transportation can lead to better health outcomes, and she is not alone.

Opportunities

Receiving a car from VFC gave interviewees to access expanded opportunities. Kate summed it up: “So many different things open up to a person that is mobile.” Recipients reported three common opportunities that were newly available once they had a car: employment, moving, and educational and enrichment opportunities for them and their families.

Economic mobility

The experiences of interviewees support the literature that shows access to a car leads to better employment outcomes and increased income. Almost all of the interviewees were already employed; they largely spoke about how having a car helped them gain access to better-paying jobs, rather than about transitioning from unemployment to employment.

Being carless limited interviewees' job opportunities. Tracy had the education and experience necessary for better-paying jobs, but without a car, she was limited to jobs near her home. She described her situation as a “Catch-22,” explaining that “in order to get a car to go to work, you have to have a job. And in this area, unless you have a car, you can't really get a decent job.” Because she was carless, Tracy had to take “minimum-wage jobs that were around my very own area that I could either walk to or bus to ... I was making money to basically survive.” Others echoed her, saying they accepted lower-paying jobs close to their home as well as turning down job opportunities because they lacked transportation.

Beyond spatial barriers, interviewees described how access to transportation was a screening question in many applications. Peter said, “I have yet to see an application that doesn't ask ... Do you have reliable transportation?” He speculated that employers were trying to gain “a sense of your stability, and are you going to be reliable as far as getting

to work and not having to depend on public transportation or anyone else to get you there?” Regardless of whether Peter could have found his own means to get to and from a job site, he felt screened out of the jobs because he did not have a car.

Having a car expanded the pool of jobs available to interviewees, and they were able to increase their earnings by switching to higher-paying jobs, picking up a second job, and taking on seasonal work. Tracy was able to escape the Catch-22 by switching to a higher-paying job farther from home. She said:

“Once I got the car and I could get the job that was farther away, I tripled my income. Then I was able to get my own place and move with my kids ... I went from making minimum wage across the street, and I started making like 60 [thousand dollars a year at a large telecom company]. Yes, it definitely tripled my income.”

Tracy’s earnings increase is at the high end of the range of salaries reported by interviewees. More typical were the experiences of Grace and Peter after receiving cars from VFC. Grace transitioned from a job at a hospital in the center of Baltimore making \$11 an hour to a position at a large government agency in the suburbs where she made \$18 an hour. Peter switched jobs and increased his earnings from \$8.75 to \$12.25 an hour one month after receiving his car. Aaliyah did not increase her earnings immediately but gained valuable experience working “with a really great mentor chef,” which led to more job opportunities down the road. She added that she did not have to “settle for working somewhere else maybe closer to home,” which she said would not have led to the same career advances.

Access to reliable transportation helped interviewees even if they stayed at the same employer. Tori said the VFC car “allowed me to keep my job” because “you need dependable transportation to keep a job, to be on time.” Taylor said that getting to work on time was “a really, really, really big issue” before she received the car from VFC; afterward, she “wasn't getting there late every day.” For others, like Charlotte, the car cleared the way for advancement. Charlotte was promoted from housekeeping to become a dispatcher at the same hospital not long after she obtained the car because she started to arrive on time and was able to stay late and work alternate shifts. The dispatch job paid more, the hours were better, and the work was less physically demanding. Others mentioned increasing earnings by working more hours and transitioning to full-time employment.

As a counterpoint to these stories, Ray’s experience is telling. He obtained a car from VFC but drove it for only a short time. “I had the car for approximately six, maybe seven months. On the Fourth of July, somebody really hit me, rear-ended me. I've been struggling all over ever since then.” After the crash, in 2018, Ray could not afford to repair his car and has been without a car since then.

Moving

Many interviewees moved not long after they got a car from VFC, and having a car played a role in their relocation. First, because they had a car, their earnings increased, and they could then afford to move. Tracy said, “Once I got the car, then I was able to get

my own place because I had a job where I made enough money.” Second, vehicle access eased and expanded interviewees’ housing searches (Dawkins et al., 2015; Jeon et al., 2018). For Cheryl, a car meant that she “was able to get around and check out places” in less time and with less hassle than on public transit. Finally, having a car made previously inaccessible neighborhoods accessible (Jeon et al. 2018). Kate described the location of her new suburban neighborhood by saying, “I wouldn’t be able to live in such a place like that because there were no bus routes close to the house.” Interviewees could prioritize factors other than transportation access, like “a safer environment” (Peter), having a “single-family” house (Tina), “better schools” (Kate), and living closer to family (Jacob).

A few interviewees received a car from VFC because they moved to a less accessible neighborhood. In these cases, interviewees were referred to VFC by social service agencies that helped them receive housing vouchers and move to suburban neighborhoods where public transit was limited. Tara, who moved from Baltimore to a suburban county, said the agency she worked with “felt if you have transportation in a certain county, it’ll help you with getting a job, maintaining work.” By helping these households acquire a car after the move to suburban neighborhoods, VFC provided a service similar to “car vouchers” (funds to purchase or repair a car), that housing scholars have suggested should augment housing vouchers (Briggs et al., 2010; Jeon et al., 2018).

Education and enrichment

Acquiring a car from VFC helped interviewees access education and enrichment activities for themselves and their children. Because school buses offer ride homes only at the end of the school day, many interviewees’ children had to skip after-school programs when the family did not have a car. Children living in households that received VFC cars could participate in after-school activities and enrichment programs outside of school, which may have long-term positive benefits (Ralph, 2018). Kristen enrolled her son in soccer, baseball, basketball, and karate. “Without [the car], he wouldn’t have been able to do those things,” she said. Kristen’s experience was typical, and others mentioned enrolling their kids in swimming, gymnastics, ballet, lacrosse, and chorus.

Parents also talked about attending more school events, going along on field trips, joining the PTA, volunteering at school, joining the YMCA, becoming affiliated with churches, and attending school board meetings. Beyond after-school activities, interviewees talked about being able to go to the library regularly, travel to the Smithsonian's National Zoo and museums in Washington, DC, and amusement parks farther away. Several interviewees mentioned being able to attend family events that they would otherwise have missed.

Moreover, interviewees used their cars to further their education after work. Peter and Aaliyah both said that without the car, traveling to and from school on public transit after a full day of work would have been time-consuming and exhausting.

Car ownership history

The recipients of cars from VFC that I interviewed had complicated car ownership histories. Twenty-five out of 30 interviewees had previously owned at least one car

before they got a car from VFC. The few who had not owned a car before getting one from VFC were younger, on average, than other interviewees (24 versus 33 years old). Given that most Americans, even most poor Americans, own a car at some point, I was not surprised that many had owned cars but was surprised by how many had done so, the number of cars they had previously owned, and how quickly they transitioned into and out of car ownership. Talking to interviewees about their car ownership history revealed the vagaries of buying a car on the open market compared with getting a car from VFC.

Without VFC, many of the interviewees would have bought cars on own. When asked what they would have done without VFC, most said they would have bought a car but it would have longer to save up and cost more. Irene’ thoughts on this were typical,

“It would have been years, a lot longer, for me to be able to get a vehicle because of the money that I was making. ... My credit still was not where it needed to be for me to be able to get a car note.” A few could not have imagined that they would have ever gotten a car without VFC.”

To understand how the VFC cars fit in their larger transportation trajectories, I asked interviewees to tell me about their car ownership history. For in-person interviews, I had interviewees fill out a timeline. Figure 2 and 3 are Taylor and Tyra timelines. Taylor’s (Figure 2), is typical of interviewees who never had a car before the VFC car. Her first car was “Bertha” which she got in early 2014 from VFC and kept for two years. She subsequently was carless for less than a year and then bought “Betty Ford” from an add on Craigslist and subsequently bought a Dodge minivan which she did not give a nickname.

13. On the sheet below, can you indicate your car ownership history on the following timeline.

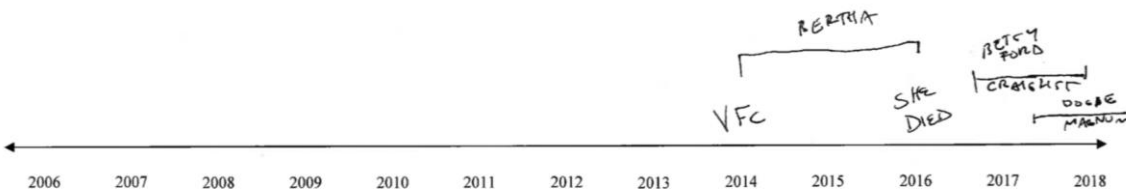


Figure 2 Taylor car ownership history

Tyra’s car ownership history (Figure 3) is more episodic and stands in for the interviewees who experienced frequent car ownership transitions. In the 11 years before she got a car from VFC, she owned seven different cars. Tyra did not clearly mark the duration of ownership for each car but they often only lasted a year. She described a cycle of buying inexpensive and unreliable cars every year with her tax rebate. After each invariably broke down,

“I would get a car around the beginning of the year. If I’m lucky, it would last a year. But usually, it didn’t. So, during the time I didn’t have one, I would just catch the bus. Then, the beginning of the year, when I filed taxes, I would get another car.”

13. On the sheet below, can you indicate your car ownership history on the following timeline.

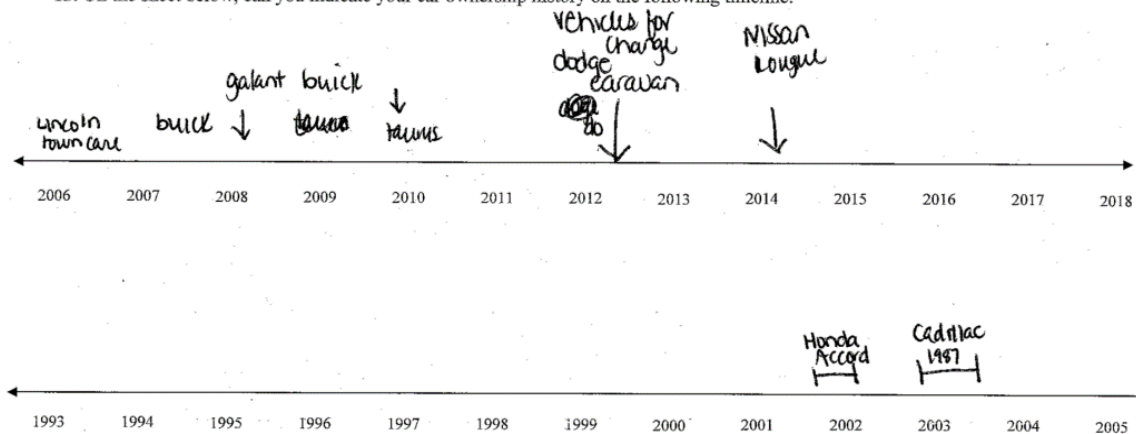


Figure 3 Tyra car ownership history

The median interviewee owned three cars before getting a car from VFC. The highest number was seven (Tyra and another interviewee both had seven). Some interviewees had difficulty recollecting exactly how many cars they had. For example, Craig, who was 39 when he got the car from VFC was not sure whether he had owned six of seven pickup trucks:

“I’ve basically just had different pickup trucks. Nothing ever brand new but some decent ones. I would have them for four or five years then move on to the next one. Probably, I don’t know, six or seven.”

Oscar, who owned four minivans bought from various sources, summed up the cars he previous owned as “the cars were very cheap and didn’t really last for long, [and] lot of maintenance throughout the year. ... Most of them didn’t even last for a year.” Oscar, Tyra, and a few others, appeared to be in a cycle of buying cheap cars that did not last long, were expensive to keep operating until they eventually broke down within a year or two. Then they would be carless for some time until they could get enough money for another cheap car and begin the cycle again. Often these interviewees bought a car with tax rebate money (a common purchase among families that received the Earned Income Tax Credit (Halpern-Meekin et al. 2015; Tach et al. 2018)).

Purchasing cars

Interviewees bought new and used cars from car dealers, car auctions, newspaper adds, online adds, off the street, and in a few cases inherited or were gifted cars. The most common sources were car dealers (19 mentions). This included franchised, chain, independent dealers, Buy Here Pay Here, CarMax car dealers and interviewees spent as little as \$3,000 and as much as \$27,000, though most were between \$5,000 and \$10,000.

The second most common place to buy cars was a car auction (12 mentions). These cars tended to be less expensive and a source for people like Tori who “wasn’t able to afford a car note.” Interviewees spent \$1,500 to \$3,000 at auctions. While most auctions are not open to the public, interviewees often had with licensed car dealer make a purchase on

their behalf (either sending giving instructions and a budget or going along with the licensed dealer).

After dealers and auctions, the next most common source for cars was Craigslist and newspaper advertisements (9 mentions). Interviewees also purchased five cars from family and friends and three more bought cars from people on the street. The prices from these sources ranged widely \$600 and \$6,000.

As expected, the costs of buying a car on the open market is generally much higher than the subsidized cars they got from VFC. Interviewees paid between 600 and 1,200 for their cars from VFC, generally in monthly installments ranging from 40 to 90 dollar per month. A few paid for their cars all at once.

Reliability

Many of the cars that interviewees bought on the open market were less reliable and required more ongoing maintenance compared with VFC cars. The duration of ownership varied widely from a few weeks to many years. A handful of interviewees bought cars that were clearly lemons, purchased on the side of the road, via newspaper ads, from Craigslist, and even from used car dealers. For example, Tierra bought a minivan from someone who posted an ad on Craigslist, but the car only lasted a few weeks. She said,

“I guess, the guy put, I don't know, sawdust or something in the transmission. So within weeks, the transmission completely gave away. ... It's horrible because you think you're getting something decent and reliable. You spent your money and you can't get it back.”

And many of the cars that interviewees purchased needed repairs right away. Ray's experience was not uncommon:

“As soon as I got the [other] car, the ball joints break, tires fall off, all kinds of foolishness [...] Right after you bought the car, you had to go right back in your pocket to do maintenance. Within a month, I had to put money into the car, on top of what I already paid and was paying for the car.”

This experience was very different with the cars they bought from VFC. This is expected since VFC requires that cars that they distribute meet standards for the age, mileage, and VFC mechanics check each vehicle thoroughly. Only cars that they think will last at least an additional two years or 24,000 miles. Interviewees kept their VFC cars for 32 months on average (the median was 32 months). A few only had the car for a few months because they crashed their car and seven interviewees still had their VFC cars at the time of the interview.

Interviewees reported that VFC cars tended to be very reliable with most reporting that maintaining the car was easy. They complimented on the condition and reliability of the car: “great condition,” “well-maintained,” and “very dependable.”

Losing cars

The most common reason why interviewees lost their non-VFC cars and became carless was because the cars were unreliable and broke down. These cars often died of natural causes, because they were old, cheap, and unreliable cars. The fact that the cars were inexpensive also meant that the costs of repairing the car often outstripped the value of the car. The interviewees financial position played an important role. Because the interviewees often had limited financial means, they bought inexpensive cars and did not have the means to repair them when they started breaking down. Following reliability, car crashes, cars being stolen, and financial problems led to interviewees losing their cars. Several interviewees mentioned that their cars were “totaled” in crashed and afterwards, they entered a period of carlessness. Others were unable to pay for car loans and the lender reposed the car. Family and relationship issues were another reason for losing access to cars. Divorces and break-ups often led to the loss of a car. Denise said, “when my husband and I broke up, he took the car.”

With most non-VFC cars, interviewees did not voluntarily give up their cars. They got rid of them because the cars broke down or the repair costs were unaffordable. In contrast, many of the interviewees sold, traded-in, or gave away their VFC cars in order to upgrade to a new one after two years.

The most common reasons why respondents shed their VFC was because were beginning to experience mechanical problems after two to three years. The most common mechanical issues were problems with the transmission, and many felt that the costs of repairs exceeded the value of the car.

By the time they sold or traded in their VFC car, many respondents were on stronger financial footing. Not only had their credit improved, but they had more reliable and or remunerative employment. As a result, several participants made it clear that they upgraded to a better car. Tyra’s experience is typical of these interviews. Describing her experience with the VFC car, she said that after “two and a half to three years, the car started giving me issues. I was in a better place, so I traded it in for another minivan. The car really helped me. I was able to get to work and do my daycare, which helped me get to where I am today.”

Most respondents quickly got another car after their VFC car. Of the 23 interviewees who no longer have their VFC car, 19 quickly transitioned from their VFC car to another car. Eight respondents sold or traded in a working car for another car while 11 replaced cars that stopped working or needed major repairs. Two respondents had entered periods of carlessness which lasted for 4 months and another for 1 year. The remaining two respondents were carless at the time of the interview and had been carless for less than two years. It is likely these two will purchase new cars if and when they are financially able.

Robin had her car for two years during which “I did the basic oil change, changed the tires and stuff like that. Basically, I just kept it clean and I really had no problems with it until the second year. We had that bad winter and the car started making this noise.”

Rather than pay for the expense of repairing the car, Robin traded it in and purchased another car. VFC also provides a six-month warranty on their cars.

For others, the story seems more complicated than simply maintaining a car. Ray, only had his car for a short time and said, “I had the car for approximately six, maybe seven months at the longest. On the fourth of July, somebody really hit me, ended me, and so was the car. I've been struggling all over ever since then.” Ray’s story points to the interrelated relationship between recipients’ financial vulnerability and mobility constraints. Ray was not able afford to repair his car and not having a car also have adverse consequences on livelihoods.

Among those who replaced their car, most traded the VFC car at a used dealer to help pay for a new car. A few sold the cars themselves on-line, to mechanics, or to family or friends. Interviewees obtained between \$300 to \$2,500 for their cars, with an average of about \$1,000. In most cases, they got back as much or more than the purchase price of the car, as Kate noted, “I went straight to a car dealership and ... they gave me, I would I say, roughly like \$1,000 for the car. This actually, it's more than what I paid for it, wink, wink. I'm like, ‘This is good.’ [laughs] You don't hear that; you hear cars depreciating their value, depreciating, so then you lose your money. I actually gained \$200.”

In addition to high interest rates, car loans can last longer than the cars themselves. Two interviewees were still paying off cars they bought from used car dealers several years after they stopped working, underscoring the risks associated with these dealers. Charlotte bought a \$9,000 used car and paid a \$1,500 down payment but “the engine died on me six months later. I bought a lemon pretty much.” The Charlotte had the car voluntarily reposed. The dealer was not able to sell the car again, so “that's how I was stuck with the full balance.” The lender then began to garnish her bank account. “It's already stressful, I live in poverty, but I do need a car. How does that go hand-in-hand? I need better transportation but at the same time, I need it affordable. That never goes hand-in-hand with transportation.” Charlotte, who is now without a car “can't even afford to go get another car” because she still has a monthly payment of \$300 for a car she does not have.

Building credit

Many of the interviewees were able to improve their credit because the VFC car payments are affordable and financed through a local bank or credit union. Low interest loans were not possible for many of interviewees before getting the VFC car because they had poor credit or no credit history. Others, like Craig, whose credit “wasn't too bad,” would have had to finance a car at subprime rates (Karger 2003). Once they finished paying off the loans for their VFC cars, respondents were able to “to go back to the credit union and get small loans” (Peter) and reported that they were able to obtain subsequent vehicles at lower interest rates than they would have been able to get otherwise.

The experience of getting a car through VFC did not impact everyone’s credit rating. Some respondents had good credit before, during, and after they received the car, so making reliable payments did not move the needle. Others did not pay attention to their credit score and so could not say whether it had other effect. Finally, some respondents

opted to pay the cost of their cars outright rather than financing them and their credit was unaffected.

DISCUSSION

Access to a subsidized automobile led to better outcomes for the poor families that I interviewed. At the most basic level, having a car made interviewees' daily travel quicker and more manageable. They had more time in the beginning and end of the day to spend with family, and they participated in more activities. The fact that the car provides such opportunities is not an inherent attribute of cars, but a result of accretion of transportation and land use policies in the U.S. that favor car travel over other modes (King et al., 2019).

Having a car enabled interviewees to take advantage of previously inaccessible opportunities. They gained access to more jobs because they could expand their spatial search, which enabled them to move up the economic ladder. Having a car also allowed interviewees to relocate, and most did. Instead of having to limit their search to housing near public transit, they could focus on other important attributes, like safety, schools, and proximity to family. Interviewees' descriptions of the changes to their shopping behavior and access to healthcare are also indicative of an expanded spatial search. Having a car enabled the recipients and their children to participate more fully in school-related activities. Without a car, most of the children of interviewees had to rely on the school bus, which offered rides home only at the end of the school day. Once their families had a car, these children were able to participate in after-school and other enrichment activities.

Several questions about car donation programs remain. While the individual and household benefits of these programs are clear, the social and personal costs are not. To the extent that interviewees transition from more to less environmentally sustainable travel, these programs have an environmental impact. Most interviewees had cars previously and may have bought their cars in the absence of VFC, evaluating the environmental trade-offs of car donation programs requires knowing much more about the cars they previously owned and what they would have done in the absence of VFC.

Policy makers should explore ways to expand subsidization of car ownership programs. Nonprofits operate most programs, and they largely depend on donated cars. The number of households that could benefit from programs that subsidize car ownership far exceeds the number of cars available. Policy makers should increase the incentives for individuals to donate cars to organizations that subsidize car ownership for poor households. Cities could also channel their impounded vehicles to these types of organizations rather than selling them at auction. Policy makers could also work with nonprofits like VFC to subsidize car repair. A model for this could be the Tune In & Tune Up program in the San Joaquin Valley of California, which subsidizes repairs for low-income owners of high-polluting vehicles (Pierce and Connolly, 2018). This program helps poor households hold on to their existing cars while also addressing air quality concerns.

ACKNOWLEDGMENTS

Thank you to the staff at Vehicles for Change, especially Marty Schwartz, for assistance with this project. Three research assistants helped with this project: Minh Tran, Senna Phillips, and Samantha Matuke.

Funding for this research was provided by the Institute for the Social Sciences (ISS) at Cornell University, the David R. Atkinson Center for a Sustainable Future at Cornell University, and the Center for Transportation, Environment, and Community Health at Cornell, a University Transportation Research Center.

The contents of this report reflect the views of the author, who is responsible for the facts and the accuracy of the information presented herein. This document is disseminated in the interest of information exchange. The report is funded, partially or entirely, by a grant from the U.S. Department of Transportation's University Transportation Centers Program. However, the U.S. Government assumes no liability for the contents or use thereof.

REFERENCES

Allard, S.W., 2017. *Places in need: the changing geography of poverty*. Russell Sage Foundation, New York, NY.

Baum, C.L., 2009. The effects of vehicle ownership on employment. *Journal of Urban Economics* 66, 151–163. <https://doi.org/10.1016/j.jue.2009.06.003>

Bischoff, K., Reardon, S.F., 2014. Residential Segregation by Income, 1970–2009 28.

Blumenberg, E., 2016. Why low-income women in the US still need automobiles. *Town Planning Review* 87, 525–545. <https://doi.org/10.3828/tpr.2016.34>

Blumenberg, E., Pierce, G., 2017. Car access and long-term poverty exposure: Evidence from the Moving to Opportunity (MTO) experiment. *Journal of Transport Geography* 65, 92–100. <https://doi.org/10.1016/j.jtrangeo.2017.10.009>

Blumenberg, E., Pierce, G., 2016. The Drive to Work: The Relationship between Transportation Access, Housing Assistance, and Employment among Participants in the Welfare to Work Voucher Program. *Journal of Planning Education and Research* 0739456X16633501. <https://doi.org/10.1177/0739456X16633501>

Blumenberg, E., Pierce, G., 2014. A Driving Factor in Mobility? Transportation's Role in Connecting Subsidized Housing and Employment Outcomes in the Moving to Opportunity (MTO) Program. *Journal of the American Planning Association* 80, 52–66. <https://doi.org/10.1080/01944363.2014.935267>

Brabo, L.M., Kilde, P.H., Pesek-Herriges, P., Quinn, T., Sanderud-Nordquist, I., 2003. Driving Out of Poverty in Private Automobiles. *Journal of Poverty* 7, 183–196. https://doi.org/10.1300/J134v07n01_10

Briggs, X. de S., Popkin, S., Goering, J., 2010. *Moving to opportunity: the story of an American experiment to fight ghetto poverty*. Oxford University Press, New York, NY.

Brown, A.E., 2017. Car-less or car-free? Socioeconomic and mobility differences among zero-car households. *Transport Policy* 60, 152–159. <https://doi.org/10.1016/j.tranpol.2017.09.016>

Cervero, R., Sandoval, O., Landis, J., 2002. Transportation as a stimulus of welfare-to-work: private versus public mobility. *Journal of Planning Education and Research* 22, 50–63. <https://doi.org/10.1177/0739456X0202200105>

Clifton, K.J., 2004. Mobility Strategies and Food Shopping for Low-Income Families: A Case Study. *Journal of Planning Education and Research* 23, 402–413. <https://doi.org/10.1177/0739456X04264919>

Dawkins, C., Jeon, J.S., Pendall, R., 2015. Vehicle Access and Exposure to Neighborhood Poverty: Evidence from the Moving to Opportunity Program. *Journal of Regional Science* 55, 687–707. <https://doi.org/10.1111/jors.12198>

- Dowling, R., 2000. Cultures of mothering and car use in suburban Sydney: a preliminary investigation. *Geoforum* 31, 345–353. [https://doi.org/10.1016/S0016-7185\(99\)00048-2](https://doi.org/10.1016/S0016-7185(99)00048-2)
- Fletcher, C.N., Garasky, S.B., Jensen, H.H., Nielsen, R.B., 2010. Transportation Access: A Key Employment Barrier for Rural Low-Income Families. *Journal of Poverty* 14, 123–144. <https://doi.org/10.1080/10875541003711581>
- Goldberg, H., 2001. State and County Supported Car Ownership Programs Can Help Low-Income Families Secure and Keep Jobs. Center on Budget and Policy Priorities, Washington DC.
- Grengs, J., 2010. Job accessibility and the modal mismatch in Detroit. *Journal of Transport Geography* 18, 42–54. <https://doi.org/10.1016/j.jtrangeo.2009.01.012>
- Gurley, T., Bruce, D., 2005. The effects of car access on employment outcomes for welfare recipients. *Journal of Urban Economics* 58, 250–272. <https://doi.org/10.1016/j.jue.2005.05.002>
- Jeon, J.S., Dawkins, C., Pendall, R., 2018. How Vehicle Access Enables Low-Income Households to Live in Better Neighborhoods. *Housing Policy Debate* 0, 1–20. <https://doi.org/10.1080/10511482.2018.1494023>
- Kawabata, M., Shen, Q., 2007. Commuting Inequality between Cars and Public Transit: The Case of the San Francisco Bay Area, 1990–2000. *Urban Studies* 44, 1759–1780. <https://doi.org/10.1080/00420980701426616>
- King, D.A., Smart, M.J., Manville, M., 2019. The Poverty of the Carless: Toward Universal Auto Access. *Journal of Planning Education and Research* 0739456X18823252. <https://doi.org/10.1177/0739456X18823252>
- Klein, N.J., Smart, M.J., 2017. Car today, gone tomorrow: The ephemeral car in low-income, immigrant and minority families. *Transportation* 44, 495–510. <https://doi.org/10.1007/s11116-015-9664-4>
- Lovejoy, K., Handy, S., 2008. A case for measuring individuals' access to private-vehicle travel as a matter of degrees: lessons from focus groups with Mexican immigrants in California. *Transportation* 35, 601–612. <https://doi.org/10.1007/s11116-008-9169-5>
- Lucas, M.T., Nicholson, C.F., 2003. Subsidized vehicle acquisition and earned income in the transition from welfare to work. *Transportation* 30, 483–501. <https://doi.org/10.1023/A:1024724224634>
- McLafferty, S., Preston, V., 2019. Who has long commutes to low-wage jobs? Gender, race, and access to work in the New York region. *Urban Geography* 0, 1–21. <https://doi.org/10.1080/02723638.2019.1577091>
- Mitra, S.K., Saphores, J.-D.M., 2017. Carless in California: Green choice or misery? *Journal of Transport Geography* 65, 1–12. <https://doi.org/10.1016/j.jtrangeo.2017.09.016>

- Ong, P.M., 2002. Car ownership and welfare-to-work. *Journal of Policy Analysis and Management* 21, 239–252. <https://doi.org/10.1002/pam.10025>
- O'Regan, K.M., Quigley, J.M., 2000. Accessibility and Economic Opportunity, in: Gómez-Ibáñez, J.A., Meyer, J.R. (Eds.), *Essays in Transportation Economics and Policy : A Handbook in Honor of John R. Meyer*. Brookings Institution Press, Washington, DC, pp. 437–466.
- Pendall, R., Blumenberg, E., Dawkins, C., 2016. What if Cities Combined Car-Based Solutions with Transit to Improve Access to Opportunity?
- Pierce, G., Connolly, R., 2018. Can Smog Repairs Create Social Justice? The Tune In & Tune Up Smog Repair Program in the San Joaquin Valley. UCLA Luskin School of Public Affairs, Los Angeles, CA.
- Pucher, J., Renne, J.L., 2003. Socioeconomics of urban travel: evidence from the 2001 NHTS. *Transportation quarterly* 57, 49–77.
- Ralph, K.M., 2018. Childhood Car Access: Long-term Consequences for Education, Employment, and Earnings. *Journal of Planning Education and Research* 0739456X18798451. <https://doi.org/10.1177/0739456X18798451>
- Raphael, S., Rice, L., 2002. Car ownership, employment, and earnings. *Journal of Urban Economics* 52, 109–130.
- Rosenblatt, P., DeLuca, S., 2012. “We Don’t Live Outside, We Live in Here”: Neighborhood and Residential Mobility Decisions Among Low-Income Families†. *City & Community* 11, 254–284. <https://doi.org/10.1111/j.1540-6040.2012.01413.x>
- Ruggles, S., Flood, S., Goeken, R., Grover, J., Meyer, E., Pacas, J., Sobek, M., 2019. IPUMS USA: Version 9.0 [dataset].
- Santos, A., McGuckin, N., Nakamoto, H.Y., Gray, D., Liss, S., 2011. Summary of travel trends: 2009 national household travel survey. US Department of Transportation, Federal Highway Administration, Washington, DC.
- Shen, Q., 2001. A Spatial Analysis of Job Openings and Access in a U.S. Metropolitan Area. *Journal of the American Planning Association* 67, 53–68. <https://doi.org/10.1080/01944360108976355>
- Smart, M.J., Blumenberg, E., 2014. Automobile ownership, transit accessibility, and earnings: Evidence from the moving to opportunity experiment, in: *Transportation Research Board Annual Meeting*. Presented at the Transportation Research Board Annual Meeting, The National Academies, Washington DC, p. 17.
- Smart, M.J., Klein, N.J., 2018. Disentangling the role of cars and transit in employment and labor earnings. *Transportation*. <https://doi.org/10.1007/s11116-018-9959-3>

Syed, S.T., Gerber, B.S., Sharp, L.K., 2013. Traveling Towards Disease: Transportation Barriers to Health Care Access. *J Community Health* 38, 976–993. <https://doi.org/10.1007/s10900-013-9681-1>

Taylor, B.D., Ralph, K., Smart, M., 2015. What Explains the Gender Gap in Schlepping? Testing Various Explanations for Gender Differences in Household-Serving Travel. *Social Science Quarterly* 96, 1493–1510. <https://doi.org/10.1111/ssqu.12203>

Teske, P., Fitzpatrick, J., O'Brien, T., 2009. Drivers of Choice: Parents, Transportation, and School Choice. Center on Reinventing Public Education, University of Washington, Seattle, WA.

Voulgaris, C.T., Smart, M.J., Taylor, B.D., 2019. Tired of Commuting? Relationships among Journeys to School, Sleep, and Exercise among American Teenagers. *Journal of Planning Education and Research* 39, 142–154. <https://doi.org/10.1177/0739456X17725148>

Ward, S.K., Savage, S., 2007. Evaluation of Bonnie CLAC Outcomes: Carsey Institute Research Report. Carsey Institute at the University of New Hampshire, Durham, NH.

Widener, M.J., 2017. Comparing Measures of Accessibility to Urban Supermarkets for Transit and Auto Users. *The Professional Geographer* 69, 362–371. <https://doi.org/10.1080/00330124.2016.1237293>