

TRANSITING FROM WELFARE TO WORK: NO BUS, NO CAR, NO WAY

by

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ABSTRACT

This paper uses a new dataset, the Iowa Transportation and Employment Survey, to examine transportation-related barriers to employment among households in a 5-county area that includes a small metropolitan county, two counties adjacent to the metro area, and two rural nonadjacent counties. Human capital barriers and transportation problems are significantly greater among low-income compared to other households, and among low-income nonworking adults compared to their employed counterparts. A two-stage multivariate analysis suggests that human capital, transportation resources and barriers, and location are predictors of employment and wages.

I. INTRODUCTION

The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) launched a major social experiment involving the nation's poor. At the broadest possible level, the group of most concern to welfare reform is the low-income population in the United States. The welfare system exists to provide assistance to families, children, and individuals in this population and to help them raise their incomes, escape poverty, and avoid the negative consequences of poverty and low incomes. Virtually all low-income groups are covered by one type of program or another historically; however, particular subgroups have been given more attention by Congress and the public (Moffitt & Ver Ploeg, 2001, p. 37). Clearly, PRWORA targeted families with children by replacing the Aid to Families with Dependent Children (AFDC) entitlement program with the Temporary Assistance to Needy Families (TANF) program, but the legislation "works toward a broader focus. As the emphasis on leaving welfare continues, and as more families attempt to gain self-sufficiency without welfare, attention tends to shift to those families off welfare who are still having difficulties and need assistance" (p. 37).

Most studies in the post-reform period have investigated the TANF population, however policy discussions are now shifting towards the more general population of needy individuals and families (both participants and nonparticipants in various welfare programs) and the possible supports that may be needed to help them access public assistance programs, move from welfare to work, or progress from poverty to

employment that supports self-sufficiency. Transportation is a critical and often overlooked issue facing low-income persons making these transitions. Despite the preponderance of research that has been conducted since passage of PRWORA, little is known about transportation access and barriers among the low-income population. The purpose of this paper is to examine the transportation-related barriers to employment faced by low-income households compared to other households, and to investigate how these barriers among low-income households influence employment and wages. This paper uses a newly available dataset on a sample of Iowa households to answer the following questions:

- (1) What resources are available to low-income households to meet their transportation needs, and do the resources vary by location of residence?
- (2) Do different barriers and capital constraints (both human and physical capital) help predict economic outcomes for low-income households?

In the next section of the paper we review relevant literature on barriers to employment and selected studies of transportation issues among low-income populations. The third section of the paper describes the dataset, the sample design and study methods. The results of descriptive and multivariate analyses are presented in the fourth section. The paper concludes with a discussion of implications for the effective design of programs and strategies to assist low-income residents in better addressing transportation barriers to employment and achieving desired social and economic outcomes.

II. LITERATURE REVIEW

Research on transportation concerns among low-income households tends to fall into two distinct fields of study. One group of recent studies focuses on barriers to employment, training or the delivery of social services facing TANF recipients. Another line of research, conducted primarily by urban planners and economists, examines the transportation needs of low-income subpopulations and tends to be heavily focused on urban centers. Neither set of studies enables us to fully understand the nature of transportation problems facing TANF recipients or low-income subpopulations in both metropolitan and nonmetropolitan settings.

Barriers to Self-Sufficiency

Though limited in scope, recent welfare reform literature provides some insight into the extent to which transportation is a barrier to employment or to meeting basic needs. The Women's Employment Survey (WES) of welfare recipients in an urban Michigan county found 47 % of the sample reported having a transportation problem, defined as having no access to a car and/or no driver's license (Danziger, Corcoran, Danziger, Heflin, Kalil, Levine, Rosen, Seefeldt, Siefert, & Tolman, 2000). Fewer than half (44.8 %) of those with transportation barriers were employed at least 20 hours per week. In comparison, about two-thirds (69.2 %) of the sample who did not experience transportation problems were employed at least half-time. Danziger et al. conducted a multivariate analysis to investigate a range of factors (including extensive measures of physical and mental health problems) that might reduce welfare recipients' employability and concluded that poor

access to transportation was significantly associated with a lack of employment, controlling for a variety of demographic characteristics and other barriers.

Using the WES dataset, Corcoran, Heflin and Siefert (1999) investigated the correlates of food insufficiency and material hardship among Michigan welfare recipients. The incidence of food insufficiency and material hardship (a broader measure of unmet food and housing needs) were higher than average for women who lacked a car and/or a driver's license. However the lack of a car or license did not significantly predict either food insufficiency or hardship, controlling for demographic, work, and human capital measures. In an analysis of two waves of WES data, Tolman, Danziger and Rosen (2001) found evidence in multivariate analyses that having transportation problems at both the initial and the second interview significantly differentiated welfare reliant women from those who were employed and receiving no welfare assistance, and predicted both household income and respondent's earnings at wave 2.

A recent national poll commissioned by The Children's Health Fund found that the lack of transportation is a major barrier to regular and follow-up care for the nation's children living in families with incomes up to \$50,000. Nine percent of children missed essential doctors appointments due to a lack of transportation, regardless of whether they were insured or not. Twenty-one percent of the children living in poverty lacked appropriate access to care because of transportation problems. Forty-seven percent of all survey respondents live in areas not served by public transportation; that figure climbs to 75 % for rural residents (Zogby & Malin, 2001).

Transportation and Job Access

The existing literature on transportation and job access for low-income households explores two key issues: the validity of the spatial mismatch hypothesis and the role of public versus private transportation options in facilitating job access.

Spatial Mismatch. John Kain (1968, 1992) initiated a 30-year debate outlining a spatial mismatch hypothesis to explain differences in black/white employment rates. Kain argued that the migration of people and employment from the urban inner city had left behind an underclass of increasingly unemployable low-income black men. Kain's initial hypothesis generated heated debate over the next two decades. In 1991, Harry Holzer summarized the literature on the spatial mismatch hypothesis, reviewing 21 studies, and concluded that there was contradictory evidence regarding the hypothesis.

Ihlanfeldt and Sjoquist (1998) have examined studies that have emerged since Holzer's review was published in 1991. They noted that welfare reform has rekindled the interest in spatial mismatch, especially as it pertains to getting former welfare recipients to work. Among their conclusions from the most recent literature is that spatial mismatch no longer explains a racial divide, but a class divide. More generally, spatial mismatch applies to lower class workers. And, they find that only about half the differences in employment patterns of minorities and white workers can be explained by spatial mismatch, even in those studies that find the strongest effects. Recent studies in several major metropolitan areas lend support that a spatial mismatch exists between welfare

recipients and the firms seeking to employ them (Allard & Danziger, 2000; Holzer & Stoll, 2001; Pugh, 1998).

Several researchers have argued that the spatial mismatch of workers and jobs is not the critical issue in understanding employment (Ellwood, 1986; Taylor & Ong, 1995; Zax, 1991). Taylor and Ong concluded that there was a “mode-mismatch,” not a spatial mismatch, of jobs in Los Angeles. Owning an automobile seemed more important to employment than did commuting. Other studies provide support for the notion that space is important in understanding employment patterns among low-income households (Blumenberg, 2000; Blumenberg & Ong, 1998; Ong & Blumenberg, 1998). As subjects, women were largely absent from the debate until Thompson (1997) examined the impact of spatial mismatch on the employment patterns of low-skilled female workers with access to automobiles. Thompson found that as access to jobs deteriorates, the probability of labor force participation decreases for all women, regardless of race. He asserted that due to the more complicated domestic lives of women, the longer a low-skilled woman had to commute, the less likely she was to participate in the labor force.

The Public versus Private Transit Debate. Several studies describe the complexities of the public versus private transit issues and have implications for the design of low-income job access strategies. A survey of TANF “leavers” in Iowa reported “almost none” of those who were employed used public transportation to get to work; however 30% gave some indication that their usual means of transportation to work was not always reliable. Among those not working after exiting welfare, 6% cited transportation

problems as a main reason (Kauff, Fowler, Fraker, & Milliner-Waddell, 2001). In fiscal year 2000, over 77% of all diversion funds for Iowa's TANF applicants and over 70% of emergency cash grants for recipients were transportation related. Kauff et al. conclude that while access to transportation was not a major barrier, the cost of vehicle maintenance may be a challenge for those who enter, or hope to enter, the workforce. However, other studies have found that transportation barriers have significant effects. Researchers in Milwaukee found that single mothers with cars were much more likely to be employed. Among single women with young children and a car, 42 % were employed full-time and 16% held part-time jobs. Single mothers with young children without cars worked much less—12% were employed full-time and 11% part-time (Pawasart & Stetzer, 1998).

Leete, Bania and Coulton's (1999) analysis of public transit use and auto access among residents of Cleveland itself, the outlying county and the surrounding counties found that auto access was lowest for city dwelling welfare recipients and that travel times to work for those persons commuting via public transit were double the travel times for private auto commuters. Clearly, those without access to automobiles were at a time disadvantage in commuting to work. Recent studies in the Cleveland area using data collected after the adoption of PRWORA have confirmed that job growth continues to be dispersed away from the inner city, and the majority of the unemployed TANF recipients have remained concentrated in urban areas (Bania, Coulton & Leete, 2000). Other urban studies support the conclusion that access to a car is an important determinant of labor market outcomes (Ong, 1996; Raphael & Rice, 2000; Raphael & Stoll, 2001).

The viability of public transportation for job access in rural areas is an increasingly important question in welfare reform policy and program debates. A study of employed women in rural Iowa found that although nearly 98% had a car available to them daily, they had many concerns about car reliability. Also, women with shorter commutes were more likely to hold more than one job (Peters & MacDonald, 1994). The high rate of use of a private automobile indicates the importance of access to reliable transportation in nonmetropolitan Iowa. Fletcher and Jensen (2000) matched motor vehicle registration and TANF lists and found only 1 in 4 adult TANF recipients in a rural Iowa county owned a registered vehicle. The Urban Institute, citing findings from its National Survey of America's Families, found that in evaluating obstacles to work, 10% of TANF recipients reported living outside a metropolitan area and having no access to a car (Zedlewski, 1999). Zedlewski believed this estimate was a conservative assessment of the extent of the rural transportation access problem. Fletcher, Flora, Gaddis, Winter and Litt (2000) conclude from their qualitative study of TANF recipients in rural Iowa communities that long commuting distances to jobs, lack of key social and educational services, and limited availability of child care combine to make transportation a particularly important barrier to self-sufficiency in nonmetropolitan areas.

A Minnesota employer survey corroborates this view, finding 30% of rural employers citing transportation as a principal barrier to hiring TANF recipients compared to 23% of urban employers (Owen, Shelton, Stevens, Nelson-Christinedaughter, Roy, & Heineman, 2000). Interestingly, Holzer and Wissoker's (2001) survey of 3,000 employers in four

metropolitan areas found that transportation was a major source of absenteeism for 41% of recently hired welfare recipients who experienced it. Transportation problems were also related to the employer's location; suburban employers or those not accessible by public transit experienced greater difficulties with absenteeism than those located in the central cities or nearer to transit (Holzer, Stoll & Wissoker, 2001). Despite the infusion of federal money into the rural sector for public transportation, nearly \$240 million in 1998, many welfare recipients remain cut off from public transit and lack access to a private automobile (Marks, Dewees, Ovelette & Koralek, 1999).

In sum, remarkably little is known about the prevalence and correlates of transportation barriers among low-income households. There is mixed evidence on the extent of transportation problems among this subpopulation. Different studies have used different measures to assess transportation problems, usually relying on a very limited number of survey questions and rarely verified by other data sources. For example, estimates of prevalence of transportation barriers range widely from less than 10% to 75%, depending in part on the measure used and the subpopulation studied. Previous research suggests that transportation problems predict employment in the welfare population. Also, there is some evidence that employment may be positively correlated with various measures of material hardship for low-income single mothers. This study extends past research by developing a more extensive set of measures of transportation barriers, documenting the prevalence of these barriers, and exploring them as predictors of employment among Iowa's low-income households.

III. DATA, SAMPLE DESIGN AND METHODS

Data and Sample Design

Our study, the Iowa Transportation and Employment Survey (ITES), uses a new survey of 768 Iowa households to assess the extent to which transportation affects employment outcomes in metropolitan and nonmetropolitan areas. Telephone interviews, lasting about 10 minutes, were conducted in February-May 2001. A dual frame sample design included a random digit dial (RDD) sample of the general population and a list sample of November 2000 welfare recipients in a five-county cluster that includes a small metropolitan county, two nonmetropolitan adjacent and two nonadjacent counties in northeast Iowa (Anderson, Nusser & Anderson, 2001). The Iowa Department of Human Services provided the names and contact information of all Family Investment Program (Iowa's TANF program) and Food Stamp recipient names and addresses for the five counties. Both frames were stratified according to population density, based on rural-urban continuum codes for counties (Butler & Beale, 1993). The study population was defined to be households in the five-county cluster. The survey design included oversampling low-income households. Completed interviews represent a 57 % response rate for the RDD sample and a 73 % response rate for the list sample. Household weights were developed to be representative of the population of households from the five-county area; the analyses use weights and procedures to account for the sample design.

The ITES survey instrument includes a transportation resources inventory (including both private and public transit access, and the use of government or informal networks for transportation assistance), an assessment of personal barriers that contribute to

transportation problems (e.g. lack of a driver's license), and an assessment of unmet transportation needs, with selected questions drawn from the Survey of Program Dynamics survey instruments. In addition to demographic and employment variables, the ITES assesses whether the respondent has quit or failed to take a job or job training activities because of transportation problems.

The ITES improves on past surveys in several ways. First, the survey captures conditions following the implementation of the work requirements and time restrictions on TANF cash benefits of the PRWORA. We present new insights about the nature and extent of transportation barriers facing welfare recipients. Second, because our data come in part from a general population survey that oversamples low-income households, we are able to extend our analyses beyond the TANF population and investigate barriers facing the broader low-income population. Third, we are able to examine the effects of location of residence. Most welfare reform surveys and nearly all transportation research focus on urban populations. Our use of a stratified sample that includes the continuum of very rural to metropolitan households allows us to analyze the role of "place" in the assessment of needs and subsequent policy design. However, given these strengths of the ITES, the emphasis on transportation in the survey instrument is also its weakness. Our cross-sectional study does not collect data on the wide range of personal barriers and other predictors that previous research has shown to influence employment nor do we have access to historical program participation or employment histories that would allow us to investigate the dynamics of these processes.

Conceptual and Analytical Approach

The household production model, as proposed by Becker and by Ferber, and later developed by Bryant (1990), provides a general framework for the analysis. This model theorizes that a household deploys human and physical resources (household capital equipment, including vehicles) in home and market work activities. We focus here on the human and physical capital resources that enable the household to participate in market work. Household composition indicating demand for child care (presence of children, age of children, number of adults present), human capital (education, health), physical capital (vehicle ownership, condition and availability), and the technical environment (including community resources, access to public transit, private transportation support and location) are all predictors of labor force participation and returns.

The analysis of the survey data includes two parts. The first part provides descriptive statistics on the demographic and transportation characteristics of high and low-income households, and for low-income households living in metro, adjacent and rural nonadjacent areas. We further explore differences in the prevalence of barriers between income groups and by employment status within the low-income households. The second part of the analysis uses multivariate analysis to estimate labor force participation and wage rate for the low-income sample. Estimating a wage rate without taking account of the probability of selection (participation) in the market will potentially produce biased and inconsistent wage rate estimates. Hence, a two-step estimation is used. In the first step, labor force participation is estimated for the entire sample of low-income households based on a reduced-form specification using a probit model of participation.

In the second step, data from respondents who were employed are used to estimate a wage equation. The wage equation is specified where the natural logarithm of wages [$\ln(\text{wage})$] is a function of human capital, household composition, physical/transportation resources, community resources and the sample selection term.

IV. RESULTS

Descriptive Analyses

The full ITES sample includes 768 cases. Our initial descriptive analysis divides the sample into a low-income subpopulation, defined as households reporting incomes less than or equal to 200% of poverty, and those households with incomes above 200% of poverty. Forty-seven cases have missing income data and are excluded from all subsequent analyses. Tables 1 and 2 provide descriptive statistics for the full sample; tables 3 and 4 describe the low-income subsample. Table 5 reports the prevalence of employment barriers within income groups, and by employment status among low-income respondents. Table 6 provides descriptive statistics for variables included in the multivariate analyses.

Table 1 reports weighted distributions for demographic characteristics for the high-income group and the low-income group. Compared to the estimates of demographic characteristics of the high-income population, the low-income sample is disproportionately young (nearly 23% are under age 30) and old (1 in 3 are age 65 and over). Two-thirds of all low-income respondents are female; 13.6 % are racial minorities. Nearly 20% of the low-income sample has less than a high school education, and about

40% of the low-income sample has more than a high school education. Almost 10% report college degrees. The majority (61.3%) of high-income respondents are married; in sharp contrast, about 65% of the low-income respondents are single (either never married, separated, divorced or widowed). About 12% of the households with low income have a child age 0-2 years, roughly double the proportion of higher income households with very young children (6.7%). Two-thirds of the low-income sample reside in the metropolitan county, about 15% reside in the two counties that are adjacent to the metro area, and nearly 19% reside in the two nonadjacent rural counties. Not surprisingly, the low-income sample—with its high proportion of elderly—has fewer employed adults in the household; about 40% have no adults working outside the home.

Table 2 documents that private transportation access is much more limited among the low-income group. One in eight (12.5%) low-income households do not own or have access to a vehicle; virtually all (99.1%) of high-income households have access to private transportation. High-income households are much more likely (77.5%) to have two or more vehicles compared to the low-income sample (45.4 %). Somewhat surprising is the proportion (20%) of low-income households with 3 or more vehicles. High-income households are more likely to have a reliable vehicle: 84.4% compared to 64.5% of the low-income households. As expected, low-income respondents are more likely to have received either public or transportation assistance, and to report that transportation problems affected training or labor force participation.

Tables 3 and 4 explicate further the low-income sample categorized by area of residence. There is a strikingly lower proportion of young (under age 30) rural (nonadjacent) households compared to the proportion in both the adjacent and metro areas (roughly 14% rural vs. 25% adjacent and metro) (see Table 3). Both the rural adjacent and nonadjacent counties have much higher proportions of elderly (41 and 44 % compared to 27 % in the metro county). Nearly a third of the metro households are single/never married while 1 in 8 fall in this category outside the metropolitan county. Minorities are clustered in the metro area. Respondents in the adjacent counties are more likely to have college degrees (17.5%) and to be employed (56.1%).

Low-income metro residents report ownership of fewer vehicles and, in general, have less access to private transportation (see Table 4). A high proportion (76.6%) of metro respondents reports that a fixed-route bus or van service is available in their area. This small metropolitan county (population 128,012) is served by a fixed-route bus service, however the hours of operation generally coincide with the traditional (8-5) work shift. The exception is a new “second shift” service that currently accepts no new passengers because of funding limitations (Iowa Transit Services, n.d.). Perhaps not surprising, very few metro respondents (6%) report that someone in the household uses public transportation on a regular basis. In contrast, about 10% of the rural nonadjacent and 8.0% of the adjacent respondents report the availability of fixed-route bus or van service in their community. In all four nonmetro counties, the regional transit system operates van services that assist targeted populations—persons with disabilities, the elderly, and low-income children. While available to the general public, these services primarily

accommodate access to health services for the elderly and disabled, weekly grocery runs for senior citizens, and transporting Head Start children to rural sites. The van services currently are not designed or sufficiently funded to meet the daily home-to-work demands of employed persons.

Table 5 defines and reports the prevalence of a set of employment barriers that are included in the ITES. We divide the barriers into two types: human capital and physical capital. Human capital barriers include having less than a high school education, having health problems or not having a driver's license. The physical capital barriers include private transportation resource constraints related to owning a car and having reliable and available transportation, and financial constraints that limit transportation access. Finally we identify one component of the transportation environment in terms of the availability of private transportation support. Chi-square tests using WesVar (2000) are used to evaluate differences in the prevalence of barriers between income groups and by employment status among low-income respondents.

The prevalence of barriers among those households with incomes above two times poverty are reported in column 1 and those with incomes below that benchmark in column 2. It is important to keep in mind that one-third of the low-income group is age 65 or over. Low-income respondents are much more likely to face barriers to employment (lacking a high school diploma, health problems and a range of transportation barriers). Interestingly, there are no income differences in access to help with rides or repairs from persons outside the households. Columns 3 and 4 report the

prevalence of barriers experienced by the employed and not employed low-income respondents. There is a consistent pattern of greater human capital and transportation barriers among those who are not employed. The exception is the significantly higher incidence of financial problems related to owning and operating a vehicle among employed low-income respondents. Transportation is a major cost associated with employment and there are few subsidies available to soften the financial burden of commuting to work. This result is consistent with Edin and Lein's (1997) finding that working single mothers experienced more material hardships than did welfare mothers. While previous studies have measured transportation access, our survey is unique in exploring in greater detail the financial pressures that vehicle ownership and the demands of employment travel placed on low-income workers.

We explored the bivariate relationship between the number of barriers and employment by location and found some evidence of a cumulative effect: there was little difference in the prevalence of employment between 0, 1 and 2 barriers, but employment was less common among respondents with 3 or more barriers. While those living in the adjacent counties were more likely to be employed, the effects of barriers do not appear to vary across locations. A more detailed examination of barrier effects by location was considered, but was not achievable due to the relatively small sample sizes.

Multivariate Results

The multivariate analysis focuses on factors affecting work force participation decisions and the predicted wage rates for the low-income population. We use both of these

measures to evaluate differences in economic outcomes. The analyses were conducted using LIMDEP (Greene, 1995). Table 6 provides information on the sample variables; Table 7 provides the estimated coefficients for the probit analysis of whether or not the respondent was currently employed (full or part time) and for the least squares estimation of the wage equation. As expected, age has a nonlinear effect on labor force participation. Women are more likely to be employed for this low-income population. Labor force participation does not vary by race. Although 20% of the sample had not completed high school, these human capital resources are not statistically significant in predicting employment. Those with fair or poor health, in contrast, are less likely to be currently employed.

Having access to reliable transportation has a statistically significant effect on employment: those with a reliable vehicle available are more likely to be employed. Those who have experienced transportation problems in the last year (i.e., did not have reliable transportation to training or jobs) are less likely to be employed, holding other factors constant, although the result is significant at only the $p < .12$ level. The experience of transportation problems is an indicator variable with value of 1 if the respondent reported that transportation problems caused one of more of the following to happen during calendar year 2000: (1) had to quit a job; (2) had to quit a training activity or school; (3) unable to start or take a job; or (4) unable to start a training activity or school. Eight percent of the population experienced transportation problems during the past year.

Location is associated with the employment outcome. Residents of counties adjacent to a metro area are most likely to be employed, whereas respondents residing in metro areas are least likely to work. The availability of bus service, independent of location, increases the likelihood of employment. Receiving government assistance or transportation assistance during the past year (calendar year 2000) is negatively associated with employment at the current time.

Finally, the condition of the local labor market as measured through the local unemployment rate is not found to be related to the likelihood of being employed. Similarly, household composition (having a child or children under age 2 or having one or more other adults in the household) is not related to employment.

The wage equation was estimated using a two-step procedure, and Table 7 reports the regression results. Human capital resources have a statistically significant effect on wages as expected: age has a nonlinear effect; having less education than a college degree is associated with lower wages. Neither gender nor race is statistically significant in this analysis. Transportation resources have a statistically significant effect: having reliable transportation has a positive effect on wages.

Location is associated with differences in wages: residing in a metro location corresponds with lower wages. Having bus/van services in the community is not related to wages. Thus, the effect of bus/van service availability seems to be important for obtaining

employment, but not for improving wages through providing access to better paying jobs. The selection bias coefficient is negative, although not statistically significant.

Given the relatively small numbers of observations, the results need to be viewed with some caution. They describe the effect of human capital, physical transportation, and other community resources on the ability of low-income Iowa residents to obtain employment and earn higher wages. The results do show that human capital resources are significant to economic outcomes. In addition, there is some evidence that transportation resources facilitate obtaining jobs and earning higher wages. Our results suggest that location does affect employment, with nonmetro respondents more likely to work and to receive higher wages.

V. SUMMARY AND POLICY IMPLICATIONS

Our descriptive and multivariate results suggest answers to the questions we have posed:

- (1) What resources are available to low-income households to meet their transportation needs, and do the resources vary by location of residence?
- (2) Do different barriers and capital constraints (both human and physical capital) help predict economic outcomes for low-income households?

Consistent with a growing body of literature that explores barriers to employment, our descriptive analyses suggest significantly lower levels of both human and physical capital, as well as lower employment rates, among the low-income population sampled in this study compared to households with higher incomes. We explore in much greater

detail than previous studies the nature of transportation barriers. We find significantly higher levels of transportation resource constraints among low-income compared to high-income households. Our descriptive analysis explores the relationship between barriers and employment in the low-income population. Human capital and transportation barriers are significantly greater among low-income nonworking respondents. We find few effects of area of residence, however additional research with larger samples across locations is needed to further explore this important question.

Our multivariate analysis examined how human and physical capital affect employment and wages using a two-stage procedure. The barriers that were significantly associated with employment, controlling for a variety of other variables, included poor health, previous receipt of government assistance, area of residence, awareness of a bus/van service in the community, and ownership of a reliable vehicle that is readily available for use. Finally, age, education, and access to a reliable, available owned vehicle were all positively associated with wages while residence in the metro area and higher unemployment rates were associated with lower wages. In sum, we find evidence that both human capital and transportation resources are important predictors of economic outcomes for low-income households and that location matters. Those in nonmetro (rural nonadjacent and adjacent) counties are more likely to work, and, in this low-income sample, wages are significantly higher.

Our findings have implications for program and policy-makers concerned about the well-being of low-income households in an era of welfare reform. Given what we know about

the transportation barriers facing low-income households, what strategies will effectively meet the work and nonwork needs of this population? Clearly, transportation constraints are an important reason some are among the “hard to employ.” Expanding public transportation options in more densely populated areas by extending bus routes (or other forms of fixed-route public transit) and offering services to second and third shift workers will benefit some potential employees. However, our data suggest that private vehicles are the predominant transportation mode for workers in rural and small metro areas. Pugh (1998, p. 39) argued against transportation initiatives that create ‘special’ programs, and instead, recommended “both incremental and systemic changes that create transportation equity for low-income people.” Imbedded in this recommendation is the understanding that these transportation policy solutions must be multi-modal.

Establishing or expanding a range of programs that increase workers’ access to reliable and affordable personal vehicles will not only increase their probability of employment, but also will increase the likelihood of obtaining a higher wage job. Subsidized auto loans and car insurance programs combined with training programs that teach basic maintenance and management skills are strategies that can reduce the financial burden of auto ownership for low-income workers. In areas where public transportation is not cost effective, incentives for carpooling or car sharing among low-income households should be explored. Our data suggest that current programs to assist low-income households with transportation needs are inadequate. Rather than providing “one shot” infusions of financial assistance or limiting subsidies to welfare recipients prior to employment, there is a need to recognize the ongoing financial burden that private vehicle ownership and the

demands of commuting place on low-income families. Post-employment supports for transportation are critical. To date, they have been an overlooked component in moving individuals into stable employment.

Finally, programs and policies should not overlook the nonwork transportation needs of low-income households. Without access to training, social services and basic needs such as groceries and health care, the well-being of all low-income families will suffer.

Planners need to acknowledge the connectedness of transportation and other social services. Local innovations in the design and adaptation of on-demand transportation services to meet critical basic needs of the low-income population will be an important step in improving transportation access. Perhaps one of the greatest challenges facing policy makers is determining the complex and diverse transit needs of both elderly and nonelderly low-income households and then working across traditional agency and funding boundaries to develop seamless transportation systems.

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Table 1. Demographic Characteristics of Iowa Transportation and Employment Survey (ITES) Sample (weighted % distributions)

Variable	> 200% of Poverty	≤ 200% of Poverty
Number (unweighted)	337	384
Gender		
Male	49.1	33.5
Female	50.9	66.6
Age		
18-20	1.4	5.5
21-25	7.5	11.5
26-29	5.2	5.7
30-39	15.0	16.6
40-49	27.3	16.0
50-64	24.0	10.9
65+	19.1	32.3
Don't know/Refused	0.5	1.5
Marital Status		
Married	61.3	26.6
Living as married	4.1	6.1
Separated/Divorced/Widowed	20.1	41.7
Single/Never married	14.5	23.7
Don't know/Refused	0.0	1.5
Race		
White	97.0	86.2
Black	1.5	10.2
Other	0.5	3.4
Don't know/Refused	1.0	0.2
Education		
Less than high school	4.0	19.7
High school or GED	30.9	38.0
Vocational/Technical	13.4	11.5
Some college	18.6	20.6
College degree or higher	33.2	9.6
Don't know/Refused	0.0	0.7
Employment Status		
Employed	76.2	44.7
Not employed	23.8	55.0
Don't know/Refused	0.0	0.3
Wage (\$ per hour) ^a		
< \$5.00	2.7	3.2

\$5.00 - \$7.49	8.3	41.9
\$7.50 - \$9.99	14.8	32.6
\$10.00 - \$12.49	20.3	10.7
\$12.50 - \$14.99	12.6	7.0
\$15.00+	41.3	4.6
Health Status		
Excellent or very good	71.5	47.7
Good	22.6	26.6
Fair or poor	5.9	25.7
Selected household characteristics:		
Household Size		
1	20.9	40.4
2	41.7	22.3
3	11.2	17.8
4	19.5	9.6
5+	6.8	9.9
Another Adult in Household		
Yes	75.7	47.9
No	23.2	51.7
Don't Know/Refused	1.1	0.4
Children Age 0-2 in Household		
Yes	6.7	12.5
No	92.2	87.2
Don't Know/Refused	1.1	0.4
Household Income		
< \$10,000	0.0	37.3
\$10,000-20,000	0.0	48.3
\$20,001-30,000	20.6	11.7
\$30,001-40,000	17.1	2.8
\$40,001-50,000	13.8	0.0
\$50,001-60,000	17.3	0.0
\$60,001-70,000	8.0	0.0
\$70,001-80,000	8.7	0.0
\$80,001-90,000	3.0	0.0
\$90,001+	11.5	0.0
Area of Residence		
Metro	62.7	66.7
Adjacent	23.0	14.7
Nonadjacent	14.3	18.5
At Least 1 Adult Working		
Yes	83.3	56.6
No	16.7	43.1
Don't know/Refused	0.0	0.3

^aCases = 225 for > 200% of poverty; 137 for ≤ 200% of poverty.

Table 2. Transportation Characteristics of Iowa Transportation and Employment Survey (ITES) Sample (weighted % distributions)

Variable	> 200% of Poverty	≤ 200% of Poverty
Number (unweighted)	337	384
Number of vehicles in household ^a		
0	1.4	12.5
1	21.1	42.2
2	45.4	25.4
3+	32.1	20.0
Own at least one vehicle		
Yes	98.6	87.5
No	1.4	12.5
Own or access to vehicle ^b		
Yes	99.1	89.1
No	0.9	10.9
Reliable vehicle available ^c		
Yes	85.4	64.5
No	14.6	35.5
Bus or van service available ^d		
Yes	46.9	54.1
No	51.8	44.2
Don't Know/Refused	1.3	1.8
Past gov't or transportation assistance ^e		
Yes	1.1	21.1
No	98.9	78.9
Past transportation problems ^f		
Yes	1.2	8.0
No	98.8	92.0

^aNumber owned or leased by all household members.

^bRespondent owns or "always" has a vehicle available for use.

^cA "very reliable" vehicle is "always" available for use. (Self-reported very reliable vs. somewhat reliable, somewhat unreliable, very unreliable or not working at all. Self-reported always vs. often, sometimes, seldom or never available for use.)

^dSelf-report that community has a bus or van service with scheduled stops along a route.

^eReports that, because income was low, someone in household received either government assistance or transportation assistance from government in calendar year 2000.

^fReports that transportation problems caused one or more of the following to happen during calendar year 2000: (1) had to quit a job; (2) had to quit a training activity or school; (3) unable to start or take a job; or (4) unable to start a training activity or school.

Table 3. Demographic Characteristics of Low-Income^a Respondents by Area of Residence (weighted % distributions)

Variable	Rural Nonadjacent	Adjacent	Metro
Number (unweighted)	127	117	140
Gender			
Male	32.0	32.9	34.0
Female	68.0	67.1	66.0
Age			
18-20	0.5	7.6	6.4
21-25	6.9	11.1	12.9
26-29	6.5	5.9	5.4
30-39	13.6	10.1	18.9
40-49	11.6	5.2	19.6
50-64	18.2	13.7	8.3
65+	41.1	44.2	27.3
Don't know/Refused	1.7	2.4	1.3
Marital Status			
Married	38.1	28.9	22.9
Living as married	4.4	4.2	7.0
Separated/Divorced/Widowed	43.7	49.3	39.4
Single/Never married	12.1	12.7	29.4
Don't know/Refused	1.7	4.9	1.3
Race			
White	99.4	99.6	79.5
Black	0.0	0.2	15.3
Other	0.3	0.3	4.9
Don't know/Refused	0.3	0.0	0.3
Education			
Less than high school	16.4	14.7	21.7
High school or GED	44.9	34.3	36.8
Vocational/Technical	17.6	13.6	9.3
Some college	12.6	15.1	24.0
College degree or higher	8.5	17.5	8.2
Don't know/Refused	0.0	4.9	0.0
Employment Status			
Employed	42.5	56.1	42.7
Not employed	55.8	43.9	57.3
Don't know/Refused	1.7	0.0	0.0

Wage (\$ per hour) ^b			
< \$5.00	1.4	0.9	4.2
\$5.00 - \$7.49	41.8	37.0	43.2
\$7.50 - \$9.99	30.5	31.6	33.4
\$10.00 - \$12.49	15.7	30.2	4.3
\$12.50 - \$14.99	0.0	0.0	10.6
\$15.00+	10.6	0.4	4.2
Health Status			
Excellent or very good	44.5	42.8	49.7
Good	26.7	33.3	25.0
Fair or poor	28.7	23.9	25.3
Selected household characteristics:			
Household Size			
1	43.1	57.7	35.8
2	23.8	15.3	23.5
3	15.2	14.4	19.3
4	9.6	6.0	10.3
5+	8.4	6.6	11.1
Another Adult in Household			
Yes	45.3	33.7	51.8
No	54.6	66.3	47.7
Don't Know/Refused	0.2		0.5
Children Age 0-2 in Household			
Yes	9.7	11.5	13.4
No	90.2	88.5	86.1
Don't Know/Refused	0.2		0.5
Household Income			
< \$10,000	32.5	38.7	38.3
\$10,000-20,000	53.2	42.8	48.1
\$20,001-30,000	12.5	15.8	10.6
\$30,001-40,000	1.6	2.6	3.1
\$40,001-50,000	0.2	0.0	0.0
At least 1 adult working			
Yes	50.3	62.0	57.2
No	49.7	38.0	42.8

^aHouseholds with income less than or equal to 200% poverty.

^bCases = 44 for rural nonadjacent; 48 for adjacent; 45 for metro residents.

Table 4. Transportation Characteristics of Low-Income^a Respondents by Area of Residence (weighted % distributions)

Variable	Rural Nonadjacent	Adjacent	Metro
Number of vehicles in household ^b			
0	10.7	9.1	13.7
1	45.5	52.6	39.0
2	23.9	19.7	27.0
3+	19.9	18.6	20.3
Own at least one vehicle			
Yes	89.3	90.9	86.3
No	10.7	9.1	13.7
Own or access to vehicle ^c			
Yes	91.3	91.1	88.1
No	8.7	8.9	11.9
Reliable vehicle available ^d			
Yes	76.5	59.4	62.3
No	23.5	40.6	37.7
Bus or van service available ^e			
Yes	9.9	8.0	76.6
No	88.2	91.9	21.4
Don't Know/Refused	1.9	0.1	2.1
Past gov't or transportation assistance ^f			
Yes	19.8	18.0	22.2
No	80.2	82.0	77.8
Past transportation problems ^g			
Yes	3.5	5.1	9.9
No	96.5	94.9	90.1

^aHouseholds with income less than or equal to 200% poverty.

^bNumber owned or leased by all household members.

^cRespondent owns or "always" has a vehicle available for use.

^dA "very reliable" vehicle is "always" available for use. (Self-reported very reliable vs. somewhat reliable, somewhat unreliable, very unreliable or not working at all. Self-reported always vs. often, sometimes, seldom or never available for use.)

^eSelf-report that community has a bus or van service with scheduled stops along a route.

^fReports that, because income was low, someone in household received either government assistance or transportation assistance from government in calendar year 2000.

^gReports that transportation problems caused one or more of the following to happen during calendar year 2000: (1) had to quit a job; (2) had to quit a training activity or school; (3) unable to start or take a job; or (4) unable to start a training activity or school.

Table 5. Prevalence of Employment Barriers (weighted %)

Barriers	% in > 200% Poverty With Barrier	% in ≤ 200% Poverty With Barrier	% in ≤ 200% Poverty Sample With Barrier	
			Employed	Not Employed
	(1)	(2)	(3)	(4)
Human Capital				
Less than high school education	4.0	19.7**	8.5	28.8**
Fair or poor health ^a	5.9	25.7**	5.9	42.0**
Does not have a driver's license	2.4	16.4**	5.2	25.1**
Physical Transportation Resource Constraints				
Does not own a car	1.4	12.5**	5.2	17.8**
Does not have access to vehicle that is "very reliable" ^b	6.9	26.2**	13.5	36.1**
Does not "always" have access to vehicle ^c	5.1	19.6**	7.9	28.7**
No "very reliable" vehicle is "always" available	14.6	35.5**	24.0	44.5**
Experienced "transportation financial hardship" ^d	20.0	33.9**	41.5	27.8*
Transportation Environment				
No access to private transportation assistance ^e	8.9	10.9	12.4	9.8

* $p < .05$. ** $p < .01$.

^aSelf-reported rating of own health (fair or poor).

^bSelf-report that available vehicle is somewhat reliable, somewhat unreliable, very unreliable or not working at all.

^cSelf-report that no vehicle is "always" available (versus often, sometimes, seldom or never available for use).

^dHas experienced "transportation financial hardship" in the past 12 months (self-reported neglect of repairs, lack of money for gasoline, lapse of insurance, missed car payment and/or vehicle repossession).

^eLacks access to private transportation assistance (self-reported seldom or never could count on getting help with transportation or car repairs from people who don't live with you).

Table 6. Descriptive Statistics for Variables in Two-Step Analyses of Employment and Wages.

Variable	Mean	Standard Deviation	Min.	Max.
Employed (yes = 1)	0.46	0.50	0	1
Wage (\$) ^a	8.94	4.87	1.50	35.00
Log wages (\$) ^a	2.10	0.39	0.41	3.56
Age (years)	49.29	21.46	19	95
White (yes = 1)	0.87	0.34	0	1
Female (yes = 1)	0.66	0.48	0	1
Education: Less than HS ^b (yes = 1)	0.20	0.40	0	1
Education: HS or GED only ^c (yes = 1)	0.38	0.49	0	1
Education: Vocational or technical diploma ^d (yes = 1)	0.11	0.32	0	1
Education: Some college but no Bachelor's degree ^e (yes = 1)	0.21	0.40	0	1
Health: fair or poor ^f (yes = 1)	0.25	0.43	0	1
Another adult(s) in HH (yes = 1)	0.50	0.50	0	1
Child(ren) less than age 2 in HH (yes = 1)	0.13	0.33	0	1
Reliable vehicle available ^g (yes = 1)	0.66	0.47	0	1
Past transportation problems ^h (yes = 1)	0.08	0.27	0	1
County unemployment rate (%)	4.36	1.36	2.8	8.1
Past government or transportation assistance received ⁱ (yes = 1)	0.21	0.41	0	1
Metro ^j (yes = 1)	0.67	0.47	0	1
Adjacent to metro ^k (yes = 1)	0.15	0.35	0	1
Bus/Van service in community ^l (yes = 1)	0.56	0.50	0	1
Cases	369			

^aCases = 132.

^bReported educational attainment. Dummy = 1 if less than high school; zero otherwise.

^cReported educational attainment. Dummy = 1 if high school diploma or GED; zero otherwise.

^dReported educational attainment. Dummy = 1 if vocational or technical diploma; zero otherwise.

^eReported educational attainment. Dummy = 1 if some college, but no Bachelor's degree; zero otherwise.

^fSelf-reported rating of own health (fair or poor).

^gReports that a "very reliable" vehicle is "always" available for use.

^hReports that transportation problems caused one or more of the following to happen during calendar year 2000: (1) had to quit a job; (2) had to quit a training activity or school; (3) unable to start or take a job; or (4) unable to start a training activity or school.

ⁱReports someone in household received either government assistance or transportation assistance from government in calendar year 2000 because income was low. Base case is that this did not occur.

^jCategorization of the urbanicity of the respondent's county of residence based on Beale's codes. Base case is residing in a rural nonadjacent area.

^kReports that community has a bus or van service with scheduled stops along a route. Base case is that the community does not have this service.

Table 7. Two-Step Analyses of Employment and Wages.

Variable	Employment Probit			Log Wage Least Squares Regression		
	Coeff.	Standard Error	b/St.Er.	Coeff.	Standard Error	b/St.Er.
Constant	-0.363	1.141	-0.318	2.219**	0.369	6.013
Age	0.046	0.028	1.625	0.031**	0.010	2.996
Age squared	-0.001**	0.0003	-3.345	-0.0003*	0.0001	-2.412
White	0.067	0.277	0.241	-0.066	0.093	-0.705
Female	0.360 ⁺	0.193	1.867	-0.041	0.063	-0.647
Ed: Less than HS ^a	0.427	0.373	1.145	-0.253*	0.125	-2.026
Ed: HS or GED only ^a	0.419	0.305	1.372	-0.492**	0.086	-5.695
Ed: Vo tech certificate ^a	0.336	0.373	0.901	-0.451**	0.113	-3.995
Ed: Some college ^a	0.084	0.339	0.249	-0.403**	0.109	-3.715
Health: fair or poor ^b	-1.040**	0.244	-4.254			
Children lt age 2 in HH	-0.107	0.262	-0.410			
Another adult(s) in HH	0.105	0.191	0.550			
Reliable vehicle available ^c	0.621**	0.215	2.883	0.274**	0.077	3.561
Past trans problems ^d	-0.497	0.314	-1.584			
County unemployment rate	0.010	0.117	0.082	-0.083*	0.037	-2.265
Past gov't. or trans. assistance received ^e	-0.579**	0.219	-2.649			
Metro ^f	-0.723 ⁺	0.435	-1.662	-0.271 ⁺	0.140	-1.938
Adjacent to metro ^f	0.933*	0.456	2.044	-0.185	0.145	-1.272
Bus/Van service in community ^g	0.490*	0.231	2.120	0.110	0.085	1.289
Lambda				-0.058	0.108	-0.542
Cases	369			Cases	132	

⁺ $p < .10$. * $p < .05$. ** $p < .01$.

^aReported educational attainment. Base case is having at least a Bachelor's degree.

^bSelf-reported rating of own health. Base case is not fair or poor (excellent, very good, or good).

^cReports that a "very reliable" vehicle is "always" available for use. Base case is no very reliable vehicles are always available.

^dReports that transportation problems caused one or more of the following to happen during calendar year 2000: (1) had to quit a job; (2) had to quit a training activity or school; (3) unable to start or take a job; or (4) unable to start a training activity or school.

^eReports someone in household received either government assistance or transportation assistance from government in calendar year 2000 because income was low. Base case is that this did not occur.

^fCategorization of the urbanicity of the respondent's county of residence based on Beale's codes. Base case is residing in a rural area.

^gReports that community has a bus or van service with scheduled stops along a route. Base case is that the community does not have this service.