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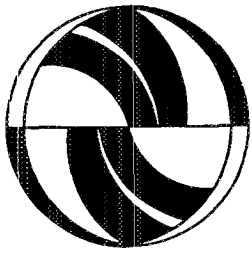
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Working Paper
UCTC No. 362

**The University of California
Transportation Center**
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Transportation Center**

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Accessibility and Economic Opportunity

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UCTC No. 362

The University of California Transportation Center
University of California at Berkeley

I. Introduction

Almost thirty years ago, the American Academy of Arts and Sciences asked John Meyer to organize an exploration of the links between transportation and poverty. During the spring of 1968, a dozen papers were commissioned, in collaboration with Harvard's Program on Regional and Urban Economics and also with the Joint Center, on topics ranging from the impact of free public transit on urban poverty to the calculation of the social costs of urban expressways.

The resulting conference and the collected papers (AAAS, 1968) drew widespread attention to the relationship between accessibility and its employment consequences for low income households. As indicated in Meyer's introduction to the volume, written with John Kain (AAAS, 1968, pp. 1-24), awareness of a possible link between inadequate transportation and poverty was, three decades ago, a distinctly new phenomenon. A major conclusion of the initial exploration was that "post-war changes in urban structure and urban transportation systems have conferred significant improvements and greater satisfactions on the majority, [but] they almost certainly have caused a relative deterioration in the access to opportunities, if not in the actual mobility of a significant fraction of the poor (AAAS, 1968, p. 2)."

This paper reviews those advances in our understanding of the link between employment access and economic opportunities which have arisen during the past three decades. We review, rather selectively, recent analyses documenting the labor market impacts of urban space, including transportation systems and accessibility. We also present new evidence on changes over time in the importance of the link between access and economic opportunity. This new evidence covers the interval 1970-1990 and is based on comparisons of household level data extracted from the Public Use Micro Sample (PUMS) of the 1990 U.S. Census with data published in the 1970 Census of Population. Finally, we present a selective review of policy initiatives aimed at increasing economic opportunity through improved transport access.

Section II presents a summary of the underlying conceptual link between urban transportation systems and labor markets. It also summarizes the principal empirical evidence available at the time of the AAAS report. Section III reviews more recent empirical research by economists and other social scientists on the general topic. Section IV summarizes trends in employment location, poverty, and commutation in the largest U.S. metropolitan areas (MSAs). Section V summarizes recent evidence from demonstrations and experiments. Section VI is a brief conclusion.

II. Basic Issues

It is hardly surprising that commuting patterns and transport choices vary systematically by household income and demographic conditions. Indeed, standard economic models of urban location suggest that important differences will exist. With a sufficiently income elastic demand for residential space, higher income households will tend to locate further from central employment nodes, commuting longer distances and paying higher commuting costs. In return, these households will live at locations where the unit cost of space is lower. Higher income households with greater demands for space can thus obtain larger aggregate savings by choosing their more spacious housing at more distant locations and incurring longer and more expensive commutes. By the same logic, lower income households can outbid the rich for the most accessible and expensive land. Since they demand only small amounts of space, lower income households will obtain larger aggregate savings by choosing central locations, paying higher unit prices for space and thereby economizing more on commuting costs.

Similarly, a variety of other demographic differences among households may suggest that systematic variations exist in the demand for space or in the cost of commuting. Predictable

differences along either dimension will affect household commuting behavior. Households with multiple workers and without children may have lower demands for residential space. Multiple worker households whose skills or human capital endowments are more similar (and are less likely to contain a "secondary worker") will often achieve greater savings from locations with improved access to central workplaces.

Households who receive only a small fraction of their incomes from wages or salaries may be more likely to choose central locations if those locations are more accessible to income elastic urban amenities than outlying areas.

These factors suggest that both housing demand and commuting patterns will vary by family size, wealth, labor force attachment, and life cycle considerations, as well as by differences in wage income.

The benign circumstances that arise in the economic model of equilibrium described above may not be achieved costlessly, and the reassuring normative implications of the neoclassical model are certainly not immune to dynamic considerations. Real capital investments -- in offices and industrial plants and in residences as well as transportation systems -- have long lives. As the location of new workplaces changes in response to demand and production technology, and as the stock of housing suitable to different demographic groups changes only slowly, the

transportation system may be called upon to ameliorate large discrepancies in the location of real capital in urban areas. The reliance on transport to buffer a growing mismatch between residential locations and worksites will certainly be harder when the transport system is itself characterized by a fixed capital stock of radial rail or road linkages.

Several factors reinforce the dynamic disadvantages of central city housing.

First, the rapid decentralization of employment in the post-war period has improved the locational advantage of residences and housing tracts in the suburbs. Simultaneously, this trend has made central city residences less accessible to geographical areas experiencing rapid job growth. For reasons indicated, the areas of improving job access are those more proximate to housing appropriate to middle income households; areas of low-income housing have become less accessible to places of growing employment.

If the housing stock could adjust cheaply and quickly -- so that low income central residential areas could be converted to more spacious high income housing, and so that low income housing in the suburbs could be produced from high income housing -- the decentralization of workplaces need not disadvantage the poor. However, conversion costs are high. Moreover, land use and environmental policies and a mercantile

structure of public finance all restrict the production of new housing appropriate for low income populations in the suburbs.

Second, income constraints on poor households greatly limit their journey-to-work options. For obvious reasons, poor households are less likely to be auto owners and are less likely to have access to private automobiles for commutation. Thus, the longer commutes from central residences to suburban jobs will increase the relative cost of travel (as a fraction of the wage). The high "tax" on gross wages (or the reduced net wage) will reduce the labor supply of these workers -- making unemployment more attractive.

Third, the reductions in net wages for the poor, which arise from increased commuting costs to the suburbs, are particularly significant in the oldest metropolitan areas, those served primarily by radial, spoke-and-wheel, public transportation systems. Increased cross handling from transit destinations to suburban worksites adds substantially to the daily commute at both ends. This reduces the net wages for those captive to the transit network, perhaps below their reservation wages.

Fourth, the legacy of racial segregation and housing market discrimination greatly increases the salience of each of these other factors for minority households. If there are non price barriers to the mobility of minority households -- or if the

price of moving into white residential areas is simply higher for minority households -- then low-income, centrally-located minority households will incur still higher commute costs, on average, and higher levels of unemployment as new jobs migrate to the suburbs.

In sum, two factors are responsible for the specific link between transport access and employment which limit the economic opportunities available to low income and minority households -- slow adjustment in real capital markets to changes in locational advantage and explicit barriers to the residential mobility of low-income or minority households.

The first empirical test of the proposition described above, as it relates to minority households, was published (Kain, 1968) about the time of the AAAS study organized by John Meyer. However, a preliminary version of the empirical analysis existed much earlier (Kain, 1965), and the mechanism was hinted at in the *Urban Transportation Problem* (Meyer, Kain, and Wohl, 1965). The tests reported by Kain were based upon aggregate postal zone data from Chicago and Detroit gathered in 1952 and 1956 respectively. The statistical analysis was quite straightforward and rather primitive. For each of these postal zones -- of quite unequal areas and shapes -- Kain measured the fraction of employment, by industry and occupation, held by black workers. He related this fraction to the fraction of

black residents in each of the neighborhoods and to the airline distance of each neighborhood from the central black ghetto. Kain found that the fraction of black employment in a postal zone was positively related to the fraction of black residences in that zone and negatively related to its distance from the central urban ghetto. The findings suggested that the intrametropolitan distribution of black employment was affected by the pattern of black residences; the intense residential segregation in these two cities affected the spatial distribution of employment for black workers.

The results of the statistical models were also used, however, to conduct a striking thought experiment -- to estimate the level of black employment in each metropolitan area in the absence of residential segregation. This counterfactual was computed by assuming that black residential proportions were constant (and equal to the fraction of black residents in each urban area as a whole) and that the distance to the black ghetto was equal (to zero) for each postal zone. The computation yielded an increase in black employment of about 9,000 jobs in Detroit and almost 25,000 jobs in Chicago. This implied that the existing spatial pattern of black residences had led to net reductions in black employment of 3 to 8 percent in these two metropolitan areas.

This result, combined with historical evidence on the suburbanization of jobs in the two cities, supported the conclusion that constraints on residential patterns increasingly disadvantaged black households in the labor market. The postwar dispersal of jobs had reduced black employment, and the magnitude was not negligible.

The conclusions of the work contained the usual academic disclaimers. Kain indicated that the conclusions and especially the forecasts were "highly tentative" and speculative.¹ Nevertheless, given the timeliness of the topic and the pedigree of the work, the 1968 paper received widespread attention. It certainly affected the substance and conclusions of Meyer's contemporaneous report to the American Academy, as well as the subsequent Kain-Meyer essay on "Transportation and Poverty" in *The Public Interest* (1970).

III. Subsequent Empirical Evidence

The effects of limitations on minority access to jobs upon employment and earnings were rather quickly challenged and subjected to reanalysis -- using the same data, using better

¹ The assumed values of the independent variables for Kain's forecasts were certainly within the range of variation of the raw data, but Kain did not present standard errors of the forecasts or other diagnostics.

data, and using completely different (sometimes even contradictory) models.

Within three years, Paul Offner and Daniel Saks (1971) published a reanalysis of Kain's own data from Chicago and Detroit. The authors replaced the linear specification relating black employment ratios to black residence ratios with a quadratic specification, observing that the latter representation was more consistent with Kain's own prose. With a quadratic specification, the authors confirmed changes in the spatial distribution of black employment arising from the impaired access of black residential neighborhoods. By implication, they also confirmed the worsening of the relative employment prospects of black workers over time. However, they also disputed the existence of the aggregate job loss estimated by Kain.

Others emphasized that the average access of black urban workers to urban jobs was no worse than the access of white workers, or else they disputed the extent of suburbanization of low skilled jobs. Noll (1970), for example, documented that, at least during the 1960's, jobs for less skilled workers were much more plentiful in central cities than in suburbs. Monographs sponsored by Brookings (Lewis, 1969) and the Urban Institute (Fremon, 1970) documented that urban populations had

decentralized more rapidly than had urban jobs during the postwar period, up to 1970.

Others enriched the simple model of relative employment in a variety of ways. Mooney analyzed the average ratio of employment to population in ghetto census tracts in the 25 largest metropolitan areas (MSAs) in 1960. He related these ratios to a variety of measures of employment suburbanization, by occupation in each MSA, the fraction of ghetto workers employed in the suburbs, and the aggregate unemployment rate for the urban area. Mooney found that employment suburbanization was negatively related to the employment rates of non white males, while suburban employment was positively related to non white male employment rates. Comparable estimates were neither large nor particularly significant for non white females.

However, Mooney's results also indicated that aggregate economic activity, as measured by the overall unemployment rate in each metropolitan area, was much more important in explaining ghetto employment rates than job suburbanization or accessibility.

Other studies differed in their definitions of job access - - for example in their reliance upon segregation indices, indices of residential or employment suburbanization, or travel times as measures of job access. For example, Masters (1975) devoted an entire monograph to the analysis of the relative

incomes in 1970 of black and white males in some 77 large MSAs. He related relative incomes to a variety of *ad hoc* MSA measures of residential segregation (e.g., the Taeuber Index of Dissimilarity, the fraction of non whites living in black majority census tracts, etc.), to the relative education levels of black and white males, and several measures of the industrial structure of the metropolitan areas. Masters interpreted the insignificance of segregation measures as predictors of relative incomes (and employment) as evidence against the proposition that reduced job access reduces black welfare. This interpretation was heavily criticized by Kain (1992) and, less so, by Holzer (1991).

Several studies compared the earnings of black and white households residing in suburban or central city neighborhoods. Harrison (1972, 1974) presented national evidence from 1966 suggesting that the incomes and employment rates of blacks living in the suburbs did not exceed those of black central city residents. In contrast, Vrooman and Greenfield (1980), using national data for 1973, found that suburban black residents had substantially higher weekly earnings than black residents of central cities. This latter finding is confirmed in a more credible analysis by Price and Mills (1985) using 1978 data. Price and Mills reported about a one-third difference in the annual earnings of full-time male black and white workers. Of

this, five or six percentage points (or almost 18 percent) could be attributed to central city-suburban residential patterns.

All of these findings are based upon data collected in the 1950's, 1960's, and 1970's.

Important additional evidence was provided by the analysis of data from the 1980 census. Leonard (1985) used 1980 census tract data for Los Angeles and Orange Counties and geocoded data from the Equal Employment Opportunity Commission to analyze average commuting times. For a large sample of census tracts, he related average commute times to a variety of aggregate sociodemographic characteristics, including the percent of residents who are black and Asian, the proportion of local jobs in blue collar and manufacturing, commuting modes, and a variety of measures of accessibility. He found a negative and significant relationship between accessibility and commute times. He also found, however, a positive relationship between the percent black in a neighborhood and average commute times -- a relationship that was robust to a variety of specifications of job access as well as measures of other demographic conditions. Thus, for a given distribution of surrounding jobs, black workers had longer commutes. Leonard's findings suggested that active discrimination in employment, not accessibility per se, caused blacks to search further afield, on average, to find employment.

Ihlanfeldt and Sjoquist (1989) analyzed the net (of commuting) annual earnings of central city heads of household as a function of individual demographic factors, and metropolitan wide data on employment, racial composition, and job location, all taken from the 1980 census. They found that the net incomes of both white and black male workers were reduced by job decentralization. For low-skilled workers, the magnitude of the estimated effect was large. For female workers the effects of job decentralization on net earnings were much smaller.

The influential book by Wilson, published in 1987, drew further attention to the isolation of the inner city poor whose access to jobs, schools, and decent neighborhoods had declined. In large parts of *The Truly Disadvantaged*, Wilson described the hopelessness of those "left behind" as the more able had left decaying neighborhoods. This rich analysis points to a major scientific problem in the interpretation of all those studies which have related the spatial access of locations to the employment and earning of individuals. It is certainly possible that those with less strong attachments to the labor force will "choose" to live in less accessible neighborhoods. Indeed, since housing in more accessible neighborhoods is more expensive, those who "plan" less attachment to the labor market will be better off living where job access is reduced. This statement about sample selectivity may seem callous to those who

are not disabled by training in the dismal science, but it is, of course, exactly the logical implication of Wilson's argument.

Thus, sample selectivity, by itself, could provide a logical explanation of the findings previously reported -- suburban black residents with higher earnings than inner city residents, ghetto residents with lower levels of labor force participation and employment. Many of the implications of sample selectivity can be overcome by the detailed measurement of household demographic factors, in an attempt "to hold constant" their effects. Nevertheless, the interpretation of much of the evidence comparing the labor market outcomes for adult workers is open to some question.

If this sample selectivity issue is important, then evidence on the labor market outcomes for youth *living at home* is potentially quite important. It is implausible to expect that youth living at home have chosen their residential sites in response to the calculus described above. It is more reasonable to presume that their residential locations are given exogeneously (by the "choices" -- perhaps severely constrained - - made by their parents). Youth take their neighborhood locations and their job access as a given and search for employment. If inadequate spatial access impairs labor market opportunity, we should observe this in the labor market outcomes

of teenagers. The effects, if any, cannot be attributed to non random sampling.

Ellwood's (1986) study of the employment of Chicago youth provided the first quantitative evidence on this issue. Ellwood used 1970 census tract data, and access data for 116 gross neighborhoods, to relate out-of-school youth employment fractions to three measures of access: the number of jobs within a half hour commute by public transit; the neighborhood job-to-resident ratio; the average commute time for neighborhood residents. In a series of multiple regressions, controlling for a variety of aggregate socioeconomic characteristics, none of the three proximity measures explained a substantial share of the variation in youth employment rates. Ellwood interprets: "...the result is not consistent with a model in which the likelihood of finding a job is sharply reduced when jobs are not located very nearby (p. 172)." The most important determinant of youth employment rates in these models was the racial composition of the census tract.

Ellwood re-estimated the model to allow for fixed neighborhood effects, and the result persisted. The effect of the racial variable was at least as important as before.

A third test of the link between access and youth employment relied upon the differences in employment access between the West and South Sides of Chicago. Ellwood used data

from the 1970 Census Employment Surveys (CES) to evaluate a "natural experiment," finding essentially no improvement in the labor market outcomes for youth living in the far more accessible West Side as compared to the South Side.

Finally, Ellwood used the 1970 CES to analyze the employment patterns of workers of differing races, finding that racial differences swamped all other differentials.

Ellwood's careful analysis has been criticized by Leonard (1986a), Kasarda (1989), and by Kain (1992). None of these criticisms is really damaging.

Leonard (1986b) replicated part of Ellwood's analysis using aggregate data from the 1980 census for Los Angeles. Leonard related average youth employment rates by census tract to measures of job proximity and to the aggregate socioeconomic characteristics of the tract's residents. Leonard measured job access by the number of blue collar jobs within a fifteen minute commute, as a fraction of resident adults. In common with Ellwood's study -- in a very different city a decade earlier -- Leonard found highly significant effects of job access on average youth employment rates, but the magnitudes were also quite small. Using aggregate census tract data, the effects of job proximity on the employment outcomes for youth were estimated to be quite small.

More definite conclusions about the effect of job access upon the economic opportunities of urban youth are based upon the analysis of micro data on individuals and their households. Ihlanfeldt and Sjoquist have conducted a series of analyses based upon the Public Use Micro Sample (PUMS) of the 1980 census and the National Longitudinal Sample of Youth cohorts for 1981-82. For example, using PUMS data for at home youth in 43 MSAs, Ihlanfeldt and Sjoquist (1991) related individual employment probabilities to the average travel times of low wage workers who live in their neighborhoods, and to a variety of individual and household characteristics. They also included the MSA unemployment rate and measures of metropolitan occupational structure. In these statistical models, average commuting time was an important predictor of youth employment; differential commuting times between black and white youth were reflected in differential employment rates.

In a related paper, the same authors (Ihlanfeldt and Sjoquist, 1990) estimated a more detailed empirical model using 1980 PUMS data for Philadelphia. Again, measures of neighborhood commuting time proved to be important predictors of youth employment. The authors were also able to estimate a version of this model for 1980 for Chicago and also for the Los Angeles metropolitan area. Their results establish the importance of access in affecting employment -- in contrast to

the results obtained earlier for the same MSAs by Ellwood and by Leonard using more primitive methods.

The Ihlanfeldt and Sjoquist methodology was employed more recently by Holloway (1996) in an analysis of youth employment in 50 MSAs in 1980 and 1990. Holloway confirmed the importance of neighborhood commute time as a predictor of male youth employment.

Steven Raphael's recent analyses of Oakland (forthcoming a, b) introduced several more sophisticated measures of youth employment access, documenting a growing spatial disadvantage of black households in an expanding metropolitan area. This analysis is also based on micro data from the 1990 Census.

In a series of recent papers (O'Regan and Quigley, 1996a, 1996b, forthcoming), we have extended these analyses of youth employment using data from the 1990 census and using a more comprehensive definition of "accessibility." As Holzer (1987), O'Regan (1993), Fernando and Harris (1993), and others have emphasized, most information about employment is disseminated informally through contacts -- friends, relative, and associates. Some, perhaps most, of these contacts (Granovetter, 1974) are residence based. Thus, the labor market access of youth living in neighborhoods of high unemployment or low labor force attachment is likely to be impaired. Individuals with whom these youth have informal contact are likely to impart less

information about employment opportunities than those in other neighborhoods.

We tested the importance of these various dimensions of accessibility upon youth employment outcomes by matching the census records of individual at-home youth and their families to neighborhood information provided by census tract aggregates and also to job proximity information. This was accomplished by building and analyzing a linked data set within the Bureau of the Census, thereby preserving the confidentiality of respondents (but also linking individual records to census tract identifiers).

The access of each census tract to metropolitan employment was computed from MSA zone-to-zone commute times by census tract using techniques described in detail in John Meyer's **Techniques of Transport Planning**.² Other neighborhood characteristics were measured by census tract aggregates -- the percent white, percent poor, percent on public assistance, percent unemployed, and the percent of adults not working.

We analyzed two outcome measures for 16-19 year old youth, separately for whites, blacks, and hispanics -- employment and "idleness" (i.e., not employed and not enrolled in school). For

² Specifically we computed transport access potential based on a gravity model, the poisson distribution, and a negative binomial distribution of trip destinations. See Meyer (1971), Volume 1, Part 2, for a discussion.

four metropolitan areas in New Jersey, the results were remarkably similar. First, the social access and job proximity of neighborhoods made a substantial difference in the employment or idleness probabilities of youth. Job proximity per se was more important in predicting employment or "idleness" for black youth than for hispanics or whites. Second, each of the other measures of the demographic or social composition of neighborhoods "mattered" in the employment of youth -- regardless of race. Ceteris paribus, teenagers who live in neighborhoods with larger fractions of adults on public assistance or larger fractions of adults not working have lower probabilities of employment and higher probabilities of idleness.

Third, the combined effects of poor social access and inaccessible residential locations greatly affect minority employment. For example, the "average Newark youth" (i.e., one with the average level of human capital and household characteristics) had about a 44 percent employment probability if s/he lived in the "average neighborhood" in which white youth reside. But if s/he lived in the "average neighborhood" in which hispanic youth reside, employment probability declined to 37 percent; if s/he lived in a neighborhood with the average job proximity and social access provided to black youth, employment probability declined to 33 percent.

Fourth, and perhaps most crucial: the largest source of differences in the employment probabilities of white and black youth is the systematic variation in the measured human capital and household attributes of youth. Roughly two-thirds of the difference in black-white youth employment rates in the metropolitan areas studied was attributable to individual and household characteristics. The other third arose from variations in spatial proximity to jobs and from social access (O'Regan and Quigley, forthcoming).

IV. Post 1970 Trends

The scholarly evidence reviewed in the previous section is invariably statistical and mostly cross-sectional. This large body of research investigates the causal relationship between the four spatial factors presented in Section II and labor market outcomes. We now turn to measurement of these factors themselves. In this section we review changes in the spatial character of urban areas since Meyer's report to the American Academy in 1968. For the most part, we review tabulations from the 1970 and 1990 U.S. Census.

The first factor affecting job accessibility for poor and minority households is the decentralization of jobs. The post war trend in decentralization noted in Meyer's 1968 report

continued from 1970 to 1990. Central cities continued to lose jobs in the declining manufacturing sector, but many also lost jobs in the growing retail and service sectors (Kasarda, 1995). This shift in employment out of central cities can be seen in Table 1 which is based on the PUMS one percent sample for 1990.³

More than half of all jobs held by metropolitan workers were still located in the central city in 1970. More than sixty percent of jobs held by black metropolitan workers were in the central city. By 1990, only 28 percent of all metropolitan jobs were clearly identified as located in a central city, a 22 percentage point decline. (Note that changes in Census definitions account for some of this decline.)⁴ While jobs held by black workers are still more concentrated in the central city than are all jobs, less than half are now found in central cities. The percent of black central city jobs declined by twenty percentage points in the two decades.

³ The PUMS (Public Use Microdata Sample) is a stratified random sample of households and their members, containing demographic and work commute information. PUMS data are available for all metropolitan areas in the U.S., areas with a population of 100,000 or more.

⁴ Due to changes in the geographic definitions used by the U.S. Census Bureau, areas are now classified as central city, non central city, and "other." The latter includes geographic areas that may contain both central city and non central city areas. Here we identify as central city only geographic areas entirely within the central city, potentially understating the centralization of work places.

Table 1
Centralization of Jobs and Workers, 1970 and 1990

	<u>1970</u>	<u>1990</u>
A. Percent Working in Central City		
All Workers	50.9	27.8
White Workers	49.6	24.4
Black Workers	60.7	41.4
B. Percent Living in Central City		
All Workers	46.5	21.5
White Workers	42.3	17.4
Black Workers	79.2	38.8
C. Central City Jobs per Central City Worker		
All Jobs/All Workers	1.09	0.93
Jobs Held by White Workers/White Workers	1.17	1.00
Jobs Held by Black Workers/Black Workers	0.77	0.70

Sources: 1970 data published in: US Bureau of the Census, **Census of Population 1970, Subject Reports**, Final Report PC(2)-9A, Low-Income Population, Washington, DC: US Government Printing Office, 1973, Table 26, pp. 268-279. Data for 1990 are computed from the PUMS one percent sample: US Bureau of the Census, **Census of Population and Housing, 1990, Public Use Microdata Sample, US** [machine readable data files], prepared by the Bureau of the Census, Washington, DC: The Bureau [producer and distributor], 1992.

There has, of course, been a concomitant decentralization of population to the suburbs. Panel B of Table 1 compares the residential locations of MSA workers in 1970 to 1990. While slightly less than half of metropolitan workers resided in a central city in 1970, less than 22 percent did so in 1990.⁵ Large declines occurred for both white and black workers, but the much higher centralization of black workers has been maintained. In 1990, black workers were still twice as likely as white workers to live in a central city.

Panels A and B are compared in the bottom of Table 1, showing a decline of jobs per worker in central cities over this time period. In 1970, there were slightly more jobs in the central city than there were workers. By 1990, there were slightly fewer jobs than workers in central cities. Over this entire time period, however, there is a much greater centralization of black workers than of jobs held by black workers. And this mismatch has worsened over time.

Of course, not all central city jobs are held by central city residents. To account for the in-commuting flow, Harry Holzer compared the gap between the number of unemployed and the number of vacant jobs in four large metropolitan areas (Holzer, 1996). In each of these cities, the apparent surplus of central

⁵ Again, changes in Census definitions may overstate this change.

city jobs disappeared; there were fewer available jobs for residents in the central city than there were in the suburbs.

To address this question of truly accessible jobs -- by skill requirements and geography -- John Kasarda examined central city employment changes in nine large cities from 1970 to 1990 (Kasarda, 1995). Overall employment changes in these cities reveal regional differences. While manufacturing declined in all central cities, employment in blue collar services was mainly stable.. The large increase observed nationally in services occurred primarily in white collar service jobs. In the cities in the north, this meant an overall loss of jobs in the central city (Boston is an exception), while in the south and west, the increase in white collar services more than compensated for other losses, resulting in modest employment gains.

Kasarda then classified industries by the mean years of schooling completed by job holders in 1982, distinguishing between industries in which the mean level of schooling was twelve years or less from those in which some schooling beyond high school was the norm. (The average level of educational attainment is taken as an indication of the educational requirements of the industry.) Table 2 summarizes his results.

Cities located in the north (and Denver as well) experienced a decline in the number of central city jobs

Table 2
Central City Jobs in Industries in which the Average Education of
Employees is Greater than or Less than Twelve Years

	<u>1970</u>	<u>1990</u>	<u>Job Change</u> <u>(thousands)</u>	<u>Percent</u> <u>Change</u>
New York				
Less than 12 years	1,552	977	-575	-37.0
More than 12 years	1,002	1,253	+251	+25.0
Philadelphia				
Less than 12 years	430	226	-204	-47.4
More than 12 years	205	231	+26	+12.7
Boston				
Less than 12 years	189	128	-61	-32.3
More than 12 years	185	237	+52	+28.1
Baltimore				
Less than 12 years	207	110	+97	-46.9
More than 12 years	90	118	+28	+31.1
St. Louis				
Less than 12 years	210	107	-103	-49.0
More than 12 years	98	79	-19	-19.4
Atlanta				
Less than 12 years	179	190	+11	+6.1
More than 12 years	92	165	+73	+79.3
Dallas				
Less than 12 years	337	468	+131	+38.9
More than 12 years	107	334	+227	+212.1
Denver				
Less than 12 years	120	107	-13	-10.8
More than 12 years	72	120	+48	+66.7
San Francisco				
Less than 12 years	132	173	+41	+31.1
More than 12 years	135	204	+69	+51.1

Source: Computed from data reported in Kasarda, John D., "Industrial Restructuring and the Changing Location of Jobs," in **State of the Union: America in the 1990s**, edited by Reynolds Farley, New York, NY: Russell Sage Foundation, 1995, pp. 248-249.

requiring less than a high school diploma. While this trend generally resulted in a loss of aggregate employment, almost all of these cities gained jobs requiring more than a high school education. For these cities, the net loss in jobs during the past two decades seriously understates the decline in those central city jobs available for less skilled workers.

In the south and west, job growth occurred in both categories, although here, too, there was a large relative shift from lower educational qualifications to higher qualifications. Even in these growing central cities, the share of jobs with minimal educational prerequisites is declining.

Focusing on the match between the educational requirements of central city jobs and central city residents, John Kasarda examined the relative distribution of education in the nine cities reported in Table 2 and compared this to the distribution of jobs. In each of these cities (although much less starkly in Los Angeles), the fraction of jobs available to workers with less than a high school education was smaller, frequently a great deal smaller, than the representation of these workers in central city populations.

This continued decentralization of jobs (and more specifically, relevant jobs) has direct implications for the second factor we examine -- commuting patterns and commuting costs of low income and minority workers. Table 3 provides

Table 3
Workplace and Residential Location of MSA Workers, 1970
 (Percent, by category)

A. Non-Poverty Households	<u>Work in:</u>	<u>Reside in:</u>	
		<u>Central City</u>	<u>Suburb</u>
All Workers	Central City	36.4	18.1
	Suburb	8.8	36.7
White Workers	Central City	33.4	19.3
	Suburb	8.1	39.1
Black Workers	Central City	62.9	7.0
	Suburb	12.2	17.9
 B. Poverty Households			
All Workers	Central City	48.5	10.7
	Suburb	9.2	31.7
White Workers	Central City	43.0	12.1
	Suburb	8.1	36.8
Black Workers	Central City	64.0	6.8
	Suburb	15.3	13.9

Source: US Bureau of Census, *Census of Population 1970, Subject Reports, Final Report PC(2)-9A, Low-Income Population*, Washington, DC: US Government Printing Office, 1973, Table 26, pp. 268-279.

commute flow information for metropolitan areas in 1970, by residence and poverty status. Among non poor workers, both whites and blacks, the dominant form of commuting is within the same residential area: central-city-to-central-city or suburb-to-suburb. For non poor white workers, however, the suburban-suburban commute is most frequent, while for non poor black workers, commutes within the central city strongly dominate. If they are not working in central cities, non poor blacks are most likely to live and work in the suburbs, but this pattern is closely followed by central city residence and a reverse commute to the suburbs. Unlike their white counterparts, non poor blacks working in the suburbs are observed living in the suburbs with far less frequency.

Among poor households, central city residence and worksite is the most likely pattern, regardless of race, although there are racial differences in magnitudes. The biggest difference across groups occurs in the second most frequent pattern. Unlike their white counterparts, poor black workers not working and living in the central city are somewhat more likely to undertake reverse commutes to the suburbs rather than to live and work in the suburbs. Poor white workers, on the other hand, if not working and living in the central city, are much more likely to live and work in the suburbs than to undertake reverse commutes. In fact, poor white workers are more likely to live

in the suburbs and to commute to the central city than they are to follow the commuting pattern of poor black workers. These racial differences in commuting patterns, after controlling for poverty status, are consistent with constrained residential choices.

The left most columns of Table 4 present similar -- although not directly comparable -- numbers for 1990. Due to changes in census designation of central cities and area, we include three possible locations: central city, non central city, and "intermediate."⁶ For comparison purposes, we focus on the central city and non central city categories.

While the magnitudes are affected by the new categories, making it hard to assess trends, the dominance of within-area commuting continues among non poor workers of both races in 1990. This pattern is also found among the poor, although with greater centralization. By 1990, it was no longer true that poor black workers were more likely to live in a central city and commute to the suburbs rather than live and work in the suburbs. It is worth noting that, while suburban living has increased for poor black workers, it has also increased for poor white workers -- who are now slightly more likely to live and

⁶ PUMAs which are designated as solely central city or non central city are classified as such. PUMAs which contain both central city and non central city portions of an MSA are classified as "intermediate."

Table 4
Workplace and Residential Location of MSA Workers
by Race and Poverty Status, 1990
 (Percent, by category)

	<u>Work in:</u>	<u>Reside in:</u>					
		<u>Central City</u>	<u>Intermediate Suburb</u>	<u>Central City Intermediate Suburb</u>			
A. Non-Poverty Households							
All Workers	Central City	51.6	17.1	30.0	13.6	4.5	7.7
	Intermediate	14.0	64.9	19.1	6.8	31.7	9.3
	Suburb	23.9	18.6	55.1	5.9	4.6	13.6
White Workers	Central City	45.2	22.0	30.2	10.8	5.2	7.2
	Intermediate	11.7	66.1	19.9	5.9	32.9	9.9
	Suburb	19.4	21.1	56.8	5.1	5.5	14.9
Black Workers	Central City	62.5	10.4	25.1	19.4	3.2	7.8
	Intermediate	19.1	63.2	15.5	8.9	29.4	7.2
	Suburb	35.9	14.8	47.1	8.1	3.3	10.6
B. Poverty Households							
All Workers	Central City	67.0	7.7	22.5	32.1	2.1	6.1
	Intermediate	12.5	70.4	14.4	6.5	36.6	7.5
	Suburb	23.2	11.4	62.7	4.9	2.4	13.1
White Workers	Central City	58.3	11.3	27.3	13.0	2.5	6.1
	Intermediate	9.7	72.0	15.8	5.3	39.3	8.6
	Suburb	18.6	12.6	66.4	4.3	2.9	15.4
Black Workers	Central City	75.1	4.0	18.7	25.1	1.3	6.3
	Intermediate	17.8	68.9	10.3	8.7	33.6	5.0
	Suburb	35.3	9.2	52.1	6.3	1.6	9.3

Source: US Bureau of the Census, *Census of Population and Housing, 1990, Public Use Microdata Sample, US* [machine readable data files], prepared by the Bureau of the Census, Washington, DC: the Bureau [producer and distributor], 1992.

work in the suburbs than to live and work in the central city. However, given the importance of the "intermediate" category, it is hard to discern more than this.

If there has been some residential adjustment to match the decentralization and restructuring of jobs, then commuting costs might not have increased over this time period. Table 5 examines one aspect of commuting costs -- commute times. Because comparable commute times are not available for 1970, we limit our analysis to patterns in the 1990 data.

Two clear patterns are evident in the 1990 data: black workers (controlling for poverty status) commute longer than white workers do; and poor blacks commute longer than non poor blacks do. These second findings are consistent with continuing residential constraints for black workers, both poor and non poor.

Table 6, based on Department of Transportation information for 1990, helps to disentangle the role of race, income, and location. The differences in 1990 commute times by race noted in Table 5 are related in part to the concentration of minority workers in large cities. Commute times are higher in larger metropolitan areas, and black workers are more concentrated in large MSAs. However, even within large MSAs and controlling for income, black workers spend more time commuting than do white

Table 5
Average Journey to Work for MSA Workers
by Race, One-Way Commuting Time, and Poverty Status, 1990
 (in minutes)

A. Non-Poverty Households		<u>1990</u>
	All Workers	26.6
	White Workers	24.8
	Black Workers	26.4
 B. Poverty Households		
	All Workers	27.8
	White Workers	25.8
	Black Workers	30.9

Source: See Table 4.

Table 6
Nonstop Worktrip Durations by Race, Income, and MSA Size, 1990
(average one-way commute, in minutes)

<u>Population of MSA:</u>	<u>Income (thousands)</u>	<u>Black</u>	<u>White</u>
Less than 1 million	LT \$15	14.3	16.7
	\$15 - 24.9	19.6	17.3
	\$25 - 39.9	16.2	18.2
	\$40 - 54.9	15.9	19.5
	GE \$55	21.0	18.4
1 to 3 million	LT \$15	17.1	16.7
	\$15 - 24.9	23.1	18.9
	\$25 - 39.9	20.4	20.1
	\$40 - 54.9	19.3	20.6
	GE \$55	19.0	22.2
More than 3 million	LT \$15	23.9	21.7
	\$15 - 24.9	26.3	16.2
	\$25 - 39.9	27.0	21.8
	\$40 - 54.9	25.8	24.4
	GE \$55	29.0	26.7

Source: US Department of Transportation, **Special Report on Trip and Vehicle Attributes**, 1990 NPTS Report Services, Washington, DC: Federal Highway Administration, February 1995, p-2-27.

workers. (Below we examine differences in mode of transit, also a contributing factor.)

Note one additional difference in income-commute patterns by race. While white workers' commute times within similar-sized MSAs generally increase with income, this is not true for black workers. As income rises, blacks generally do not translate their higher earnings into residential choices requiring longer commutes. Only blacks in the highest income category, living in either the largest or smallest MSAs commute longer than other blacks. This suggests that there are pronounced differences in the residential consumption preferences of blacks or, more likely, in their residential options.⁷

While all workers are potentially affected by the changes in the spatial form of cities, low income workers are differentially impacted by the third and fourth factors noted in Section II: their greater concentration in older cities with antiquated transportation systems (including public transit);

⁷ In addition to time costs, commuting patterns and options are affected by out-of-pocket costs. For travel by private automobile, these costs are large and perhaps, for low income households, prohibitive. Over the twenty years considered, the cost of a new car increased by one-third in constant (1990) dollars, from \$12,000 in 1970 to \$16,000 in 1990. In terms of income, in the 1970s the cost of a new car was equivalent to twenty weeks of the median pay. By 1990, it cost twenty five weeks of median pay. However, total operating costs, inclusive

and their more limited abilities to make residential adjustments to workplace changes.

Table 7 documents one form of adjustment to spatial deconcentration of jobs -- increased reliance on the most flexible form of commuting (automobiles). Auto usage increased from 81 percent of worker commutes in 1970 to 88 percent in 1990. This increased use of private automobiles is associated with a decreased reliance on public transit (from over eight percent to approximately five percent) and an increase in the number of cars owned per household. The percent of households without cars has declined over this period from 17.5 percent to 11.5 percent.

Two factors complicate these observed trends. First, reliance on automobiles is lower in the largest metropolitan areas (where poor and minority households are disproportionately represented). Second, many lower income households do not own cars and are limited to public transit. Table 8 reports auto usage in the eight largest metropolitan areas for the past decade. While there is an increase in auto commutes over this time period, it is small. Only Detroit and Los Angeles have usage rates higher than the national average. For each of the other large MSAs, auto use is well below average.

of fuel, maintenance, insurance, etc. has remained more stable. (See Pisarski, 1995, for a discussion.)

Table 9 documents differences in car ownership by race and residence. While only 11.5 percent of households nationally are without any automobile, more than 14 percent of central city households do not own vehicles. Over thirty percent of black households are without a car, regardless of where they live, while over 37 percent of central city black households have no car available. *For over a third of black households living in central cities, adjusting to the changes in the spatial pattern of jobs requires relying on public transit.*

Table 10 examines trends in public transit use over this period. As noted previously, public transit use declined between 1970 and 1990. The relative use by subpopulations has remained quite similar. Controlling for race, poor workers are more likely to use public transit than are non poor workers. Controlling for poverty, black workers rely much more heavily on public transit than do white workers. In fact, in both years, even non poor blacks rely much more heavily on public transit than do poor whites.

Some of these racial differences are driven by residence and workplace location. Tables 11 and 12 help control for these by presenting transit use for each commute option. Even after controlling for commute pattern, we find that non poor blacks rely much more heavily on public transit than poor whites do. Location does play an important role, however. Within any

Table 7
Commuting Patterns and Vehicle Ownership
1960-1990

	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>
A. <u>Commuting Mode (in percent)</u>				
Private vehicle	69.5	80.6	85.9	88.0
Private vehicle (Large MSAs)	61.0	---	---	83.4
Public transit	12.6	8.5	6.21	5.1
Walk	10.3	7.4	5.6	3.9
B. <u>Vehicles Owned (number)</u>				
Per household	1.03	1.25	1.61	1.66
Per household (Large MSAs)	1.00	---	---	1.59
Per worker	0.85	1.03	1.34	1.32
C. <u>Households without Vehicles</u> (in percent)	21.5	17.5	12.9	11.5

Note: Large MSAs are those with populations of one million or more.

Source: US Department of Transportation, *Journey to Work Trends in the United States and its Major Metropolitan Areas, 1960-1990*, Washington, DC: Federal Highway Administration, 1993, pp. 2-2 ff.

Table 8
Commutation by Auto for the Eight Largest MSAs
1980-1990

<u>Rank</u>	<u>Metropolitan Area</u>	Percent of Worktrips by Auto	
		<u>1980</u>	<u>1990</u>
1	New York	59.0	62.6
2	Los Angeles	87.2	88.3
3	Chicago	75.9	78.5
4	San Francisco	79.0	81.8
5	Philadelphia	78.0	81.4
6	Detroit	91.2	92.7
7	Boston	76.3	80.5
8	Washington	76.2	78.8

Source: US Department of Transportation, *Journey to Work Trends in the United States and its Major Metropolitan Areas, 1960-1990*, Washington, DC: Federal Highway Administration, pp. 5-13 ff.

Table 9
Percent of Households without Vehicles
1990

<u>Residence</u>	<u>All</u>	<u>White</u>	<u>Black</u>	<u>Hispanic</u>	<u>Asian</u>
United States	11.5	8.4	30.5	19.0	13.1
Central City	20.4	14.5	37.2	27.1	21.6
Suburbs	6.7	5.8	15.8	9.2	4.4
Rural	5.9	4.9	20.7	7.7	4.9

Source: Pisarski, Alan E., *Commuting in America II*, Lansdowne, VA: Eno Transportation Foundation, 1995, pp. 34-36.

Table 10
Worktrip Mode for MSA Workers by Race and Poverty Status
 (Percent Taking Public Transit)

A. Non-Poverty Households	<u>1970</u>	<u>1990</u>
All Workers	11.5	5.1
White Workers	9.5	3.9
Black Workers	28.5	12.1
B. Poverty Households		
All Workers	18.0	8.2
White Workers	11.8	4.6
Black Workers	39.1	15.7

Source: See Table 1.

Table 11
Worktrip Mode for MSA Workers
by Race, Workplace, Residential Location, and Poverty Status, 1970
 (Percent Taking Public Transit, by category)

A. Non-Poverty Households	<u>Work in:</u>	<u>Reside in:</u>	
		<u>Central City</u>	<u>Suburb</u>
All Workers	Central City	67.3	15.0
	Suburb	7.5	10.1
White Workers	Central City	63.1	18.5
	Suburb	6.5	11.9
Black Workers	Central City	68.5	3.4
	Suburb	11.5	16.6
B. Poverty Households			
All Workers	Central City	74.1	6.4
	Suburb	10.9	8.6
White Workers	Central City	70.8	9.3
	Suburb	8.8	11.1
Black Workers	Central City	80.6	3.5
	Suburb	11.3	4.7

Source: See Table 3.

Table 12
Worktrip Mode for MSA Workers
by Race, Workplace, Residential Location, and Poverty Status, 1990
(Percent Taking Public Transit, by category)

	<u>Work in:</u>	<u>Reside in:</u>		
		<u>Central City</u>	<u>Intermediate</u>	<u>Suburb</u>
A. Non-Poverty Households				
All Workers	Central City	55.5	14.6	28.1
	Intermediate	23.6	56.1	16.6
	Suburb	44.7	10.1	39.6
White Workers	Central City	43.5	21.9	32.3
	Intermediate	17.5	59.7	18.0
	Suburb	35.0	12.8	44.6
Black Workers	Central City	69.2	6.9	22.9
	Intermediate	29.6	54.3	12.8
	Suburb	54.1	8.1	35.6
B. Poverty Households				
All Workers	Central City	79.6	4.9	13.6
	Intermediate	25.1	61.1	10.3
	Suburb	52.3	5.8	38.5
White Workers	Central City	68.8	8.4	19
	Intermediate	24.0	62.3	9.4
	Suburb	51.0	6.4	39.5
Black Workers	Central City	83.1	3.2	12.9
	Intermediate	26.7	60.4	10.1
	Suburb	57.3	3.8	35.9

Source: See Table 4.

racial and poverty category, working or living in the central city increases reliance on public transit. For whites, after controlling for commute pattern, poverty only increases public transit use for those living in the central city, and the increase is generally small. For blacks, poverty has a larger and more systematic effect on transit mode. Being poor and being black affect public transit use, most strongly among central city residents.

These differences in commute mode have a large impact on the time spent commuting. Table 13 presents one-way commute times by residence-workplace pairs and commute mode for 1990. Within any residence-workplace pair, commuting by public transit takes considerably more time. For workers living and working in the central city, relying on public transit doubles commute time, amounting to more than an hour a day. For non central city residents, the public transit commute times are much longer.

The role of the public transit system itself in commute times can be seen by examining commute times for non transit users. Here, for all categories of workers, the shortest commute time is for within area commutes. For public transit users, this is rarely true. The commute times do not vary in such a systematic way. Clearly, spatial distance is not the prime determinant of commute time.

Table 13
Worktrip Mode for MSA Workers
by Race, Workplace, Residential Location, and Poverty Status, 1990
 (Percent Taking Public Transit, by Category)

	<u>Work in:</u>	<u>Central City</u>	<u>Reside in:</u> <u>Intermediate</u>	<u>Suburb</u>
A. Non-Poverty Households				
All Workers	Central City	43.2	4.9	15.9
	Intermediate	3.4	14.5	2.4
	Suburb	5.3	1.2	9.1
White Workers	Central City	35.7	6.7	22.1
	Intermediate	2.2	14.8	2.8
	Suburb	4.4	1.2	10.2
Black Workers	Central City	56.3	1.8	5.2
	Intermediate	4.8	15.4	1.5
	Suburb	7.5	1.3	6.3
B. Poverty Households				
All Workers	Central City	43.8	1.5	4.5
	Intermediate	4.1	26.9	1.9
	Suburb	8.7	0.8	8.0
White Workers	Central City	34.0	1.4	6.1
	Intermediate	3.4	31.9	1.7
	Suburb	9.5	0.9	11.1
Black Workers	Central City	50.8	1.5	3.5
	Intermediate	4.1	23.5	1.8
	Suburb	9.0	0.5	5.3

Source: See Table 4.

After controlling for residence-workplace location and commute mode, there are some remaining differences in commute times worth noting.

Examining differences by poverty status, for each mode choice, non poor whites commute longer than poor whites. This is consistent with our expectations. However, we do not find this pattern among blacks. For those commuting by car, there is very little difference in commute times between non poor and poor blacks. For public transit users, poor blacks frequently have slightly longer commutes than do non poor blacks.

Holding poverty status constant, there remains a difference in commute times across the races. Within each residence-workplace pair, blacks commuting by car travel slightly longer than do whites commuting by car. This is also true for public transit commuters in almost all categories -- always for central city residents. The commute time differences suggest that either residential or workplace options for black households are more constrained than for whites.

Finally, since the AAAS report, there has been increased attention to the spatial concentration and isolation of poverty households (Wilson, 1987, Jargowsky, 1997). Much of this is distinct from transport considerations and the isolation of low income workers from jobs. Instead, the concern is that the poor

increasingly live in neighborhoods with other poor and are isolated from those who are not poor.

Comparing 1970 through 1990 Census data, Jargowsky (1997) found that the number of high-poverty census tracts (with poverty rates greater than forty percent) more than doubled, and that the total number of persons living in such areas also almost doubled (see Table 14). While the majority of poor do not live in these areas, the share who do so has increased from 12 to 18 percent. This increase was not distributed equally among different demographic groups. The concentration of poverty increased principally among the white poor and among the black poor. However, as Table 14 shows, the initial concentration levels of the white and black poor were dramatically different. While the percent of white poor living in high poverty tracts doubled in this time period, only 6.3 percent of white poor lived in areas of concentrated poverty in 1990. For black poor, the comparable number (33.5 percent) is five times as large. By 1990, about a third of the black poor lived in neighborhoods where at least forty percent of their neighbors were also poor.

The increase in the concentration of urban poverty in particular neighborhoods changes those neighborhoods in ways that may affect human capital production -- the quality of schools, the rates of crime, and the availability of role

Table 14
Poverty Rates and Poverty Concentration, 1970-1990

A. Poverty Rate	<u>1970</u>	Year <u>1980</u>	<u>1990</u>
All Residents			
All Persons	10.3	12.4	12.8
White	10.3	9.0	9.0
Black	34.6	29.9	29.1
Hispanic	24.4	23.6	24.7
Metropolitan Residents			
White	7.7	7.4	7.5
Black	28.1	27.0	26.4
Hispanic	21.4	22.6	23.9
B. Percent of Poor Living in Poor Neighborhoods*			
All Persons	12.4	13.6	17.9
White	2.9	3.3	6.3
Black	26.1	28.2	33.5
Hispanic	23.6	19.2	22.1

*Note: Poor neighborhoods are defined as those with poverty rates of forty percent or more.

Source: Paul Jargowsky, **Poverty and Place: Ghettos, Barrios, and the American City**, New York: Russell Sage Foundation, 1997. Tables 2.2, 2.3, and 2.4 based on Census Data From 1970-1990.

models, and so forth. Furthermore, the lower employment levels and the dearth of informal contact with employed people in these neighborhoods undoubtedly creates obstacles for informal job search and acquisition of general labor market knowledge. As noted previously, evidence of the effects of these neighborhoods and spatial factors on labor market outcomes is inconclusive. Nevertheless, their existence would help explain why more recent empirical studies find spatial effects on labor markets. These empirical findings may not arise from improved methodology but rather from the measurement of an increasingly important factor in urban labor markets.

V. The Lessons of Transit Subsidy Policy

At the time of Meyer's initial analysis of transportation and poverty, there were a variety of "demonstrations" or "experiments" underway, seeking to address the imbalance between residential locations of the poor and the sites of potential employment. The AAAS report describes several demonstrations initiated in 1966 and 1967. These experiments and demonstrations were a substantial departure from historical practice. Until 1961, the federal government had played a very minor role in urban transit. Federal transit aid was first authorized in 1961, and capital investment subsidies were first

appropriated in 1965. But only two years later, federal transport policy was seen by some as a way to combat poverty.

The earliest projects were community-based and were focused on improved bus service. For example, one demonstration provided express bus service between the growing industrial parks in Nassau and Suffolk Counties in New York and concentrations of low income populations in Long Beach, Hempstead, Hicksville, and other parts of Long Island close to the central city. Similar experiments using express busses were undertaken in St. Louis, Los Angeles, and Boston, among other places.

The overwhelming consensus is that these projects of the 1960's and 1970's demonstrated only meager success, at best (Meyer and Gomez-Ibanez, 1981, and Altshuler, 1982). As reported by Black (1995), many of the job openings at the suburban destinations of new express bus programs remained unfilled. Minimum wage jobs with no scope for advancement remained unattractive because bus commute times could not be shortened enough to reduce the reservation wages of potential workers. Second, as indicated in the previous section, a more important obstacle to the employment of urban poor and ghetto residents was the lack of skills and education required to qualify for non menial suburban jobs.

A few demonstrations proved to be successful in increasing the employment opportunities of the poor. Ironically, these projects were not financially viable. When experimental programs were successful in helping the unemployed to get jobs, the newly employed workers were likely to use their earnings to buy autos in order to economize on commuting times. Thus, an experiment "successful" in alleviating poverty might have few riders and a larger deficit than other routes serving stable middle-income workers. Maintaining adequate numbers of riders on such reverse commute lines then required the continual recruitment of new riders.

Financial viability was a critical component of the long-run success of these projects. Of the fourteen demonstration projects created in over fifty cities, only three were eventually taken over by local transit operators (Rosenbloom, 1992). However, those demonstration projects which created financially viable routes could not document an appreciable number of new hires among their passengers.

Through the 1970s, a shift in the focus of federal transport policy was evident. The creation of the Urban Mass Transportation Administration (UMTA) in 1968 consolidated the federal role in mass transit. Federal appropriations increased in the 1970s, especially for hardware and capital intensive projects, including BART and the Washington Metro. These were

touted as contributions to the alleviation of poverty, but it is clear that this was not a primary goal.

UMTA funded two reverse commute programs with transit operators at this time. Neither of these programs catered to the urban poor. However, these projects demonstrated the financial viability of reverse commute programs -- where there is pre-existing demand (Rosenbloom, 1992). Other more recent projects, initiated in response to employer requests (and the initial subsidies from employers) further document this point. However, even under these conditions, many projects fail to cover their marginal costs of operations. So, while there have been some successful efforts at improving reverse commuting options, these projects have not been oriented exclusively on improving inner city employment. Rather, they have generally focused on providing transportation for those already employed.

More recent reverse commute programs have taken a much wider range of forms. Those specifically focused on inner-city employment were generally sponsored by private non-profit agencies in a variety of forms (i.e., social service agencies, tenant management associations), or public non-transit agencies (frequently agencies directly focused on inner-city employment problems). In a study of these projects through the early 1990's, Rosenbloom (1992) reiterates that, as discovered

earlier, transport is not the only or perhaps even the primary obstacle to employment.

A collection of factors impedes the employment of inner city residents in the suburbs, most notably: skill mismatch, unwillingness of firms to hire this workforce, unwillingness of firms to subsidize their commutes, workers' unwillingness to commute these distances for low wages, and the continuing need for support services such as day care.

Those programs succeeding in increasing employment did not merely improve transport access. Rather, transportation was one component in a package of services. And the transportation provided was generally transitional. Establishing a financially viable permanent transportation system was usually not an objective of the program.

One example of this comprehensive approach to job access is provided by the Public-Private Ventures' "Bridges to Work Program," located in several cities around the nation. Participants are provided counseling and assistance with job search, and the program emphasizes creative locally-designed interventions to meet transportation needs. These more comprehensive approaches are still in their infancy.

The Gatreux project in Chicago started in 1976 provides experimental evidence on the importance of transportation policy. In response to a consent decree arising from a housing

discrimination case, thousands of central city public housing residents were placed in publicly subsidized private housing, both inside Chicago and in its suburbs. Residents who qualified for the program were offered the first housing units available, so the sorting across city and suburbs did not arise from self-selection. In their analysis of outcomes a decade later, Rosenbaum and Popkin (1991) found higher employment rates among those who had moved to the suburbs, even though there were no observable differences between the groups prior to the move.

In follow-up interviews, residents cited the availability of jobs as the major factor boosting their employment. Neighborhood factors, including changes in safety and motivation, were also stressed. Despite the improved employment outcomes, respondents still cited lack of transportation and labor market discrimination as continuing obstacles. This program is currently being replicated and evaluated in ten cities nationally.

Finally, auto ownership is one manifestation of the complicated role that transportation plays in the life of the poor. In their survey of lower skilled workers in the Detroit area, Farley et al., specifically focused on job search patterns. They found systematic differences in the search patterns of the unemployed who owned cars compared to the unemployed who did not. Those with cars searched for work over

a wider range of areas, and these differences affected the type and quantity of job opportunities discovered. Differences in auto ownership seem to have affected success in a recent program designed for non custodial fathers of welfare recipient children. Participants in the program were provided job and training assistance. The Manpower Demonstration Research Corporation's (MDRC) analysis of attrition concluded that car ownership was an important prerequisite to participation in the program and to successful labor market outcomes.

VI. Conclusion

The 1968 report organized by John Meyer focused systematic attention on the link between inadequate transportation and urban poverty. The evidence accumulated in the past three decades reinforces those insights about the effects of urban space upon employment outcomes and incomes. A variety of cross-sectional analyses based on aggregate census data and, more recently, upon micro data on individual workers has sought to quantify the importance of these linkages. As with most social science research, more sophisticated analyses of access and employment reveal more complexities and ambiguities in their effects.

Our own assessment of this literature is that it establishes that limitations on the access provided to low income and minority workers affect labor market outcomes in a significant way. The literature based on the behavior of adults in the labor market is equivocal in its quantitative conclusions and is, for technical reasons (i.e., sample selectivity) more ambiguous in its interpretation. For this reason, we are more persuaded by more recent micro analyses based on the behavior of youth. Our conclusion about the strength of the link between transport access and poverty is more confident than that put forward by Jencks and Mayer (1990), but their assessment was made before much of the research on teenage employment was available.

In the thirty years since John Meyer's report, all the trends suggest that the access to employment enjoyed by poor and minority households has declined. Jobs have continued to decentralize -- much faster than the suburbanization of the low income population. Low-skill jobs in particular are now less available in central city locations. Documentation of most of these trends is only available through 1990, but there is no reason to expect that these trends have been disrupted.

Notwithstanding these trends, and the importance of transportation, it is worth noting that other factors are more important in affecting the employment of low income and minority

workers. Education, training, skills, and the overall health of the economy are all more important in affecting the labor market outcomes of disadvantaged workers than is transportation or access *per se*.

Finally, many of the most important policies to improve the labor market access of disadvantaged workers may not be transportation policies at all. Policies directed towards the elimination of obstacles to the construction of low cost housing in the suburbs and policies which enforce more vigilantly equal opportunity in the housing market may be more effective than policies emphasizing the daily movement of people in urban areas.

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