

Travel and Transportation Impacts of Urban Gentrification: Chicago, Illinois Case Study

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Authors:

Emily R. Kushto, P.E.
Ph.D. Candidate
Department of Civil and Environmental Engineering
Northwestern University
Evanston, IL 60208
e-kushto@northwestern.edu
Phone: 847-491-5164
Fax: 847-491-4011
(Corresponding author)

Joseph L. Schofer, Ph.D.
Professor
Department of Civil and Environmental Engineering
Northwestern University
Evanston, IL 60208
j-schofer@northwestern.edu
Phone: 847-467-8795
Fax: 847-491-7300

ABSTRACT

Gentrification - the process in which higher income (and often younger) households displace lower income residents of a city neighborhood - has been occurring in many urban neighborhoods over the last few decades. This process changes the demographics, and often the essential character, of the neighborhood. As a result, we can expect it to change neighborhood travel characteristics and transportation requirements. This work uses multi-year Census (aggregate) data and (disaggregate) travel survey information to examine gentrification in a sample of Chicago, Illinois neighborhoods to find out how mode choice, vehicle ownership, and travel are affected by gentrification.

The aggregate results show that geography of gentrification changed over the twenty years from 1980 to 2000: the gentrified census tracts between 1990 and 2000 were closer to the center of the city compared to non-gentrified census tracts, while gentrified and non-gentrified tracts were about the same distance from the center between 1980 and 1990. The gentrified group used public transit to work more even though they had about the same number of cars as the non-gentrified group. Households showing signs of gentrification that have lived at their current location between 1 and 2 years have lower vehicle miles of travel (VMT) than the non-gentrified households that have been at their current location for the same amount of time, while gentrifying households that have been in their current location more than 2 years consume about the same VMT as the non-gentrified households.

This analysis suggests that the gentrification process, and its participants, have changed over the last twenty years. There is at least a modest trend toward less auto dependence for more recent gentrifiers, and so the opportunity to reduce auto dependence may have become a more important force in this process. However, longer tenure at central locations seems to be associated with increasing auto dependence. This may suggest that transportation benefits of gentrification are not stable over time as a consequence of many other factors occurring in and outside of the household.

INTRODUCTION AND OBJECTIVE

Gentrification - the process in which higher income (and often younger) households displace lower income residents of a city neighborhood - has been occurring in many urban neighborhoods over the last few decades. This process changes the demographics, and often the essential character, of the neighborhood. As a result, it also changes neighborhood travel characteristics and transportation requirements. This work uses multi-year Census household travel data, as well as data from a recent household travel survey, to examine gentrification in a sample of Chicago neighborhoods to find out how mode choice, vehicle ownership, and vehicle miles traveled are affected by gentrification, and to guide policy making about gentrification and associated transportation services.

The travel and transportation implications of gentrification were isolated by analyzing characteristics such as household vehicle ownership and means of transportation to work. Chicago, Illinois was the focus of this research because it had a well-established and stable public transportation service at the start of the study period, thus eliminating confounding effects that might be caused by the introduction of major transit improvements.

Most of the previous studies of gentrification and transportation have examined how transportation affects gentrification. This paper examines the association from the opposite perspective: how gentrification affects travel and transportation. It identifies neighborhoods in Chicago that were gentrified over time, as well as gentrifying households, and contrasts them with non-gentrified areas and households.

LITERATURE REVIEW

There are various definitions of gentrification dating back to the first use of the term in the early 1960s by Ruth Glass, who used it to describe the phenomena of the working class being displaced by the middle class and the changing of the social character of many London districts (1). According to the 1980 Oxford American Dictionary, gentrification is the “movement of middle class families into urban areas causing property values to increase and having [the] secondary effect of driving out poorer families”.

Few reports have studied the relationship between gentrification and travel behavior. In an unpublished study done at Rutgers University, Kim found a link between gentrification in Williamsburg-Greenpoint, Brooklyn and an increase in public transit use and commuting time as higher income individuals moved into the area and commuted to Manhattan for work (2).

A previous study of gentrification in Chicago reviewed the period between 1975 and 1991 and examined the percentage change in land values as evidence of gentrification (3). It found evidence that property closer to transit stations increased in value more than properties further away and interpreted that transit access was a stimulus to gentrification in these areas.

Danyluk and Ley (4), studying gentrification in Canadian cities, focused on transport mode for journey to work, and hypothesized that gentrified groups would prefer non-automobile modes. However, their results were mixed. Although gentrified districts showed an affinity to cycling to work, residents in many gentrified districts used public transportation less than those in non-gentrified districts and in some of these areas automobile commuting was used more than all other modes.

The present study looks at both directions of the transit and gentrification relationship: it examines both the relationship of gentrification to transit access and, like

Danyluk and Ley, it assesses travel characteristics, specifically mode to work, vehicle ownership, work place location, and work trip travel time for the gentrified areas.

Brian J. L. Berry identified several characteristics that revitalized, or gentrified, neighborhoods have in common (5). In a study of the transition of Boston's South End, Berry reported that about half of the revitalized community was composed of younger couples with the average age significantly lower than the prior residents. He found that the attributes of a gentrifying area included high-income neighborhoods that have a high proportion of childless households, unmarried adults, and higher education levels. Gentrification leads to a decrease in vacancy rates, increases in property values, and a displacement of renters. These observations can be grouped into two sets: measurement of changes in market activity (price changes, renovations, building permits, and sales); and measurement of changes in household status (size, education, income, etc.) (6).

AGGREGATE ANALYSES: DATA AND METHOD OVERVIEW

This study evaluated gentrification and travel characteristics using both aggregate and disaggregate data. Data for the aggregate research was from three latest decennial censuses, 1980, 1990, and 2000. All data were obtained at the tract level, a unit of geography composed of block groups and designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions at the time of establishment.

The study examined all of the census tracts in Chicago, Illinois. Because tract boundaries sometimes change between census years, 2000 tracts were used and GeoLytics Neighborhood Change Database software (7) was used to allocate the data from other census years to the 2000 census boundaries.

***A priori* classification variable selection**

Census tracts that showed characteristics of gentrification between the years 1980 and 1990 and between the years 1990 and 2000 were identified using an *a priori* classification. Based on Berry's work and other literature, census tracts that exhibited all of the following four traits were classified as going through gentrification during the time interval¹:

1. **Aggregate family income.** The census provided the aggregate family income for the year prior to the census year. To enable comparisons between different census years, all incomes were adjusted to the 1999 dollars using the US Bureau of Labor Statistics' consumer price index (CPI). Expectation: gentrified zones will show greater income growth than non-gentrified zones.
2. **Percentage of rental units.** This was calculated using total number of renter-occupied housing units and total number of housing units for each tract and each census year. Expectation: gentrified zones will show a decreased percentage of rental units.
3. **Percentage of families with children.** This was calculated using the total number of families and subfamilies with own children and total number of families and sub

¹ It is important to note that gentrification is a symmetrical process; when higher income households move in, lower income households are displaced. The census data only shows who is in the tract, not who has moved out and is not there. This study evaluates the households that are in the tracts and does not examine who is displaced due to gentrification.

families for each tract and each year. Expectation: gentrifying places will show a decreased number of families with children.

4. **Percentage of adults who have a bachelors or graduate/professional degree.** This was calculated using total number of persons 25+ years old who have a bachelor or graduate/professional degree and total persons 25+ years old for each tract and each year. Expectation: gentrified zones will have increasing education levels.

This method resulted in 35 of the 875 Chicago census tracts being classified as gentrifying between 1980 and 1990, and 92 census tracts classified as gentrifying between 1990 and 2000. Figure 1 shows the distribution of these gentrified areas.

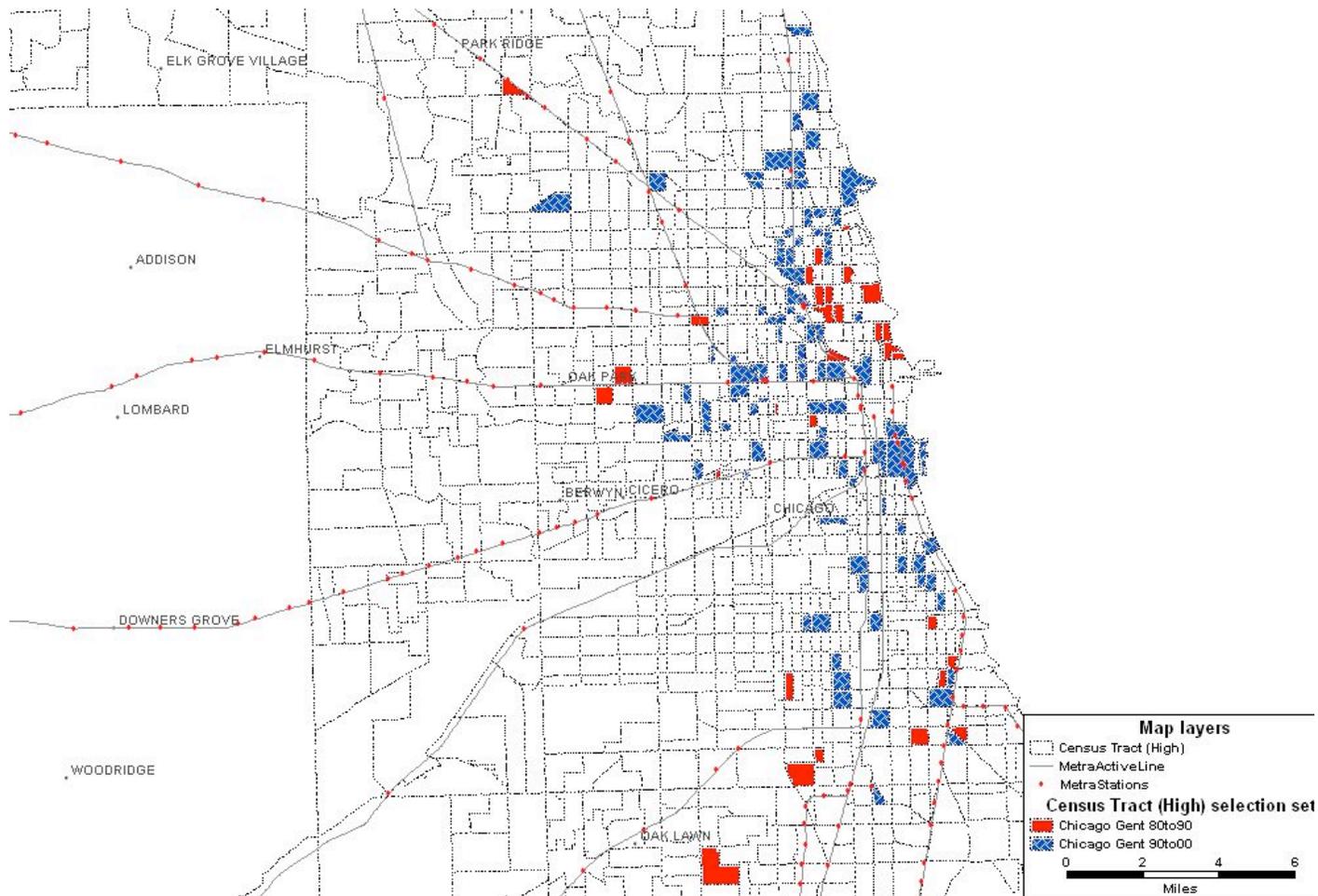


FIGURE 1 *A priori* defined gentrified census tracts in Chicago.

DISAGGREGATE DATA AND METHOD OVERVIEW

This study also used data from a household travel survey conducted in 2007 and 2008 for the Chicago Metropolitan Agency for Planning (CMAP) (8). Although the survey focused on households in the Chicago metropolitan areas, including 6 Illinois counties and parts of

Indiana, only the data from the 2,572 Chicago households surveyed for CMAP were used for this analysis. The survey included demographic and travel characteristics such as trip purpose, mode, origin, and destination. The origin and destination information for all of the daily trips was used to calculate straight-line vehicle miles traveled (VMT). Since Cook County's road network is primarily a grid, the actual road distance is arguably linearly related to straight-line distance and thus it was reasonable to use this VMT measure.

***A priori* classification**

Similar to the method used to classify gentrified areas at the aggregate level, households that contribute to gentrification of a neighborhood were identified by four traits:

1. Lived at current location less than 10 years.
2. Own their residence.
3. Household income was 25% above the survey's median income.
4. All adult respondents have a college degree.

Using these criteria, 160 of the Chicago households in the survey were classified as contributing to gentrification.

ANALYSIS AND RESULTS

Gentrification Geography, vehicle ownership, and mode of travel to work

The gentrification geography changed between the two decades: between 1980 and 1990, the gentrified and non-gentrified tracts were about the same distance from the center of the city, but between 1990 and 2000 gentrified tracts were closer to the center of the city.

This study looked at percentage of households with no vehicle, as shown in Table 1, to answer the question, do households in areas that go through gentrification have more cars than those in areas that do not go through gentrification? Surprisingly, the answer is no. During both time periods, the difference between these measures was not significant.

Despite similarity in vehicle ownership, the gentrified residents used public transportation to work more than non-gentrifiers. Distances to the closest rail station (Chicago Transit Authority rapid transit and Metra commuter rail) for the gentrified and non-gentrified tracts were not significantly different for either time period.

TABLE 1 Relationships between gentrified and non-gentrified census tracts within Chicago.

Within Chicago:	Distance to Downtown Chicago		% of Workers taking Public Transit to Work		% of HH's with no Car	
	Gent	Non-Gent ²	Gent	Non-Gent	Gent	Non-Gent
1980 to 1990	0.9	1.0	36.2%	30.3%	36.1%	38.4%
1990 to 2000	0.5	1.0	34.1%	24.9%	32.5%	34.0%

² A random sample of non-gentrified tracts was used as for comparison to assure that the number of gentrified and non-gentrified tracts was approximately equal. This was necessary because there were many more non-gentrified tracts. The same sample tracts were used for 1980-1990 and 1990-2000 comparisons.

Relationship between gentrifying households and Vehicle Miles Traveled (VMT) by Mode

At the disaggregate level, the longer gentrifying households have lived in their current location, the more auto VMT they consume (see Figure 2). However, residents who have been in their current location for less than a year have the highest auto VMT, perhaps because they cannot immediately adjust their travel patterns to the new location. Figure 2 also shows that gentrifying households that have lived in their new locations longer tend to consume less transit VMT. This could be a result of changes in family cycle (maturation). To test this, demographic characteristics of the gentrifying households were examined across tenure periods, but no significant demographic changes were found in available data. Alternatively, because we are looking at cross sectional data, the observed VMT pattern may indicate that more recent gentrifiers are relocating for a different reason – perhaps putting greater emphasis on reducing reliance on the automobile.

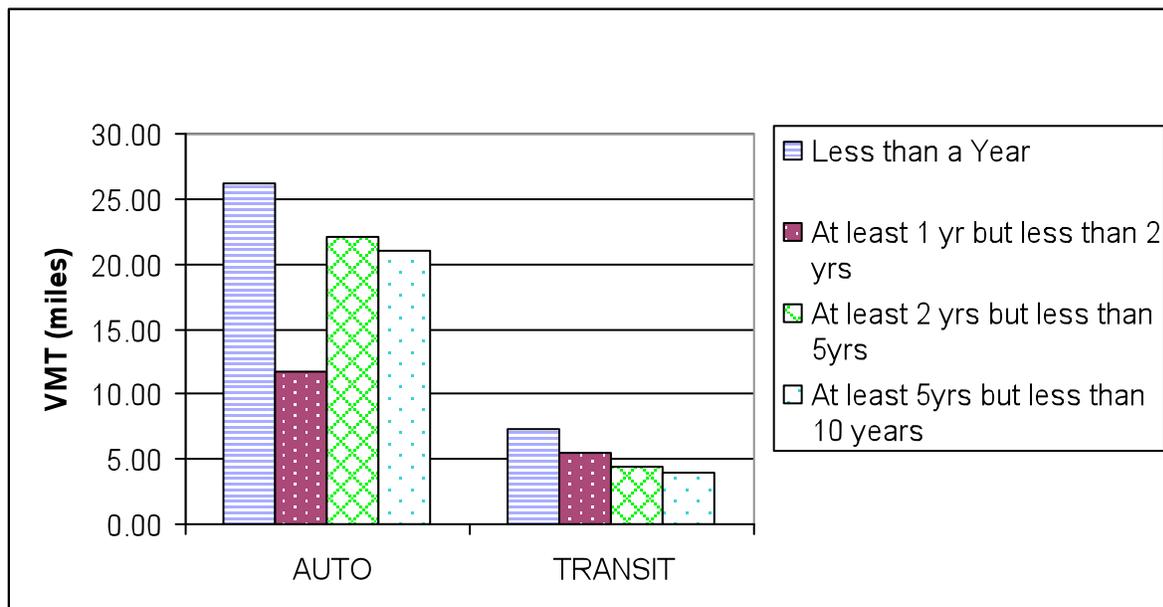


FIGURE 2 Gentrifying households and their VMT by mode versus length of stay at current location.

Figure 3 compares the auto VMT for gentrifying and non-gentrifying movers across tenure periods. Gentrified households that have been at their current location between 1 and 2 years consume fewer auto VMT than non-gentrified households; gentrified households that have been at their current location for a short time period (less than a year) have more auto VMT than non-gentrified households; and gentrified households that have been at their current location the longest (2 to 10 years) have approximately the same auto VMT than non-gentrified households.

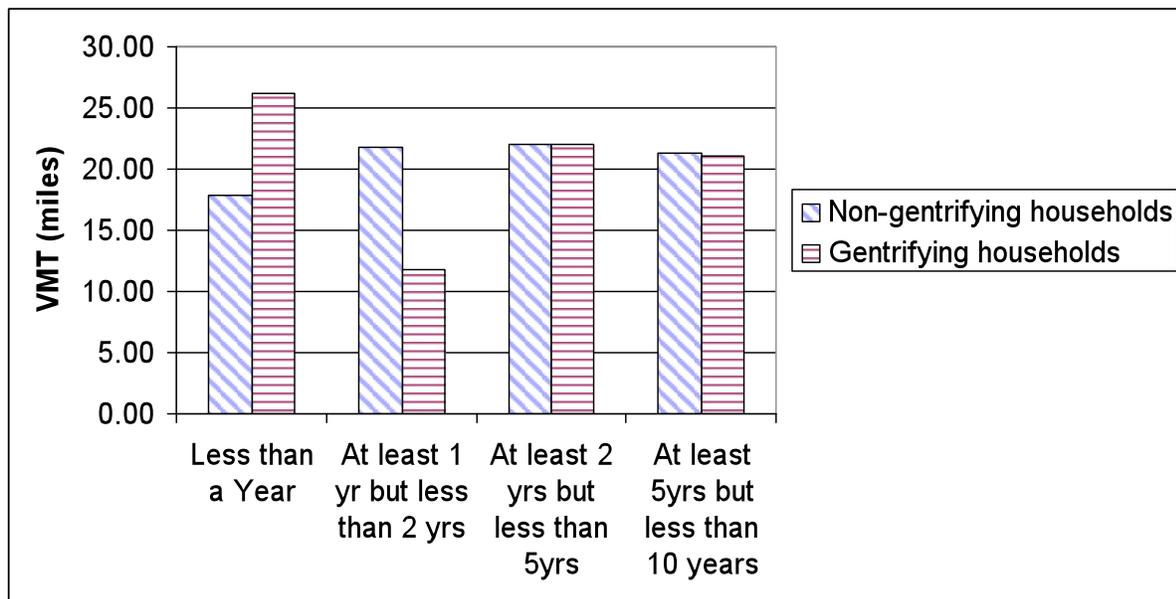


FIGURE 3 Auto VMT for gentrifying and non-gentrifying households versus length of stay at current location.

Relationship between gentrifying households and mode choice by trip purpose

The result of mode choice is analogous to the VMT finding: the longer gentrifying households have lived in their current location, the more they choose auto for their work and shopping trips (see Figure 4). An exception to this is shopping trips for households that have been at their current location between 2 and 5 years. They have the lowest auto VMT for shopping trips compared to the gentrified households who have been at their current location for all other time periods. Gentrifying residents at their current location between 1 to 2 years use transit the least for work trips.

Because these cross sectional data show different waves of in-migrating gentrifiers, these results suggest that new gentrifiers may be choosing to relocate to reduce their auto dependence.

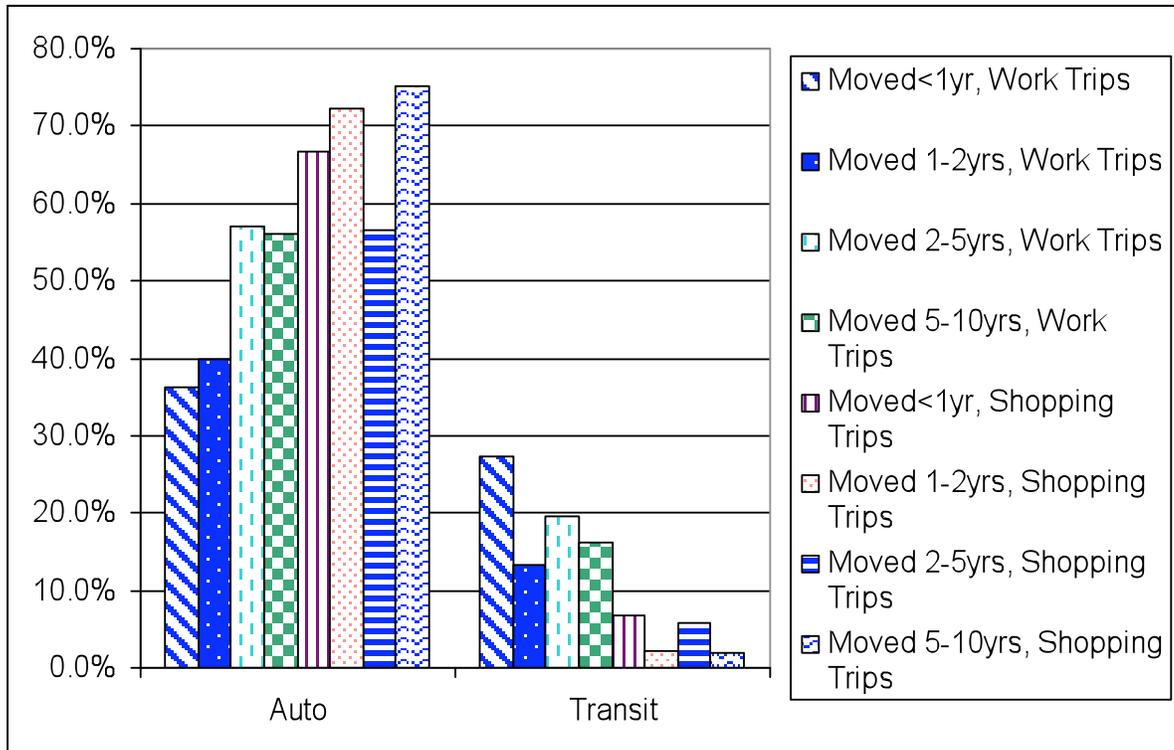


FIGURE 4 Gentrifying households and their mode choice versus length of stay at current location and trip purpose.

CONCLUSION

The relationships above describe gentrification in Chicago from 1980 to 2000 and how it relates to travel characteristics. Both geographic and travel characteristics associated with gentrification have changed over that period. More recently gentrification has been occurring in census tracts closer to the center of the city, where densities are higher. Gentrification was associated with changes in transportation characteristics such as mode choice to work, and work place location but not vehicle ownership. During the two decades examined here, residents of gentrified tracts relied more heavily on public transit to commute to work than those in non-gentrified tracts, even though both had similar vehicle ownership levels. Access to public transit did not effect the locations of gentrified tracts since the distances to transit stations was not significantly different for gentrified and non-gentrified tracts for either time period. This analysis suggests that the gentrification process and its participants have changed over the last twenty years, and the opportunity to reduce auto dependence may have become a more important force in this process.

At the household level, both VMT and mode choice shift when these travel characteristics are viewed in terms of length of stay in a new location. Recent movers showed less auto dependence after about one year of adaptation, but auto use rebounded over time in a location: after two years in place, a majority of the gentrifying households traveled the same amount of miles by car as did non-gentrified households. This pattern may reflect the general (secular) decline in transit usage over the years due to several factors, including the

shift of work locations away from the central city, as well as some degradation of transit service as a result of funding limitations. Because the data represent a cross section of household, this pattern may also reflect increasing motivation to (re)locate to reduce auto dependence.

Thus, while there appear to be some important transportation benefits of gentrification, as well as a trend for households to seek out those benefits through gentrification, these patterns may not necessarily be stable over time as a consequence of many other factors occurring in and outside of the household.

Acknowledgement and Disclaimer

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