Gulf Coast Research Center for Evacuation and Transportation Resiliency

LSU / UNO University Transportation Center

Worker Experiences of Accessibility in Post-Katrina New Orleans

Final Report

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Performing Organization
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GULF COAST RESEARCH CENTER FOR EVACUATION AND TRANSPORTATION RESILIENCY

The Gulf Coast Research Center for Evacuation and Transportation Resiliency is a collaborative effort between the Louisiana State University Department of Civil and Environmental Engineering and the University of New Orleans' Department of Planning and Urban Studies. The theme of the LSU-UNO Center is focused on Evacuation and Transportation Resiliency in an effort to address the multitude of issues that impact transportation processes under emergency conditions such as evacuation and other types of major events. This area of research also addresses the need to develop and maintain the ability of transportation systems to economically, efficiently, and safely respond to the changing demands that may be placed upon them.

Research

The Center focuses on addressing the multitude of issues that impact transportation processes under emergency conditions such as evacuation and other types of major events as well as the need to develop and maintain the ability of transportation systems to economically, efficiently, and safely respond to the changing conditions and demands that may be placed upon them. Work in this area include the development of modeling and analysis techniques; innovative design and control strategies; and travel demand estimation and planning methods that can be used to predict and improve travel under periods of immediate and overwhelming demand. In addition to detailed analysis of emergency transportation processes, The Center provides support for the broader study of transportation resiliency. This includes work on the key components of redundant transportation systems, analysis of congestion in relation to resiliency, impact of climate change and peak oil, provision of transportation options, and transportation finance. The scope of the work stretches over several different modes including auto, transit, maritime, and non-motorized.

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16. Abstract: Existing research has identified transportation challenges that low-income workers face, including a spatial mismatch between suburban entry level-jobs and urban low-income workers. These studies rely on travel models and secondary data and thus may not capture the temporal or other constraints that low-income workers experience. To better understand mobility patterns and accessibility as experienced, this analysis considers commute choices and perceptions of accessibility. Findings are based on open-ended surveys with 50 low-income workers in New Orleans and its inner suburbs. According to a sizable share of respondents (40%), transportation problems do not preclude applying to jobs. Black and centrally located respondents most commonly did not perceive transportation as a limitation to job opportunities. On the other hand, many respondents did describe an inability to get to suburban job opportunities. Even when missed job opportunities were not reported, almost all respondents cited transportation problems for some locations or activities, especially shopping. Losing a functional automobile was a common reason to change commute mode after Hurricane Katrina, indicating that low-income workers may shift in and out of car ownership, as well change home and job locations. A few respondents— mostly active mode users—were highly satisfied with their journey to work. Interviewees most commonly desired increased frequency and reliability as critical transit improvements. The mixed findings on perceived job accessibility demonstrate the need to better integrate transportation and workforce research and policy. In addition, more transportation research work on perceptions and actual challenges is needed, including the role of time in workplace demands and physical accessibility. Finally, given dynamic auto ownership status, jobs, and residential patterns, longitudinal study is needed.

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Executive Summary

The ability to reach job opportunities is critical but can be challenging for low-income workers. While nationally the majority of low-income workers drive to work, they are more likely than other groups to rely on carpooling, walking, and public transit. Existing research has identified a spatial mismatch—between entry level-jobs and low-income workers. Studies of entry-level worksites and residential patterns typically utilize travel models and gross job counts and may not capture the temporal or other constraints that low-income workers experience. To better understand mobility patterns and experienced—rather than modeled—accessibility, this study examines commute choices and perceptions of accessibility. New Orleans provides an especially interesting case, especially given the dramatic decrease in transit service levels. Thus, in addition to interviews, the study considers census data on commute mode change. Specifically, the study addresses the following four questions:

1. What factors affect low-income workers' commute behavior, especially mode choice?

2. How has the commute behavior of low-income workers changed since Hurricane Katrina?

3. What accessibility limitations do low-income workers identify?

4. What transportation changes are most important to this workforce?

Findings are based on surveys with 50 low- and moderate-income workers (earning approximately 50% or less of the area median household income) in the core of the New Orleans metropolitan area. A survey, primarily with open-ended questions, was administrated to participants. Participants were recruited through a variety of methods (online, social service provider, advocacy groups, etc.). To qualify, participants had to travel to work by any mode other than drive alone, not be a full-time student, and earn $25,000 or less annually. The resulting data provides a cross-section of perspectives and insights. It is not intended to be a representative, random sample. Census data on journey to work was reviewed, but observations are not conclusive due to margins of error and changes in methodology.

Results showed some variance by race, with blacks especially likely to ride the bus and Latinos to carpool, aligning with existing quantitative studies. Travel time varied by mode and racial group. Active mode users more frequently described their commute mode as convenient, while bus riders were most likely to report mode usage was due to a lack of choice. There may be spatial patterns to perceived choice in mode usage, as centrally located workers were less likely to report a lack of mode choice.

The largest shift in commute behavior appears to be a reduction in transit share, although some respondents formerly drove alone and now use transit. Census data shows that across

categories a greater share of workers are driving alone and a smaller share are using public transit. Because the survey sample did not include drivers, this study does not have data on the shift to drive alone (which could also be due to changes in the base population rather than change in commute behavior of those residing in the city). Among those respondents who shifted modes after Katrina, losing a functional automobile was a common reason to change modes. Only some of the automobile losses were due to the storm, indicating that low-income workers may shift in and out of car ownership, as well as change home and job locations.

Despite the spatial mismatch hypothesis, transportation problems do not preclude applying to jobs according to a sizable share of respondents (40%). Black and centrally located respondents most commonly did not perceive transportation limitations for job opportunities. When missed opportunities were reported, most jobs opportunities were in the suburban job growth corridors, as the spatial mismatch theory would predict. Even when missed job opportunities were not reported, almost all respondents reported transportation problems for some locations or activities, especially shopping.

Workers most commonly reported a motorized vehicle would improve their commute. A few—especially active mode users—did not identify needed improvements for their trip to work. Interviewees most commonly identified increased frequency (sometimes described as "more buses on the line") and reliability of service as desired transit changes.

Findings have important implications for future research and for local policymakers. This study contributes to nascent knowledge on how low-income workers perceive and experience accessibility and mobility in cities. The dynamic locations of employment and residence, as well as car ownership status, demonstrate that static models do not reflect the life circumstances of low-income workers. Research should explore whether racial differences persist in perceived access to jobs. What role does location, race and knowledge of job opportunities play? More work on perceptions and actual challenges is needed, including the role of workplace time constraints. Given dynamic job locations, residential patterns, and auto ownership status, further longitudinal study is needed.

Locally and regionally, some interviewee priorities do align with recommendations in a recent transit operations report (Nelson\Nygaard Consulting Associates Inc., 2012). The mixed findings on perceived job accessibility demonstrate the need to better integrate transportation and workforce programs and policies. Many respondents suggested car ownership is what would improve their commute, a potentially controversial policy intervention. Policy responses should account for—not necessarily support—the stated desire for automobile access. Further research could examine which inaccessible services and time burdens most greatly contribute to the appeal of automobiles for low-income households. For transportation research, findings supplement quantitative analyses that show that central city locations have accessibility advantages within metropolitan areas.

Abstract

Existing research has identified transportation challenges that low-income workers face, including a spatial mismatch between suburban entry level-jobs and urban low-income workers. These studies rely on travel models and secondary data and thus may not capture the temporal or other constraints that low-income workers experience. To better understand mobility patterns and accessibility as experienced, this analysis considers commute choices and perceptions of accessibility. Findings are based on open-ended surveys with 50 low-income workers in New Orleans and its inner suburbs. According to a sizable share of respondents (40%), transportation problems do not preclude applying to jobs. Black and centrally located respondents most commonly did not perceive transportation as a limitation to job opportunities. On the other hand, many respondents did describe an inability to get to suburban job opportunities. Even when missed job opportunities were not reported, almost all respondents cited transportation problems for some locations or activities, especially shopping. Losing a functional automobile was a common reason to change commute mode after Hurricane Katrina, indicating that low-income workers may shift in and out of car ownership, as well change home and job locations. A few respondents— mostly active mode users—were highly satisfied with their journey to work. Interviewees most commonly desired increased frequency and reliability as critical transit improvements. The mixed findings on perceived job accessibility demonstrate the need to better integrate transportation and workforce research and policy. In addition, more transportation research work on perceptions and actual challenges is needed, including the role of time in workplace demands and physical accessibility. Finally, given dynamic auto ownership status, jobs, and residential patterns, longitudinal study is needed.

1.0 Introduction

Access to jobs is one of transportation's most important benefits, but traveling to employment locations can prove challenging for low-income workers. Efforts to improve job accessibility emphasize mass transit for reverse commuting, in part due to the influence of the spatial mismatch hypothesis. Blumenberg (2002) argues that such programs have limited benefits for low-income women, whose employment choices reflect household and other responsibilities. Furthermore, travelers may have fixed-location or time-constrained activities, in addition to home and work, that limit the opportunities available to them (Schwanen, Kwan, & Ren, 2008). Transportation researchers and policymakers can develop a more nuanced understanding of job accessibility, drawing both on space-time measures (Schwanen, Kwan, & Ren, 2008) and exploratory research on the experiences of low-income workers and household mobility (Boschmann, 2011; Clifton, 2004). Based on survey interviews with low-income workers, this research examines the perceived accessibility and mobility choices of low-income workers in New Orleans, including attention to changes in commute behavior after Hurricane Katrina.

This research finds that perceived accessibility differs substantially from spatial mismatch hypothesis. Contrary to much of the policy emphasis on physical accessibility, a substantial share of workers did not report that they missed job opportunities due to transportation challenges, but white respondents were more likely to report missed opportunities due to transportation limitations. Respondents did frequently report limited ability to reach retail, social and recreational opportunities. Across categories a notable share of interviewees reported "choosing" their mode of travel due to a lack of choice. The majority of residents who lived in the metropolitan area prior to Katrina had since switched modes, with the largest number shifting from driving alone. While some reported losing cars to the storm, others reported loss of automobiles due to other factors. Changes in automobile ownership, as well as new home and work locations, demonstrate the need to understand automobile ownership, along with sites of work and home, as dynamic. Each has a potentially strong effect on accessibility and mode choice. Findings are based on semi-structured interviews with low-income workers, who travel to work using a mode other than a single-occupant vehicle. The next section describes existing research on accessibility and low-income workers. Following that, the report describes research methods and finding.

2.0 Existing Research

2.1 Transportation and Job Accessibility

Much of the research and policy dialogue about job access for low-income workers has revolved around the spatial mismatch hypothesis proposed in the 1960s. According to Kain's (1968) spatial mismatch hypothesis, unemployment and low earnings among African Americans was a result of job growth in suburban locations, coupled with the housing market discrimination that kept African Americans living in central cities. Transportation between jobs and people has become the near-term solution, at least when compared to other strategies to address the presumed spatial mismatch—central city job development and the dispersal of low-wage workers to suburban residential locations (Blumenberg & Waller, 2004).[1]

Recent work (Hess, 2005; Grengs, 2010) has focused on accessibility to job opportunities, rather than simply the location of jobs, workers, and the distance between them. Distance has some connection to but does not solely determine the accessibility of job opportunities. Rather, transportation infrastructure, transit service and mode availability, along with the built environment and urban form, determine whether a worker can get to a specified location and the travel time and other costs of such a trip. Most studies—and empirical analyses for plans—count the number of skill- or wage-appropriate jobs within a certain travel time from neighborhoods with high shares of low-income residents. The measures for employment opportunities and techniques vary by study and so do findings (See Hess, 2005, p. 1179 for a summary of findings by metropolitan area and study). For example, Hess (2005) measures the number of low-wage jobs within 30 minutes travel time from concentrations of low-income workers in the Buffalo and Niagara Falls metropolitan statistical area. He finds significant job access variability among locations within the metropolitan area, but despite job decentralization, central city locations can offer robust accessibility to jobs. Likewise, in a critique of the spatial mismatch hypothesis and related policy interventions, Blumenberg observes: "Despite decades of increasing suburban employment growth, most central cities still host large shares of employment that are well suited for low-wage female workers" (2004, p. 271, emphasis added).

Private automobiles generally increase accessibility, due to their typical speed and the temporal and spatial flexibility they provide. Even in the transit-rich San Francisco Bay Area, Kawabata and Shen (2007) found substantial difference in job accessibility by car and by transit, though accessibility varied by location within the metropolitan area. Commuters from locations with low accessibility generally experience longer commutes, especially when traveling by transit.

[1] Some, like Chapple (2006), however, propose a different strand of policy focused on social networks and employment intermediaries.

Grengs (2010) identifies the importance of mode when determining accessibility levels, observing a "striking" magnitude of difference between transit- and auto-based accessibility (p. 49). He finds that central city locations offer the best access to jobs, but this "superior" access is contingent on car ownership. He argues that based on the "more refined concept of job accessibility…even Detroit no longer fits with our conventional spatial mismatch understandings…The inner-city is not disadvantaged by its geographic position in regional space" for job access (p. 52). Rather, residents of the central city are disadvantaged if they do not own automobiles and thus face a "modal mismatch." While identifying poor transit as a barrier to accessibility, he joins Blumenberg's (2004) call to support auto ownership for low-income workers.

To date, studies have found a stronger relationship between employment and automobile ownership than between employment and transit access. In a study of six regions, Sanchez, Shen and Peng (2004) find "virtually no association" between transit access and employment of welfare recipients. Ong (1996) and Raphael and Rice (2002) do, however, find a strong relationship between automobile ownership and employment outcomes. Gautier and Zenou (2002) attribute the lower wages and higher unemployment of minorities to an initial difference in wealth that enables whites to buy cars. Car ownership "improves their [white low-wage workers] bargaining position and results in higher wages and lower unemployment rates" (p. 398).

Despite these studies, the most common transportation solution for job access has been increased transit to suburban jobs. Created by Congress in 1998, the Job Access and Reverse Commute (JARC) program provided 50-80 percent funding for local projects and programs to improve workforce mobility. In 2012, a major transportation bill ended the program but allowed some use of formula funds by transit agencies to serve the same goals. How innovative such transportation initiatives are depends on grassroots and institutional support (Sandoval, Petersen, & Hunt, 2009). Evidence of JARC impacts and success is limited, perhaps due to workers buying cars when their earnings increased. The reverse commute focus of many initiatives, however, is inappropriate for the demands and preferences of low-income households that are headed by single mothers (Blumenberg, 2004). Blumenberg's critique of such programs and descriptions of the travel needs of single, low-income mothers demonstrates the complexity of time and space demands. Whether faced by primarily modal or spatial obstacles, the actual, experienced accessibility and mobility of individual low-income workers is not well-understood.

2.2 Individual Accessibility, Choice, and Constraints

Policy interventions and research relying on zone-based assessments have significant limitations and may fail to capture accessibility, as low-income workers experience it. This section describes the limitations of zoned-based accessibility measures, alternative measures, and then emerging qualitative findings on the constraints and adaptations that low-income travelers make.

Practicing planners and most researchers use area spatial units (zones) to measure accessibility to employment and other key locations. Analysts first identify zones or areas with high shares of low-income residents or working poor. These geographic units or zones may be based on census block groups or tracts, traffic analysis zones, or municipal and neighborhood boundaries. Models then incorporate a proxy for the location of opportunities, commonly the locations of low-wage jobs, health care facilities, parks, or schools. Next, using traffic models, researchers measure the number of opportunities accessible in a certain travel time (e.g. 30 minutes, one hour), by various modes (e.g. walking, transit, and/or automobile). The results of such analyses are typically the number of opportunities (e.g. low-wage jobs, health care facilities or schools) available within a fixed travel time, from the low-income and minority zones. Some MPO equity analyses (see CTPS, 2009 and MTC, 2009) compare opportunities available from these zones to the number available from more affluent neighborhoods or the region as a whole.

Zone-based measures, however, may not accurately capture individual accessibility. Accessibility of jobs varies substantially for individuals, even within small-scale zones, depending on access to automobiles or other individual characteristics. Weber and Kwan (2002) suggest that individual factors matter more than distance: "the role of distance…appears to be quite limited relative to variations in individual travel behavior, mobility offered by the street network, and the location and size of activity opportunities" (2002, p. 227).

Overall accessibility may be far more limited than models indicate, because models do not incorporate time of day. Weber and Kwan (2002) find reduced accessibility in a model that incorporates peak-period congestion that slows automobile travel. Furthermore, most assessments fail to incorporate the fixed spatial locations or time constraints for some activities and their associated destinations. For example, work hours and location are generally fixed, as are obligations like day care pick-up times. Other opportunities have more flexibility but still some constraints. For example, a worker can grocery shop at multiple locations but most stores are not open 24 hours a day (See Schwanen, Kwan and Ren, 2008 on fixed activities and gender). In addition, zonal analysis typically only measures accessibility to one destination, not multi-destination trip chaining (e.g. when a worker must first go to a childcare facility before traveling to his/her worksite).

Furthermore, accessibility based on spatial units or zones is subject to the mobile areal unit problem (MAUP). The mobile area unit problem occurs when the scale/resolution or grouping scheme for units may affect results (See Kwan, 2009). For example, analysis at the block group level could indicate income or racial segregation that is not apparent in analysis by zip codes. Even when analysis responds to MAUP by selecting the "best" spatial resolution, according to Kwan and Weber (2008), there are at least three additional, substantial problems: 1) zones tend to be selected due to data availability rather than appropriateness; 2) aggregated measures may not reflect individual experiences and variability; and 3) "The size and shape of zones used (or using points to represent zones) can also introduce substantial errors into distances measured between locations" (p. 112). Furthermore, using spatial units as proxies for individual accessibility may lead to problematic interpretations, akin to the ecological fallacy.

Kwan and Weber (2008) propose several individual space-time measures to avoid MAUP and the problems of aggregation and incorporate time and opportunities that are fixed in time and/or space. Using a subset of travel diary participants from Portland, Oregon, Kwan and Weber attempt to comprehensively measure individual accessibility to opportunities. Their multiple measures of total opportunity accessibility are based on the concept of a potential path area (PPA): "This area contains all possible combinations of routes a person could traverse while traveling between successive fixed activities. Only those potential activities that can be found within the PPA are available [accessible])" (p. 115). Thus they do not model zones and potential job sites, but rather track the fixed obligations of actual travelers and the opportunities that are available within their feasible geographic scope of travel. As their subset only included automobile users, one measure is total street miles available, while other measures incorporate the accessible opportunities (square feet of land categorized as commercial or retail is their proxy). All their measures incorporate time of day, with reduced speed due to congestion in peak periods and opportunities limited by presumed closing times. Several measurement and assumptions may have shortcomings, but their assessment of a potential path area still captures constraints, possibilities and choices in ways that assessments based on geographic units cannot. Kwan's work (Kwan & Weber, 2008; Weber & Kwan, 2002) incorporates increased use of disaggregated quantitative data, but qualitative research may offer solutions as well.

Even without exploring the complexities of space-time measures, the variability of travel behavior by individual characteristics demonstrates the limitations of zone-based accessibility measures. In fact, research has found significant variation by numerous individual characteristics. Income, gender, race, national origin, occupation and household characteristics all demonstrate strong relationships to travel behavior. Men typically commute further, although among younger age groups the effect of gender is shrinking (Crane & Takahashi, 2009). Indeed, Blumenberg (2004) overviews research on employment, income, gender and commuting and observes that low-income, single-mothers are likely to seek shorter commutes to juggle their multiple responsibilities. Kim, Sang, Chun and Lee (2012), however, find more variation in commute distance by industry sector than gender. Immigrants in the United States also exhibit distinctive travel behavior. Smart (2010) finds an "immigrant effect" of increased bicycle usage, even when controlling for location and socio-demographic characteristics. Though immigrants use public transit more than native-born, they carpool far more frequently (about 12 times more than use public transport) (Blumenberg & Smart, 2010, p. 443). Such analysis shows diverging patterns but does not explain the choices or perspectives of commuters. Emerging qualitative research has delved into the adaptations low-income households make to ensure mobility, illuminating how multiple household, individual and spatial characteristics interact for a very complex experienced accessibility.

The actual employment and residential choices of low-income workers may be far more fluid and complex than existing models account for. Boschmann (2011) finds that low-income workers, who participated in his Columbus-based study, change jobs and residential locations frequently. Rather than a trade-off between housing costs and distance to work, interviewees reported on general mobility (or access) to multiple locations, activities and bus lines—not

simply distance to work—as an important factor in residential location. Put simply, "residential choice is not mediated by work location…Yet commuting is not irrelevant to the residential decision process. For these informants, what most influences final residential choice are their mobility options, particularly the proximity to bus lines" (p. 680). Job accessibility is critical for seeking and retaining jobs, but may be far more complex than realized and mediated by time. Boschmann provides the example of a worker interested in a Honda plant outside of Columbus. Her mobility was almost sufficient to make the job accessible, but a critical link was missing. The plant provided a shuttle, but bus service did not run late enough to connect her to the shuttle service.

Low-income workers and households adapt in complex ways. Boschmann observes, "these individuals [low-income study participants] are creative and resourceful in the face of ever changing situations and mobility" (p. 680). Likewise, Clifton's (2004) study of grocery-shopping by low-income households revealed adaptations. Clifton describes how a grocery shopper may use a combination of modes (walk or take a bus to a store and then be picked up or take a taxicab home). Many of her informants actually shopped at multiple locations, including larger grocery stores with lower prices and increased selection, even though stores were not close to all interviewees. The innovation and adaptations for grocery-shopping, however, often demand significant time for social or transit coordination.

In sum, employment decentralization impacts the ease of traveling to jobs, especially for low-income workers without private automobiles. The spatial mismatch theory does not account for the continued importance of central location and job density in cities. Models of access and travel time may identify gaps in transport networks or distance to jobs. However, access is far more complicated than zonal models account due to individual characteristics, differences in points within a zone, and time. This research explores the experienced accessibility of jobs and challenges and adaptations by carless workers to Post-Katrina New Orleans. More complex understanding of job accessibility can also add to discussions of environmental justice, as current transportation planning analyses typically rely on geographic units as proxies for groups (Duthie, Cervenka, & Waller, 2007).

3.0 Research Design and Methods

This research explored the accessibility experiences and needs of low-income workers in metropolitan New Orleans. Rather than create a statistically significant model or set of variables, we sought to understand potential variability in mode choice, perceived accessibility, and differences in travel behavior since Hurricane Katrina in 2006. More specifically, data collection was designed to address the following questions:

1. What factors affect low-income workers' commute behavior, especially mode choice?
    a) What demographic factors correlate with mode choice and travel time?
    b) How do workers explain their rationale for mode choice?
2. How has the commute behavior of low-income workers changed since Hurricane Katrina?
3. What accessibility limitations do low-income workers identify?
4. What transportation changes are most important to this workforce?

These questions differ from existing studies by incorporating the experiences, changes and perceptions that low-income workers describe, rather than using large quantitative data sets. In addition, the survey instrument accounted for the use of more than one mode of travel (e.g. biking to the bus) or variability in mode choice (some days taking the bus and other times getting a ride). The main data collection tool was survey interviews with low-income workers. However, to provide context and greater understanding about mode shift among low income workers (question two), we analyzed census data over time and in relationship with other metropolitan areas and cities.

3.1 Background Interviews with Key Stakeholders

To understand the context of low-income worker mobility, the principal investigator interviewed eight individuals from five regional and local institutions (Regional Planning Council, Regional Transit Authority, LA Department of Transportation and Development, Tulane University, and a city-affiliated planner).

3.2 Survey

The purpose of the study was to understand change, decision making and experienced mobility. This demanded a substantial number of participants (50) as well as a variety of respondents. The survey instrument used was primarily an open ended-survey, interviews were conducted in

person. In order to allow unexpected themes to emerge, interviewers provided response options only for demographic questions (race, income, education and gender). In addition, when respondents were unclear on what was meant by asking "how" they got to work, interviewers would provide sample modes—getting a ride, walking, taking the bus. The survey instrument was piloted twice in the spring of 2012, with some resulting additions and changes. The principal investigator and a graduate assistant conducted the remainder of survey interviews in May and June of 2012. Early participants were hesitant about and opted not to be audio-recorded. Thus, all interview responses were written by interviewer, but most were not recorded verbatim. In a few instances, interviewers paused to capture a verbatim phrase and indicated direct quotations in the survey record. Coding categories were created for open ended questions based on responses, rather than pre-existing codes.

Requirements & Participant Characteristics

Workers residing in either Orleans Parish (co-terminuses with the City of New Orleans) or Jefferson Parish (the adjacent parish) were recruited. Eligible participants were those who 1) earn $25,000 or less annually (approximately 50 percent of household area median income); 2) work at least part-time; 3) do not drive themselves to work; and 4) are not primarily students. Participants received a $20 stipend for participating. The interviews typically lasted around 15 minutes, but several interviews lasted nearly an hour.

Given the goal of deepening the understanding of perspectives and how they differ, the sample includes a range of groups rather than a random, representative sample. To ensure a diversity of ethnic, industry and age groups, we used a variety of methods for recruitment.

- On-campus facilities staff

We approached several on-campus service/facilities staff persons.

- Flyers

Although yielding few responses, we posted flyers at locations in the city of New Orleans and in adjacent Jefferson Parish. Sites included bulletin boards at medical center and neighborhood stores (targeting several stores in a part of Jefferson Parish with a strong Latino presence).

- Online

A more successful method was a posting under the "Etc." category of jobs via the online bulletin board "craigslist" (where advertisements for research participation frequently are posted). Clearly, this method would exclude those without internet access, but was only one among all these methods.

- Public spaces with transit stops.

To reach bus riders—particularly those who transfer between the New Orleans Regional Transit Authority (RTA) that serves the City of New Orleans and the Jefferson Parish service (JeT)—we recruited bus riders interviewees as they waited in public space.

- Snowball sampling

We were able to connect with 13 interviewees living nearby or socially connected to a community center/school.

- Organizational partners
    - A staff contact at a social service center coordinated.
    - An advocacy organization allowed us to invite participants from among their membership. These interviews were connected in Spanish and responses translated into English during data entry.

Table 1 – Recruitment methods

Method/source	Participants
Public space at bus stops	6
Online	12
Advocacy organization	5
Social service agency	7
Community center/snowball	13
University workforce	6

As a result of these recruitment methods, participants provided varying perspectives that contribute to the research's goals of exploring a more complex picture of accessibility, travel adaptations and challenges. Again, the sampling method does not provide a basis for statistical extrapolations, nor is it a random sample. Given the difficulty of recruiting Jefferson Parish residents and workers, fewer are included (see Figure 1 for a map of residential locations of interviewees). Furthermore, fewer Jefferson Parish workers who would qualify for participation, given that participation was limited to those who do not drive alone to work. The largest share of workers was employed in food service; Table 2 summarizes the most common employment sectors among the interviewees. African Americans comprised 62 percent of the respondents, while 28 percent identify as White-not Latino, and 10 percent identify as Latino. Women are somewhat over-represented (72%). The most frequent response to highest level of education completed was 2-yr/Associates degree (24% of the respondents). The second most

frequent response was graduate high school (20%), suggesting a sample with more education than typical for these income categories. Of those interviewed, 19 had moved to the metro since Katrina, perhaps a disproportionately high share.

Table 2 – Employment Sector of Survey Respondents

Employment sector	Participants
Food Service	15
Clerical/Office	9
Facility Services	6
Social Services and advocacy	6
Health, child, and elder care	5

3.3 Census Data Analysis

To understand changes in the commutes of low-income workers, this report utilizes census data from before and after Hurricane Katrina. Journey to work data by sub-groups within various geographies is available from the Census Transportation Planning Package (CTTP) for 2000 (based on decennial census) and 2006-08 (three year American Community Survey tabulations). We examine two categories of low-income separately: workers earning less than 25 percent of the area median income (AMI) and workers earning from approximately 25 percent to approximately 50 percent of AMI. For the two periods under consideration, the AMI of the respective time period is used, meaning income categories are adjusted to the time period's AMI and the reported ranges of the census.[2] Until 2000, the decennial census long form collected data on the journey to work, including information on the primary mode of travel, time of day, travel time and work location. After 2000, the American Community Survey replaced the long form, but incorporates journey to work questions. The census bureau continually collects ACS data and releases multi-year and single year estimates. Thus, the questions are comparable but data collection and sampling differences may limit comparability. In addition, ACS data typically has large margins of error (especially for smaller geographies or categories). Given the demographic changes in Post-Katrina New Orleans, it is especially challenging to parse out what mode split changes might be due to sampling changes, margin of error, travel behavior change, and population/resident change. In sum, the report's analysis of change in commuting behavior based on census data is informative but inconclusive.

[2] For New Orleans, the AMI in 2000 was $35,315. The census income categories included for less than 25 percent ($8, 829) were those under $10,000 and ranging from $10,000 to $17,499 for 25-50% of AMI ($8,829-$17,658). For 2006-2008, AMI was $49,167 (notably higher, could reflect shift in population). Census income categories used were those under $12,500 for under 25% AMI and $12,500-$24,999 ($24,584 was 50% AMI).

We supplement New Orleans-area temporal comparison with a review of commute mode change in the primary cities of five other metropolitan areas. Certainly, no two metropolitan areas are identical nor did other metropolitan areas experiences the effects of crises similar to Hurricane Katrina. Nonetheless, to understand changes in relation to other locations, we analyzed mode shift in the primary cities of Birmingham, AL; Buffalo, NY; Providence, RI; Memphis, TN; and Norfolk VA. The criteria for selection included total metropolitan statistical area (MSA) population, rate of population growth/decline, racial composition, income (median household income and share of population in poverty), mode split (relatively high shares of transit and low shares of single-occupant vehicle commutes) and transit service (hours and miles of revenue service). Some MSAs clearly mirrored New Orleans MSA in one aspect or another. Tables incorporating the primary city mode shifts in these MSAs are available in the appendices.

4.0 Metropolitan Area Background

Currently, the City of New Orleans has a population of 360,740 and the metropolitan area's (7-parish/county MSA) is 1,191,089. Population at both scales has shrunk relative to 2000, following Hurricane Katrina in 2005 (Ortiz & Plyer, 2012). The share of population lost, however, differs. The MSA population has rebounded to 90 percent of its 2000 population, while the city is just under 75 percent of its 2000 population (*ibid)*. The inner, adjacent suburban parish [county]—Jefferson—has almost reached its 2000 level (95%). Thus, the decline in population has not been geographically even. Ortiz and Plyer report that population decline has been uneven across racial and income groups, with black population decreasing more relative to 2000 levels than white population and the number of Latinos growing. The median income of the MSA remains below that of the US average (Ortiz & Plyer, 2012).

Metropolitan New Orleans is situated at the mouth of the Mississippi River. The city's emerged as a critical port in colonial North America. Peirce Lewis famously described it as "an inevitable city on an impossible site" due to the strategic location for water transport, coupled with the location's vulnerability to flooding. New Orleans' economy still has freight and logistics components, but tourism and related services are also very important economically. A substantial share of metropolitan area jobs are thus in accommodations and food service, as shown in Table 3 below. Retail, health care and social aid also employ substantial shares of the workforce.

As in many other metropolitan areas, the core city retains a substantial number of low wage jobs, but job growth has been substantial outside of the primary city. As of 2008, Jefferson Parish (adjacent to New Orleans) had more jobs (197,742) than the city (146,530) (Plyer, Ortiz, & Pettit, 2010). The City of New Orleans/Orleans Parish, however, contains clusters with the highest density (jobs/square mile) of jobs and low-income jobs specifically (Plyer & Campenella (2010). The city and Jefferson Parish each actually "import" more low-wage commuters than they export (Plyer, Ortiz, & Pettit, 2010). In other words, both still provide jobs for low-wage workers residing inside and beyond their boundaries—both jurisdictions are work locations for more low-earners than they are home.

Table 3 – New Orleans-Metairie-Kenner Employment by Sector

		Paid employees
Employment total for all sectors	446,087	100%
Agriculture, forestry, fishing and hunting	64	0%
Mining, quarrying, and oil and gas extraction	4,800	1%
Utilities	n/a	n/a
Construction	29,242	7%
Manufacturing	27,433	6%
Wholesale trade	22,287	5%
Retail trade	57,585	13%
Transportation and warehousing	20,570	5%
Information	6,243	1%
Finance and insurance	19,073	4%
Real estate and rental and leasing	8,210	2%
Professional, scientific, and technical services	30,685	7%
Management of companies and enterprises	8,054	2%
Administrative and support and waste	28,398	6%
Educational services	20,181	5%
Health care and social assistance	70,096	16%
Arts, entertainment, and recreation	10,117	2%
Accommodation and food services	59,858	13%
Other services (except public administration)	19,673	4%

(Source: US Census MSA Business Patterns and authors' calculations)

The New Orleans Regional Transit Authority (RTA) provides service within the City of New Orleans/Orleans Parish (and one route in another municipality). RTA operates four streetcar and 32 bus routes (http://www.norta.com/about/index.html). The agency lost rolling stock with Katrina and levels of transit service declined dramatically. In 2004, the agency provided 1.1 million hours of revenue service 2004 and an average of 154,049 unlinked trips on weekdays. After Hurricane Katrina, service levels declined dramatically. In 2006, RTA operated 0.3 million hours of revenue service and provided 22,485 weekday unlinked trips on average (National Transit Database profiles). More recently (NTD, 2011 profile), RTA has rebounded to 0.5 million hours of revenue service annually and 60,581 average weekday unlinked trips (both less than 50% of 2004 metrics). Jefferson Parish has a different and smaller transit service (JeT), which faced smaller decreases in ridership. JeT currently provides an average of 7,044 weekday trips and .13 million hours annually of revenue service (NTD profile 2011).

5.0 Results

Commute Behavior and Choices (Question 1)

This section addresses the first research question by describing commute behavior. We first summarize mode choice, then travel time, and finally rationale for mode selection.

Mode Usage

For respondents' primary jobs, mode usage patterns among demographic groups generally aligned with existing studies. Across categories, 38 percent of the respondents (n=19) primarily ride the bus to their primary job. The second most frequent means of transportation was walking, used by 22 percent of the respondents (n=11). Carpooling (or "getting a ride") was the third most frequent option for commuting. Based on census data, this group may be underrepresented in the sample. Five respondents reported using multiple modes during one commute, which generally included a mix of walking or biking and riding transit. More than 20 percent of respondents (n=11) report using different modes at different times (e.g. to versus from work) or on different days. Four respondents that usually commute by bus will sometimes also carpool or get a ride to work. Similarly four respondents that usually carpool as their main commute mode will use the bus. Of those respondents that bike to work, 50 percent will sometimes walk to work.

Table 4 – Means of Transportation to Primary Job

Means of Transportation	Respondents	
Bus	19	38 %
Walk	11	22 %
Carpool/Get a ride	7	14 %
Bike	6	12 %
Multiple Modes	5	10 %
Streetcar	2	4 %
Total	50	100 %

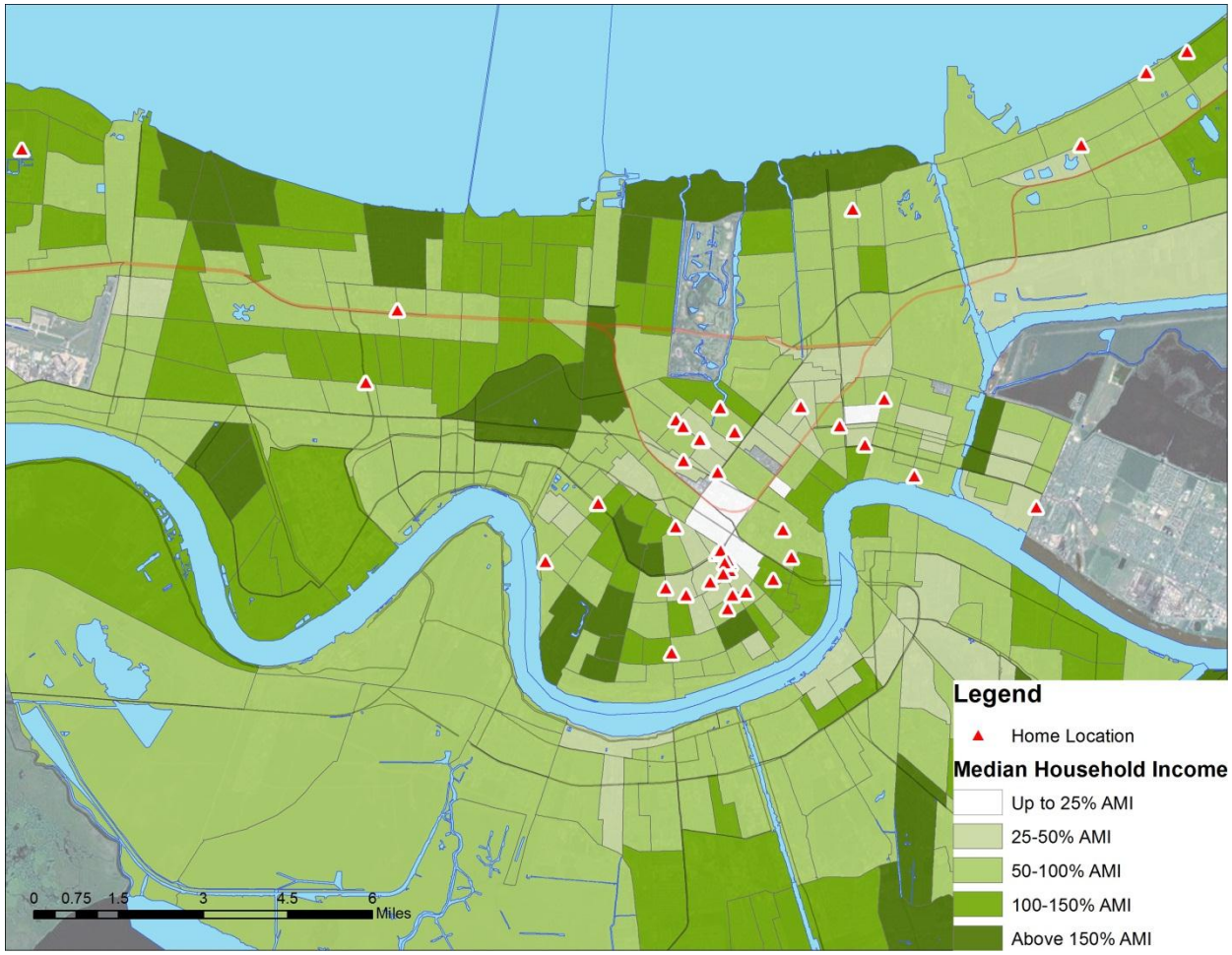

Figure 1 – Home Location and Median Household Income

Seven interviewees reported having a second job. Of those reporting a second job, two bike and two use multiple modes to commute to work. Three others reported carpooling, using the streetcar, and driving alone as each individual's means of transportation.

Table 5 – Means of Transportation to Second Job

Means of Transportation (2)	Respondents	Percentage
Bus	0	
Walk	0	
Carpool/Get a ride	1	
Bike	2	

Multiple Modes	2
Streetcar	1
Drove Alone	1
Total	7

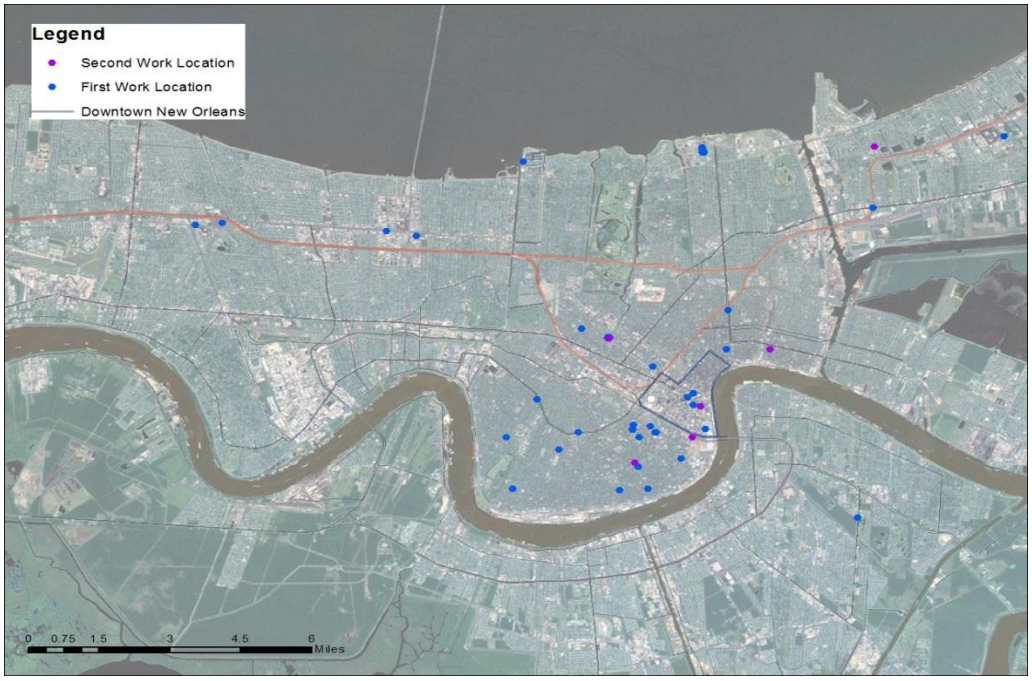

Figure 2 – Primary and Second Work Location

Both female and male respondents reported riding the bus as the most frequent means of commuting to work (n=14; n=10 respectively). The second most frequent mode for women is walking with 10 respondents, while for men it is either through multiple modes or carpooling each with 3 respondents. The sample of male respondents was much smaller, however, meaning this pattern may not hold in larger samples. Furthermore, based on larger datasets, this sample is likely to underrepresent carpoolers.

Table 6 – Means of Transportation by Gender

Means of Transportation	Women	Men
Bus	14	5
Walk	10	1
Carpool/Get a ride	4	3
Bike	4	2
Multiple Modes	2	3
Streetcar	2	0
Total	36	14

While the sample size is small and not random, racial patterns align with existing studies. African-American respondents most frequently take the bus to work, while white respondents most frequently walk. Hispanics most commonly carpool, as the literature and census data finds.

Table 7 – Means of Transportation by Race

Means of Transportation (1)	Black	%	White	%	Hispanic	%
Bus	15	48	2	14	2	40
Walk	7	23	4	29	0	0
Carpool/Get a ride	3	10	1	7	3	60
Bike	3	10	3	21	0	0
Multiple Modes	3	10	2	14	0	0
Streetcar	0	0	2	14	0	0
Total	31	100	14	100	5	100

Travel Time

Many workers did not report travel time burdens that would suggest limited job accessibility. The substantial majority (68 percent) traveled to work in less than 30 minutes, and 80 percent travel for less than one hour to work. However, one-fifth of interviewed workers travel more than one hour to reach work and almost 15 percent travel more than 90 minutes to work.

Bus riders were more likely than users of other modes to have long travel times, indicating a *high cost* for travel to work in terms of time expended. Average travel time by mode is displayed in Figure 3 and the distribution of respondents by time is shown in Figure 4, separated by bus and all other modes. High bus travel times were sometimes a result of scheduling challenges. For instance, one worker reported needing the high travel time to avoid being 10 minutes late. Others had to transfer bus lines and sometimes switch transfer transit providers.

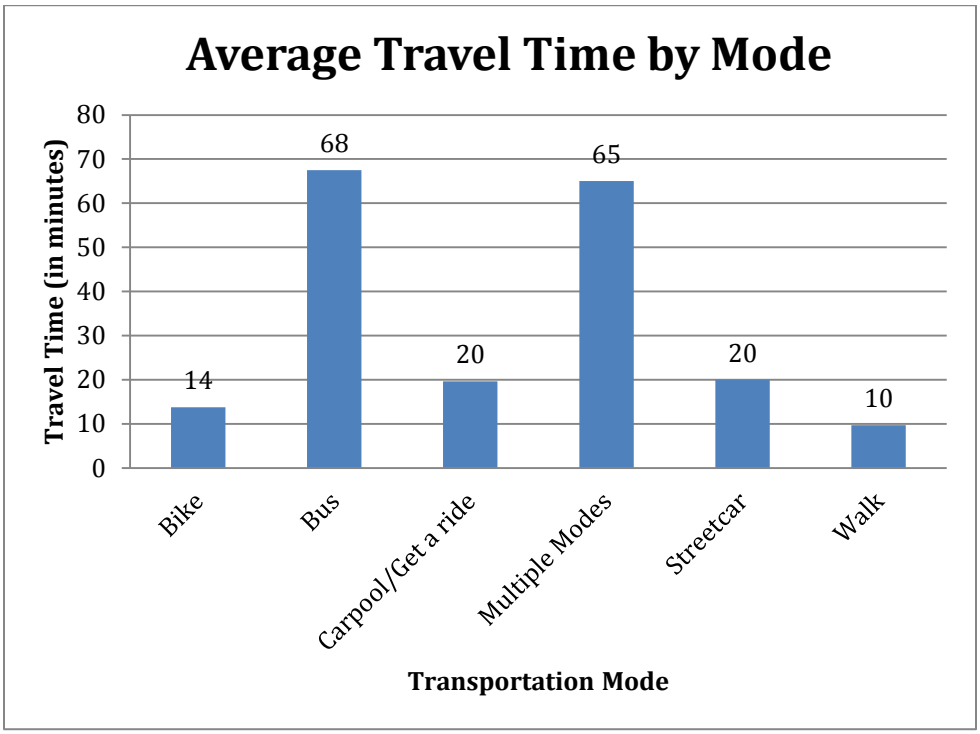

Figure 3 – Travel time by Mode

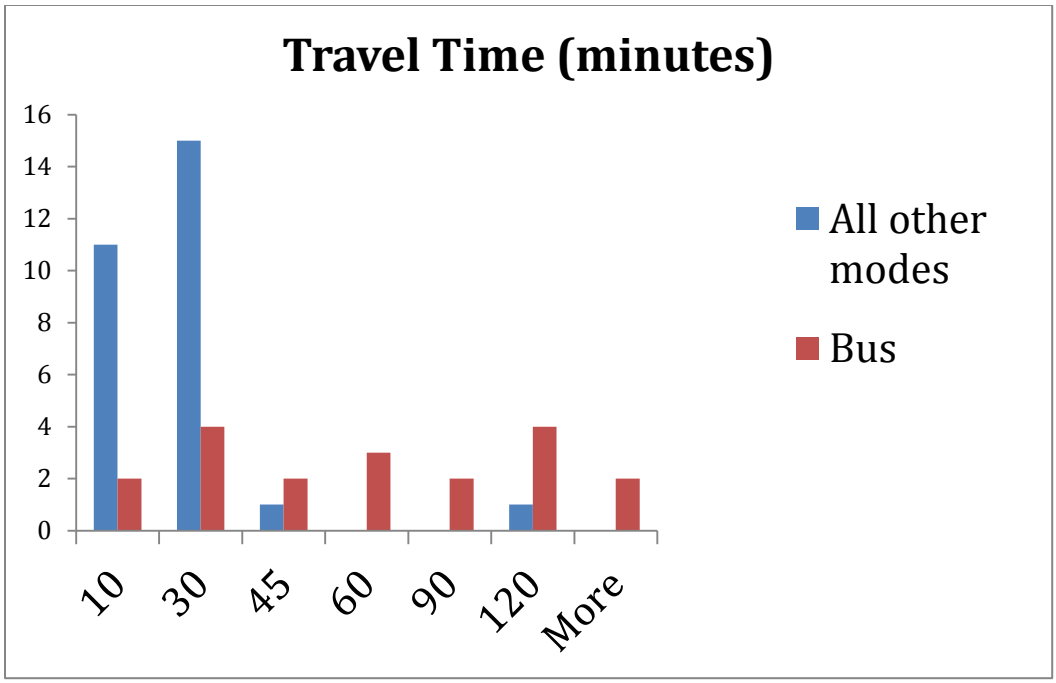

Figure 4 – Travel time (in minutes) Histogram by Mode

Among respondents, racial groups also had different mean and median commute times.

Table 8 – Mean and Median Travel Times (minutes) by Race

	Mean	Median	Count
Black	40	20	30
Hispanic	67	30	5
White	25	14	12

Because travel time varied by mode and mode usage varied by race, we also examined travel time by mode and race in combination. Table 9 shows mean travel times by mode and racial groups, but most sub-categories had very few respondents.

Table 9 – Mean Travel Time by Mode and Race

	Mean	Count
Bicycle, black	13	3
Bicycle, Hispanic	n/a	0
Bicycle, white	15	3
Bus, black	57	15
Bus, Hispanic	135	2
Bus, white	83	2
Carpool, black	21	3
Carpool, Hispanic	22	3
Carpool, white	10	1
Multiple modes, black	65	3
Multiple modes, Hispanic	n/a	0
Multiple modes, white	n/a	0
Streetcar, black	n/a	0
Streetcar, white	20	2
Walk, black	11	6
Walk, Hispanic	n/a	0
Walk, white	10	4

Rationale for Mode Choices

Many respondents identified reasons for their mode choice, but a sizable share understood their mode use as a result of *a lack* of choice or automobility. Those identifying rationale most commonly explained their mode was affordable and easy. The second most common reason was that the selected mode was faster than other options. But, commonly respondents described mode choice as a lack of choice—seven explained their mode choice as a result of lacking driving skills or an automobile. Sometimes in conjunction with these responses or separately, interviewees noted their mode as their only choice (n=11). Bus riders were likely to report that a lack of options (e.g. automobile ownership) was behind their mode "choice." The demographic composition of those reporting their mode was their only choice was similar to the pool of respondents as a whole. For each racial group, 20-24% of the respondents reported their mode was their only choice.

Table 10 – Respondents with Limited Choice

	Total	Doesn't drive/own car		Only choice	
Means of Transportation		Count		Percent	Count	Percent
Bus	19	7		37%	7	37%
Walk	11	0		0%	1	9%
Carpool/Get a ride	7	2		29%	1	14%
Bike	6	0		0%	1	17%
Multiple Modes	5	1		20%	1	20%
Streetcar	2	0		0%	0	0%

Commuters using some modes less frequently reported mode use due to a lack of choice. Neither of the streetcar users reported a lack of choice. Active mode users—walkers and bikers—also less frequently reported a lack of choice. The respondents that bike to work (n=6) do so because of its convenience. For example, one respondent prefers biking to taking the bus, because it is more reliable and quicker. Two other respondents reported that biking is more affordable, because it saves on gas and fare cost. Only one respondent bikes due to a lifestyle preference.

Some workers use different modes at different times. One respondent stated that his decision of whether to bike would depend on weather conditions. Four respondents, who generally walk or use multiple modes to commute to work, carpool or get a ride when it is raining. Similarly, three respondents that usually ride the bus prefer getting a ride or carpooling at times because it is faster.

There may be spatial patterns to perceiving choice in mode selection. As noted in the methods

section, the Jefferson Parish workers were not as well-represented as Orleans workers. Also, there was a notable share of respondents clustered in some neighborhoods, as the included maps illustrate. However, the cluster of respondents living in the "Central City" neighborhood (a centrally located and close to the CBD and Uptown corridor, both job rich-areas) were also less likely to identify a lack of choice or automobility as their rationale. Figure 5 below shows residential locations of those who identified a lack of choice or resources as rationale for mode use.

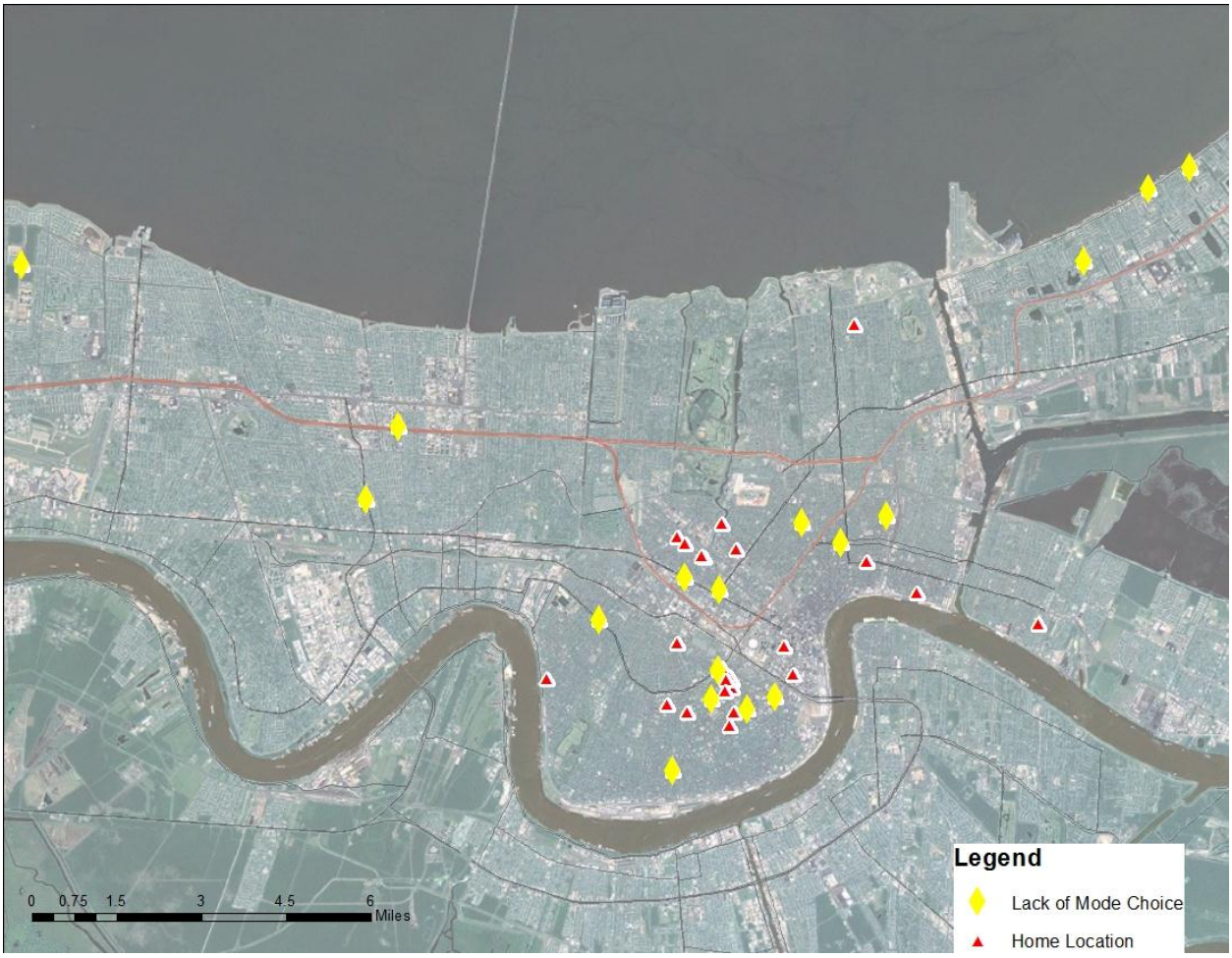

Figure 5 – Reason for Mode Choice

Post-Katrina Mode Shifts

Census Data Analysis

Among low-income workers, the most significant change in census data is an increase in the percentage of drive alone commuters and decrease in transit use, across income sub-categories

and parishes. Census mode split change could reflect shifts in the population, rather than different travel choices among residents (on the area's demographic changes see Ortiz & Plyer, 2012).This section reviews census transportation planning package data on commute mode among low-income workers. To accommodate inflation and economic changes, the numerical value for income categories were adjusted relative to the AMI of the respective time period (see earlier Footnote number x). In Jefferson Parish, there were fewer residents earning less than 25% AMI than in New Orleans, but the number of workers residing there earning approximately between 25 and 50% AMI increased in the second time period (2006-08). There was a decrease in the total number of workers in both income categories in New Orleans (Orleans Parish) and thus Jefferson Parish is home to a higher number of workers earning between 25 and 50 percent of the area median income ($12,500-$24,999).

As Table 11 on the next page shows, the drive alone mode split for workers earning less than 25 percent of the AMI increased from 37 to 60 percent in Orleans Parish and from 62 to 69 percent in Jefferson Parish. Coupled with this increase in driving, the share riding buses decreased from 29 percent to 12 percent. A reduction in bus share also occurred in Jefferson parish (from 9 % to 3.6%). The trend of increased drive alone commuters also occurred in the primary cities of the metropolitan areas reviewed, with the exception of Providence (a 3% reduction) though with a much smaller share increase (ranging from a .3 percent in Buffalo, NY to 10 percent in Norfolk, VA).

Looking at Table 12 on the next page, drive alone share also increased for workers in the second low-income category (25%-50% AMI). Again, the increase was more substantial for workers living in New Orleans than those living in Jefferson Parish. There was a decrease in carpool share and bus share, although the decrease was again greater New Orleans. The changes in modal split for drive alone in other primary cities were less substantial (see Appendix). Even with the increase, the percentage of drive alone for these workers in New Orleans remains below that of Birmingham, AL; Memphis, TN; Norfolk, VA; and Providence, RI (only Buffalo is higher).

The public transit share for the metropolitan area as a whole (across income categories) has rebounded further since the CTPP (2006-08), but still remains below pre-Katrina levels (See annual data in the Appendix p. 32). Modal split by racial group is available in the appendix (xxx). In general, the modal split for whites, among which driving alone was already more common, changed less than other groups. Interestingly, opposite the other racial groups in New Orleans, the share of Latino workers carpooling increased. This could be due to demographic shifts, including an increase in the total number of Latinos in these two counties. However, the increase was coupled with a shift from Orleans (which had a net decrease from 6,671 to 5,821) to Jefferson Parish (increased from 14,505 to 18,200).

Table 11 – Mode Split among Workers Earning below 25 Percent of Area Median Household Income

	Total workers		Drove alone		Carpool		Bus/trolley		Streetcar		Bike/walk		Taxi/other	
	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08
Jefferson Parish	6,095	4,570	62%	69%	17%	16%	9%	4%	0%	0%	6%	6%	3%	3%
Orleans Parish	12,120	4,675	37%	60%	15%	12%	29%	12%	0.80%	0.40%	12%	10%	2%	4%

Table 12 – Mode Split among Workers Earning 25-50 Percent of Area

	Total workers		Drove alone		Carpool		Bus/trolley		Streetcar		Bike/walk		Taxi/other	
	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08	2000	2006-08
Jefferson Parish	11,385	13,310	69	76	14	10	6	5	0.1	0	5	6	4	2
Orleans Parish	12,120	4,675	44	57	17	9	26	16	0.4	0	9	11	1	4

Survey Results

Twenty-four interviewees reported a mode for pre-Katrina travel to work.[3] Of those reporting a pre-Katrina work mode, approximately two-thirds (15/23) had switched modes, most from driving alone. Rather than the appeal of a new mode, most respondents who switched from driving to work (11) reported losing access to a working car (n=8). Four reported losing cars during Katrina and four had other issues, such as car break downs, accidents, or repossession. Two mentioned the cost of driving to work. Across the modes, changes in the location of residence or work also led to mode shift.

Table 13 – Respondents That Switched Modes Post-Katrina

Did Not Switch Modes	9
Switched Modes	15
No functioning auto	8

Perceived Accessibility to Employment and Other Sites

Employment Opportunities

A sizable share of respondents did not report transportation as limiting job opportunities. Just over 40 percent of respondents (21) expressed that there were not jobs that they would like to apply to but could not get to. Generally, the mode share was similar among those reporting no inaccessible jobs and those identifying jobs or locations of employment they could not apply for (due to problems getting to the site). However, there was a higher share of workers carpooling/getting rides that reported no inaccessible jobs. Likewise, the distribution across income categories and mean education levels was similar for those reporting or not reporting jobs opportunities lost due to transportation challenges.

Table 14 – No Inaccessible Jobs

	None	Reporting location	Kenner/Met	Other locations
Women	18	17	7	10
Men	3	10	6	4
Total	21		13	14

[3] A substantial number of respondents had located in the area since Katrina (19), and several had not worked prior to Katrina

Racial group was the variable that showed the most difference in responses. White and Latino respondents far more frequently reported jobs for which transportation was a barrier (see Table 15), but both were smaller samples and the Latino respondents were all from the same recruitment source. The majority of black respondents, conversely, reported that transportation access did not prevent applying for jobs. In addition to racial variance, there were differences in the mean and median travel times between those reporting inaccessible job opportunities and those responding that transportation was not a barrier. Mean travel time for those reporting inaccessible jobs is 39.5 minutes, and the median is 20 minutes. Those who reported no inaccessible job opportunities tended to have shorter commutes: the mean is 22 minutes and the median is 15 minutes.

Table 15 – No Inaccessible Jobs by Race

	Reporting none		**Reporting location**	
	Count	**Share of racial group**		**Share of racial group**
Black	16	55%	13	45%
White	4	29%	10	71%
Latino	1	20%	4	80%

The gender distribution of respondents was heavily split towards women (36 of 50), but women were almost evenly split between those reporting no locations (18) and those reporting locations (17) [one response missing]. Among the smaller sample of men (14), the majority (10) reported getting to a job site as a barrier to job opportunities. In sum, women, black respondents, and those with short commutes least commonly reported getting to a location as a barrier to applying for a job.

In line with the spatial mismatch theory, the most commonly reported location of inaccessible jobs was the Metairie/Kenner area, which is the suburban area to the west of New Orleans and a site of substantial job growth. Differing from the conventional spatial mismatch theory (but aligning with some more recent studies discussed above), centrally located workers less frequently reported missed job opportunities as seen in Figure 6 below.

No Inaccessible Jobs

Figure 6 – Respondents reporting transportation wasn't a barrier to job opportunities

Accessibility to Locations and Activities Other Than Work

Most respondents (n=40 of 44) identified locations and/or activities difficult to reach; only four reported no difficulty in getting to desired locations. In descending order of frequency, places difficult to access are: mall/shopping centers, movie theaters, big box stores/grocery stores, and the West Bank (part of the City of New Orleans located on the western side of the Mississippi), and parks. One woman described the challenge of grocery shopping while relying on the bus thus: ""It limits what I can get, which ironically makes you spend more. I didn't realize that till I was on the bus." Another worker reported one could depend on those "playing taxi" for transportation home with groceries. (For this respondent, playing taxi is when individuals linger outside of grocery stores to provide rides home for money.) Though less common, family and friends, medical care and educational opportunities were sometimes identified as difficult or impossible to access.

Desired Changes (Question 4)

Thirteen respondents reported being satisfied with their commute. Among satisfied respondents, six walk, four carpool, one bikes, and only two utilize public transportation to get to work. These respondents' average commute time is just over 13 minutes.

Most respondents identified changes that would improve their commute or mobility. A sizable number of respondents (n=18) believed that access to a motorized vehicle would best improve their commuting ease. (Note: This question was open-ended and thus automobile ownership was not in response to a prompt or set of responses). Additionally, nine other respondents stated the need for a more reliable and frequent service through the addition of "more buses on the line." For these respondents a reliable service means buses running on time and schedule, as well as longer hours and increased frequency. One respondent proposed the introduction of a fleet of "microbuses" or smaller buses that could run more frequently than the larger buses during the less busy hours of the day and night. Another respondent reported there should be more express routes, suggesting a bus route along South Carrollton Avenue. In terms of new bus lines, another respondent suggested a bus line along St. Charles Avenue since the streetcar tends to fill up quickly and is slower.

Among the carpoolers, one respondent finds it difficult to transfer between bus routes, while one Hispanic respondent also agrees that information related to transfers is lacking. Another respondent desired updated information at bus stops or that information is added to locations without it. Two out of five Hispanic respondents expressed the need for information to be available in Spanish as well as other languages. Three respondents agreed that it would be beneficial to track the buses online through an application for android phones, as it is already the case in other big cities like Chicago and San Francisco. Respondents that ride the bus generally agree that bus service in certain neighborhoods is limited, stopping early during the evening. Additionally two respondents reported the need for more signs, benches, and shaded areas for stops.

Respondents rarely mentioned streetcar expansion. However, a respondent would like to see some of the old streetcar lines come back such as the Esplanade, Elks Basin, Superdome, and Jefferson Davis lines. Another respondent suggested that the South Carrollton Avenue streetcar line be extended down to Canal Street, connecting it with the two Canal Streetcar lines to "close the [streetcar service] triangle."

Bicycle infrastructure could be improved, according to interviewees. A long-time bicycle rider asserted the need for clearly defined bike lanes. He specifically suggested bike lanes that are separated from automobile lanes, as in the Netherlands. One respondent complained about the lack of bike racks on streetcars, while another respondent wanted better road pavement

conditions. The latter also complained about the fact that there are not direct, efficient bike routes for many destinations in New Orleans, making for long trips via bike.

Other Findings

Residential Location Choice

When asked the reason for residential location choice, respondents gave a wide variety of answers from affective to practical reasons. Forty percent of respondents chose their neighborhoods based on affective reasons such as proximity to family and friends. Some respondents live in neighborhoods they feel attached to, often because they grew up there. Fifty-five percent of respondents based their residential location choice on practical decisions. Among more practical reasons, the most prominent were safety, quiet atmosphere, proximity to amenities, and proximity to work. Other practical reasons included transportation access, affordability, aesthetics, and friend/boss owns a house. Thirty respondents (60%) confirmed thinking about transit when choosing where to live (the question did specifically ask workers about this factor while other themes were respondent provided).

Table 16 – Reason for Residential Location

	Residential Choice	Respondents	
Affective	Family	10	20%
	Roots	6	12%
	Friends	4	8%
Practical	Quite Atmosphere	5	10%
	Safety	4	8%
	Close to Amenities	3	6%
	Work	3	6%
	Transportation Access	2	4%
	Affordability	2	4%
	Aesthetics	1	2%
	Friend/Boss owns house	2	4%
	Lifestyle	1	2%
	No Option	4	8%
	N/A	3	6%
	Total	50	

6.0 Discussion

Reports of lost job opportunities due to transportation were not dramatic. More than a third of respondents reported that they did not miss job opportunities due to transportation problems. Some did identify locations where job opportunities were missed because of transportation challenges. Findings could reflect that entry-level jobs are still numerous within the city of New Orleans. Even as adjacent Jefferson Parish [county] recently became the parish with the highest total number of jobs, New Orleans still is a net "importer" of low-wage workers. In other words, more low-income workers are coming into the city to work than leaving to work in other places. In many parts of the city, density of employment also remains higher than the job corridors in Jefferson Parish.

Yet many factors could account for the limited *reports* of missed opportunities. Given the remaining jobs in Orleans Parish, respondents may see jobs in less convenient locations as no more desirable. The difference in perception by race could be due to numerous factors beyond transportation. Thus, while some workers may experience difficult commutes, a lack of physical or transportation accessibility may not be the sole or primary barrier to job access. Job quality, social networks, and skill mismatches all could affect perceived opportunity and access to jobs.

Workers face timing constraints –related to household or employment obligations—and sometimes a lack of transportation options. Just under a quarter reported that a lack of choices determined their mode of travel. Bus riders most commonly reported a lack of transportation choices.

Timing—beyond simply travel time—matters. One interviewee explained she had to leave two hours before work, because shifting her schedule to the next later bus would make her 10 minutes late for her shift. Another explained her start time varied each week, sometimes 6am and sometimes 7am; she didn't feel able to request the later time. When assigned the early shift, she must take a taxicab—she could not quite make it on time because she has to change bus lines. Entry-level workers may lack the discretion that many professionals take for granted—the ability to shift one's schedule slightly. The lack of control over work schedules, sometimes over mode choice, and frequent challenges of switching and waiting for buses can limit the choices of some low-income workers and could affect their quality of life.

Automobile ownership was the most common response to what would improve one's travel. Automobile ownership—though potentially with high financial burdens—gives users far more flexibility on time and exact location. Bus riders desired more frequent service and reliable service. On the other hand, many respondents did not identify anything that would improve their commute, perhaps indicating satisfaction and experiences of sufficient accessibility.

Life circumstance, including car ownership, may be very dynamic for many low-income households. Automobile ownership appears desirable to respondents but also fluid. While some workers consistently own working vehicles and others never drive, whether low-income households have automobiles varies over time. (Some have suggested this is part of the reason

the success of reverse commute programs is difficult to gauge. A transit rider may get access to a job or better paying job and then purchase a vehicle with new earnings.) However, without a large financial cushion, storms, accidents and break-downs may make a worker or household carless. As Boschmann (2011) finds, work and home locations are also dynamic.

Understanding these shifts over time merits more research as shifts can have drastic consequences for workers. One interviewee recounted how she had owned a car when moving to Jefferson Parish. Due to layoffs, she had faced financial hardship and given up her automobile. Had she known she would later not have a car, she would not have moved to the suburb. When she found employment again, it came at a great cost in terms of travel time—two and a half hours each way.

Opportunities other than employment were frequently noted as challenging to reach. Even though Clifton (2004) finds (and some reported) innovative ways of accessing discount shopping for household provisions, many reported difficulty shopping. In metropolitan New Orleans the major shopping centers are located in Jefferson Parish, served by a different transit provider than the city. Several interviewees mentioned coordinating across systems was difficult. Though carrying less policy traction, movie theaters were reported as difficult to get to. (No *major* cinemas are located within the City of New Orleans).

7.0 Conclusion

This exploratory study provides insights into the complexity of and perceptions related to accessibility. Some patterns align with recent work in travel behavior (e.g. Latinos are more likely to carpool) and analyses of job access (central locations may still offer robust access due to proximity and job density). Confirming the perceptions and experiences from worker perceptions is valuable verification of secondary data analysis. Beyond this, the study also indicates potential areas for further qualitative research and modifications in quantitative modeling of employment accessibility.

Transportation forms only one part of dynamic life circumstances. Transportation and housing initiatives—whether focused on housing locations, transit, or auto ownership—must account for changes and constraints. Part of this study examined change in travel behavior, given the decrease in transit service in New Orleans after Hurricane Katrina. However, findings on the dynamic status of car ownership suggest the need for longitudinal studies of the relationships among residential location, transportation, employment, and other activities. Policy and programs must account for the complexities of household and job timing demands, as well as shifts in car ownership, residence and employment.

Transportation, which provides physical access, is only one part of complex workforce dynamics and access to opportunity. More qualitative work is needed to understand how transportation contributes to life opportunity as *experienced,* thereby supplementing and refining opportunity mapping (see Reece & Gambhir, 2008) and job access transportation programs. In addition, transportation interventions and research should build on existing workforce and housing research to better understand how race matters for transportation initiatives.

Further research could explore whether centrally located workers do experience better accessibility and well-being. This could be why they do not report missed employment opportunities as frequently. Yet the limited reports on transportation barriers to job opportunities could be due to a lack of social networks or knowledge of job opportunities. It could legitimately reflect that job quality is no better in other locations. Further studies thus could further verify if low-income workers tend not to experience a spatial mismatch. However, research on accessibility must account for access to quality education, public safety, and housing segregation (See Tegeler's [2013] caution about unintended H+T index consequences).

Timing matters but is not accounted for in most quantitative assessments of low-income job access. Of course total travel time matters, but coordinating transfers between bus routes or transit operators can increase the time burden. Moreover, matching schedules to work demands can be difficult—modeled travel time does not account for whether workers have to have long cushions/waits due to work schedules. In addition, many practitioners and researchers have noted the challenge of non-traditional work shifts (early morning, late/overnight). Qualitative research could further explore the complexity of timing, while

quantitative assessments should develop tools to account for constraints and coordination/waits beyond point to point travel time.

Mode choice is sometimes reported as a lack of choice, especially among bus riders. Active transportation users generally reported more satisfaction and convenience than users of other modes. Could more bus riders be open to active mode usage and would this improve their perceptions of access and mobility? Would it improve the convenience of their commute? Bus riders also sometimes faced burdensome commute times and desired "more buses on the line" to increase frequency and reliability.

For the New Orleans region, respondents desired some changes that aligned with a recently commissioned regional transit report (Nelson\Nygaard Consulting Associates Inc., 2012). Timing—hours, schedule coordination, frequency—rather than spatial expansion was much more commonly desired by respondents. Like most systems, local transit systems in New Orleans depend on public subsidies for the majority of their revenue. Several bus lines have excess demand, and expanded service on these lines would operate at a more cost-effective rate than the system as a whole current does (*ibid)*. The external report calls for increased coordination between the primary two transit providers. While reverse commutes may still be important for a share of workers, Orleans and Jefferson Parish are net importers of low wage workers. Existing literature and this report highlight that reverse commute programs may not be the improvement most amenable to the needs, preferences and realities of low-wage workers in the core and innermost suburbs for *commuting.* On the other hand, many respondents did observe the challenge of meeting shopping and recreational/social needs in Jefferson Parish. In research and policy, debates will continue on the automobile versus transit programs for low-income households. Regardless of the relative modal emphasis, increased frequency and reliability are the most popular improvements desired by transit-dependent riders and latent demand analysis shows increased service levels could be highly cost-effective, especially on several critical corridors.

Appendix A: Participant Profiles

Table 17 – Area Median Incomes and Income Group Classification

Area Median Incomes and Income Group Classification

2000 Classification

	25%		50%		AMI		150%	
	Value	Under 25% Range	Value	25-50% Range	Value	50-100% Range	Value	100-150% Range
Birmingham MSA	$9,820	Under $10,000	$19,640	$10,000 to $19,999	$39,280	$20,000 to $39,999	$58,920	$40,000 to $59,999
Buffalo MSA	$9,623	Under $10,000	$19,245	$10,000 to $19,999	$38,490	$20,000 to $37,499	$57,735	$37,500 to $59,999
Memphis MSA	$10,050	Under $10,000	$20,100	$10,000 to $19,999	$40,200	$20,000 to $39,999	$60,300	$40,000 to $59,999
New Orleans MSA	$8,829	Under $10,000	$17,658	$10,000 to $17,499	$35,315	$17,500 to $34,999	$52,973	$35,000 to $54,999
Norfolk MSA	$10,613	Under $10,000	$21,225	$10,000 to $19,999	$42,450	$20,000 to $42,499	$63,675	$42,500 to $59,999
Providence MSA	$10,438	Under $10,000	$20,875	$10,000 to $19,999	$41,750	$20,000 to $42,499	$62,625	$42,500 to $59,999

2006-08 Classification

	25%		50%		AMI		150%	
	Value	Under 25% Range	Value	25-50% Range	Value	50-100% Range	Value	100-150% Range
Birmingham MSA	$12,188	Under $12,500	$24,376	$12,500 to $24,999	$48,752	$25,000 to $49,999	$73,128	$50,000 to $74,999
Buffalo MSA	$11,669	Under $12,500	$23,338	$12,500 to $22,499	$46,676	$22,500 to $47,499	$70,014	$47,500 to $74,999
Memphis MSA	$11,578	Under $12,500	$23,155	$12,500 to $22,499	$46,310	$22,500 to $47,499	$69,465	$47,500 to $74,999
New Orleans MSA	$12,292	Under $12,500	$24,584	$12,500 to $24,999	$49,167	$25,000 to $49,999	$73,751	$50,000 to $74,999
Norfolk MSA	$14,184	Under $15,000	$28,369	$15,000 to $27,499	$56,737	$27,500 to $54,999	$85,106	$55,000 to $74,999
Providence MSA	$13,881	Under $15,000	$27,762	$15,000 to $27,499	$55,523	$27,500 to $54,999	$83,285	$55,000 to $74,999

Source: 2000 CTPP, Table P1-088; 2006-2008 ACS, Table B19013

Figure 7 – Worker Composition by Household Income

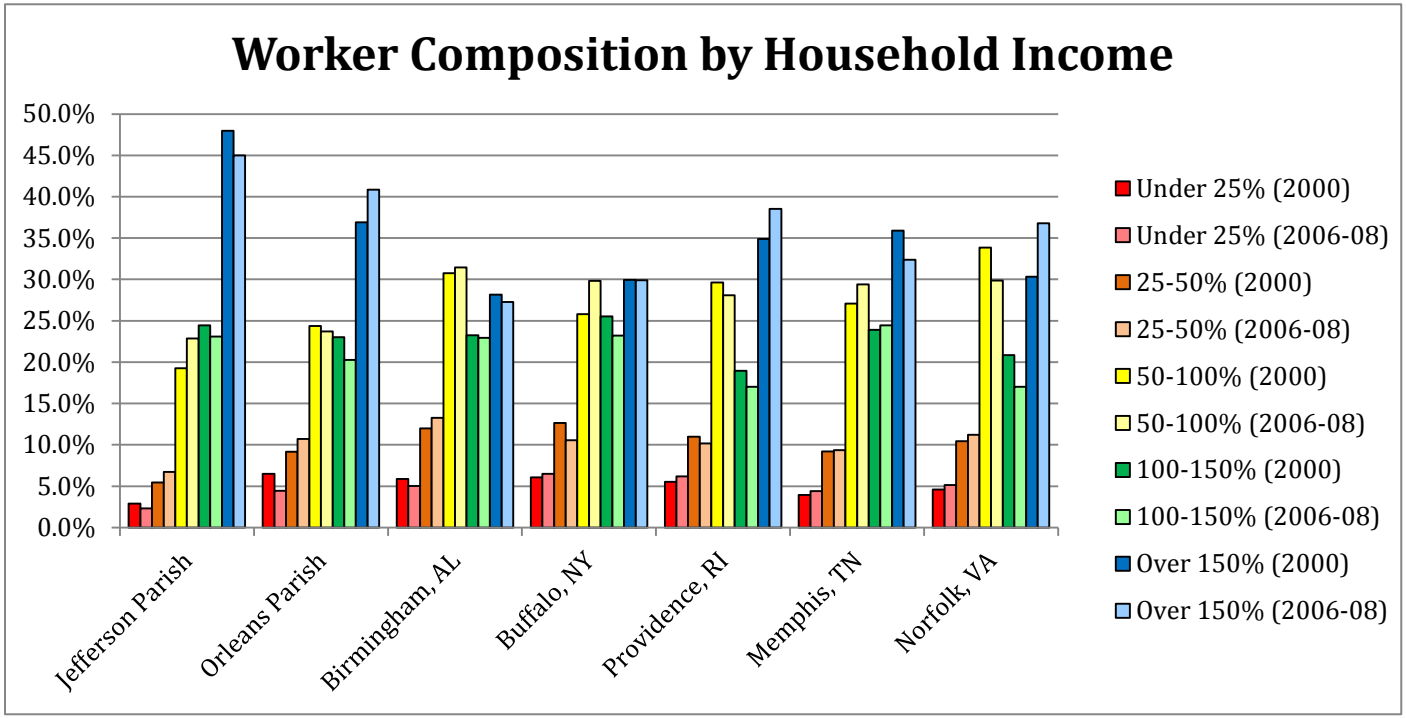

Table 18 – Worker Composition by Household Income, 2000 to 2006 - 2008

Worker Composition by Household Income, 2000 to 2006-08

	All Workers			% Under 25% AMI			% 25-50% AMI			% 50-100% AMI			% 100-150% AMI			% Over 150% AMI		
	'00	'06-08	Change	'00	'06-08	Diff.	'00	'06-08	Diff.	'00	'06-08	Diff.	'00	'06-08	Diff.	'00	'06-08	Diff.
Jefferson Parish	209,205	197,640	-5.5	2.9	2.3	-0.6	5.4	6.7	1.3	19.3	22.9	3.6	24.4	23.1	-1.3	48.0	45.0	-3.0
Orleans Parish	186,125	105,095	-43.5	6.5	4.4	-2.1	9.2	10.7	1.5	24.4	23.7	-0.7	23.0	20.3	-2.8	36.9	40.9	3.9
Birmingham, AL	96,145	89,195	-7.2	5.9	5.0	-0.9	12.0	13.3	1.3	30.8	31.5	0.7	23.2	23.0	-0.3	28.2	27.3	-0.9
Buffalo, NY	109,835	100,810	-8.2	6.1	6.5	0.4	12.6	10.6	-2.1	25.8	29.8	4.0	25.5	23.2	-2.3	30.0	29.9	-0.1
Providence, RI	61,865	68,720	11.1	5.5	6.2	0.7	11.0	10.2	-0.8	29.6	28.1	-1.6	18.9	17.0	-1.9	34.9	38.5	3.7
Memphis, TN	273,650	274,465	0.3	3.9	4.4	0.5	9.2	9.4	0.2	27.1	29.4	2.3	23.9	24.5	0.6	35.9	32.4	-3.5
Norfolk, VA	95,315	97,825	2.6	4.6	5.1	0.6	10.4	11.2	0.8	33.8	29.9	-4.0	20.8	17.0	-3.8	30.3	36.8	6.5

Source: 2000 CTPP, Table P1-034; 2006-2008 ACS CTPP, Table 13204

Table 19 – Change in Mode Shares by Household Income, 2000 to 2006 – 2008

Change in Mode Shares by Household Income, 2000 to 2006-2008

	Total Workers in Households Under25% AMI		
	2000	*2006-08*	*% Change*
Jefferson Parish	6,095	4,570	-25.0
Orleans Parish	12,120	4,675	-61.4
Birmingham, AL	5,645	4,470	-20.8
Buffalo, NY	6,665	6,550	-1.7
Providence, RI	3,415	4,250	24.5
Memphis, TN	10,735	12,050	12.2
Norfolk, VA	4,365	5,025	15.1

	% Drove Alone			% Carpooled			% Bus or Trolley Bus			% Streetcar, Trolley Car, Subway, or Elevated		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	61.6	69.3	7.6	16.7	16.4	-0.3	8.7	3.6	-5.1	0.0	0.0	0.0
Orleans Parish	37.4	60.3	22.9	15.2	11.6	-3.6	28.6	11.8	-16.9	0.8	0.4	-0.4
Birmingham, AL	59.2	64.9	5.7	22.5	22.6	0.1	7.8	6.6	-1.2	0.0	0.0	0.0
Buffalo, NY	41.2	41.5	0.3	11.3	7.4	-3.8	30.3	33.2	2.9	0.9	0.9	0.0
Providence, RI	48.0	44.8	-3.2	13.8	14.2	0.5	12.7	13.4	0.7	0.3	0.0	-0.3
Memphis, TN	60.5	62.2	1.8	19.7	14.1	-5.6	9.9	8.9	-1.0	0.1	0.0	-0.1
Norfolk, VA	52.7	62.8	10.1	16.8	12.8	-4.0	15.9	13.7	-2.2	0.0	0.0	0.0

	% Railroad or Ferryboat			% Bicycle or Walked			% Taxicab, Motorcycle, or Other Means			% Worked at Home		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	0.2	0.0	-0.2	6.0	6.1	0.1	3.2	2.5	-0.7	3.5	2.1	-1.4
Orleans Parish	0.2	0.0	-0.2	12.2	10.1	-2.1	1.7	3.7	2.0	3.9	2.2	-1.6
Birmingham, AL	0.1	0.0	-0.1	6.5	3.4	-3.1	2.1	0.8	-1.3	1.9	1.9	0.0
Buffalo, NY	0.1	0.0	-0.1	10.4	11.4	0.9	1.6	3.6	2.0	4.3	1.9	-2.4
Providence, RI	0.3	0.0	-0.3	21.1	22.2	1.2	2.5	0.6	-1.9	1.6	4.5	2.9
Memphis, TN	0.0	0.0	0.0	5.7	7.9	2.2	2.2	3.6	1.4	2.0	3.2	1.2
Norfolk, VA	0.2	0.0	-0.2	8.8	7.5	-1.4	2.3	1.2	-1.1	3.3	2.1	-1.2

Source: 2000 CTPP, Table P1-034; 2006-2008 ACS CTPP, Table 13204

Table 20 – Change in Mode Shared by Household Income, 2000 to 2006 - 2008

Change in Mode Shares by Household Income, 2000 to 2006-2008

	Total Workers in Households 25-50% AMI		
	2000	*2006-08*	*% Change*
Jefferson Parish	11,385	13,310	16.9
Orleans Parish	17,060	11,250	-34.1
Birmingham, AL	11,525	11,845	2.8
Buffalo, NY	13,885	10,655	-23.3
Providence, RI	6,805	6,995	2.8
Memphis, TN	25,155	25,705	2.2
Norfolk, VA	9,940	10,970	10.4

	% Drove Alone			% Carpooled			% Bus or Trolley Bus			% Streetcar, Trolley Car, Subway, or Elevated		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	68.6	75.9	7.2	14.3	10.2	-4.1	6.2	5.2	-1.0	0.1	0.0	-0.1
Orleans Parish	44.1	56.9	12.8	16.5	9.0	-7.5	26.3	16.3	-10.0	0.4	0.0	-0.4
Birmingham, AL	71.5	68.3	-3.2	17.8	20.3	2.5	3.9	6.1	2.2	0.0	0.0	0.0
Buffalo, NY	51.8	50.1	-1.7	13.4	9.5	-3.9	19.9	22.1	2.3	0.9	2.1	1.2
Providence, RI	55.5	59.0	3.5	16.5	18.8	2.3	10.1	11.1	1.0	0.3	0.0	-0.3
Memphis, TN	67.0	72.6	5.5	19.0	13.1	-6.0	6.8	6.3	-0.5	0.1	0.1	-0.1
Norfolk, VA	62.6	70.2	7.6	15.4	12.4	-3.0	11.1	11.0	-0.1	0.0	0.0	0.0

	% Railroad or Ferryboat			% Bicycle or Walked			% Taxicab, Motorcycle, or Other Means			% Worked at Home		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	0.0	0.0	0.0	4.6	5.6	1.0	3.6	2.3	-1.3	2.6	0.8	-1.8
Orleans Parish	0.1	0.1	-0.1	9.0	11.2	2.2	1.4	3.9	2.5	2.2	2.7	0.5
Birmingham, AL	0.3	0.0	-0.3	4.3	1.8	-2.5	1.6	2.1	0.5	0.7	1.4	0.7
Buffalo, NY	0.1	0.0	-0.1	10.3	11.8	1.5	1.5	0.7	-0.8	2.2	3.6	1.4
Providence, RI	0.2	0.9	0.7	14.1	7.1	-7.0	1.2	1.6	0.4	1.9	1.4	-0.6
Memphis, TN	0.0	0.0	0.0	3.5	5.4	1.9	1.8	1.4	-0.4	1.7	1.3	-0.5
Norfolk, VA	0.1	0.0	-0.1	7.9	4.1	-3.9	1.9	0.5	-1.4	1.1	2.0	0.9

Source: 2000 CTPP, Table P1-034; 2006-2008 ACS CTPP, Table 13204

Table 21 – Change in Mode Shares by Household Income, 2000 to 2006 – 2008

Change in Mode Shares by Household Income, 2000 to 2006-2008

	Total Workers in Households 50-100% AMI		
	2000	*2006-08*	*% Change*
Jefferson Parish	40,280	45,180	12.2
Orleans Parish	45,365	24,930	-45.0
Birmingham, AL	29,570	28,065	-5.1
Buffalo, NY	28,330	30,080	6.2
Providence, RI	18,335	19,290	5.2
Memphis, TN	74,150	80,710	8.8
Norfolk, VA	32,255	29,205	-9.5

	% Drove Alone			% Carpooled			% Bus or Trolley Bus			% Streetcar, Trolley Car, Subway, or Elevated		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	73.3	77.0	3.7	16.2	15.0	-1.2	3.5	2.1	-1.3	0.0	0.0	0.0
Orleans Parish	53.5	60.9	7.4	16.6	16.9	0.4	17.5	8.2	-9.3	0.8	0.7	-0.1
Birmingham, AL	76.3	78.3	2.0	17.0	14.6	-2.3	2.2	3.0	0.8	0.0	0.0	0.0
Buffalo, NY	63.3	62.2	-1.0	14.3	10.1	-4.2	13.4	15.7	2.3	0.6	0.6	0.0
Providence, RI	63.2	66.5	3.3	16.9	15.6	-1.3	6.7	6.0	-0.7	0.1	0.4	0.4
Memphis, TN	74.4	79.6	5.2	17.3	12.8	-4.5	3.7	3.0	-0.7	0.0	0.0	0.0
Norfolk, VA	71.0	73.2	2.3	16.5	12.6	-3.9	5.3	6.6	1.3	0.0	0.1	0.1

	% Railroad or Ferryboat			% Bicycle or Walked			% Taxicab, Motorcycle, or Other Means			% Worked at Home		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	0.0	0.1	0.0	3.4	1.7	-1.7	1.8	1.8	0.0	1.8	2.4	0.6
Orleans Parish	0.2	0.2	-0.1	7.2	8.0	0.7	1.8	3.3	1.5	2.2	1.9	-0.4
Birmingham, AL	0.1	0.0	-0.1	2.2	2.6	0.4	1.4	0.4	-1.0	0.8	0.9	0.1
Buffalo, NY	0.0	0.0	0.0	6.5	8.6	2.1	1.0	0.9	0.0	1.0	1.8	0.8
Providence, RI	0.6	1.1	0.4	9.2	6.5	-2.6	1.5	0.6	-0.9	2.0	3.1	1.1
Memphis, TN	0.0	0.0	0.0	2.1	2.1	-0.1	1.0	1.5	0.5	1.4	1.0	-0.4
Norfolk, VA	0.0	0.0	0.0	4.1	4.3	0.2	1.6	2.3	0.7	1.6	1.0	-0.6

Source: 2000 CTPP, Table P1-034; 2006-2008 ACS CTPP, Table 13204

Table 22 – Change in Mode Shares by Household Income, 2000 to 2006 – 2008

Change in Mode Shares by Household Income, 2000 to 2006-2008

	Total Workers in Households 100-150% AMI		
	2000	*2006-08*	*% Change*
Jefferson Parish	51,105	45,670	-10.6
Orleans Parish	42,850	21,290	-50.3
Birmingham, AL	22,335	20,475	-8.3
Buffalo, NY	28,045	23,385	-16.6
Providence, RI	11,720	11,700	-0.2
Memphis, TN	65,400	67,115	2.6
Norfolk, VA	19,855	16,640	-16.2

	% Drove Alone			% Carpooled			% Bus or Trolley Bus			% Streetcar, Trolley Car, Subway, or Elevated		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	79.2	80.7	1.5	14.5	12.8	-1.7	1.7	1.1	-0.6	0.0	0.0	0.0
Orleans Parish	63.8	68.6	4.9	18.0	16.3	-1.7	10.0	2.3	-7.6	0.6	0.0	-0.6
Birmingham, AL	78.4	83.6	5.2	15.9	12.7	-3.2	2.1	0.9	-1.2	0.0	0.0	0.0
Buffalo, NY	70.4	74.1	3.7	15.4	10.0	-5.4	7.8	5.6	-2.2	0.4	0.9	0.5
Providence, RI	64.6	65.9	1.3	20.1	18.1	-2.0	5.6	5.6	-0.1	0.2	0.0	-0.2
Memphis, TN	77.7	82.2	4.5	16.9	12.2	-4.7	1.7	2.2	0.5	0.1	0.0	-0.1
Norfolk, VA	77.9	77.5	-0.4	14.9	13.1	-1.8	2.5	2.6	0.0	0.0	0.0	0.0

	% Railroad or Ferryboat			% Bicycle or Walked			% Taxicab, Motorcycle, or Other Means			% Worked at Home		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	0.0	0.0	0.0	1.8	0.9	-0.9	1.3	0.9	-0.4	1.6	3.6	2.0
Orleans Parish	0.1	0.0	-0.1	4.6	7.7	3.0	1.2	2.7	1.5	1.8	2.4	0.7
Birmingham, AL	0.0	0.0	0.0	1.8	1.5	-0.3	0.6	0.2	-0.4	1.0	1.1	0.1
Buffalo, NY	0.1	0.0	-0.1	4.0	5.0	1.0	0.5	1.5	0.9	1.4	2.9	1.5
Providence, RI	1.1	1.3	0.2	6.1	6.8	0.7	0.9	1.1	0.2	1.3	1.2	-0.2
Memphis, TN	0.0	0.0	0.0	1.4	1.1	-0.2	0.7	0.8	0.0	1.5	1.5	0.0
Norfolk, VA	0.0	0.0	0.0	2.3	2.9	0.7	1.1	2.8	1.8	1.3	1.1	-0.2

Source: 2000 CTPP, Table P1-034; 2006-2008 ACS CTPP, Table 13204

Table 23 – Change in Mode Shares by Household Income, 2000 to 2006 – 2008

Change in Mode Shares by Household Income, 2000 to 2006-2008

	Total Workers in Households Over 150% AMI		
	2000	*2006-08*	*% Change*
Jefferson Parish	100,340	88,905	-11.4
Orleans Parish	68,715	42,940	-37.5
Birmingham, AL	27,070	24,340	-10.1
Buffalo, NY	32,905	30,150	-8.4
Providence, RI	21,580	26,490	22.8
Memphis, TN	98,205	88,880	-9.5
Norfolk, VA	28,900	35,985	24.5

	% Drove Alone			% Carpooled			% Bus or Trolley Bus			% Streetcar, Trolley Car, Subway, or Elevated		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	82.7	83.2	0.5	12.0	10.8	-1.2	1.0	0.6	-0.4	0.0	0.0	0.0
Orleans Parish	72.1	70.9	-1.2	15.1	13.9	-1.3	4.4	4.3	-0.2	0.4	0.2	-0.2
Birmingham, AL	83.2	84.6	1.4	12.4	11.1	-1.4	1.0	0.4	-0.5	0.0	0.1	0.0
Buffalo, NY	74.5	76.3	1.9	14.5	10.3	-4.2	5.0	6.0	0.9	0.7	0.5	-0.2
Providence, RI	70.1	69.1	-1.0	13.4	11.7	-1.7	3.9	5.0	1.1	0.2	0.7	0.5
Memphis, TN	82.4	84.3	1.9	12.4	10.0	-2.4	1.2	0.5	-0.6	0.1	0.0	0.0
Norfolk, VA	82.0	80.8	-1.2	10.4	10.8	0.4	1.6	1.3	-0.3	0.0	0.0	0.0

	% Railroad or Ferryboat			% Bicycle or Walked			% Taxicab, Motorcycle, or Other Means			% Worked at Home		
	2000	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*	*2000*	*2006-08*	*Change*
Jefferson Parish	0.0	0.0	0.0	1.1	1.0	0.0	1.0	0.7	-0.3	2.2	3.7	1.5
Orleans Parish	0.1	0.5	0.4	3.5	6.0	2.5	1.0	0.9	-0.1	3.3	3.4	0.0
Birmingham, AL	0.1	0.0	-0.1	1.1	1.3	0.2	0.6	0.8	0.2	1.7	1.9	0.2
Buffalo, NY	0.0	0.0	0.0	3.2	3.3	0.1	0.4	0.6	0.2	1.6	2.9	1.2
Providence, RI	1.9	1.6	-0.3	6.4	6.3	-0.1	1.0	1.1	0.1	3.0	4.4	1.4
Memphis, TN	0.0	0.0	0.0	1.0	1.0	0.0	0.8	1.1	0.3	2.1	2.9	0.9
Norfolk, VA	0.0	0.0	0.0	2.4	2.6	0.2	1.3	1.2	-0.1	2.3	3.3	1.1

Source: 2000 CTPP, Table P1-034; 2006-2008 ACS CTPP, Table 13204

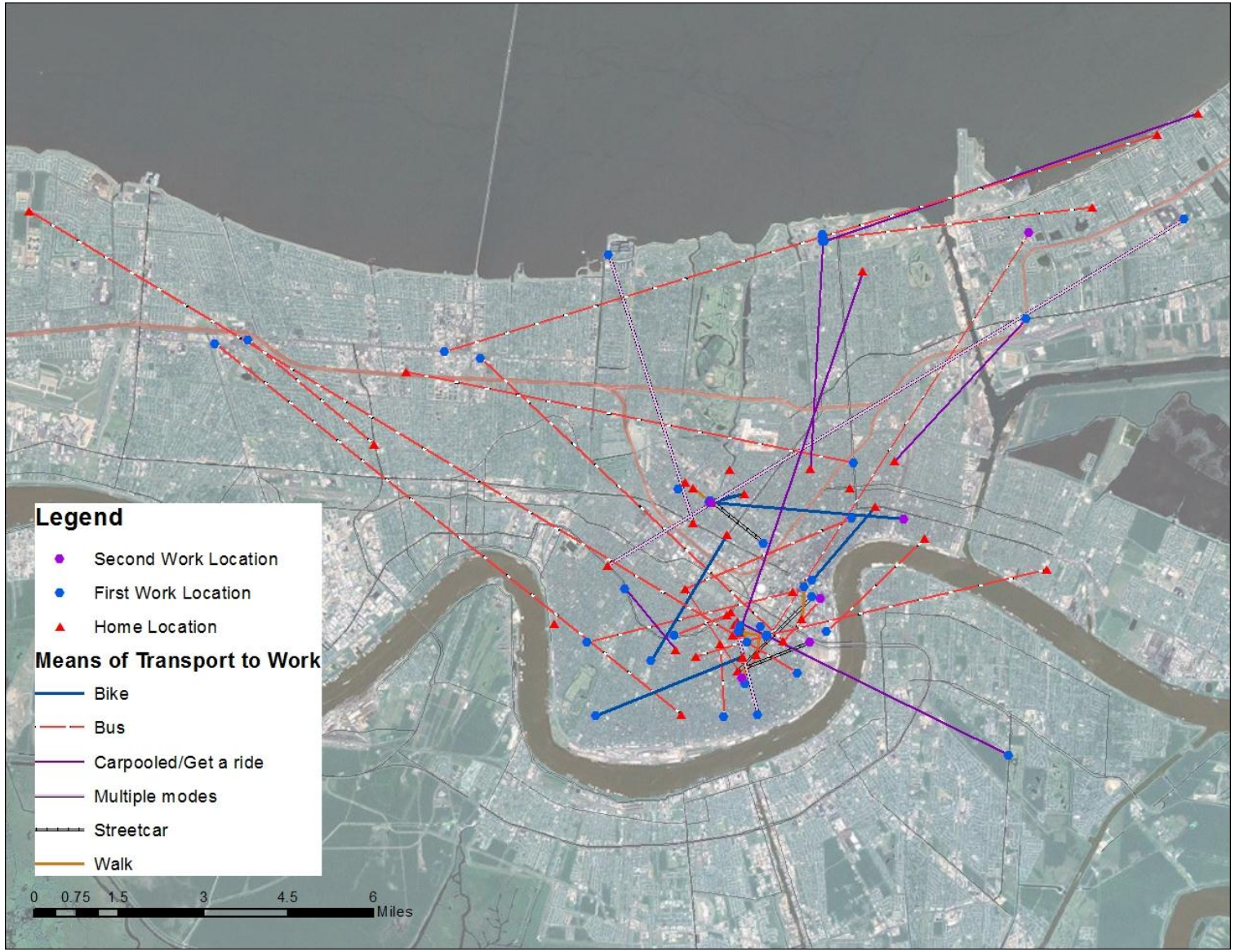

Figure 8 – Means of Transport to Work

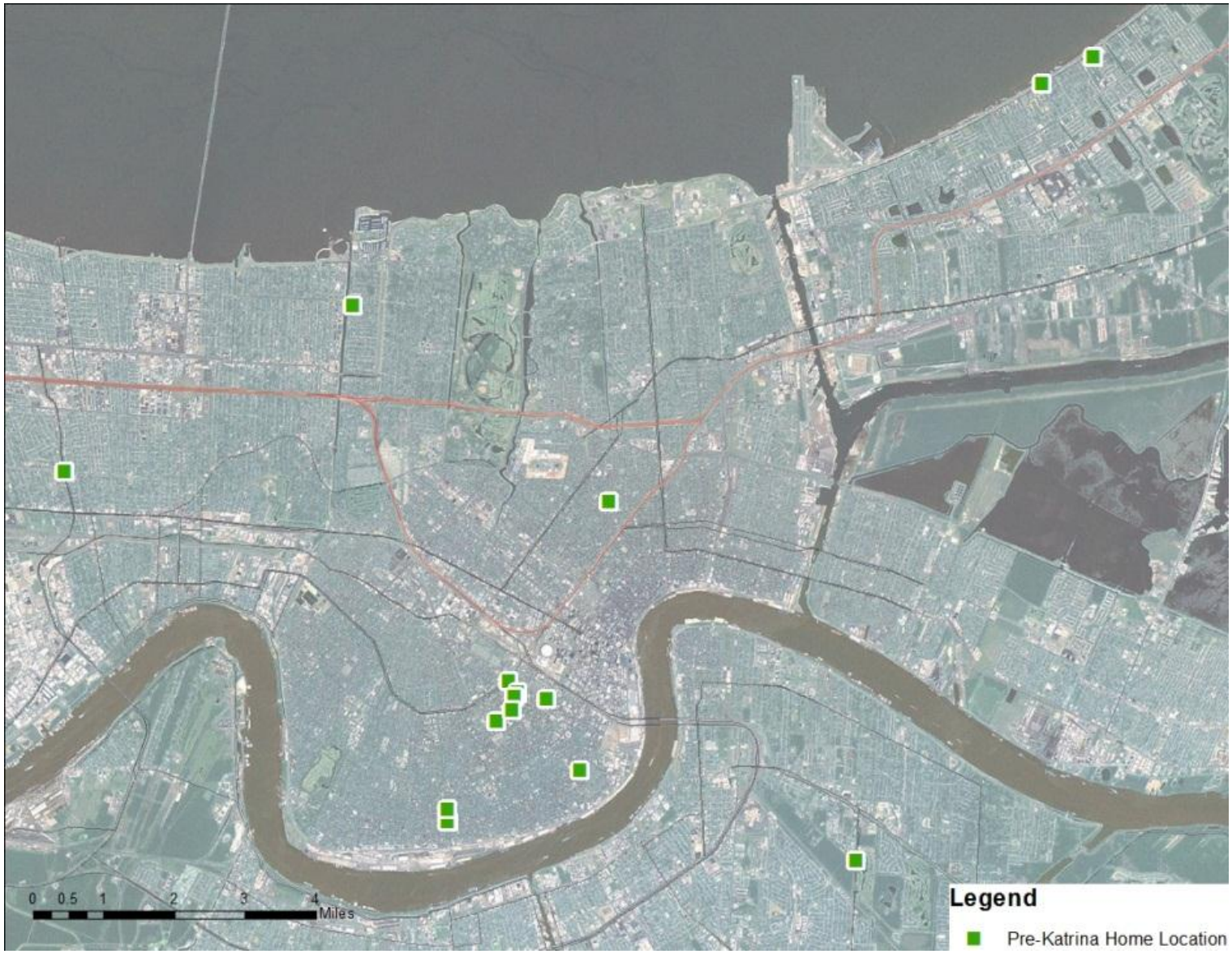

Figure 9 – Pre-Katrina Home Locations

Appendix B: Interview Instrument

Work Mobility Questionnaire

Interviewer_____ Recruitment source_____

Date_____ Time_____Location_____

This study is about how workers who don't drive to work and how they get around in metropolitan New Orleans. This questionnaire focuses on where and how you get to work and your access to jobs. Your participation is confidential and your consent form will be kept separately from your responses.

1. First, I'd like to know what know what neighborhood you live in. I don't need the exact address, but could you tell me an intersection of streets or a landmark where you live?
    a. [location]

    b. How long have you lived there? (years)

    c. Why did you choose this neighborhood to live in?

    d. How long have you lived in metropolitan New Orleans?

    e. [Only ask if b is less than 6.5 years but c is 6.5 years or greater] Where did you live prior to Hurricane Katrina in 2005?

2. Now, I'd like to learn about where you work and how you get there. We'll talk about up to two jobs. How many jobs do you currently work at [at least 10 hours a week]?

3. Let's talk about the job you work at the most.

    a. Where is it near? [again I don't need the exact address, just an intersection of landmark]

    b. About how many hours a week do you work here on average?

    c. What kind of work do you do there—like food service, housekeeping, retail, childcare?

    d. How do you get to work most days?

Drove Alone	Carpooled/get a ride	Bus	Streetcar	Railroad or Ferry	Walk	Bike	Motorcycle, Taxi, Other

e. How long does it take you to get to work?

f. About how many days a week do you get to work this way?

g. Why do you use this way to get to work?

h. Do you go another way some days? Y N
How [if yes]?

Drove Alone	Carpooled/get a ride	Bus	Streetcar	Railroad or Ferry	Walk	Bike	Motorcycle, Taxi, Other

i. How many often do you go this other way?

j. Why do you use this way to get to work?

k. What errands or stops do you make on the way to work or on the way from this job, at least once a week?

4. [if 2 is greater than 1] Let's talk about your second job.
   a. Where is it near? [again I don't need the exact address, just an intersection of landmark]

   b. About how many hours a week do you work here on average?

   c. What kind of work do you do there—like food service, housekeeping, retail, childcare?

   d. How do you get to work most days?

Drove Alone	Carpooled/get a ride	Bus	Streetcar	Railroad or Ferry	Walk	Bike	Motorcycle, Taxi, Other

   e. How long does it take you to get to work?

   f. About how many days a week do you get to work this way?

   g. Why do you use this way to get to work?

   h. Do you go another way some days? Y N
   How [if yes]?

Drove Alone	Carpooled/get a ride	Bus	Streetcar	Railroad or Ferry	Walk	Bike	Motorcycle, Taxi, Other

i. How many often do you go this other way?

j. Why do you use this way to get to work?

k. What errands or stops do you make on the way to work or on the way from this job, at least once a week?

5. [If 1d is 6.5 years or greater/they lived in metro New Orleans before Katrina]
   a. How did you get to work before Katrina?

Drove Alone	Carpooled	Bus	Streetcar	Railroad or Ferry	Walk	Bike	Motorcycle, Taxi, Other

   b. Why did you switch (if it's a different mode)?

6. Thinking about your current job(s),
   a. What would make it easier to get to work?

   b. [If answer is getting a car] anything else?

7. What changes in bus and streetcar service would you like to see?

8. Do you think about bus service when you're deciding where to live? What do you want to be near?

9. Are there jobs you have wanted to apply for-- but could not get there? [Follow up to find out what type of job and where it was] Where?

10. Now, thinking about other places—not just jobs--where do you want to go but have a lot of trouble getting there?

Now, I'd like to finish by asking you a few questions about you and your household

1. How many people live in your household?_____

2. How many people are under 18?_____

3. What is your race or ethnicity?

White (Non-Hispanic)	Black (Non-Hispanic)	Hispanic	Asian	Other (specify)

4. Gender: [circle, do not need to ask] Female Male

5. What is your age?_____

6. What is the highest level of education you've completed? _____
   Up to 8th grade [enter 8]
   Completed some high school [enter 10]
   Graduated high school [enter 12]
   Completed some college [enter 13]
   2-yr/Associates degree [enter 14]
   4-yr/Bachelors degree [enter 16]
   Some graduate school [enter 17]
   Masters degree [enter 18]
   Doctoral degree [enter 20]

7. How many working vehicles are there in your household?_____

8. What category describes your personal annual income]? (Note: 2010 AMI is $46,134)

9.

Under $4,999	$5,000-$9,999	$10,000-$15,000	$15,000-$19,999	$20,000-$25,000	$25,000-$35,000	More than $35,000

   a. If you're not sure, can you provide a weekly or monthly estimate?

Thank you very much for your participation in this study. We plan to publish results in academic and policy outlets. We will also share findings with local decision-makers who make transportation choices. Should you have any questions feel free to contact the principal investigator, Kate Lowe. (provide business card)

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