STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

TECHNICAL REPORT DOCUMENTATION PAGE

TR0003 (REV 10/98)

ADA Notice

For individuals with sensory disabilities, this document is available in alternate formats. For alternate format information, contact the Forms Management Unit at (916) 445-1233, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

1. REPORT NUMBER	2. GOVERNMENT ASSOCIATION NUMBER	3. RECIPIENT'S CATALOG NUMBER
CA16-2634		

4. TITLE AND SUBTITLE	5. REPORT DATE
Exploring Bicycle and Public Transit Use by Low-Income Latino Immigrants: A Mixed-Methods Study in the San Francisco Bay Area	May 2016
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR	8. PERFORMING ORGANIZATION REPORT NO.
Jesus M. Barajas, MURP, Daniel G. Chatman, Ph.D., and Asha Weinstein Agrawal, Ph.D.	MTI Report 12-57
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. WORK UNIT NUMBER
Mineta Transportation Institute College of Business San José State University San José, CA 95192-0219	11. CONTRACT OR GRANT NUMBER DTRT12-G-UTC21
12. SPONSORING AGENCY AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
California Department of Transportation Department of Research, Innovation and System Information P.O. Box 942873 Sacramento, CA 94273-0001 U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology University Transportation Centers Program 1200 New Jersey Avenue, SE Washington, DC 20590	Final Report 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Latin American immigrants will continue to make up a large share of transit ridership, bicycling and walking in the United States for the foreseeable future, but there is relatively little research about them. This mixed-methods study compares the travel patterns of low-income immigrants living in the San Francisco Bay Area with that of other groups and investigates the barriers and constraints faced by low-income immigrants when taking transit and bicycling. Much of the previous work on immigrant travel has relied on national surveys and qualitative analysis, which underrepresented disadvantaged population groups and slower modes of travel, or are unable to speak to broader patterns in the population. We conducted interviews with 14 low-income immigrants and a paper-based intercept survey of 2,078 adults. Interviewees revealed five major barriers that mad public transit use difficult for them, including safety, transit fare affordability, discrimination, system legibility, and reliability. Although crime was the most prominent issue in interviews, the survey results suggest transit cost is the most pressing concern for low-income immigrants. Low-income immigrants were less likely than those with higher-incomes to have access to a motor vehicle, and were less likely than higher-income immigrants or the U.S.-born of any income to have access to a bicycle or bus pass. Finally, although most barriers to public transit use were the same regardless of nativity or household income, low-income immigrants were much less willing to take public transit when they had the option to drive and less willing to bicycle for any purpose. The prevalence of concerns about transit affordability, crime, and reliability suggest transit agencies should consider income-based fare reductions, coordinated crime prevention with local law enforcement, and improved scheduling.

17. KEY WORDS	18. DISTRIBUTION STATEMENT
Immigrants, Public transit, Bicycle, Travel behavior, Surveys	No restrictions. This document is available to the public through The National Technical Information Service, Springfield, VA 22161.

19. SECURITY CLASSIFICATION *(of this report)*	20. NUMBER OF PAGES	21. COST OF REPORT CHARGED
Unclassified	89	$15.00

Reproduction of completed page authorized.

DISCLAIMER STATEMENT

This document is disseminated in the interest of information exchange. The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This publication does not constitute a standard, specification or regulation. This report does not constitute an endorsement by the Department of any product described herein.

For individuals with sensory disabilities, this document is available in alternate formats. For information, call (916) 654-8899, TTY 711, or write to California Department of Transportation, Division of Research, Innovation and System Information, MS-83, P.O. Box 942873, Sacramento, CA 94273-0001.

Exploring Bicycle and Public Transit Use by Low-Income Latino Immigrants: A Mixed-Methods Study in the San Francisco Bay Area

MTI Report 12-57

MINETA
TRANSPORTATION INSTITUTE
MTI

MINETA TRANSPORTATION INSTITUTE

The Mineta Transportation Institute (MTI) was established by Congress in 1991 as part of the Intermodal Surface Transportation Equity Act (ISTEA) and was reauthorized under the Transportation Equity Act for the 21st century (TEA-21). MTI then successfully competed to be named a Tier 1 Center in 2002 and 2006 in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Most recently, MTI successfully competed in the Surface Transportation Extension Act of 2011 to be named a Tier 1 Transit-Focused University Transportation Center. The Institute is funded by Congress through the United States Department of Transportation's Office of the Assistant Secretary for Research and Technology (OST-R), University Transportation Centers Program, the California Department of Transportation (Caltrans), and by private grants and donations.

The Institute receives oversight from an internationally respected Board of Trustees whose members represent all major surface transportation modes. MTI's focus on policy and management resulted from a Board assessment of the industry's unmet needs and led directly to the choice of the San José State University College of Business as the Institute's home. The Board provides policy direction, assists with needs assessment, and connects the Institute and its programs with the international transportation community.

MTI's transportation policy work is centered on three primary responsibilities:

Research

MTI works to provide policy-oriented research for all levels of government and the private sector to foster the development of optimum surface transportation systems. Research areas include: transportation security; planning and policy development; interrelationships among transportation, land use, and the environment; transportation finance; and collaborative labor-management relations. Certified Research Associates conduct the research. Certification requires an advanced degree, generally a Ph.D., a record of academic publications, and professional references. Research projects culminate in a peer-reviewed publication, available both in hardcopy and on TransWeb, the MTI website (http://transweb.sjsu.edu).

Education

The educational goal of the Institute is to provide graduate-level education to students seeking a career in the development and operation of surface transportation programs. MTI, through San José State University, offers an AACSB-accredited Master of Science in Transportation Management and a graduate Certificate in Transportation Management that serve to prepare the nation's transportation managers for the 21st century. The master's degree is the highest conferred by the California State University system. With the active assistance of the California Department of Transportation, MTI delivers its classes over a state-of-the-art videoconference network throughout the state of California and via webcasting beyond, allowing working transportation professionals to pursue an advanced degree regardless of their location. To meet the needs of employers seeking a diverse workforce, MTI's education program promotes enrollment to under-represented groups.

Information and Technology Transfer

MTI promotes the availability of completed research to professional organizations and journals and works to integrate the research findings into the graduate education program. In addition to publishing the studies, the Institute also sponsors symposia to disseminate research results to transportation professionals and encourages Research Associates to present their findings at conferences. The World in Motion, MTI's quarterly newsletter, covers innovation in the Institute's research and education programs. MTI's extensive collection of transportation-related publications is integrated into San José State University's world-class Martin Luther King, Jr. Library.

DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the information presented herein. This document is disseminated under the sponsorship of the U.S. Department of Transportation, University Transportation Centers Program and the California Department of Transportation, in the interest of information exchange. This report does not necessarily reflect the official views or policies of the U.S. government, State of California, or the Mineta Transportation Institute, who assume no liability for the contents or use thereof. This report does not constitute a standard specification, design standard, or regulation.

REPORT 12-57

EXPLORING BICYCLE AND PUBLIC TRANSIT USE BY LOW-INCOME LATINO IMMIGRANTS: A MIXED-METHODS STUDY IN THE SAN FRANCISCO BAY AREA

Jesus M. Barajas, MURP
Daniel G. Chatman, Ph.D.
Asha Weinstein Agrawal, Ph.D.

May 2016

A publication of
Mineta Transportation Institute
Created by Congress in 1991

College of Business
San José State University
San José, CA 95192-0219

Copyright © 2016
by **Mineta Transportation Institute**
All rights reserved

Library of Congress Catalog Card Number:
2016938519

To order this publication, please contact:

Mineta Transportation Institute
College of Business
San José State University
San José, CA 95192-0219

Tel: (408) 924-7560
Fax: (408) 924-7565
Email: mineta-institute@sjsu.edu

transweb.sjsu.edu

050216

ACKNOWLEDGMENTS

We are indebted to the many people who helped us at every stage of this project. We offer our thanks to Laura Lopez and Gabriella Garcia of the Street Level Health Project, Laura Camberos of Mujeres Unidas y Activas, Gabriel Hernandez and America Enciso of the Day Labor Center, and Lydia Guel of Sacred Heart Community Services for their help in recruiting interviewees and use of their facilities to conduct interviews.

We thank Darlene Da Silva and Cecilia Chavez for their research and interviewing assistance, and offer Cecilia additional thanks for her assistance in coordinating the survey logistics in San Jose. We also thank our many survey administrators: Sana Ahmed (who also helped with additional field research), Dylan Baker, Sergio Escobedo, Rigo Garcia, Norma Guzman, Michelle Herrera, Christian Hunter, Melissa Jeng, Michelle Li, Oscar Ruiz, Keith Tanner, and Tina Tran.

The authors thank MTI staff, including Executive Director Karen Philbrick, Ph.D.; Publication Support Coordinator Joseph Mercado; Executive Administrative Assistant Jill Carter; and Editor and Webmaster Frances Cherman.

TABLE OF CONTENTS

Executive Summary **1**
Methods 1
Key Findings 1

I. Introduction **3**

II. Literature Review: Immigrant, Transit, and Bicycle Travel **4**
Immigrant Travel Behavior 4
Motivators of and Barriers to Public Transit Use 5
Motivators of and Barriers to Bicycle Travel 6

III. Methodology **8**
Interviews 8
Intercept Survey 9

IV. Findings from In-Depth Interviews **13**
Safety 13
Discrimination 14
Cost 15
Legibility 17
Reliability 18
Bicycling: Overcoming Barriers 19
Summary 20

V. Intercept Survey Findings **21**
Sociodemographic Characteristics 21
Low-Income Immigrant Travel Patterns 26
Public Transit and Bicycling Travel Experiences 30

VI. Summary of Findings and Policy Implications **39**
Travel Behavior 39
Transportation Experiences 40
Study Limitations 41
Policy Implications 42
Future Research Needs 43

Appendix A: Interview Protocol **45**
English Version 45
Spanish Version 49

Appendix B: Intercept Survey Questionnaire **52**

Appendix C: Summary Tables for "Transportation Experiences" Questions **56**

Appendix D: Survey Sites and Responses Received **62**

Abbreviations and Acronyms **63**

Endnotes **64**

Bibliography **70**

About the Authors **75**

Peer Review **76**

LIST OF FIGURES

1. Mode Choice in the San Francisco Bay Area 5

2. Survey Sites by Type and Responses Received 12

3. Home ZIP Codes of Survey Respondents 25

4. Factors that Would Increase Transit Use 32

5. Transit Mode Substitution and Missed Trips 33

6. Transit Barriers 34

7. Factors that Would Increase Bicycle Use 35

8. Bicycling Mode Substitution 36

9. Bicycling Barriers 38

LIST OF TABLES

1. Countries of Origin of Immigrant Intercept Survey Respondents 22

2. Proportion of Respondents in Each Income Group by Nativity 22

3. Comparison of Respondents' Sociodemographic Characteristics to Population Characteristics 23

4. Comparison of Respondents' Sociodemographic Characteristics by Nativity and Income Group 24

5. Proportion of Respondents Who Had Motor Vehicle Access by Number of Days of Access 26

6. Proportion of Respondents Who Had Bicycle Access by Number of Days of Access 26

7. Mean Number of Travel Days per Mode 27

8. Mean Number of Travel Days per Mode by Survey Site Location, Low-Income Immigrants 28

9. Mean Number of Travel Days per Transit Access Mode, by Nativity and Income Group 28

10. Mean Number of Days of Travel per Mode, by Employment Status, for Low-Income Immigrants 29

11. Mean Number of Days of Travel per Mode, by Intercept Survey Site Type, for Low-Income Immigrants 29

12. Mean Number of Days of Travel per Mode, by Child Presence, for Low-Income Immigrants 30

EXECUTIVE SUMMARY

Immigration to the United States is growing. Over the next four decades, many immigrants will come from Latin America with few resources, relying on public transit, bicycling, and walking to meet their transportation needs. Previous research on low-income immigrant travel has relied on national surveys and qualitative analysis, which underrepresent disadvantaged population groups and slower modes of travel, or are unable to speak to broader patterns in the population. This study addresses additional research needs by exploring the travel behavior and experiences of low-income immigrants.

METHODS

The analysis is based on interviews with 14 low-income immigrants and a paper-based intercept survey of 2,078 adults in the San Francisco Bay Area. Survey site selection criteria resulted in a purposive oversample of low-income immigrants. Interviews generated questions for the survey instrument and focused on experiences with transit and bicycling, transportation barriers, and transportation preferences. The survey asked about respondents' recent travel, their experiences with transit and bicycling, and their sociodemographic information. Both qualitative and quantitative information contribute to the findings in this report.

KEY FINDINGS

First, low-income immigrants talked about five major barriers that made public transit use difficult for them: safety, discrimination, cost, legibility, and reliability. In our interviews, crime was the most prominent barrier—almost every interviewee had a story about their experiences with verbal or physical violence when accessing or using public transit. In contrast to the interview data, among survey respondents transit cost was the most commonly identified barrier for low-income immigrants.

Second, there were small differences in personal vehicle access and travel patterns according to income and immigrant status, consistent with prior research. Low-income immigrants were less likely than those with higher incomes to have access to a motor vehicle, and were less likely than U.S.-born or higher-income immigrants to have access to a bicycle.

Third, most reported barriers to public transit use were about the same irrespective of income and immigrant status, including concerns about affordability, neighborhood crime, reliability, transit access, and sufficient information about public transit. But some barriers are unique to low-income immigrants. Low-income immigrants were much less willing to substitute taking public transit for driving when they have the option to drive, suggesting they obtain car access for particular purposes that transit does not serve, or that their experiences on public transit have been unpleasant. Low-income immigrants were also less willing ride their bicycles for any trip purpose, a finding that is contrary to claims made in other published research. Respondents surveyed at day labor sites rode bicycles more frequently than those surveyed at other locations, suggesting type of employment partially accounts for this finding.

The study results yield a number of implications for policy. The prevalence of concerns about transit affordability, crime, and reliability suggest transit agencies should consider income-based fare reductions, coordinated crime prevention with local law enforcement, and improved scheduling. A significant minority of transit riders value bicycle access to transit, suggesting judicious investment in bike-transit integration is warranted. Finally, because some differences in immigrant travel habits and experiences were significant, travel and on-board surveys should collect data on nativity.

I. INTRODUCTION

Over 40 million immigrants live in the United States, composing about 13 percent of the U.S. population.[1] The U.S. Census Bureau projects that the foreign-born population will grow by 85 percent over the next 45 years, resulting in the largest share of immigrants in this country's history.[2] One out of every five Americans will have been born elsewhere by 2060. Many will come from poorer countries in Latin America, a region that currently accounts for the majority of U.S. immigration. Public transportation is a vital link in meeting the mobility needs of immigrants. Roughly 2 percent of all trips nationwide are made by public transit, but immigrant households earning less than $25,000 per year take nearly 9 percent of their trips on public transportation.[3]

Previous research on the travel behavior of low-income immigrants has used national transportation surveys, telephone-based surveys, qualitative interviews, and focus groups to understand particular influences on travel.[4] However, general transportation surveys tend to underrepresent disadvantaged population groups and slower modes of travel, and qualitative data cannot speak to general patterns in a population group. To overcome these limitations, we designed a mixed-methods study, including both interviews and an original survey, in which we recruited low-income immigrants in neighborhoods where they were most likely to travel. We define a low-income immigrant as a person born outside the United States whose household earned $25,000 or less in the previous year, the approximate federal poverty level for a family of four.

The purpose of this study is to better understand how low-income immigrants' travel behavior differs from that of other immigrants and people born in the US. We focus on two primary questions:

1. How frequently do low-income immigrants drive, take public transit, walk, and cycle, and how does this compare to other groups?

2. What preferences do low-income immigrants hold, and what barriers and constraints do they face, in taking transit, bicycling, and accessing transit by bicycle?

We designed an intercept survey after interviewing 14 low-income immigrants, whom we recruited through organizations that provide social services and employment opportunities in low-income communities. We collected 2,087 responses from the survey, administered at 44 locations across the San Francisco Bay Area – primarily at rail and bus stops, but also at street fairs, grocery stores, flea markets, and day laborer waiting sites.

The remainder of the report is organized as follows. Chapter II briefly reviews the literature on immigrant travel behavior and influences on transit and bicycle travel in the U.S. Chapter III describes the methodology of the study, including interview recruitment and interview data analysis, survey questionnaire design, intercept site selection, and survey data analysis.

Chapter IV discusses in-depth interview findings, yielding five themes that helped us design the questionnaire. Chapter V describes sociodemographic characteristics and travel habits of survey respondents. The report concludes with a summary of findings and offers policy recommendations to address the travel needs of low-income immigrants.

II. LITERATURE REVIEW: IMMIGRANT, TRANSIT, AND BICYCLE TRAVEL

This chapter summarizes existing research on the travel behavior of immigrants to the United States, as well as influences on transit and bicycle travel. The three elements of the literature review helped us understand how we could best use an intercept survey to address gaps in the literature about immigrant bicycle and transit travel.

We begin by describing how the travel of immigrants is different from people born in the United States, discussing possible reasons for those differences, and describing current immigrant travel trends in the San Francisco Bay Area. Next, the chapter discusses influences on public transit travel, describing some of the particular barriers that low-income groups face. The final section reviews influences on bicycle travel, from the built environment to packages of transportation policies.

IMMIGRANT TRAVEL BEHAVIOR

Immigrants in the U.S. today are more likely to take public transit, carpool, bicycle, and walk compared to non-immigrants. This pattern remains even after controlling for a variety of demographic, socioeconomic, and spatial characteristics.[5] As immigrants remain in the U.S., over time they tend to replace their sustainable transportation patterns with driving, diminishing but not completely eliminating the differences.[6]

Scholars have hypothesized several reasons for the variation in travel. Some of this scholarship accounts for part of the difference by referring to an unexplained “immigrant effect”—latent cultural attributes that contribute to travel behavior.[7] Other evidence suggests that workplace area characteristics and neighborhood preferences can account for much of the remaining variation in travel.[8]

Several studies also point to the importance of social networks in immigrant travel behavior. Informal travel services and networks address a critical gap in immigrant travel needs. For example, camionetas, or private jitney services, cater to Latin American immigrants making intercity trips. Camioneta riders in Southern California reported preferring camionetas to other bus services because the trips were faster and they felt safer because drivers were also Spanish speakers.[9] A critical mass of non-English speakers can also help intracity travelers taking public transit, as longer-tenured immigrants help reduce language barriers for newcomers by translating transit information and their local knowledge of the systems.[10] Immigrants living in predominantly immigrant neighborhoods are more likely to carpool than immigrants living elsewhere, suggesting a strong influence of social networks in arranging travel.[11] Social networks in immigrant neighborhoods might also explain immigrants’ increased propensity for walking and biking.[12]

In the study area for this report, consisting of Alameda, Contra Costa, San Francisco, and Santa Clara Counties, immigrant travel patterns largely correspond to the trends identified in the literature. The California Household Travel Survey[13] reports that low-income immigrants most often walk for their trips (see Figure 1). They make few trips by bicycle, and make fewer trips by transit than by car. Regardless of nativity status, low-income

groups take transit more, walk more, and bike less than their higher-income counterparts. But irrespective of income, immigrants are more likely to carpool than the U.S.-born in the Bay Area.

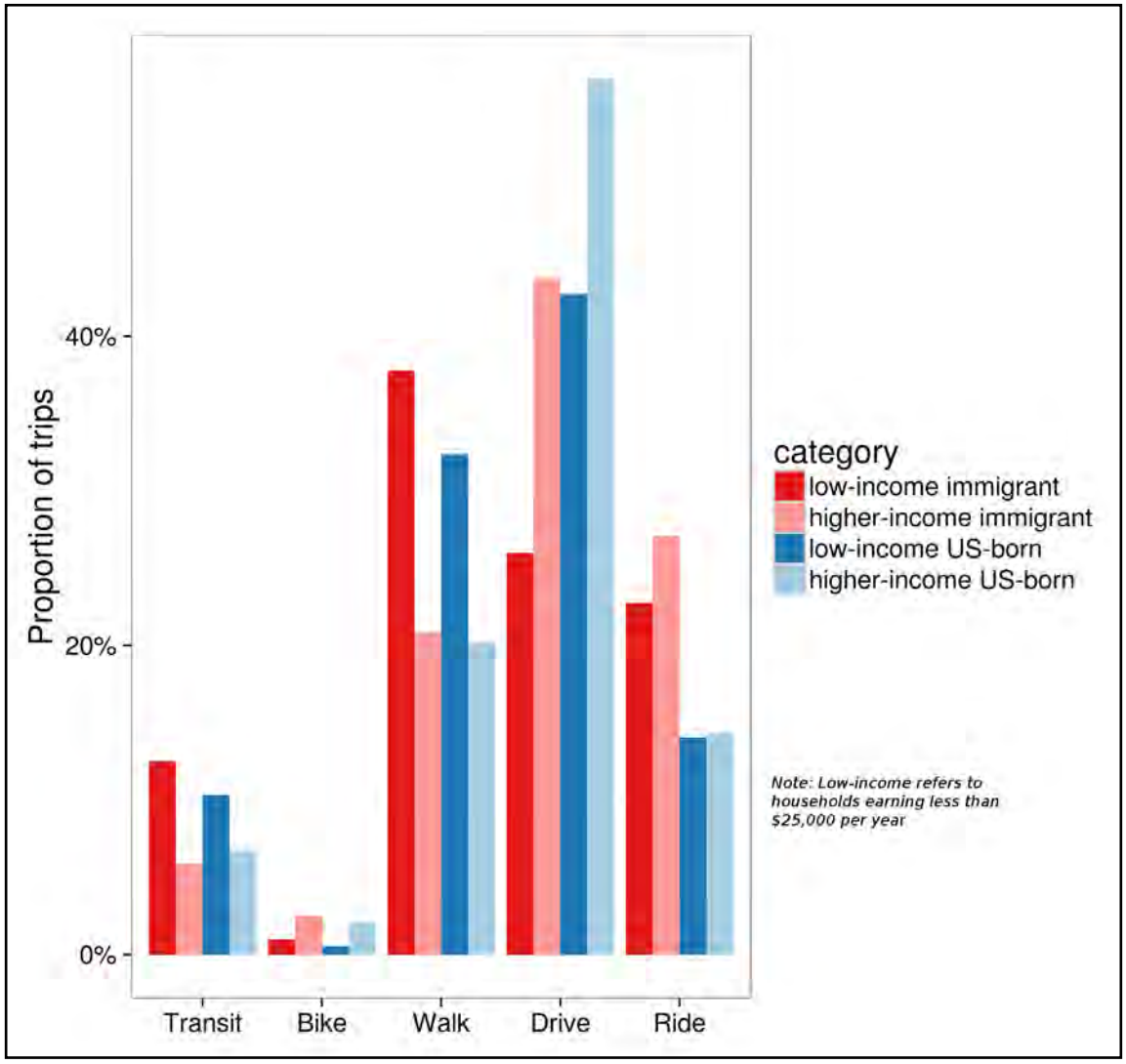

Figure 1. Mode Choice in the San Francisco Bay Area (weighted by population)

Source: California Department of Transportation, "2010-2012 California Household Travel Survey," 2013.

MOTIVATORS OF AND BARRIERS TO PUBLIC TRANSIT USE

What influences the use of public transit? Factors that explain transit ridership can be divided into four broad categories: regional geography and economy, population, automobile accommodation, and transit systems.[14] Greater population density, higher proportions of poor and immigrant residents, more households without cars, more frequent transit service, and lower fares are all associated with greater transit ridership in a metropolitan area. If it is relatively fast and cheap to use transit, people are more willing to take it.

But low-income transit riders face significant burdens that others experience less often or do not experience at all. Poor access to jobs is a particularly large burden for low-income

travelers: the suburbanization of low-wage jobs, and the increasing suburbanization of low-income residents—not necessarily to the same cities and towns—means that public transit cannot provide sufficient service to reach multiple employment opportunities disbursed throughout the region.[15] Owning a car increases income and employment opportunities for low-wage workers more than access to public transit does.[16] And although public transit use is highest among low-income households, commuting alone by car is still their most common mode of travel to work.[17]

Vulnerable groups face additional barriers to public transit use beyond job access. In the 1995 National Personal Travel Survey, a majority of transit riders responded that transit took too much time, transit vehicles were not sufficiently clean and were too crowded, and they were worried about crime when taking transit.[18] Particularly for women, fear of crime on transit may cause people to modify their travel behavior to avoid what they perceive to be unsafe environments.[19] For the lowest-income riders, managing household budgets to account for the cost of transit fares against all other expenditures can add stress and can reduce their ability to participate in additional activities or travel beyond a walking distance from their homes.[20] Low-income women who care for children tend to make more trips related to their care, and often find it difficult to use public transit when traveling with children.[21] Furthermore, immigrants with limited English proficiency have reported experiencing rude behavior from bus operators when speaking another language and difficulty understanding monolingual transit information.[22]

MOTIVATORS OF AND BARRIERS TO BICYCLE TRAVEL

What encourages or prevents people from bicycling for work or errands? Several recent literature reviews have synthesized hundreds of studies to find a few key factors that influence bicycling in metropolitan areas, which include bicycle infrastructure, land use characteristics, provisions and amenities at destinations, and transportation policy.[23] The relationship between demographics and bicycling, however, is less clear.

Almost all studies that look at the question of bicycle travel have found bicycle infrastructure—separated bike paths, on-street bike lanes, and shared bicycle routes—to have a significant relationship to the amount of bicycling.[24] Some cyclists will go out of their way to use dedicated bike infrastructure, even if it adds time and distance to their trips.[25] Separated bicycle facilities may help increase bicycling by creating a perception of safety, an important determinant of bicycling – particularly among women, children, and the elderly.[26]

Short distances are also conducive to bicycling, though the shortest trips are easily replaced by walking.[27] Mixed land uses and higher density development have a positive relationship with bicycling, as they bring origins and destinations closer together.[28] Some of the influence of the built environment on bicycling may be due to self-selection effects; that is, people who prefer to bicycle may move to a bicycle-friendly neighborhood, so the influence of the built environment could be overstated, but both direct effects of the built environment and residential sorting likely play important roles.[29]

Amenities available at the end of trips also have an influence on bicycling frequency. Secure and sheltered bicycle parking at the destination significantly increase bicycling,[30] while a lack of shower facilities at work has a negative effect on bicycle commuting.[31] Transit riders cycle more often to stations that feature bike lockers and staffed bike facilities. For example, on the BART system in the San Francisco Bay Area, the number of secure bike parking spaces at a given station is the most significant factor in predicting the share of people accessing transit by bike.[32] Building secure bike parking and connecting neighborhood bicycle facilities to station areas also led to increases in bicycle access on the system over a ten-year period, underscoring the importance of planning for these provisions during facility upgrades.[33]

Research emphasizes the importance of integrated packages of transportation policies that increases bicycling. Some scholars attribute the success of bicycling in several Western European countries to parking pricing, vehicle taxes, land use restrictions, and traffic calming, in addition to providing adequate bicycle facilities. High levels of bicycling in some U.S. cities may be attributed to extensive bicycle infrastructure, education, and traffic enforcement.[34]

Finally, evidence on the relationship between socioeconomics and the propensity to ride a bicycle is mixed. Men bicycle more than women, in large part because women have greater household and childcare burdens, reducing their time available for bicycling and their options to transport children.[35] However, gender differences are often reduced in locations where women feel safer while bicycling.[36] On the other hand, the relationship between factors such as income, race, and ethnicity is somewhat unclear. Some studies have found that whites and higher income households bicycle more frequently,[37] and others have found the opposite or no relationship.[38] Still others report that in the southern United States and particularly car-dependent metropolitan areas, the lowest income groups bicycle most.[39] One study finds low-income immigrants to be the most likely income and nativity group to bicycle; they are also more likely to bicycle for utilitarian purposes such as commuting and shopping than those born in the United States.[40]

III. METHODOLOGY

In this mixed-methods study, we collected data by means of in-depth interviews with foreign-born informants, followed by a self-completed intercept survey at various locations across the region. In the San Francisco Bay Area, more immigrants come from Central America—including Mexico—than any other subregion.[41] Thus, we surveyed in English and Spanish in predominantly Latino immigrant neighborhoods. The survey data were the main focus of analysis, as the purpose of the interviews was mainly to help develop appropriate questions for the survey. Nevertheless, the interviews yielded valuable insights that we report in Chapter IV.

This chapter first describes how we recruited for and conducted the interviews, and how we analyzed the interview data. The second half of the chapter then describes the intercept survey development, administration procedures, and analytical techniques.

INTERVIEWS

Recruitment

We contacted about a dozen organizations in the San Francisco Bay Area that provide services to low-income immigrants, such as language training, connecting people to employment, and basic health care. Four organizations agreed to assist in recruiting their members for initial interviews – three in Alameda County and one in Santa Clara County. The organizations invited our research team to present at general membership meetings, where we introduced our project and invited people to participate in individual in-depth interviews.

Fourteen people agreed to participate in interviews, six women and eight men. They ranged in age from early 20s to nearly 60. All were from either Mexico or Guatemala, as most Spanish-speaking clients of the organizations tended to be. Two participants had regular access to a car; the others did not. The interviews took place in March and April 2014.

Interview Guide

We designed a semi-structured interview protocol to ask about people's travel experiences for the day, the usual ways they get around, a particularly memorable experience they had on transit, and their experience bicycling both locally and other places they have lived. If interviewees did not bicycle, we asked them what prevented them from doing so. Finally, we asked the interviewees how they accessed transit, their experiences associated with transit access and egress, and the role that bicycling plays in their getting to transit. (See Appendix A for a copy of the interview guide.)

Participants were welcome to share other experiences they considered relevant, although we encouraged them to stay on the themes of the interview. The semi-structured interviews allowed us to begin with topics we hypothesized were important but allowed for flexibility for interviewees to speak about meaningful experiences that we did not anticipate.[42]

Interview Process

Thirteen interviews took place on site at the supporting organizations. One participant was unable to leave home, so we conducted the interview there. Two San Jose State University student researchers, who were fluent in Spanish, conducted twelve of the interviews with assistance from the report authors. Two interviews were conducted in English. Each interview lasted between thirty minutes and one hour. At the beginning of the conversation, the interviewer obtained informed consent for the participant. The interviewer audio-recorded the interview and also took notes. Each participant received a pair of movie tickets as an incentive for completing the interview.

Data Analysis

A professional service transcribed each interview and provided transcripts in the original interview language. A bilingual research team member then used open coding techniques to develop an initial codebook for the set of interviews and to code each interviewee's responses. After the first round of coding, the research team member returned to the codebook for axial coding to make connections among the open codes. We turned these axial codes into questions that we later incorporated into the survey. This type of theme generation is the hallmark of qualitative research. It is not meant to yield generalizable or statistically representative results. Rather, the purpose is to describe the particularities of a phenomenon within a specified setting. In the case of mixed-methods work such as this study, the findings can be subsequently tested through a quantitative approach.[43]

INTERCEPT SURVEY

We administered a self-completion, paper-based intercept survey at 44 sites across the San Francisco Bay Area over a 16-week period between October 2014 and March 2015, excluding the four weeks during the winter holidays. The questionnaire was available in both English and Spanish. Questionnaires were distributed during morning peak commute hours, late afternoon, evening peak commute hours, and on weekends. We achieved the highest returns during evening commute hours. Surveys were only distributed during daylight hours. The sampling strategy may have been somewhat biased toward people employed during standard working hours, though we varied our survey times and locations to ensure we had some representation from itinerant workers, shift workers, and the unemployed.

We chose an intercept survey over other survey methods primarily to ensure we obtained a sufficient number of responses from low-income immigrants who access transit by bicycle, because this group is such a small share of the population (approximately 0.02%[44]). Because it is such a low proportion of all people in the population, the only way to ensure we would reach a sufficient number was to approach them while they were on their way to or from transit. Intercept methods are also often better than random mail or phone surveys at reaching vulnerable population groups reluctant to respond to survey requests, such as undocumented immigrants.[45] We did not ask about legal immigration status so we do not know the extent to which the sample represents undocumented immigrants. However, 15 percent of respondents indicated they were born outside the U.S. and earned less than $25,000 per year.

Questionnaire

We asked questions in three categories: recent travel, transportation experiences, and personal information. (See Appendix B for the questionnaire.)

In the *recent travel* section, people reported on their travel in the seven days prior to taking the survey. They noted how many days they drove, got a ride, bicycled, walked, or took public transportation. Respondents who traveled by bus or rail reported their access and egress modes. Respondents also reported the number of days they had access to a bicycle and a motor vehicle. We asked about vehicle access rather than ownership because some low-income and immigrant households rely on borrowing cars as a mobility strategy.[46]

The *transportation experiences* section included questions about attitudes toward, perceptions of, and constraints related to travel by bicycle and transit. We asked respondents to estimate how much more they would have taken public transit and bicycled given hypothesized changes in transit cost, crime abatement, bikeway provision, and ease of using bikes with transit. We also asked them to report how often they substitute one mode for another and how much they agree or disagree with statements about public transit and bicycling.

The *personal information* section collected standard demographic and socioeconomic information, as well as a home address or a nearby intersection.

Before finalizing the complete questionnaire, we pre-tested the survey on a convenience sample of respondents in both English and Spanish and then pilot-tested the survey in the field. The choice of an intercept survey limited the number and types of questions we could ask, as respondents must be able to complete the questionnaire quickly – in no more than three to five minutes, per best practices.[47] Draft versions of the questionnaire originally included questions about the current trip a traveler was taking – including origin, destination, mode, and trip purpose. However, those questions pushed the survey length over five minutes in pilot tests and were confusing for those who were not in the process of completing a trip (e.g., were shopping in a plaza). The questionnaire thus focuses more on general patterns of behavior rather than specific instances.

Survey Locations and Procedures

We designed the sampling method to overrepresent low-income Latino immigrants who ride transit, with additional emphasis on obtaining responses from people who access transit by bike. Most of the neighborhoods targeted are in Alameda, Santa Clara, and San Francisco Counties, the counties with eight of the ten largest cities in the metropolitan area.[48] Two of our sites were in nearby Contra Costa County. We used American Community Survey data to rank Census tracts along the following dimensions: the proportion of foreign-born residents, the proportion of the foreign-born population that earns less than $25,000 per year, the median income of the census tract, and the proportion of people who take public transportation to work. We selected locations that ranked in the top third within each county on at least four of those variables. The criteria were chosen after we tested several other combinations of variables that yielded similar neighborhood selections.

We surveyed at public transit stops, businesses that cater to immigrants, public plazas, and day-labor sites. Two-thirds of the intercept sites were at transit stops. We chose the transit stops within each tract with the highest bus and rail ridership. About one-quarter of the intercept sites were at public places and businesses. The remainder were at locations where day laborers regularly wait for work (see Figure 2 and Appendix D).

In order to sample as diverse a set of people as possible at each chosen location, surveyors either selected potential respondents randomly or approached everyone present. At high-traffic sites, surveyors approached every fifth person to ask him or her to take the survey. At lower traffic sites, such as most bus stops, surveyors approached every person. In all instances, surveyors were instructed to prioritize bicycle riders to achieve a sufficient sample of responses from those who used bicycles together with transit. The response rate (the number of people who completed a survey divided by the number of people surveyors asked to take the survey) was 33 percent. Twenty-nine percent of respondents completed a Spanish-language survey.

The survey took approximately five minutes for each respondent to complete, and was designed to be finished at the intercept site, although 4 percent of respondents mailed their surveys back. We did not offer cash incentives, but we did offer each potential respondent a granola bar as a token of appreciation for completing the survey.

Data Analysis

Research team members entered the response data from each paper survey into an online database. We entered approximately two-thirds of the surveys twice to aid in error-checking. We then analyzed the dataset using standard descriptive statistics and tests of comparison, categorizing the data set by nativity (immigrant or U.S.-born) and income (low-income or higher-income).

The number of useable responses for each analysis in Chapter V differs depending on how complete each questionnaire was; that is, every comparison does not contain the same exact subset of responses. However, 1,431 respondents provided both nativity and income information, which form the basis of analysis for group comparisons.

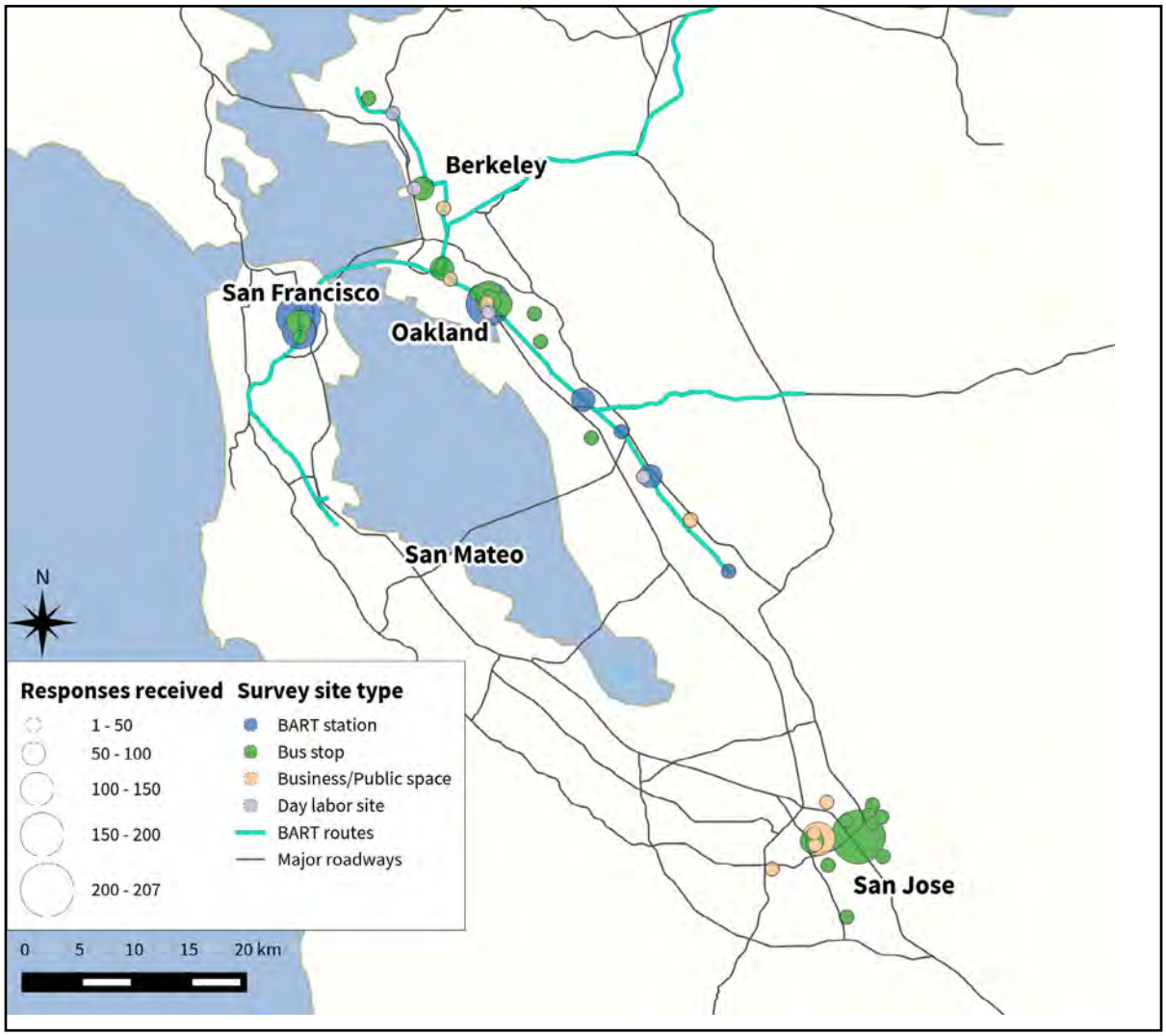

Figure 2. Survey Sites by Type and Responses Received

IV. FINDINGS FROM IN-DEPTH INTERVIEWS

Immigrant interviewees shared stories about safety, cost, legibility, reliability, discrimination, and the role bicycling plays in overcoming other transportation barriers. We report in detail on each of these themes, and conclude the chapter by explaining how the findings influenced the survey design.

SAFETY

One of the most persistent themes throughout the interviews was safety. All but one of the participants spoke in some way of dangerous conditions that served as barriers to taking public transportation or bicycling, whether referring to neighborhood safety or dangerous encounters with other bus riders. Everyone knew someone else who had been robbed or assaulted. Several respondents talked about having been assaulted or robbed at one time or another, usually while walking from or waiting for the bus. One story illustrating the salience of the issue came from Lupe,[49] a middle-aged woman who, having recently arrived in the U.S., rode the bus to do housework for a woman stricken with cancer.

> And I went by bus, but I didn't know that the [the bus I took] didn't—I thought that the bus went to [a neighboring city] and I was sure that I would get off there. But the [bus] didn't take me farther than [a couple miles away] and from there I had to walk. And when I was walking, like this with my bag, I saw someone going behind me, but I never imagined—but he caught my attention because when I was walking faster he was also walking faster. And I told myself "I think he's in a hurry and he's going to pass by me," and I was like this waiting for him to pass by and no, and he grabbed my bag… and threw me to the ground. And he saw I was wearing a wedding ring and he turned around and asked me for it and said I had to give it to him very quickly and when he saw that I didn't—the same nerves as if my hands were tied—then he pulled out a gun and told me that he was going to kill me if I didn't give him the ring.[50]

Later in the interview, Lupe said that she did not believe she would ever regain her confidence while traveling. "You always go around looking who's going ahead and who's coming behind," she said. Immigrants reported violent crime occurring during daylight hours as well as at night, suggesting travel causes continual stress. Associating negative events with transportation may have some role in motivating immigrants to switch from transit to sharing rides or other modes.

Violence is not limited to the streets, thus leading to more directly negative associations with riding the bus. Several participants spoke about dangerous encounters with other bus riders, including verbal and physical assault, while on the vehicle. There was a consensus that additional security measures needed to be taken on buses to make them safer, particularly in comparison to other forms of public transit.

> **David:** …Sometimes people who come on [the bus] are on drugs and everything. And it makes you feel uncomfortable. And there they start to speak nasty, I don't like it. BART is different – BART has cameras and everything, it's totally different.

> **Interviewer:** Then you feel more comfortable on BART than on the bus?
>
> **David:** Yes, on BART, yes. On BART you can go wherever you want, but on the bus you can't….The bus is smaller, you notice someone and if you want to move to a different part, it's complicated. On BART, no, it's big. You can change the train you're on.

We propose the same relationship holds in bicycling as well. Although no one had reported being a victim of violent crime while riding a bike, several interviewees spoke of experiences where they saw people assaulted while riding bikes, especially at night. Gabriela told us about her experience witnessing violence on a person riding a bike:

> Unfortunately, I've noticed someone whose bike was robbed. The person was going very peacefully riding his bike when a person just stopped him, did this with his hand [holds arm straight out], and knocked him over. When the man got up from the hit, the other man grabbed his bike and fled. That left me terrified.

Indeed, Gabriela later shared that this experience prevented her from riding a bike. Others concerned with security suggested that improved safety might increase their own likelihood of riding bicycles more frequently. One interviewee noticed a distinct improvement in safety for bicyclists when the police increased their presence in the neighborhood.

Despite the danger many interviewees associate with getting to transit, for some the bus is the way to mitigate problems while traveling in unsafe neighborhoods; that is, it is safer than walking. One interviewee reported that even though she might have to wait for a long time for the bus, it was more dangerous to walk in her neighborhood and so the time spent waiting was worth it. Others prefer bicycling because it is safer than the alternatives. Two people who frequently relied on their bikes appreciated bike lanes that designated separate roadway space for bicyclists. Carlos, who did not use a bicycle, talked of his conversations with friends about their experiences on the bike.

> Well, it's safer than walking. Some of them complain about the car drivers not respecting people who ride bikes and even being aggressive or insulting them, but it doesn't happen all the time... Other than that, most of them are happy because they feel safer when riding a bike than walking on the street.

Our interviews suggest that regular bicyclists feel safer from neighborhood crime when bicycling because they can travel alone and quickly, while others have mixed perceptions about the relative safety of taking public transportation in comparison to walking.

DISCRIMINATION

For many of the Latino immigrants interviewed in this study, issues concerning discrimination present another barrier to transit access. This is not to say that bus operators or other passengers who hold any sort of implicit prejudice toward others prevent them from riding the bus, but rather their actions and attitudes make the transportation experience difficult and stressful. We did not expect the level to which transit riders reported discrimination while traveling to be as high as it was, and we propose these discriminatory actions as

another component in our earlier hypothesis regarding what prevents travel habits from forming. These episodes may not represent a general trend in the interactions between drivers and passengers or among passengers themselves, but they do reflect the salience of incidents on how the interviewees' experienced daily travel.

A common complaint from interviewees concerned rude bus drivers, whose discourtesy was seemingly directed at the immigrants themselves. Some perceived this as a racial bias and noticed problems most frequently when bus operators and passengers were different races. Others, such as Lourdes, saw driver actions as a general lack of a customer service-oriented attitude.

> It's because the operators, the bus drivers are very arrogant, they disrespect you or treat you badly. [It makes me feel] uncomfortable, because one is paying his bus ticket, his fare and if they are considerate, some good people, they chat a little with you. Sometimes I find it's because they speak Spanish, yes, but other people are that way, others that speak English are very annoying. They drive quickly too.

Interviewees did not understand what regulations applied to bus drivers—for example, when they should get involved in altercations on the bus and how much time they should wait at stops—but every interviewee who talked about the bus operators thought they needed to do a better job in treating passengers fairly. Carlos talked about an instance when he and his friend realized they needed a bus transfer after they had already paid their fare at boarding.

> [The driver] started shouting and yelling at me, saying that a transfer should be bought at the time that we bought the bus ticket and not after. I said sorry, I was blocks away, but he said the third block, right? He kept yelling and screaming at me, and said that I was not gonna get the transfer, and he was not gonna give me one and if I didn't like it I could make a complaint. 'You do whatever you want, but I'm not giving you the transfer.' So to me that was the moment to stop, 25 cents transfer was not worth but it wasn't the 25 cents, it was the driver, it was the way he was screaming and yelling.

A couple of interviewees suggested bus operators should take classes in how to treat people with respect. Others were more idealistic, hoping that recognizing common human rights and a common history of oppression among riders and drivers from historically disadvantaged groups could improve the way riders were treated.

COST

One objective of public transit is to provide access and mobility to all individuals. However, based on our interviews, low-income immigrants see travel by transit as a constraint on mobility because of its temporal and monetary cost, and the fact that they must adapt their travel patterns to fit this constraint. Gabriela spoke of taking her daughter out of school because of the added expense of taking her child there when she no longer worked near the school.

> I had just changed my job—and as I told you, I don't drive—so then I had to change my daughter's school. I took her out in third grade. Right now she's in fifth and she wants to return to the [old] school, but I think about the expense of transportation, and as I said, I'm going the same direction. I know that it's going to be the same cost, it's $2.35 to go, $2.35 to return, and again because I have to take her, return to my house, pick her up, and return to my house.

Some of the cost would be alleviated by purchasing a monthly pass, but Gabriela noted that "sometimes it's easier to spend $10 per day because you don't have $80 to buy the monthly pass." Likewise, for others who earn little money, transit is still too expensive to travel beyond the local area despite the relative savings public transit brings compared to owning a vehicle.

> There's got to be a point where there's got to be a little more understanding of how much I make and how much I pay in our system and how much I'm giving back, being productive... . Let's say a ticket back from San Francisco is about almost $8. I make $8 an hour, well, that's an hour of work. But if I spend also an hour going back and forth, that's two hours. And I don't see an incentive on public transportation when it's expensive. (Carlos)

The same interviewee saw the cost of transportation as a serious limitation to opportunity. This non-bicyclist said that people who did not have the money to spend on transportation were forced to look for work within bicycling distance, which restricted better employment. Those who rode bicycles more frequently disagreed with that observation, suggesting that as immigrants spend more time bicycling, they view it as enabling opportunity. Francisco, who relied mostly on his bicycle, spoke about the importance of bicycling to save money: "If you don't have money or if you do, you can save a little more by not spending it on transportation." Others found enjoyment in riding a bike to save time and money. For Gabriela, the experience was "marvelous." She spoke of bicycling during her lunch break from work:

> ... [I]t was 15 minutes by bike. They gave me an hour to eat, so I took 15 minutes to come here and go back and I could come home to eat. So for me it was marvelous: to be able to go home for half an hour, sometimes it was to eat, sometimes it was to see my children, but it was great to be able to go by bike.

Longer travel distances require mixing modes of transportation, often as a means of saving money as well. This suggests that mixing modes of transportation enables the greatest access for immigrants. For day laborers, it was common to get rides by car to their final work site from a central pick-up location. For those who normally rely on bikes, they would ride their bikes to the pick-up location and usually park it there. One woman spoke of her husband's usual way to work that involved both driving and bicycling: because of the lack of free parking near his work site, he drove his car to the neighboring city, parked over a mile from work, and bicycled the rest of the way. Others talked of frequent experiences walking to their final destination from transit rather than waiting, paying, and transferring to a second bus.

LEGIBILITY

For many interviewees, understanding both the city and the transportation networks proved difficult. Because of both difficulty of language comprehension and complex transit system interoperability, immigrants are less likely to understand how transit works, particularly at first, presenting another barrier to travel. The earlier story of the woman who was robbed at gunpoint while walking, because the bus didn't take her to her final destination, illustrated that not fully understanding the system can lead to potentially dangerous situations. Others frequently got lost when they first arrived in the city. Furthermore, the way different transit systems label their bus and train routes is not always consistent with each other, causing confusion for some riders.

> The first time is—was difficult, I didn't know, I couldn't—it was a mess when I took BART, that over there [in San Francisco] there's the B, the E. There are letters and sounds that they have here and I didn't know what they meant. Well, I knew "D" and "E," but I didn't know what they were for. The first time cost me. (Manuel)

Several interviewees wanted more signs and information in Spanish for all modes of transportation. This is a critical issue for some, because inability to understand schedules and directions leads to direct out-of-pocket costs when traveling on systems with distance-based fare structures.

> **Interviewer:** You don't understand BART?
>
> **Lourdes:** No. Sometimes when I transfer I don't understand it because I went to San Francisco one time to get some papers. We couldn't go because we didn't understand it there.
>
> **Interviewer:** What do you think could be done better to be able to understand it?
>
> **Lourdes:** Well now I don't know, maybe to be clearer, because there are a lot of people who don't understand English well and it costs us a lot to travel... It could be that [information in Spanish] would be good too, that way we could see where we can get off, reading it better that way.

For others, on the other hand, riding the bus was the way to learn the city when they first arrived.

> But here I can realize, there are places where I've never been and if I go by bus, if I go, for example, to 20th Street from here I can see how the street numbers are changing and I can realize where I'm going to get off. That's how I've learned to get around here. (Lupe)

For Lupe, traveling by bus was better than BART for this reason, despite other relative advantages of the rail system. Even still, for this interviewee, it took several weeks after arriving for her to develop the courage to begin to travel by herself. The bus, which has a lower cost, offers a lower barrier to entry to make mistakes or to learn to read the city, notwithstanding issues of safety as mentioned earlier.

Fare structures are also opaque to many of the interviewees, particularly information about passes and differences in payment information between transit systems across the San Francisco Bay Area. Most of the interviewees themselves knew about monthly bus passes, but had acquaintances who did not know about them or that they would save money in the long run, despite a high upfront cost.

> I've thought to myself that I'd like to make something that would be published—maybe on the bus, in English and in Spanish—"Look, there's a ticket that costs so much a month, but you can use it a lot." As I ... like I just told you I changed my daughter's school when I saw that I was paying $10 per day, sometimes not being able to pay for the ticket. But when you have the information, how are you going to act, right? Get this—your $80 is what it will cost you right now, but one day you will have spent as much. I know people who don't have that information, and I would like to help them. (Gabriela)

Several respondents wanted more information in Spanish, but also wanted information to be more widely available in various outlets, including the bus, children's schools, grocery stores, and other organizations they frequent.

RELIABILITY

In some respects, the bus has a contradictory nature for many of the interviewees. The bus provides access to more distant locations than they would otherwise be able to reach because they do not drive or do not have everyday access to a car. However, every interviewee who had regular experience riding the bus talked about unreliability to some extent. This unreliability places undue burden on low-income immigrants' time, making economic advancement difficult. Lourdes spoke about effects of unpredictable schedules on her job.

> And what's more, when I worked I took two buses and that affected me because it didn't arrive on schedule and I arrived late to work too... [Work] calls you and asks, "Are you coming or what happened?" There are times that that also bothers you, not completing [the trip], leaving early in the morning, waiting there so that the buses come by too late or not knowing what time they're going to come because they don't come at the time that's listed on the bus schedule.

For a trip that might take 20 minutes by car, some interviewees reported leaving up to two hours early to be sure they arrived to work on time. Many reported better results when they were able to take the rapid, limited-stop bus to get to their destinations, but they could not count on other buses to arrive on time or at all. People recognized bus bunching as a frequent problem, as then they would have to wait much longer for the next bus to arrive.

To combat such issues, people described making trips that allowed them to avoid taking the bus as much as possible. For some, that meant minimizing transfers.

> ... I already know how complicated it is to be on the bus, as I've said, sometimes because it's full or sometimes because they don't let you get on with a baby stroller. So I try to look for closer places to try to get on the bus only once. That is, to go and return on the same route, to not be cruising around and all that because you lose too much time—you lose too much time. (Gabriela).

For others, that meant eliminating bus trips altogether.

> Well I always walk, I prefer to go walking because otherwise it makes me very late. If I'm going to be waiting until the bus arrives, I'll be very late. (María)

María continued, describing it as troubling to be in an emergency for a population that cannot afford to rely on an ambulance or trust that they will have a ride available whenever they need it.

> So then I tell you it depends on if [the buses] come every 45 minutes, if they don't come every half hour, if it's 45 minutes. To see the schedule they need more because in an emergency, many people get sick, I've found like on the route I take is from [the hospital] ... They need to put more on these routes because it's necessary when they go to that hospital, that general hospital ... that's the most efficient way to go.

Most did not understand why these issues took place, but wanted bus operations staff to find ways to run buses more frequently and on schedule.

BICYCLING: OVERCOMING BARRIERS

In contrast to mostly negative attitudes toward public transit, many of the respondents recognized and associated bicycling with positive transportation experiences. The more familiar immigrants are with bicycling, the more likely they are to see it as a way to overcome barriers associated with transit. Most people we interviewed enjoyed bicycling as a form of recreation and healthy activity. Several saw bicycling as a way to get exercise while performing other activities – for example, to go shopping or to travel to other recreational activities. Particularly for these individuals, bicycling is a relaxing form of transportation.

> ... Because I'm single and I don't have a wife yet, I'm not married or anything, when I relax I have almost a whole day free. So then I like to bicycle because I like to clear my mind, then I leave my house, go to the store, I take my time so I'm not bored at home. That's why I bike a lot or I go to the park to play soccer and I get there by bike. Well, I like it a lot. (José)

The majority of interviewees reported they did not bicycle daily or bicycle for errands or other utilitarian reasons, but still enjoyed bicycling as a purely recreational activity. Lourdes reported that she used to bicycle with her spouse around the park, and had a neighbor who used to ride bicycles with her own daughter. Nonetheless, for this woman and others, bicycling was not an option for work because it was too far. For others, such as Ana, needing to carry items for work prohibited bicycling as a viable option. The few respondents who did not bicycle reported that they saw the value in bicycling as a form of exercise or enjoyment with family.

Part of the enjoyment of bicycling stems from its ability to help people be self-reliant—not having to wait for public transportation or rely on others. David talked of his comfort level on his bike:

> I think that you go alone and you can stop where you want. Sometimes I think it's not so complicated—you go and don't have to go at a certain speed. You can go at the speed you want, and for that reason, it feels good.

Apart from enjoying bicycling, participants talked about the utility of bicycling, especially when compared to other modes of transportation. Three participants talked about the central role that bicycling occupies in their getting to work. For those participants, bicycling was best for getting to work when distances were relatively short.

SUMMARY

Our interviews suggest confirmation of barriers to transit that others have found in focus group sessions, including discriminatory and unwelcoming behavior from bus operators and the unreliability of transit.[51] Likewise, cost of travel emerged as a common hardship, similar to what others have reported.[52] However, our interviews also highlight two other factors that are in the forefront of immigrants' decision-making but not highlighted as such in other research: neighborhood safety and traffic safety. For some, particularly those who regularly travel by bicycle, it means choosing the bicycle as the safest travel option. For others, neighborhood safety deters bicycling, and motivates taking transit or walking. Portions of each question in the "transportation experiences" section of the survey address the themes we developed from the interviews.

Key Takeaways

- Safety was mentioned by nearly all interviewees as a barrier to both transit use and bicycling
- Safety from violence and safety from traffic are interrelated; most view addressing both issues as an obligation of transportation agencies.
- Although uncommon, the perception of discrimination based on language and cultural background increases the stress associated with riding transit.
- Unaffordable transportation is seen as a barrier to employment opportunities in the region.
- Understanding the transit system is difficult: fare structures, system maps and transfers, and the responsibility of transit operators with respect to safety are often opaque.
- Questions about bus reliability require additional buffer time for travelers to ensure they make it to destinations on time, increasing the burden on transit-dependent individuals.
- Some rely on bicycles as a way to be self-reliant and overcome barriers associated with transit use, but most do not.

V. INTERCEPT SURVEY FINDINGS

This chapter reports on the analysis from the intercept survey. It starts by describing the sociodemographic characteristics of the 2,087 survey respondents, both compared to population statistics and stratified by nativity and income group. It then describes findings from the portion of the intercept survey that asked how people traveled during the seven days prior to taking the survey and how often they had access to a car, bike, or bus pass. In particular, it compares the travel habits of low-income immigrants with three comparison groups: higher-income immigrants, and both low-income and higher-income U.S.-born respondents. The analysis suggests that the costs of travel and employment might explain why low-income immigrants use some modes of transportation less than other groups.

In the final section, the chapter presents findings from the questions that asked respondents to report on barriers, attitudes, and preferences with respect to public transit and bicycling, the collection of which we call "transportation experiences." As in the other sections of this chapter, we compared the group of low-income immigrants with three other comparison groups by nativity and income. We find low-income immigrants to confront affordability as the biggest barrier to taking transit, but to have had a variety of experiences that differ from those in other groups. We also find low-income immigrants to be the group least likely to consider bicycling as a travel option, but also to report having the fewest barriers to bicycling.

Before proceeding, we define a few terms we use to characterize the survey respondents. The term *immigrant* means anyone who was born outside of the United States. *Low-income* refers to the group of households that earned less than $25,000 last year, the approximate federal poverty level for a family of four.[53] A *transit rider* is someone who took public transportation at least one day in the seven-day period immediately prior to taking the survey. A *bicycle rider* is someone who rode a bicycle at any time during the seven-day period immediately prior to taking the survey—whether to access or egress transit only, or for a stand-alone trip.

SOCIODEMOGRAPHIC CHARACTERISTICS

Immigrant Origins

Forty-five percent of respondents reported that they were born outside the United States. On average, these immigrants had lived in the United States for 15 years, though 19 percent of immigrant respondents had arrived within the previous five years.

Mexico was the most common country of origin, accounting for 44 percent of immigrant respondents. Other frequently listed origins include countries in the remainder of Central America, the Philippines, China, and India (see Table 1).

We chose intercept survey locations in order to oversample both immigrants in general and Latino immigrants in particular. Thus the survey respondents were more likely than Bay Area residents to be immigrants from Central America or Mexico. According to 2009–2013 American Community Survey five-year estimates,[54] 32 percent of the population in

the San Francisco Bay Area was foreign-born, 27 percent of whom came from Central America or Mexico.

Table 1. Countries of Origin of Immigrant Intercept Survey Respondents

Origin	Count
Mexico	387
Guatemala	88
El Salvador	87
China	41
India	40
Philippines	39
Vietnam	24
Honduras	21
Nicaragua	14
Peru	11
Other	125

Income and Other Sociodemographic Characteristics

Respondents had lower household incomes than the regional average, largely because we oversampled transit users. The median household income category among respondents was $15,000–$24,999, compared to the regional median of $91,500.[55] Immigrants in the sample tended to earn less than U.S.-born respondents. Sixty-two percent of immigrants responded that their households earned less than $25,000 last year, compared to 44 percent of the U.S.-born (see Table 2). The median household income category for immigrant respondents was $15,000–$24,999, while it was $25,000–$49,999 for the U.S.-born. A significantly greater proportion of immigrants did not provide income information.

Table 2. Proportion of Respondents in Each Income Group by Nativity

Income	Immigrants (%)	U.S.-born (%)
$0–$4,999	22	12
$5,000–$14,999	20	16
$15,000–$24,999	20	16
$25,000–$49,999	18	18
$50,000–$74,999	9	18
$75,000–$99,999	5	8
$100,000–$149,999	3	6
$150,000–$199,999	2	4
$200,000 or more	1	2
Not provided	33	23

Note: Responses are from 936 immigrants and 1,038 U.S.-born. 113 respondents did not provide nativity information.

Survey respondents were not representative of the San Francisco Bay Area population according to other sociodemographic characteristics (Table 3). Due to the focus on Latino immigrants, more than half of all respondents identified as Hispanic or Latino, compared to 21% in the regional population. Survey respondents were less educated, more likely to be in school, more likely to be renters, and less likely to be female compared to the overall population. They were younger than the average San Francisco Bay Area resident, and tended to have larger households. Immigrants who responded to the survey had been in the United States eight fewer years than the average immigrant in the region.

Table 3. Comparison of Respondents' Sociodemographic Characteristics to Population Characteristics

		Intercept survey respondents	SF Bay Area population
Proportions			
Race/ethnicity			
Hispanic/Latino		54%	21%
Asian		12%	30%
Black		13%	6%
White		15%	40%
Two or more		3%	3%
Education			
Less than HS		17%	12%
High school		31%	17%
More than HS		52%	71%
Employed		64%	64%
In school		27%	11%
Female		43%	51%
Renter		83%	42%
Means			
Years in U.S. (immigrants)		15	22
Age (years)		39	46
Household size (total)		3.9	2.6
	Under age 16	1.1	0.5
	Age 16 and over	3.0	2.1
Median			
Median household income		$15,000–$24,999	$91,500

Note: Summary statistics for the SF Bay Area population are estimated from the Public Use Microdata Series (PUMS) data[56] for Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara counties, using PUMS-provided household and person weights. Only the population 18 years of age or older were tabulated in the summary, to match the survey eligibility criteria.

Sociodemographic characteristics of low-income immigrant respondents differed from those of other groups in a number of key ways (Table 4). They were more likely to be Hispanic or Latino compared to all other income and nativity groups, and more likely to be

Asian than the U.S.-born groups. Nearly half of low-income immigrant respondents had less than a high-school education, almost five times as many as the next highest group. They were less likely to be employed than both higher-income immigrant and U.S.-born respondents, as well as less likely to be in school than those born in the United States. They were five years older on average than those born in the U.S. Fewer than one in ten low-income immigrants owned their homes, compared to a quarter of higher-income immigrants and a third of higher-income U.S.-born respondents.

Table 4. Comparison of Respondents' Sociodemographic Characteristics by Nativity and Income Group

	Low-income immigrant	Higher-income immigrant	Low-income U.S.-born	Higher-income U.S.-born	All Respondents
Proportions					
Race/ethnicity					
Hispanic/Latino	83%	**55%**	**41%**	**31%**	54%
Asian	12%	**31%**	**4%**	**6%**	12%
Black	1%	3%	**23%**	**20%**	13%
White	1%	**7%**	**23%**	**32%**	15%
Two or more	1%	1%	**4%**	**6%**	3%
Education					
Less than HS	46%	**10%**	**7%**	**1%**	17%
High school	33%	29%	**41%**	**17%**	31%
More than HS	22%	**61%**	**52%**	**82%**	52%
Employed	54%	**80%**	55%	**81%**	64%
In school	19%	25%	**33%**	**31%**	27%
Female	43%	44%	48%	41%	43%
Renter	93%	**75%**	90%	**67%**	83%
Means					
Years in U.S.	15	16			15
Age (years)	42	41	**37**	**37**	39
Household size (total)	4.0	4.0	3.8	**3.3**	3.9
Under age 16	1.3	1.2	**0.9**	**0.8**	1.1
Age 16 and over	2.8	2.7	3.0	2.5	3.0
Total responses	389	240	352	450	2,087

Note: Bold indicates significant differences from low-income immigrant group, using two-sample equality of proportions or means tests ($p < 0.05$). Proportions summarize responses from questions with categorical-response options; means summarize responses from questions with continuous, handwritten responses. Every respondent did not answer every question.

Social Characteristics of Bicycling

To get a sense of social influences upon bicycling, we asked respondents to estimate how many people they knew who bicycled for utilitarian purposes. The majority of respondents knew at least one person who did so; 83 percent knew ten or fewer. However, low-income

immigrants were more likely to respond that they did not know anyone who bicycled. About 40 percent responded that nobody they knew bicycled, significantly different from the 30 percent of higher-income immigrants, 24 percent of low-income U.S.-born respondents, and 20 percent of higher-income U.S.-born respondents who did not know any bicyclists.

Home Locations

Seventy percent of respondents provided their home ZIP code. Respondents lived across the San Francisco Bay Area and beyond, with 169 ZIP codes represented, but they were concentrated near the intercept sites (see Figure 3). The majority of responses came from ZIP code 94601 in Oakland, which contains the Fruitvale BART station. The second-highest number of responses came from the Mission District in San Francisco, where all the San Francisco survey sites were located. A large share of respondents also lived in a cluster of ZIP codes in central and east San Jose.

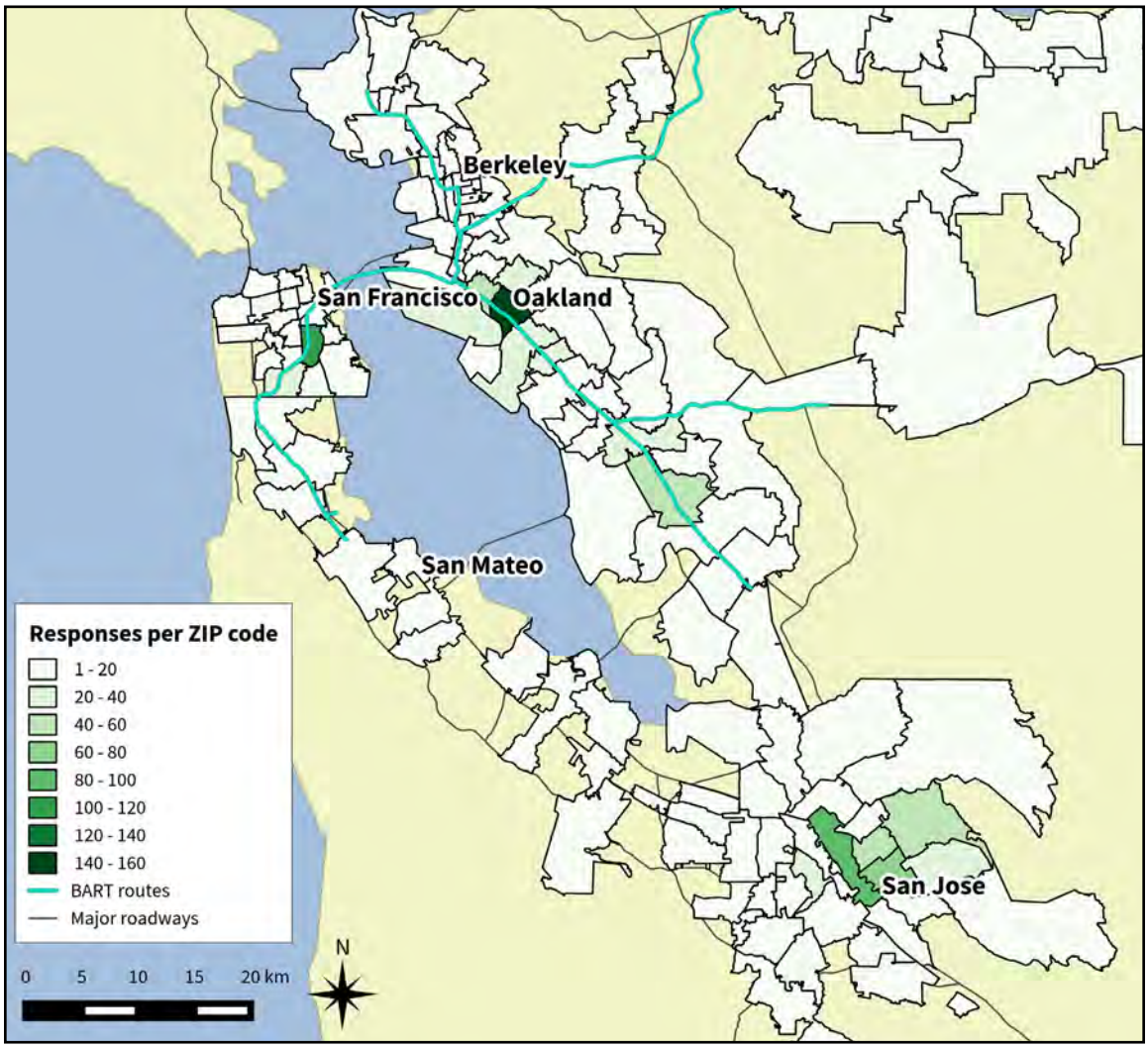

Figure 3. Home ZIP Codes of Survey Respondents

LOW-INCOME IMMIGRANT TRAVEL PATTERNS

Motor Vehicle, Bicycle, and Bus Pass Access

Two survey questions asked respondents how many days in the previous seven they had access to a "working motor vehicle" and to a bicycle (see Table 5 and Table 6).

Low-income immigrants had less access to a motor vehicle than both higher-income groups, though their access was about the same as that for low-income U.S.-born respondents. About 69 percent of low-income immigrants did not have access to a motor vehicle in the week prior to taking the survey, and only 14 percent had access every day that week. In contrast, 32 percent of higher-income immigrants and 43 percent of the higher-income U.S.-born respondents had access to a vehicle every day. Vehicle availability was about the same for both low-income groups.

Table 5. Proportion of Respondents Who Had Motor Vehicle Access by Number of Days of Access

	Low-income immigrant	Higher-income immigrant	Low-income U.S.-born	Higher-income U.S.-born	All respondents
0 days	69	**50**	69	**43**	63
1-6 days	16	17	13	15	13
7 days	15	**32**	18	**43**	24

Note: Values are percentages. Bold indicates significant differences from the low-income immigrant group, using two-sample equality of proportions test ($p < 0.05$). Based on 1428 responses.

Low-income immigrants as a group were the least likely to have access to a bicycle. About 15 percent had access to a bicycle every day, compared to 22 percent or more of all other groups. Four of every five low-income immigrants lacked access to a bicycle at all.

Respondents in all four groups generally reported having bicycle access either always or never; it was rare for anyone to indicate they had part-time access to a bicycle between one and six days. This suggests few people in the sample share bicycles – either informally with neighbors, friends, or other household members, or formally by using the regional bike share system – since those with access to bicycles almost always had access.

Table 6. Proportion of Respondents Who Had Bicycle Access by Number of Days of Access

	Low-income immigrant	Higher-income immigrant	Low-income U.S.-born	Higher-income U.S.-born	All respondents
0 days	80	**72**	**72**	**58**	71
1-6 days	5	5	3	5	5
7 days	15	**22**	**25**	**37**	24

Note: Values are percentages. Bold indicates significant differences from the low-income immigrant group, using two-sample equality of proportions test ($p < 0.05$). Based on 1,377 responses.

Finally, we asked respondents whether they had a bus pass. Significantly fewer low-income immigrants (38 percent) said they had a bus pass, compared to all other respondents (55 percent).

Travel Patterns

The first portion of the questionnaire asked respondents how frequently in the previous seven days they had taken various modes of transportation. Respondents took public transit most often, using it an average of 4.4 days per week. Most transit riders were regular riders – about 24 percent used it five days a week, 6 percent used it six days, and 36 percent used it all seven. Almost nine out of ten respondents had taken transit at least one day in the previous week.

Walking for an entire trip was the next most common mode of transportation—respondents walked an average of 2.3 days per week. Respondents drove, carpooled, and bicycled one day or less in the week prior to taking the survey. However, bicycle riders—respondents who reported riding a bicycle at least one day—rode their bikes an average of 3.7 days in the week prior to taking the survey. One quarter of all bicycle riders rode their bike every day.

On the whole, none of the differences in travel patterns between low-income immigrants and other groups are large (see Table 7). The two biggest differences are between low-income immigrants and higher-income immigrants. Low-income immigrants walked almost one day more and drove almost one day less on average compared to higher-income immigrants. We observed smaller differences between low-income immigrants and higher-income U.S.-born respondents in all modes except carpools. The only significant difference between low-income immigrants and the low-income U.S.-born was the number of days taking transit.

Table 7. Mean Number of Travel Days per Mode

	Low-income immigrant	Higher-income immigrant	Low-income U.S.-born	Higher-income U.S.-born	All respondents
Transit	4.1	4.0	**4.7**	**4.5**	4.4
Walk	2.6	**1.7**	2.5	**2.1**	2.3
Drive	0.8	**1.7**	0.7	**1.5**	1.0
Ride	0.9	0.9	0.9	1.1	1.0
Bike	0.7	0.7	1.0	**1.0**	0.8

Note: Bold indicates significant differences from the low-income immigrant group, using linear regression with categorical predictors ($p < 0.05$).

There are few differences in the geographic variation in travel patterns among low-income immigrants (see Table 8). Low-income immigrants in the East Bay, San Francisco, and San Jose drove, carpooled, and walked with about the same frequency. However, low-income immigrants in the East Bay bicycled almost one day more than those in San Francisco – who almost never bicycled – and 0.6 days more than those in San Jose. Low-income immigrants in the East Bay took transit less – 1.4 days less than low-income immigrants in San Francisco, and 0.7 days less than low-income immigrants in San Jose.

Table 8. Mean Number of Travel Days per Mode by Survey Site Location, Low-Income Immigrants

	East Bay	San Francisco	San Jose
Transit	3.6*†	5.1*	4.3†
Walk	2.5	2.8	2.5
Bike	1.1*†	0.2*	0.5†
Drive	1.0	0.4	0.8
Ride	1.0	0.6	1.0

Note: Matched symbols in each row indicate statistically significant difference pairs ($p < 0.05$, Tukey's range test).

Access to Transit

Likewise, there are few significant differences in the modes various groups took to access transit (see Table 9). Respondents most often walked to and from transit, and low-income immigrants walked to transit on average a half day more often than both higher-income groups. Low-income immigrants drove to transit slightly less often than higher-income immigrants, and they bicycled to transit about half as often as U.S.-born respondents.

Table 9. Mean Number of Travel Days per Transit Access Mode, by Nativity and Income Group

	Low-income immigrant	Higher-income immigrant	Low-income U.S.-born	Higher-income U.S.-born	All respondents
Walk to transit	3.5	**3.0**	3.7	**3.1**	3.4
Drive to transit	0.3	**0.5**	0.2	0.4	0.3
Ride to transit	0.4	0.4	0.4	0.5	0.4
Bike to transit	0.4	0.4	**0.8**	**0.9**	0.6

Note: Bold indicates significant differences from the low-income immigrant group, using linear regression with categorical predictors ($p < 0.05$).

About 15 percent of all transit riders rode their bikes to transit at least one day in the week prior to taking the survey. Respondents who bicycled to transit did so regularly – an average of 4.2 days per week. Among those who bicycled to transit, there are no significant differences in the frequency with which low-income immigrants and the other comparison groups did so.

Low-Income Immigrant Employment and Travel Patterns

Employment status is associated with differences in travel mode frequency (see Table 10). Working respondents got a ride or carpooled more, took transit more, and walked less than low-income immigrants who were not employed. There are no significant differences in the way low-income immigrants accessed transit when looking at employment status.

Table 10. Mean Number of Days of Travel per Mode, by Employment Status, for Low-Income Immigrants

	Employed	Not employed
Transit	4.5	3.7
Walk	2.3	2.9
Ride	1.1	0.6
Drive	0.9	0.6
Bike	0.8	0.6

Note: Bold values indicate significant differences ($p < 0.05$, two-sample difference of means test). Based on 384 responses.

As we described in Chapter III, we selected four broad categories of sites at which to survey. We surveyed half of low-income immigrants at bus stops, about a quarter at BART, 16 percent at day-labor sites, and the remaining 11 percent at businesses or public plazas. We can use the site type as a proxy to understand how the travel of day laborers as a unique classification of worker differs from others.

There are several significant differences in the average number of days low-income immigrants took each mode when categorizing survey results by intercept location type (see Table 11). Respondents recruited at businesses drove more frequently than respondents recruited at BART stations. Responses from day labor sites walked between one-and-a-half and two days more than all other respondents at survey locations. They bicycled about one day more frequently than those surveyed at transit stops. They took transit about half as often as respondents surveyed at BART, and one third as often as respondents at bus stops.

Table 11. Mean Number of Days of Travel per Mode, by Intercept Survey Site Type, for Low-Income Immigrants

	BART	Bus stop	Business	Day labor site
Transit	5.1*†	4.2*‡	3.9	2.8†‡
Walk	2.2*	2.4†	2.5‡	4.0*†‡
Bike	0.6*	0.5†	0.6	1.5*†
Drive	0.4*	0.8	1.6*	1.0
Ride	0.6	0.9	1.0	1.3

Note: Matched symbols in each row indicate statistically significant difference pairs ($p < 0.05$, Tukey's range test). Based on 389 responses.

Other Demographic Relationships with Travel Patterns

Low-income immigrants with children under the age of 16 used a car more often than those without children (Table 12). There were no significant differences in average days traveled by other modes of transportation, suggesting having children is not a major deterrent to transit or bicycling. This was not true for the low-income population born in the U.S., however. In addition to using cars less, low-income U.S.-born respondents with children took transit about one half day less per week than those without children. There were

no significant differences for higher-income immigrants or the U.S.-born with respect to average number of travel days by mode and having children.

Table 12. Mean Number of Days of Travel per Mode, by Child Presence, for Low-Income Immigrants

	No children	Children
Transit	4.2	4.0
Walk	2.7	2.4
Ride	**0.7**	**1.2**
Drive	**0.5**	**1.2**
Bike	0.7	0.6

Note: Bold values indicate significant differences ($p < 0.05$, two-sample difference of means test). Based on 389 responses.

Fewer differences in mode use by sex exist among low-income immigrants, except for bicycling. Women bicycled an average of 0.2 days in the week prior to taking the survey, compared with men who bicycled an average of 1.1 days. This pattern is similar among the other nativity and income comparison groups. In every case, women bicycled less frequently than men. Among the higher-income U.S.-born population, the difference between female and male bicyclists was a half day, a statistically significant difference over low-income immigrants.

As we explored multiple bivariate relationships within the low-income immigrant group, sample sizes decreased and standard errors increased, reducing the likelihood of finding statistically significant differences. Even within tests that were statistically significant, the differences in frequency of mode use between the comparison groups were one day or less, except in some comparisons involving survey site locations and type. The substantive differences are relatively small.

PUBLIC TRANSIT AND BICYCLING TRAVEL EXPERIENCES

This section addresses three questions about public transit and bicycling: what might increase use of each mode of travel; how often people miss trips or switch to other modes; and the complexity of transit and bicycle travel in terms of traveling companions, multiple stops, and language barriers.

Public Transit Experiences

What might increase transit use?

The first set of questions the survey asked was headed by the prompt, “How much more would you have taken the bus or the train in the past seven days if the following were true?” The four factors tested were transit affordability, crime, bicycles on board transit vehicles, and bike parking at transit stops. Respondents gave one of four answer choices: no change, one day more, two to three days more, or four or more days more (see Figure 4).

Transit fare cost is a significant barrier for all respondents except the higher-income U.S.-born group. About 60 percent of low-income immigrants declared that they would have taken public transit at least one more day in the previous week if fares were more affordable. Other low-income individuals and other immigrants responded in much the same way – there are no significant differences in their responses. People born in the U.S. earning more than $25,000 responded significantly differently; fewer than half reported they would take public transit more often if fares were cheaper. Furthermore, for those to whom transit fares mattered at all, they mattered a lot. In every comparison group, the most common response was that people would have taken transit at least four more days in the previous week if costs were lower (see Appendix C for more detailed results tables, including the number of responses for each question).

A significant minority of respondents indicated that crime is also a barrier to more transit use. Slightly less than half (44 percent) of low-income immigrants reported that little crime would have increased their transit use, about the same as low-income U.S.-born residents. A majority of high-income immigrants reported crime was a major barrier, though not significantly different from other immigrants at a 95 percent confidence interval. Higher-income U.S.-born respondents were significantly less likely to see crime as a barrier.

Most people indicated that bicycling facilities are not something they take into consideration when riding public transit. Only about one quarter of low-income immigrants would increase their transit use if there were a guaranteed space on transit for their bikes, and about one fifth thought sufficient bike parking at transit stops would increase their transit use. Only low-income U.S.-born respondents answered differently from low-income immigrants; 33 percent indicated readily available bike parking would cause them to take transit more.

Note that although we intended the affordability question and the others like it to measure respondents' potential for switching modes, response patterns indicate that not everyone understood them this way. For example, about 20 percent of people who answered "4+ days more" to whether affordable fares would have affected how often they took public transit already took the bus or train at least four days during the week. In other words, people responded illogically that they would have taken public transit eight or more days in a seven-day period. Nevertheless, we can interpret the responses as the degree of agreement with the question prompt.

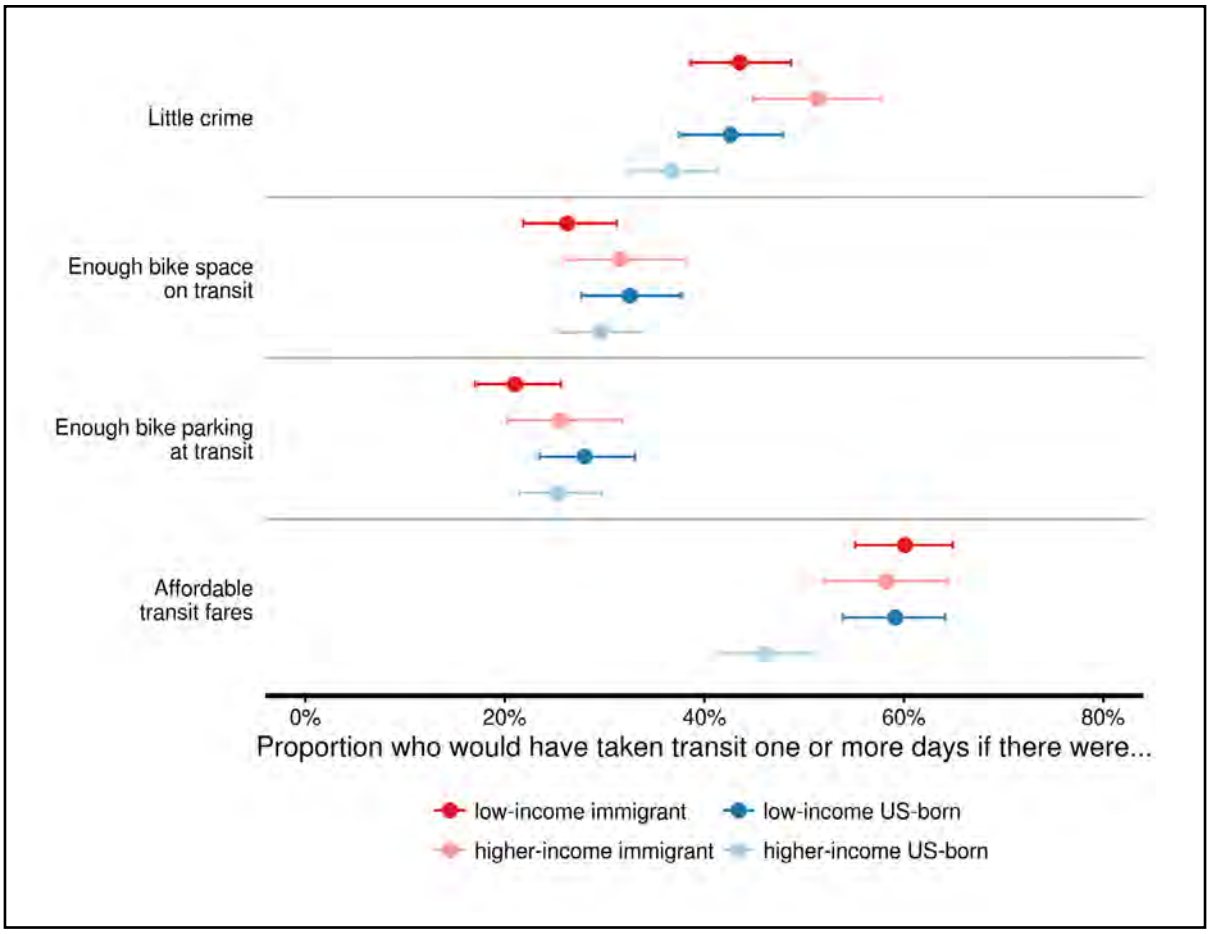

Figure 4. Factors that Would Increase Transit Use

How often do people switch modes or miss trips?

The second set of transit questions asked how often respondents drove instead of taking transit, how often they missed trips because they did not have a car, and how often they missed a trip because a bus passed them by or never came. Respondents chose from the options “never,” “at least once per month,” “at least once per week,” and “more than once per week” (see Figure 5).

Low-income immigrants were less likely than any other group to take transit if they had the option to drive. Differences in group responses to this question are the largest of all the transportation experiences questions in the survey. About 42 percent substituted transit for driving when the latter was an option, compared to over half of each of the groups. A majority of low-income immigrants also reported being unable to make a desired trip at least once a month, whether it was because a bus passed them by or because they did not have a vehicle to make the trip. Similar proportions of respondents missed trips because of unreliable bus service at least once per month. However, both low-income immigrants and low-income U.S.-born respondents were more likely to miss a trip because they did not have access to a car than both higher-income groups.

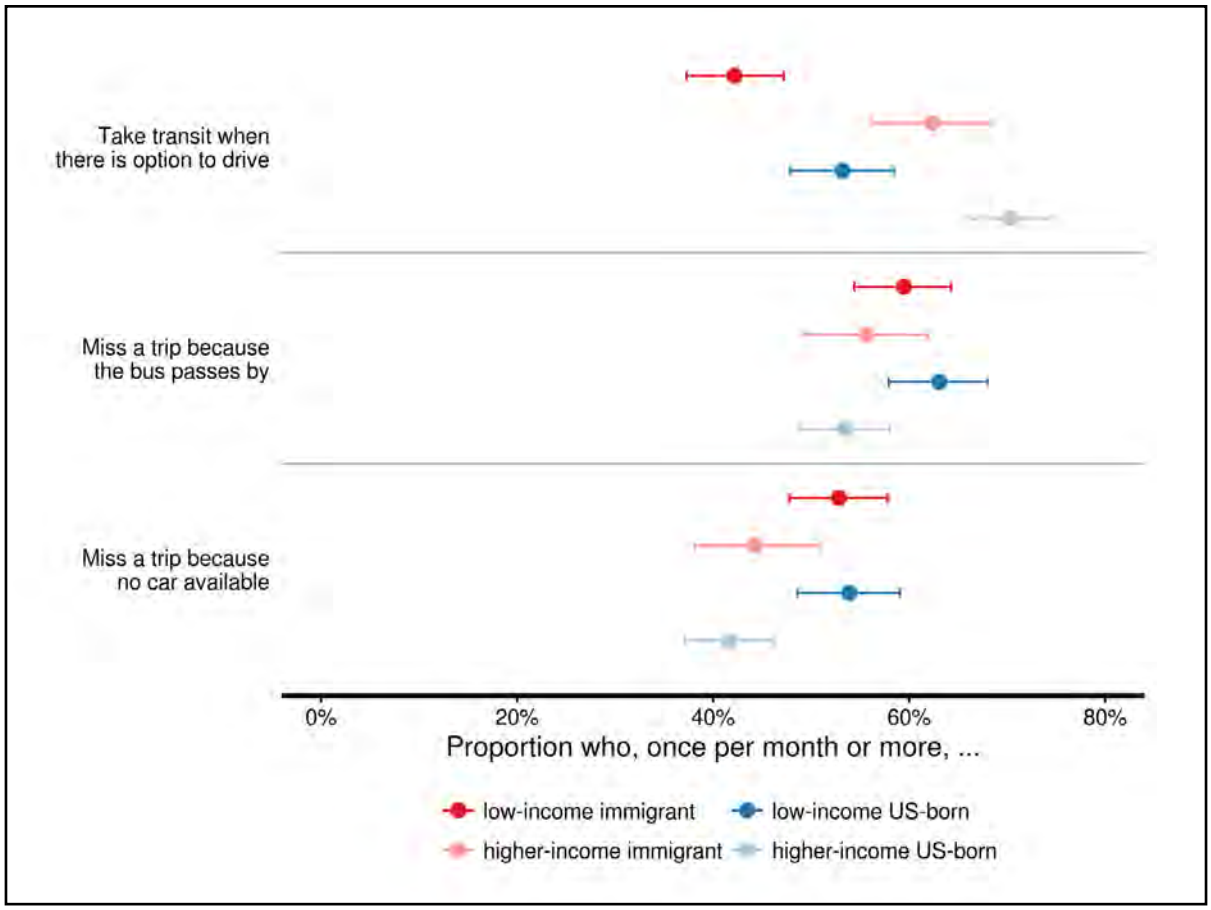

Figure 5. Transit Mode Substitution and Missed Trips

How complex is transit travel?

The final set of questions about transit experiences asked respondents to rate their agreement or disagreement with statements about travel on a five-point Likert-type scale. The statements addressed several different barriers to travel: language, taking transit with other people, and taking transit to multiple stops (see Figure 6).

Almost two-thirds of low-income immigrants agreed that public transit information was available in their language. There are no significant differences in the total proportion who agreed, although low-income immigrants were less likely to “completely agree” and more likely to “somewhat agree” compared to both U.S.-born groups. It is likely that some respondents who answered this question considered the availability of transit information regardless of language. For example, approximately 12 percent of respondents who returned the English-language version of the survey disagreed that transit information was available.

Low-income immigrants responded differently than others with respect to complex travel patterns on transit: significantly more low-income immigrants agreed that it was hard to take transit with others compared to both U.S.-born groups, yet significantly fewer low-income immigrants agreed that it was hard to take transit when stopping at more than one

place compared to both higher-income groups. Higher-income immigrants responded in a similar manner to low-income immigrants on the former question; low-income U.S.-born respondents answered similarly on the latter.

Significant differences in these responses might reflect other characteristics associated with low-income immigrants and their travel. Low-income immigrants have more children on average compared to both U.S.-born groups, so for them traveling with others is more likely to mean transporting people under their care. Some of the difference might also arise from the characteristics of the type of transit taken. Although we did not ask separate questions about perceptions of rail and bus transit, answers may have been influenced by which mode respondents were taking at the time of the survey. About half of both low-income groups took the survey at a bus stop, compared to 40 percent of higher-income immigrants and 36 percent of the higher-income U.S.-born group. Bus networks are much denser than rail networks, suggesting bus riders have access to more places and are better aware of how to transfer to other routes compared to rail riders, making multiple-stop trips comparatively easier to take.

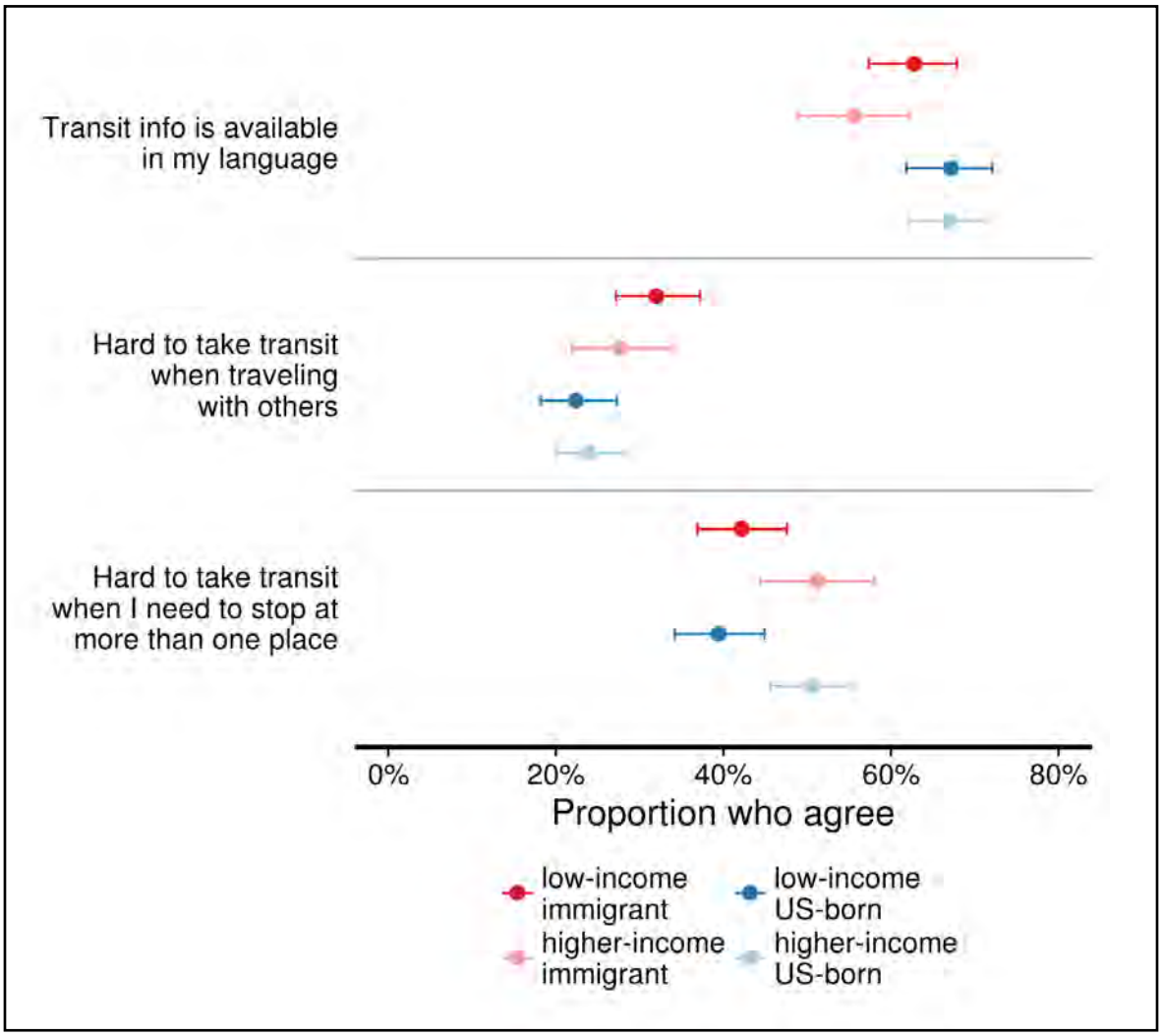

Figure 6. Transit Barriers

Bicycling Experiences

What might increase bicycling?

The first set of questions on bicycling was similar to the set of questions on public transit use; the one difference was that the questionnaire asked about the role of on-road bicycle infrastructure (like bike lanes) regarding the potential for more frequent bicycling (see Figure 7).

Most respondents, including low-income immigrants, did not report that they would bicycle more if there were a reduction in crime, an increase in bike lanes or paths, or better integration with public transit. In each case, however, higher-income immigrants were more sensitive than low-income immigrants to each of the bicycling barriers. Low-income immigrants were least likely to indicate that they would bicycle more in response to these changes.

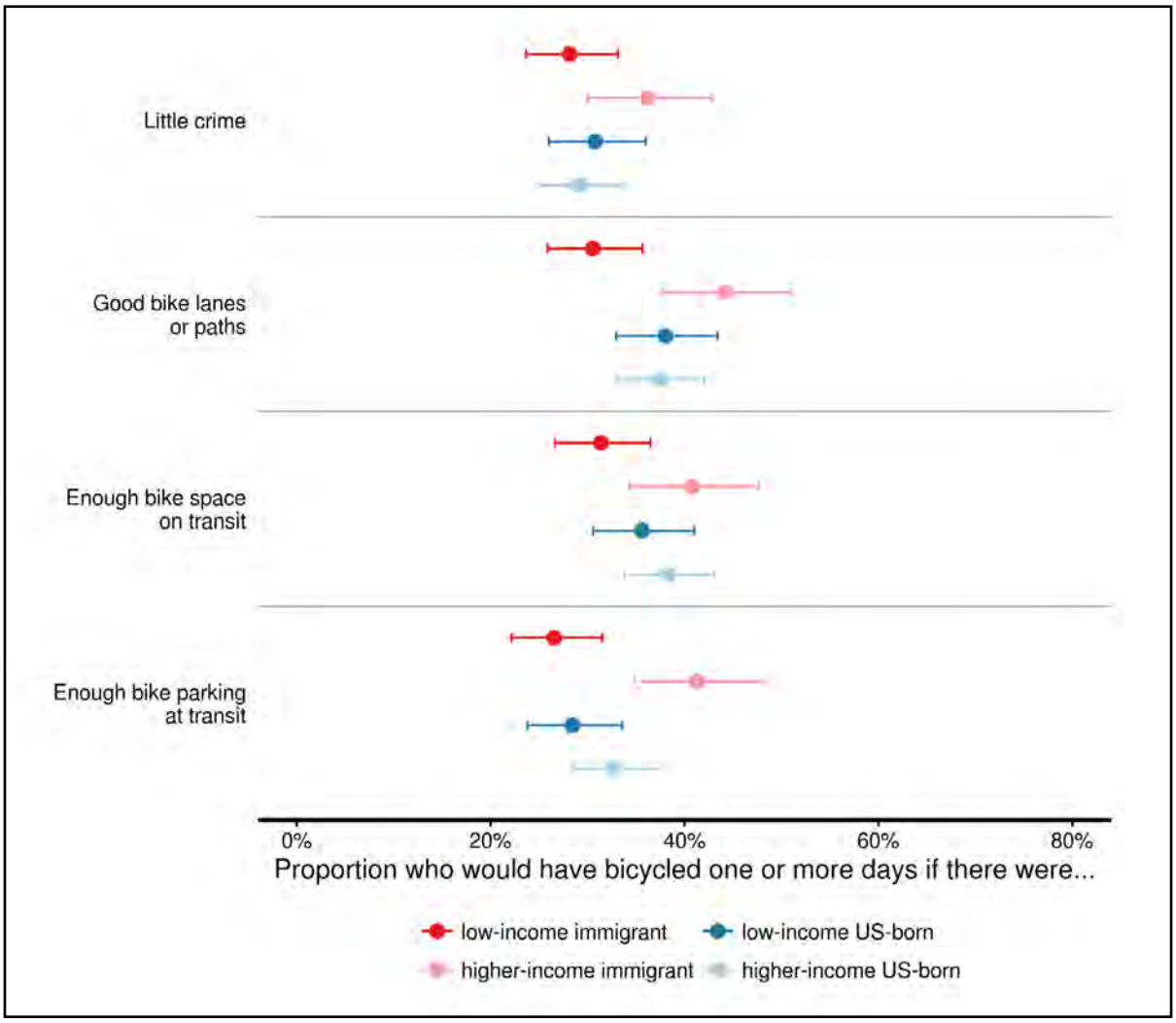

Figure 7. Factors that Would Increase Bicycle Use

How often do people switch to bicycling?

The second set of questions about bicycling asked whether respondents bicycled instead of taking transit to save time or money. The survey also asked respondents how often they bicycled instead of driving.

Most respondents indicated they would not substitute bicycling either for taking transit or driving (see Figure 8). However, low-income immigrants are the group least likely to consider bicycling as a substitute for any reason. About 14 percent of low-income immigrants bicycled at least once a month when they had the option to drive, and about 20 percent bicycled instead of taking transit to save time or money. There are no significant differences between both immigrant groups in how often they took transit instead of bicycling, but U.S.-born respondents bicycled significantly more often to save time and money. Low-income immigrants were significantly less likely to bike instead of driving compared to all other groups.

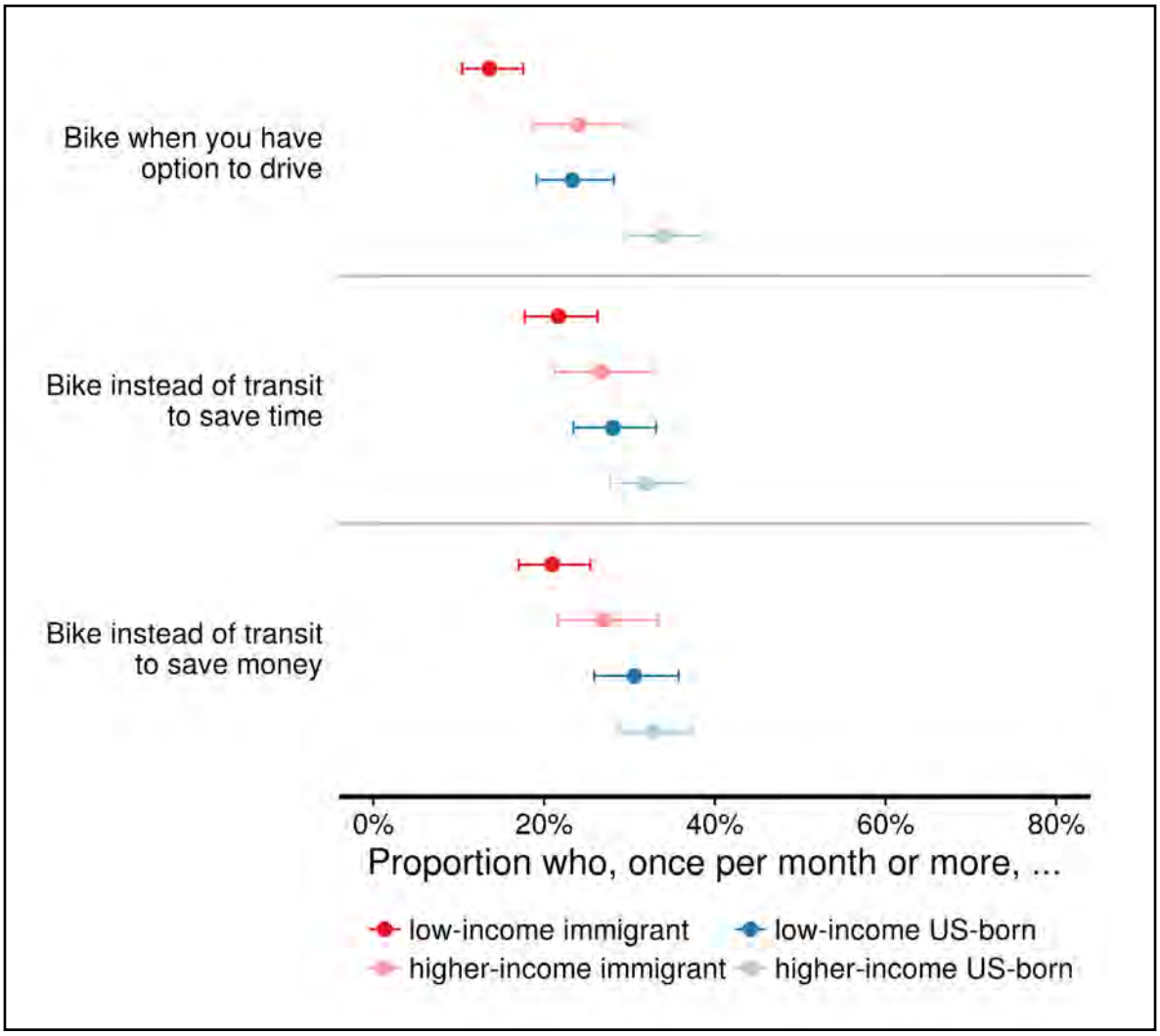

Figure 8. Bicycling Mode Substitution

How complex is bicycle travel?

We asked four questions about bicycling that were similar to the questions about transit complexity. Respondents answered whether they found it hard to bicycle with others, whether they found it hard to bicycle to multiple stops, how difficult it was to find bike parking at transit stops, and whether they needed their bicycles to complete their trips on transit. The first two questions can be broadly construed as barriers to cycling, the third as the lack of a barrier, and the fourth as how cycling allows people to overcome barriers to transit.

Responses to this group of questions were mixed (see Figure 9). Between 10 and 15 percent of low-income immigrants agreed that it was hard to bike with others or with multiple stops along the way, suggesting that those conditions do not add much complexity to trips completed by bicycling. On the other hand, only 13 percent of low-income immigrants agreed that they could quickly find a bicycle parking spot at transit, suggesting bicycling to transit is made harder by insufficient bike parking. However, few low-income immigrants saw bicycles as a necessary component of their transit trips.

Low-income immigrants agreed significantly less often than higher-income U.S.-born respondents for all four questions. Both higher-income groups were more likely to agree that they could quickly find bike parking at transit stops, and more likely to agree that it was hard to bicycle with others. Both U.S.-born groups were more likely to agree that they needed to bring their bikes on transit to complete their trips.

We should urge caution when interpreting these results. About half of the respondents answered “doesn’t apply” to this series of questions (see Appendix C). Low-income immigrants were more likely than other groups to respond that barriers to bicycling do not apply to them, suggesting they are less likely to consider bicycling to be one of their mode choice options.

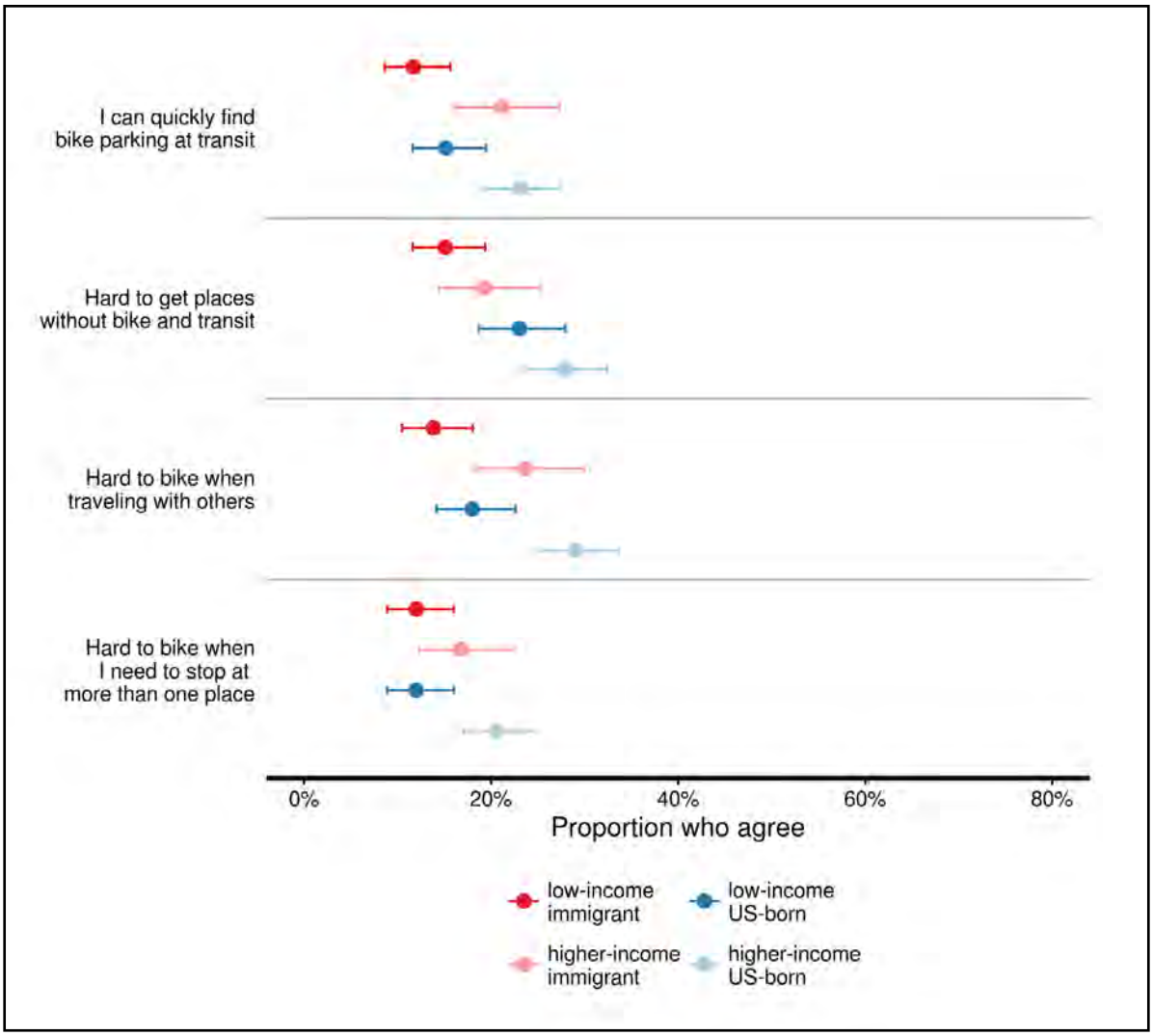

Figure 9. Bicycling Barriers

VI. SUMMARY OF FINDINGS AND POLICY IMPLICATIONS

This study set out to explore the travel of low-income immigrants in the San Francisco Bay Area. We found a few differences in mode use and perceptions of public transit and bicycling among low-income immigrants, people born in the United States, and those from higher-income groups. The greatest single difference is that low-income immigrants more frequently drove instead of using transit when they had the option to drive. But for most survey questions, low-income immigrants did *not* respond significantly differently from other income or nativity groups, both because of small group sample sizes and small substantive differences.

In this chapter we explain likely reasons for those differences and similarities. In the first section, we discuss low-income immigrants' travel patterns and travel experiences as they compare to those of other groups. Our comparisons suggest the built environment plays a critical role in explaining travel, perhaps more so than nativity or income. In the second section, we offer policy implications based on the analysis. We conclude by identifying some limitations of the study and suggesting topics for future research.

TRAVEL BEHAVIOR

Income and immigrant status appear to affect travel patterns in different ways. Income may explain why low-income immigrants are more likely to rely on walking and less likely to rely on driving. Both low-income groups drove less and had less access to a motor vehicle compared to higher-income groups. However, low-income immigrants were not entirely carless: nearly half reported having access to a vehicle, driving, or getting a ride from someone at least one day in the week prior to taking the survey. Fewer reported driving at least one day in the previous week compared to getting a ride, indicating it is more common for low-income immigrants to negotiate rides than to borrow a car to drive outright. Thirteen percent of low-income immigrants who had access to a car did not drive it –and most of them took transit – indicating that some in this group are indeed "choice" riders. Additionally, low-income groups walked more than higher-income groups, consistent with previous research that finds walking to be an important mode choice for the poor.

In contrast, with respect to taking transit or bicycling, low-income immigrants are more like other immigrants than they are like other low-income respondents. Both immigrant groups bicycled and took transit less than the U.S.-born groups. However, it appears that low-income immigrants are more likely to substitute walking for transit or cycling, while higher-income immigrants are more likely to drive instead. Interestingly, low-income immigrants have less access to bicycles than higher-income immigrants, and higher-income immigrants appear to be more motivated to bicycle based on their responses to bicycling barriers, yet their level of transit use and cycling is about the same.

Examining results by employment status, employment type and residential geography helped explain some of the variation. Within the low-income immigrant group, it appears that transit and carpooling play more important roles when compared to travel for people who do not work, for which walking is more common. Employment type also appears to

account for how some low-income immigrants get around. The people we surveyed at day labor sites were more likely than other low-income immigrants to walk and bike, which are flexible modes of travel that match mobility needs of a group that does not have a fixed workplace. Low-income immigrants in the East Bay bicycled more than those in other areas, which may reflect the area's density in between San Francisco and San Jose, offering more bikeable distances than either. They were more likely to take transit in San Francisco, which may come as a result of the city's greater transit density and service frequency compared to San Jose or the East Bay.

TRANSPORTATION EXPERIENCES

Many potential barriers to public transit use are nearly universal. Most respondents are equally concerned with affordability, neighborhood crime, reliability, transit access, and sufficient information about public transit. In one sense, we should expect these findings because we surveyed a variety of people in the same neighborhoods who would be affected by transit service quality and transportation infrastructure in the same ways. These findings suggest that characteristics of residential neighborhoods could predict travel behavior and opinions better than income or nativity status. On the other hand, other demographic variables may better explain travel behavior than income, nativity, or the local environment. For example, low-income immigrants were more likely to report that they found it hard to take transit with other people, though the association might not be due to immigrant status, but instead household structure and the need to travel more frequently with young children. (See Table 3 and Table 12 for details on household composition and travel.)

Some barriers to public transit use are more prominent among low-income immigrants, however. Notably, low-income immigrants were much less likely to take public transit for trips when they had the option to drive. This might be true principally because they have fewer options to drive, given their lower vehicle access in our sample. For the carless, each opportunity to use a vehicle might be negotiated for a specific purpose that transit does not serve, such as accessing health care services in a place without transit access, buying bulk groceries, or traveling outside the region.[57] Some of our interviewees mentioned getting rides for work travel as an occasional need for car use.

A second reason for some groups' preferring transit to a car may result from spatial variation in employment location. Because most of the survey respondents rode public transit five days per week and were employed, it is likely a high proportion of respondents who rode public transit took it to work. Higher-income workers are more likely to commute into San Francisco, which is served well by rail transit with short headways.[58] They may have the option to drive, but parking scarcity, parking cost, and good access to transit on both ends of the trip make transit a more attractive option.[59] Low-wage employment is typically more spatially dispersed, making a car more convenient if one is available. It is less clear why there are differences in the frequency with which the two low-income groups drive when they have the option to take transit, because both groups had access to motor vehicles and drove the same number of days in the week prior to taking the survey.

Low-income immigrants appeared to be the group least motivated to ride bicycles. Both low- and higher-income immigrants were less likely to bicycle, to have full-time access to a bicycle, or to report that they bicycled to save time or money, than the U.S.-born. Low-income immigrants were least likely to respond that any intervention would encourage them to bicycle more than they do. In addition, they were the group most likely to respond that the bicycling questions did not apply to them. The findings about bicycling are different from those in other research that has found the opposite to be true—that immigrants bicycle more than non-immigrants.[60] Based on spatial variation in responses (Table 8) and potential type of employment (Table 11), we suggest that controlling for socioeconomic, demographic, and spatial characteristics in future work may shed light on this relationship. This study adds to other work by exploring the relationship between bicycle access and nativity, which most other studies do not.

Qualitative analysis adds some context to the survey findings. Stories from the interviews with low-income immigrants suggested that personal safety (fear of crime) was a primary concern for interview participants when they rode public transit. This conclusion does not appear to hold as strongly in light of the survey data. Significantly more low-income immigrants reported affordability to be a bigger barrier to travel than crime. Also, concern about crime appears to impact the comparison groups about as much as it affects low-income immigrants, which concurs with other research.[61] One possible explanation for the lack of variation in groups' responses to impacts of crime on their transit use may result from the station selection criteria. Most intercept sites were in low-income neighborhoods, which research has linked to the incidence of crime on transit and at transit stops.[62] Although respondents live in neighborhoods across the region in a variety of socioeconomic strata, it is possible that the intercept site was most salient when they answered the survey.

Interviews revealed two additional concerns with public transit. Many interviewees reported that they had concerns that public information was not available in their native languages, but the majority of survey respondents indicated it was not a problem. However, about a third of U.S.-born survey respondents—almost all of whom completed the English-language questionnaire—indicated they could not find transit information when they needed it. This suggests that language is not the only issue affecting access to transit information.

Immigrant interviewees also relayed worry about discrimination. Several recalled instances when buses drove by, apparently still with open seats, or when bus operators were rude because their English skills needed improvement, which interviewees attributed to intentional discrimination. Survey results suggest these experiences are uncommon for all respondents. It is encouraging that there do not appear to be disparate impacts of transit unreliability. On the other hand, over half of each respondent group indicated buses passed them by at least once per month, and a quarter of all respondents had a bus pass them by at least once per week, suggesting everyone could benefit from service improvements.

STUDY LIMITATIONS

Generalizing our results must be done carefully. First, the non-random sampling method prevents generalizing the results to all low-income immigrants in the Bay Area. The findings are most relevant to people who travel to the locations where we surveyed, even though

we were able to achieve a large number of responses in comparison to previous studies of immigrant travel. Second, we administered our survey in English and Spanish, but not other languages. About 15 percent of immigrants in the San Francisco Bay Area speak one of several Asian languages but do not speak English well.[63] Third, the analysis presented here does not control for urban form characteristics, or transportation infrastructure and level of service, which may partly explain differences otherwise ascribed to income and nativity status.

Intercept surveys must be designed to be relatively short, as respondents do not have the comfort of home or the length of time as they might have when answering other types of surveys. Thus, the survey necessarily omitted questions that may be relevant to travel, such as trip purpose, type of employment, household expenditures, or knowledge and use of formal car sharing or bike sharing systems.

POLICY IMPLICATIONS

The cost, safety, and reliability of transportation were the core concerns for the participants in this study. Bicycle infrastructure, parking, and integration with public transit were considerations for many, but were much less important, particularly for low-income immigrants. We suggest a number of considerations for transportation planners and policymakers to address low-income immigrant travel needs.

First, if transit planners can find ways to reduce fares and to keep fares low for the lowest-income groups, this would have a strong positive effect on low-income immigrants. Our interviews suggest a need for making fare structures easier to navigate. This might occur through improved marketing and outreach about how to save money on fares by using multi-day passes. It might also occur by improving automatic conversion of cash fares to day passes – which already occurs for AC Transit passengers using the Clipper regional fare card – and conversion of day passes to monthly passes. These programs would save passengers money and, importantly for low-income riders, would eliminate the need to pay for a monthly pass up front, which eliminates an affordability barrier. Other ways of reducing the cost burden for low-income riders are also important: the impact of halving the price of a week's worth of day passes on AC Transit, for example, would add $17.50 to a family's bank account – a 3.6 percent raise for a household of four earning poverty wages. Although programs such as the Metropolitan Transportation Commission's Lifeline program target planning and investments in low-income communities have been in place for some time,[64] transit operators have recently begun to enact programs that base fares on income across their whole systems. Sound Transit in Seattle, Washington implemented ORCA Lift on March 1, 2015, a program that discounts fares by over 50 percent for households earning less than double the federal poverty level.[65]

Second, transit agencies should consider investing resources to improve safety not only on transit vehicles, but near and beyond transit stops, working with local police and safety experts to reduce the fear of and susceptibility to crime along the whole journey, from origin to destination. Although areas beyond the station or stop typically fall outside the transit operator's purview, they are clearly very important to transit riders and therefore to ridership.

Passenger safety improvements could additionally come by integrating automatic vehicle location technologies with emergency dispatch to decrease response times to on-board incidents. However, because establishing a greater police presence is a contentious topic in many communities of immigrants and people of color, such steps should be carried out carefully.

Third, improving transit reliability will reduce travel burdens across the board, as the majority of survey respondents indicated they had missed trips because of unreliable service. Adding additional service during peak hours to prevent driving by passengers, reducing bus bunching, and installing real-time arrival information devices on bus stops will reduce anxiety over whether the next bus will come in a timely manner. Online real-time information services, such as NextBus or the 511.org website, serve as complements, but not replacements, for real-time information at bus stops. People without web-enabled phones or whose English proficiency is limited would be unable to access the websites, leaving them at a disadvantage in knowing current bus arrival predictions.

Fourth, transit agencies should continue to invest in accommodating bicycle access to transit. Although bicycling to transit is not a critical access mode for low-income immigrants, a significant minority of respondents to the survey would like to see more space for bicycles on buses and better bike parking at stations.

Finally, the survey data in this study show that there are significant differences in some of the responses between immigrants and non-immigrants. Transit agencies should regularly collect nativity information in on-board surveys or other data collection efforts to understand immigrants' unique travel needs.

FUTURE RESEARCH NEEDS

Additional research can explore questions on immigrant travel that we were unable to address in this study. Some findings are puzzling and worth further research, such as why low-income immigrants are significantly less interested in bicycling compared to other groups. Some interviews in this study implied that safety was the primary reason for not bicycling, but we did not ask about traffic safety as distinct from better infrastructure, which could be addressed in future surveys. Additional work with this particular dataset should control for socioeconomic characteristics beyond nativity and income to understand how those factors affect travel patterns. It should also test how transportation experiences affect travel behavior when controlling for external factors not collected in the survey, such as land use and transportation infrastructure.

Additional work is also needed to fully understand the specific relationships behind the questions about transportation experiences, which were necessarily short in this study so as to fit in an intercept survey. For example, knowing the threshold at which low-income immigrants consider transit fares to be affordable would enable planners to assess price sensitivity across income groups.

Although the focus of this particular study was on Latino immigrants in the San Francisco Bay Area, the region has substantial populations of immigrants from China, India, Vietnam, and

the Philippines. Additional work on immigrant travel should engage people in in languages other than English and Spanish, which would help capture additional variation in immigrant communities. A study of this sort would be able to compare immigrant groups to speak to a wider range of preferences and cultural backgrounds that motivate or hinder travel.

Finally, the San Francisco Bay Area is a transit-rich and generally bicycle-friendly region when compared with other metropolitan areas in the country. Future work should assess how barriers and motivations might change in other regions where it is not as easy to rely on transit or bicycling for daily travel.

APPENDIX A: INTERVIEW PROTOCOL

ENGLISH VERSION

Basic Information to be recorded by interviewer

Name of Interviewer(s):
Interviewee Number:
Location of Interview:
Date and Time:
Language of Interview:
Gender:
Estimated Age:
Other Information:

Introduction and Informed Consent

Hello, my name is _____. I am a [student/researcher] from San José State University [or University of California, Berkeley]. I am working on a research project with professors of city planning. We want to understand how immigrants get where they need to go, like to work, shopping, school, or recreation. Your answers will help us give recommendations to local government and planners on how to improve transportation for people like you.

I expect the interview to take about an hour. I will ask you questions about transportation – how you get around town to where you need to go. I want to find out about what you like or find easy about getting around, and what you find difficult or would like to see improved.

I have some questions I want to ask you, but this is an open discussion. If there is a topic you'd like to discuss that we haven't talked about, please let us know. I want to hear any thoughts you have about your transportation experience that you think would be helpful to me. Also, there are no right or wrong answers to any of the questions I will ask.

I would like to record the interview and take notes as we talk to make sure I've clearly understood what we talked about today. However, I won't write down your name anywhere, so that what you say is completely anonymous. The research team will have a company transcribe [and translate *if it's being done in Spanish*] the interview, but your name will not be anywhere in the recording. **Is this OK?**

Your participation is voluntary. If you decide not to participate in any part of this study, it will not affect your relations with San José State University. Also, you have the right to not answer any questions you do not wish to answer. The results of this study may be published and shared with transportation planners and agencies, but the research team won't write anything that might allow someone to identify you. As a token of appreciation for speaking with us today, we have a pair of movie tickets to give to you at the end of our interview. Do you have any questions or concerns about participating in this study? [*Wait for response. If no questions/concerns, then:*]

Topic Guide Questions

Throughout the interview, the interviewer should be aware of when the interviewees mentions a barrier to or attitude toward transportation, and adapt the interview questions to follow that lead. Prompts and probes are not meant to be exhaustively covered during the interview or read verbatim, but are ways to help the respondent think about some of the topics we're interested in.

Main interview (45 min)

1. Could you tell me about all the places you have gone or will go today, including here [*to the interview site*]? I'd like to know how you got to or will get to each place, and your experience on each part of your trip.

***Prompts and probes*:**

- If respondent mentions transit, ask about access and egress at same level of detail as other components of the trip
- Why did the respondent take a particular mode? If multiple modes taken throughout the day, what caused the respondent to switch modes?
- If someone was traveling with the respondent, did that play a role in the mode he or she selected?

2. Are there other ways you get around but didn't happen to do so today?

***Prompts and probes*:**

- You talked about using [*list modes*] as ways you get around. How did you make your choice?
- Are there advantages or disadvantages for you to using a particular way [*car, transit, biking, walking, etc.*] to get around?

3. Can you think back to a recent time you took transit somewhere? Where did you go and what was the experience like?

***Prompts and probes*:**

- Where were you traveling between?
- How many places did you have to get to on that day?
- How did you get from your starting point to the bus or train stop? Tell me about that part of the trip.
- How did you get to your final destination once you got off the bus or train? Tell me about that part of the trip.
- Were there particular moments on that trip that stick out in your mind?
- How did you find the trip? That is, was it easy to make, or did you have any problems?
- If the last transit trip was by bus, ask the respondent to compare that trip with the most recent one on BART, light rail, or Caltrain. And vice versa for rail.

3a. **If the interviewee mentions biking to transit**: Why did you to ride your bike to the bus or train stop?

***Prompts and probes*:**

- Why didn't you bike all the way to your destination?
- How was your experience taking your bike with you on the bus or train?
- Are there some things that would make it easier for you to take your bike on the train?

4. Have you ridden your bicycle for any [other] trips within the last year?
If yes: Could you tell me about the last time you biked?
If no: Why not? What prevents you from bicycling?

Prompts and probes for "yes"	Prompts and probes for "no"
• *If the last trip was for **recreation**, ask about another trip for work, school, shopping, or visiting. If respondent didn't bike for any of these, explore why not.* • How did you find the trip (easy, challenging)? • Were there particular moments on that trip that stick out in your mind? • What types of trips do you bike for? • How often do you bike? • Why do you bike rather than find another way to get places? • Are there some ways you might ride your bike for more trips? Could you tell me about them? [*Or, is there anything that prevents you from riding for certain trips?*] • Do you know other people who bike? What have they told you about their experiences?	• Can you imagine a specific trip or situation where it would be feasible for you to ride your bike somewhere? Could you tell me about that? [*Or, why wouldn't it be feasible?*] • Do you know other people who bike? What have they told you about their experiences? [*Or, what have they told you about why they do not bike?*]

5. How does getting around in the Bay Area compare with other places you've lived?

***Prompts and probes*:**

- If needed, prompt for: information available from transportation operators, frequency and availability of transit service, cost, different transportation services, bike- and pedestrian-friendly design, driver licensing.

Final questions (5-10 min)

6. Is there something we didn't talk about today that you think is important about your transportation needs?

7. What could **transportation planners** do to better address your needs and the needs of other immigrants like you?

8. If we wanted to distribute a short survey to ask immigrants who take transit or ride their bikes about how they get around, where would you suggest we go to find people to talk to?

Other demographic information

Now I have just a few final questions about yourself before we finish up.

9. How long have you been in the U.S.?

10. What is your native country?

11. What neighborhood do you live in now? And what is the nearest intersection to your home?

Thank you for taking the time to answer our questions. Do you know other people [not affiliated with this organization *if recruited through social service organization*] who might be willing to be interviewed? [*Give participant business cards or contact information from research team to distribute to his or her contacts. Hand out incentive.*]

SPANISH VERSION

Información básica

Nombre de entrevistador:
Número de entrevistado:
Lugar de entrevista:
Fecha y hora:
Idioma de entrevista:
Sexo/género:
Edad estimada:
Otra información:

Introducción y consentimiento informado

Hola mi nombre es _____. Soy una estudiante/investigadora en estudios graduados en la Universidad Estatal de San José [y/o Universidad de California, Berkeley]. Formo parte de una investigación con algunos profesores de la planificación urbana. Queremos entender cómo los inmigrantes logran llegar a su destino, como al trabajo, al escuela, de compras o lugares de recreación. Sus respuestas nos ayudarán a darle recomendaciones a su gobierno local y a otras personas encargadas en planificar la ciudad sobre como mejorar el transporte para personas como usted.

La entrevista tendrá una duración de aproximadamente una hora. Le haré preguntas sobre el transporte--para saber más sobre cómo llega a los lugares que tiene que ir en la ciudad. Quiero saber más sobre lo que le gusta del transporte o lo que encuentra fácil al usarlo y también sobre lo que le resulta difícil o le gustaría que se mejorara. Además me gustaría preguntarle sobre las experiencias de otros inmigrantes que usted conoce.

Tengo algunas preguntas que me gustaría preguntarle, aunque esto será una discusión abierta. Por favor hágame saber si hay algún tema del cual no hemos hablado y usted está interesada/o en compartir. Quiero escuchar cualquier idea que tenga y piense que sería de ayuda para mi, en respecto a su experiencia con el transporte. Además, no hay respuestas correctas o incorrectas a las preguntas que le voy a hacer.

Me gustaría grabar la entrevista y tomar notas para asegurarme que he entendido claramente todo lo que hemos discutido hoy. Aunque los resultados de esta investigación podrán ser publicados, ningún tipo de información que la/lo pueda identificar será utilizada. De esta manera, lo que usted diga permanecerá completamente anónimo. El equipo de investigadores haciendo el estudio le va pedir a una compañía que haga una transcripción y traducción de la entrevista, pero su nombre no se usará en ninguna parte de la grabación. ¿Le parece bien?

Su participación en esta investigación es voluntaria. Si usted decide que no desea participar, esto no le afectará en ninguna manera sus conexiones con la Universidad Estatal de San José. Usted tiene el derecho de no contestar preguntas que no desea contestar. Le quiero recordar que aunque los resultados de esta investigación puedan ser publicados y compartidos con agencias y planificadores de transporte, el equipo de investigadores se asegurará de no escribir ningún tipo de información que la/lo pueda identificar. Para mostrarle nuestro agradecimiento por hablar con nosotros, queremos darle un par de entradas para el cine después de nuestra entrevista.

¿Tiene alguna pregunta o inquietud sobre su participación en esta investigación? [*Espere respuesta. Si no hay preguntas o preocupaciones*:]

Preguntas para la entrevista

Entrevista principal (45 min)

1. Me puede hablar sobre todos los lugares a los que ha ido hoy y los que tiene que ir, incluyendo a este lugar [*para esta entrevista*]? Me gustaría saber como llegó o como planea llegar a cada lugar y su experiencia en cada parte de su viaje.

***Prompts and probes*:**

Si el/la participante menciona su uso de transito, pregunta sobre su acceso y salidas al mismo nivel de detalle que los otros componentes del viaje.
¿Porque usó ese modo de transporte en particular? Si hubieron varios modos de transporte usados durante el día, ¿cual fue la razón o razones por estos cambios?
Si alguien viajaba con la persona, ¿Tuvo algo que ver la persona con la que viajaba con el modo de transporte que decidio tomar?

2. Hay otras maneras en las que usted viaja pero que no escogió viajar de esa manera hoy?

***Prompts and probes*:**

- Habló usted sobre su uso de (lista de los medios de transporte) para llegar a sus destinos. *Como fue que hizo estas preferencias?*
- Hay ventajas o desventajas para usted al usar un tipo de transporte en vez de otro? *(Por ejemplo, carro, transporte público, caminar, etc.)*

3. Puede recordar algún día en el que uso el tránsito para llegar a algún lugar? A donde fue y como fue su experiencia?

***Prompts and probes*:**

- ¿A qué lugar viajaba en este transcurso?
- ¿A cuantos lugares tenía que llegar en ese dia?
- ¿Cómo llegó de donde comenzó su viaje al autobús o a la parada del tren?
- ¿Cómo fue que llegó a su último destino cuando se bajó del tren o autobús? Cuénteme más sobre esa parte de su viaje.
- ¿Hay momentos de se viaje que le resaltan más que otros?
- ¿Como le pareció ese viaje? Se le hizo facil o se enfrentó con algunos problemas?
- ¿Puede comparar este viaje con algún viaje que ha tomado usando el BART, tren ligero o Caltrain?

3a. **If the interviewee mentions biking to transit**: ¿Porque escogió andar en bicicleta para llegar a la parada de autobus o tren?

***Prompts and probes*:**

- ¿Porque no usó su bicicleta para llegar hasta su última parada?
- ¿Cómo fue su experiencia al llevar su bicicleta en el tren o autobús consigo?
- ¿Que sugerencias tiene para que se le haga más facil llevar su bicicleta en el tren?

4. ¿En el último año, ha andado en bicicleta para hacer otros viajes?
Si la respuest fue sí: ¿Me puede decir más sobre la última vez que andaba en bicicleta?
Si la respuesta fue no: ¿Qué lo impide usar su bicicleta?

Prompts and probes for "yes"	Prompts and probes for "no"
• *Si el último viaje fue por razones de recreación, como su experiencia al ir al trabajo, la escuela, de compras o al hacer una visita. Si el participante no anduvo en bicicleta para ninguna de esas razones, por que no?* • ¿Como le pareció el viaje (facil, dificil)? • ¿Hay momentos de ese viaje que le resaltan más? • ¿Para qué tipos de viajes escoge andar en bicicleta? • ¿Qué tan seguido anda en bicicleta? • ¿Porqué escoge andar en bicicleta en vez de encontrar otra manera de llegar a esos lugares? • ¿Me puede decir si hay algunos métodos en los que puede andar más en su bicicleta durante ciertos viajes? [¿O hay algo que la/lo previene andar en bicicleta en algunos viajes?] • ¿Conoce a otras personas que usan su bicicleta? ¿Que le han contado sobre sus experiencias?	• ¿Se puede imaginar algún viaje o alguna situación en donde sería posible que usted usará su bicicleta? ¿Me puede contar más sobre eso? [¿O que es lo no lo haría posible?] • ¿Conoce a otras personas que anden en bicicleta? ¿Qué le han contado sobre sus experiencias? [O que le dicen ellos que son sus razones para no andar en bicicleta?]

5. ¿Cómo se compara la manera en la que viaja aqui en la área de la bahía con otros lugares en los que ha vivido?

***Prompts and probes*:**

- Información sobre operadores de transporte público, la frecuencia y disponibilidad del servicio de transito, el costo, diferentes opciones a servicios de transporte, el planeamiento de las calles para ciclistas y peatones, licencias de conducir.

Preguntas finales (5-10 min)

6. ¿Hay algo que no hablamos pero que desea compartir sobre sus necesidades de transporte?

7. ¿Cuáles sugerencias les daría a **planificadores de transporte** para mejor responder a sus necesidades y las necesidades de otros inmigrantes como usted?

8. Si queremos distribuir un cuestionario corto para preguntarle a otros inmigrantes que usan el transporte público o sus bicicletas sus experiencias al tomar estos viajes, ¿en dónde nos sugiriera que deberíamos ir para poder encontrar y hablar con estas personas?

Otra información demográfica

Me gustaría hacerle algunas preguntas básicas sobre usted antes de terminar

9. ¿Cuánto tiempo ha vivido en los EE.UU.?

10. ¿Cuál es su país de origen?

11. ¿En qué área/barrio/comunidad vive ahora? ¿Y cuál es la intersección más cercana a su hogar?

Gracias por tomar su tiempo para contestar estas preguntas. ¿Conoce a otras personas [que no tengan conexión con esta organización] quienes podrían estar dispuestos para ser entrevistados?

APPENDIX B: INTERCEPT SURVEY QUESTIONNAIRE

TRANSPORTATION SURVEY

Thank you for agreeing to take this voluntary survey. Your answers will help researchers at San José State University and the University of California, Berkeley understand how people travel. Your answers are important to us even if you don't use many different kinds of transportation. The survey will take about five minutes. There are no right or wrong answers to the questions, and you can skip any question. Your responses are anonymous.

SECTION A: YOUR RECENT TRAVEL

1. In the past 7 days, how many days were you away from the Bay Area? _____ days

Think about the travel you did during the past 7 days IN THE BAY AREA. Do not count walking or biking you did ONLY for exercise or fun, such as walking a dog or taking a long bike ride. Write "0" if you did not travel by that mode.

2. In the past 7 days, how many days did you:
   - i. Drive? _____ days
   - ii. Carpool or get a ride? _____ days
   - iii. Walk all the way somewhere? _____ days
   - iv. Bike all the way somewhere? _____ days
   - v. Take public transportation? _____ days

If you took public transportation, go to 2a
If not, skip to question 3.

2a. **For only the days you took public transportation** in the past 7 days, how many days did you:
   - i. Drive to or from the stop? _____ days
   - ii. Carpool or get a ride to or from the stop? _____ days
   - iii. Walk to or from the stop? _____ days
   - iv. Bike to or from the stop? _____ days

3. How many days did you have access to a working BICYCLE? _____ days
4. How many days did you have access to a working MOTOR VEHICLE like a car, truck, or motorcycle that you can use either as a driver or passenger? (Exclude taxis.) _____ days

SECTION B: EXPERIENCES WITH TRANSPORTATION

We'd like to learn about your experiences and feelings toward taking the bus or the train, and bicycling. By "train" we mean BART, VTA light rail, MUNI light rail, Caltrain, ACE, or Amtrak. Your answers are important to us even if you don't take the bus or train, or ride your bike.

5. How much MORE would you have taken THE BUS OR THE TRAIN in the past 7 days if the following were true?	No change	1 day more	2-3 days more	4+ days more
a. Affordable bus or train fares or passes.	☐	☐	☐	☐
b. Little crime near the places you go.	☐	☐	☐	☐
c. Buses or trains always have space to carry your bike.	☐	☐	☐	☐
d. Enough bike parking at the bus or train stops you use.	☐	☐	☐	☐

6. How much MORE would you have BICYCLED in the past 7 days if the following were true?	No change	1 day more	2-3 days more	4+ days more
a. Little crime near the places you go.	☐	☐	☐	☐
b. Good bike lanes or paths where you go.	☐	☐	☐	☐
c. Buses or trains always have space to carry your bike.	☐	☐	☐	☐
d. Enough bike parking at the bus or train stops you use.	☐	☐	☐	☐

7. How often do you...	Never	At least once per month	At least once per week	More than once per week
a. Take the bus or train when you have the option to drive?	☐	☐	☐	☐
b. Miss a trip because you don't have a car available?	☐	☐	☐	☐
c. Miss a trip because a bus passes you by or never comes?	☐	☐	☐	☐
d. Bicycle instead of taking the bus or train to save money?	☐	☐	☐	☐
e. Bicycle instead of taking the bus or train to save time?	☐	☐	☐	☐
f. Bicycle when you have the option to drive.	☐	☐	☐	☐

PLEASE TURN OVER FOR NEXT PAGE →

8. How much do you disagree or agree with the following statements?	Completely disagree	Somewhat disagree	Neither agree/disagree	Somewhat agree	Completely agree	Doesn't apply
a. I find it hard to take the bus or train when I travel with others.	☐	☐	☐	☐	☐	☐
b. I find it hard to take the bus or train when I need to stop at more than one place.	☐	☐	☐	☐	☐	☐
c. Bus or train information is available in my language.	☐	☐	☐	☐	☐	☐
d. I find it hard to bicycle when I need to travel with others.	☐	☐	☐	☐	☐	☐
e. I find it hard to bicycle when I need to stop at more than one place.	☐	☐	☐	☐	☐	☐
f. I would have a hard time getting to places I regularly go if I could not take my bike with me on the bus or train.	☐	☐	☐	☐	☐	☐
g. I can quickly find a spot to park my bike at the bus or train stop.	☐	☐	☐	☐	☐	☐

SECTION C: ABOUT YOU

Please answer the following questions. There are no right or wrong answers, and you can skip any question.

9. Were you born in the US?
☐ Yes ☐ No

9a. **If no**, what is your country of origin?
_____

9b. **If no**, how many years have you lived in the US?
_____ years

10. Are you of Hispanic, Latino, or Spanish origin?
☐ Yes ☐ No

11. What is your race? *Select all that apply.*
☐ White
☐ Black/African American
☐ Asian
☐ Native Hawaiian or Pacific Islander
☐ American Indian or Alaska Native
☐ Other: _____

12. What is the highest level of school you have completed?
☐ Less than high school
☐ High school, GED, or equivalent
☐ Some college or Associate's degree
☐ Bachelor's degree
☐ Graduate or professional school

13. Are you employed?
☐ Yes ☐ No

14. Are you in school?
☐ Yes ☐ No

15. What is your age? _____

16. What is your sex?
☐ Male ☐ Female

17. Is your home owned or rented?
☐ Owned ☐ Rented

18. Do you have a bus pass?
☐ Yes ☐ No

19. About how many people do you know who bike to work, to school, or for personal errands?
☐ None ☐ 1–10 ☐ 11–20 ☐ 21 or more

20. In what city and ZIP code is your home?
_____

21. What is your home address or the nearest cross streets to your home?
_____
(ex.: 222 Main St OR 2nd and Main)

22. Do you live with one or more roommates?
☐ Yes ☐ No

23. INCLUDING YOURSELF, how many people live with you in your household?
Under age 16: _____ 16 years or older: _____

24. What was the approximate total combined income of all working adults in your household last year? *EXCLUDE income from roommates.*
☐ $0–$4,999
☐ $5,000–$14,999
☐ $15,000–$24,999
☐ $25,000–$49,999
☐ $50,000–$74,999
☐ $75,000–$99,999
☐ $100,000–$149,999
☐ $150,000–$199,999
☐ $200,000 or more

COMMENTS

Please write comments, especially to explain changes that would make it easier for you to get places you need to go. Thank you!

Survey location: _____

ENCUESTA DE TRANSPORTE

Gracias por acceder tomar esta encuesta voluntaria. Sus respuestas ayudarán a los investigadores de la Universidad Estatal de San José y de la Universidad de California, Berkeley a entender como la gente usa el transporte. Sus respuestas son importantes aunque no use todas las formas de transporte. La encuesta solo tomará aproximadamente 5 minutos. No hay respuestas correctas ni incorrectas. Puede omitir cualquier pregunta. Sus repuestas son anónimas.

SECCIÓN A: SUS RECIENTES VIAJES

1. En los últimos 7 días, ¿cuántos días estuvo usted fuera del Área de la Bahía? _____ días

Piense en los viajes que hizo en el ÁREA DE LA BAHÍA en los últimos 7 días. Omita el caminar o el uso de bici SÓLO por recreación, tal como caminar el perro o tomar paseos largos en bici. ***Escriba "0" si no usó ese modo.***

2. En los últimos 7 días, ¿cuántos días usted:
   - i. Manejó? _____ días
   - ii. Compartió el carro o alguien lo/la llevó? _____ días
   - iii. Caminó todo el camino a algún lugar? _____ días
   - iv. Usó su bici todo el camino a algún lugar? _____ días
   - v. Tomó el transporte público? _____ días

Si tomó el transporte público, vaya a la 2a.
Si no, pase a la pregunta 3.

2a. **Solo por los días que tomó el transporte publico** en los últimos 7 días, ¿cuántos días usted:
   - i. Manejó desde o hasta la parada? _____ días
   - ii. Compartió el carro o alguien lo/la llevó a la parada? _____ días
   - iii. Caminó desde o hasta la parada? _____ días
   - iv. Usó la bici desde o hasta la parada? _____ días

3. ¿Cuántos días tuvo acceso a una BICICLETA que funciona? _____ días
4. ¿Cuántos días tuvo acceso a un VEHICULO MOTORIZADO que funciona, tal como un carro, camioneta, o motocicleta que usted pudriera usar o bien como chofer o pasajero? (Excluya los taxis.) _____ días

SECCIÓN B: EXPERENCIAS CON EL TRANSPORTE

Nos gustaría aprender sobre sus experiencias al usar el autobús o tren, y el andar en bicicleta. Cuando usamos la palabra "tren" nos referimos a BART, la estación de tren ligero de VTA o MUNI, Caltrain, ACE, o Amtrak. Sus repuestas son importantes aunque usted no tome el autobús o tren, ni use su bici.

5. ¿Cuánto MÁS hubiera tomado el AUTOBÚS O TREN en los últimos 7 días si lo siguiente fuera cierto?	No cambio	1 día más	2-3 días más	4+ días más
a. Tarifas o pases de autobuses o trenes económicos.	☐	☐	☐	☐
b. Poco crimen cerca de los lugares al cual usted va.	☐	☐	☐	☐
c. Autobuses o trenes siempre tuvieran espacio para llevar su bici abordo.	☐	☐	☐	☐
d. Suficiente parking para bicis en las paradas de autobús o tren.	☐	☐	☐	☐

6. ¿Cuánto MÁS hubiera usado su BICICLETA en los últimos 7 días si lo siguiente fuera cierto?	No cambio	1 día más	2-3 días más	4+ días más
a. Poco crimen cerca de los lugares al cual usted va.	☐	☐	☐	☐
b. Buenos carriles o caminos para bicis por donde usted va.	☐	☐	☐	☐
c. Autobuses o trenes siempre tuvieran espacio para llevar su bici abordo.	☐	☐	☐	☐
d. Suficiente parking para bicis en las paradas de autobús o tren.	☐	☐	☐	☐

7. ¿Con qué frecuencia...	Nunca	Al menos 1 vez/mes	Al menos 1 vez/semana	Más de 1 vez/semana
a. Toma el autobús o tren cuando tiene la opción de manejar?	☐	☐	☐	☐
b. Pierde un viaje por no tener un vehículo disponible?	☐	☐	☐	☐
c. Pierde un viaje por causa de que lo pasó el autobús sin parar o que nunca pasó el autobús?	☐	☐	☐	☐
d. Usa su bici en vez de tomar el autobús o tren con el propósito de ahorrar dinero?	☐	☐	☐	☐
e. Usa su bici en vez de tomar el autobús o tren con el propósito de ahorrar tiempo?	☐	☐	☐	☐
f. Usa su bici cuando tiene la opción de manejar?	☐	☐	☐	☐

POR FAVOR DAR LA VUELTA A LA PÁGINA SIGUIENTE →

8. ¿Cuánto está en desacuerdo o en acuerdo con lo siguiente?	Muy en desacuerdo	Algo en desacuerdo	Ni de acuerdo ni en desacuerdo	Algo en acuerdo	Muy en acuerdo	No aplica
a. Me resulta difícil tomar el autobús o tren cuando viajo con otros.	☐	☐	☐	☐	☐	☐
b. Me resulta difícil tomar el autobús o tren cuando necesito tomar un viaje con varias paradas.	☐	☐	☐	☐	☐	☐
c. Información sobre el autobús o tren está disponible en mi idioma.	☐	☐	☐	☐	☐	☐
d. Me resulta difícil usar mi bici cuando viajo con otros.	☐	☐	☐	☐	☐	☐
e. Me resulta difícil usar mi bici cuando necesito tomar un viaje con varias paradas.	☐	☐	☐	☐	☐	☐
f. Me resultaría difícil ir a los lugares que frecuento si no pudiera llevar mi bici abordo del autobús o tren.	☐	☐	☐	☐	☐	☐
g. Puedo encontrar rápidamente un espacio para estacionar mi bici en la parada de autobús o tren.	☐	☐	☐	☐	☐	☐

SECTION C: SOBRE USTED

Por favor responda a lo siguiente. No hay respuestas correctas ni incorrectas. Puede omitir cualquier pregunta.

9. ¿Nació usted en los EE.UU.?
☐ Sí ☐ No

9a. **Si no,** ¿cuál es su país de origen?
_____

9b. **Si no,** ¿cuántos años ha vivido en los EE.UU.?
_____ años

10. ¿Es usted de origen hispano, latino, o español?
☐ Sí ☐ No

11. ¿Cuál es su raza? ***Marque todas las que apliquen.***
☐ Blanca
☐ Negra/africana americana
☐ Asiática
☐ Nativa de Hawaii or de las islas del Pacífico
☐ India americana o nativa de Alaska
☐ Otra: _____

12. ¿Cuál es el nivel escolar más alto que ha completado?
☐ Menos que la escuela secundaria
☐ Graduado de escuela secundaria o diploma equivalente
☐ Algunos créditos de universidad o título asociado
☐ Título de licenciatura
☐ Escuela graduada o profesional

13. ¿Tiene empleo?
☐ Sí ☐ No

14. ¿Asiste a la escuela?
☐ Sí ☐ No

15. ¿Cuál es su edad? _____

16. ¿Cuál es su sexo?
☐ Masculino ☐ Femenino

17. ¿Es usted dueño/a de la casa, o la alquila?
☐ Dueño/a ☐ La alquila

18. ¿Tiene usted un pase de autobús?
☐ Sí ☐ No

19. ¿Alrededor de cuánta gente conoce que usa su bici para ir al trabajo, la escuela, o para diligencias personales?
☐ Ninguna ☐ 1–10 ☐ 11–20 ☐ 21 o más

20. ¿En qué ciudad y código postal está su casa?
_____

21. ¿Cuál es su dirección o las calles más cercanas a su casa?
_____
(ej., 222 Main St. O 2nd y Main)

22. ¿Vive con uno o más compañeros de cuarto?
☐ Sí ☐ No

23. INCLUYÉNDOSE AUSTED, ¿cuánta gente vive con usted en su hogar?
Menores de 16: _____ 16 años o mayores: _____

24. ¿Aproximadamente cuál fue el ingreso anual total combinado de todos los adultos que trabajan y viven en su hogar en el año pasado? *EXCLUYA ingresos de sus compañeros de cuarto.*
☐ $0–$4,999
☐ $5,000–$14,999
☐ $15,000–$24,999
☐ $25,000–$49,999
☐ $50,000–$74,999
☐ $75,000–$99,999
☐ $100,000–$149,999
☐ $150,000–$199,999
☐ $200,000 o más

COMENTARIOS

Por favor escriba sus comentarios, especialmente para explicar los cambios que le resultaría más fácil viajar y llegar a donde necesita ir. ¡Gracias!

Survey location: _____

APPENDIX C: SUMMARY TABLES FOR "TRANSPORTATION EXPERIENCES" QUESTIONS

This appendix lists detailed responses to each question from Section B of the survey, on travel experiences. Each table contains the proportion of responses for each income and nativity category, for respondents who did not provide both income and nativity, and the total response proportions.

Q5: How much more would you have taken the bus or the train in the past seven days if the following were true?

A. Affordable bus or train fares or passes

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	40	14	17	29	*381*
Higher-income immigrant	42	16	14	29	*235*
Low-income U.S.-born	41	13	16	31	*350*
Higher-income U.S.-born	54	10	14	23	*450*
Not identified	47	10	17	26	*629*
Total	45	12	16	27	*2045*

B. Little crime near the places you go

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	56	12	15	16	*365*
Higher-income immigrant	49	12	18	21	*226*
Low-income U.S.-born	57	10	16	16	*345*
Higher-income U.S.-born	63	10	10	16	*446*
Not identified	64	13	10	14	*614*
Total	59	12	13	16	*1996*

C. Buses or trains always have space to carry your bike

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	73	7	7	12	*339*
Higher-income immigrant	68	6	12	13	*215*
Low-income U.S.-born	67	7	11	15	*332*
Higher-income U.S.-born	70	7	9	13	*432*
Not identified	72	8	9	11	*557*
Total	71	7	9	13	*1875*

D. Enough bike parking at the bus or train stops you use

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	79	6	6	9	*338*
Higher-income immigrant	74	5	8	13	*215*
Low-income U.S.-born	72	7	8	13	*332*
Higher-income U.S.-born	75	6	8	12	*426*
Not identified	76	8	7	10	*554*
Total	75	7	7	11	*1865*

Q6: How much more would you have bicycled in the past seven days if the following were true?

A. Little crime near the places you go

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	72	8	6	14	*341*
Higher-income immigrant	64	10	12	14	*210*
Low-income U.S.-born	69	9	8	15	*325*
Higher-income U.S.-born	71	7	10	12	*419*
Not identified	77	7	5	11	*535*
Total	71	9	9	13	*1830*

B. Good bike lanes or paths where you go

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	69	4	11	15	*337*
Higher-income immigrant	56	9	15	21	*208*
Low-income U.S.-born	62	8	13	16	*326*
Higher-income U.S.-born	63	8	12	18	*420*
Not identified	68	8	10	14	*529*
Total	65	7	12	16	*1820*

C. Buses or trains always have space to carry your bike

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	69	8	9	14	*338*
Higher-income immigrant	59	7	17	17	*206*
Low-income U.S.-born	64	11	9	16	*323*
Higher-income U.S.-born	62	9	14	15	*420*
Not identified	70	8	11	11	*526*
Total	65	9	12	14	*1813*

D. Enough bike parking at the bus or train stops you use

	No change	1 day more	2-3 days more	4+ days more	*Responses*
Low-income immigrant	73	7	8	11	*335*
Higher-income immigrant	59	9	14	18	*206*
Low-income U.S.-born	72	8	8	13	*320*
Higher-income U.S.-born	67	9	10	13	*418*
Not identified	72	9	9	11	*526*
Total	70	8	9	13	*1805*

Q7: How often do you…

A. Take the bus or train when you have the option to drive?

	Never	At least once per month	At least once per week	More than once per week	*Responses*
Low-income immigrant	58	12	6	23	*337*
Higher-income immigrant	38	14	10	38	*234*
Low-income U.S.-born	47	10	8	36	*342*
Higher-income U.S.-born	30	9	13	48	*442*
Not identified	60	9	7	24	*605*
Total	48	10	9	33	*1960*

B. Miss a trip because you don’t have a car available?

	Never	At least once per month	At least once per week	More than once per week	*Responses*
Low-income immigrant	47	27	13	13	*371*
Higher-income immigrant	56	20	16	9	*230*
Low-income U.S.-born	46	31	11	12	*345*
Higher-income U.S.-born	58	23	12	7	*444*
Not identified	53	23	10	13	*602*
Total	52	25	12	11	*1992*

C. Miss a trip because a bus passes you by or never comes?

	Never	At least once per month	At least once per week	More than once per week	*Responses*
Low-income immigrant	41	29	16	15	*375*
Higher-income immigrant	44	28	18	9	*230*
Low-income U.S.-born	37	34	17	12	*347*
Higher-income U.S.-born	47	32	14	8	*440*
Not identified	46	29	13	12	*594*
Total	43	30	15	11	*1986*

D. Bicycle instead of taking the bus to save money?

	Never	At least once per month	At least once per week	More than once per week	*Responses*
Low-income immigrant	79	6	6	9	*358*
Higher-income immigrant	73	7	10	10	*214*
Low-income U.S.-born	69	8	10	12	*330*
Higher-income U.S.-born	67	9	8	15	*425*
Not identified	78	6	4	12	*537*
Total	74	7	7	12	*1864*

E. Bicycle instead of taking the bus to save time?

	Never	At least once per month	At least once per week	More than once per week	*Responses*
Low-income immigrant	78	7	5	10	*355*
Higher-income immigrant	73	8	7	11	*214*
Low-income U.S.-born	72	6	9	12	*328*
Higher-income U.S.-born	68	9	9	14	*428*
Not identified	76	7	5	12	*533*
Total	73	7	7	12	*1858*

F. Bicycle when you have the option to drive?

	Never	At least once per month	At least once per week	More than once per week	*Responses*
Low-income immigrant	86	5	4	5	*353*
Higher-income immigrant	76	8	8	8	*212*
Low-income U.S.-born	77	5	5	13	*330*
Higher-income U.S.-born	66	8	9	17	*425*
Not identified	84	4	3	9	*530*
Total	78	6	6	11	*1850*

Q8: How much do you disagree or agree with the following statements?

A. I find it hard to take the bus or train when I travel with others.

	Completely disagree	Somewhat disagree	Neither	Somewhat agree	Completely agree	Doesn’t apply	*Responses*
Low-income immigrant	41	16	3	15	17	8	*377*
Higher-income immigrant	40	17	8	14	17	5	232
Low-income U.S.-born	42	17	14	14	9	4	*345*
Higher-income U.S.-born	38	19	13	16	10	4	*446*
Not identified	42	14	8	18	13	5	*524*
Total	41	16	9	16	13	5	*1924*

B. I find it hard to take the bus or train when I need to stop at more than one place.

	Completely disagree	Somewhat disagree	Neither	Somewhat agree	Completely agree	Doesn’t apply	*Responses*
Low-income immigrant	30	17	6	18	24	4	*378*
Higher-income immigrant	26	10	10	23	30	1	*229*
Low-income U.S.-born	29	18	9	22	18	3	*348*
Higher-income U.S.-born	23	14	8	28	23	3	*447*
Not identified	28	13	6	20	30	3	521
Total	27	15	8	22	25	3	*1923*

C. Bus or train information is available in my language.

	Completely disagree	Somewhat disagree	Neither	Somewhat agree	Completely agree	Doesn’t apply	*Responses*
Low-income immigrant	17	8	10	21	38	7	*378*
Higher-income immigrant	21	7	7	12	45	8	*229*
Low-income U.S.-born	13	3	8	10	58	8	343
Higher-income U.S.-born	11	2	7	5	62	13	*442*
Not identified	18	5	7	12	49	9	*504*
Total	16	5	8	12	51	9	*1896*

D. I find it hard to bicycle when I need to travel with others.

	Completely disagree	Somewhat disagree	Neither	Somewhat agree	Completely agree	Doesn’t apply	*Responses*
Low-income immigrant	11	5	7	8	8	61	339
Higher-income immigrant	16	4	8	11	19	42	*213*
Low-income U.S.-born	19	9	13	13	7	39	*326*
Higher-income U.S.-born	14	5	14	17	14	36	*420*
Not identified	18	3	9	9	11	50	*436*
Total	15	5	10	12	11	46	1734

E. I find it hard to bicycle when I need to stop at more than one place.

	Completely disagree	Somewhat disagree	Neither	Somewhat agree	Completely agree	Doesn’t apply	*Responses*
Low-income immigrant	11	8	5	6	9	61	*341*
Higher-income immigrant	23	6	8	10	11	43	*212*
Low-income U.S.-born	23	8	14	10	5	40	*330*
Higher-income U.S.-born	22	12	10	13	9	34	423
Not identified	19	5	8	8	10	51	*439*
Total	19	8	9	9	9	46	*1745*

F. I would have a hard time getting to places I regularly go if I could not take my bike with me on the bus or train.

	Completely disagree	Somewhat disagree	Neither	Somewhat agree	Completely agree	Doesn’t apply	*Responses*
Low-income immigrant	10	5	5	7	11	63	*348*
Higher-income immigrant	16	6	9	9	15	45	210
Low-income U.S.-born	14	5	13	11	14	43	*331*
Higher-income U.S.-born	14	8	14	12	18	35	*428*
Not identified	14	4	8	8	14	52	*437*
Total	13	6	10	9	14	47	*1754*

G. I can quickly find a spot to park my bike at the bus or train stop.

	Completely disagree	Somewhat disagree	Neither	Somewhat agree	Completely agree	Doesn’t apply	*Responses*
Low-income immigrant	12	5	7	5	8	63	*349*
Higher-income immigrant	15	3	11	11	14	45	*210*
Low-income U.S.-born	13	9	17	10	7	44	*332*
Higher-income U.S.-born	12	9	14	11	14	40	*427*
Not identified	15	4	10	6	11	53	435
Total	13	6	12	8	11	49	*1753*

APPENDIX D: SURVEY SITES AND RESPONSES RECEIVED

Survey Site	City	Site type	Responses
King and Story	San Jose	Bus stop	207
Mission and 16th St	San Francisco	BART	179
Fruitvale BART	Oakland	BART	174
Mission and 24th St	San Francisco	BART	133
Grocery Outlet	San Jose	Business/Public plaza	125
Foothill Blvd and Fruitvale Ave	Oakland	Bus stop	95
International Blvd and 34th Ave	Oakland	Bus stop	90
Mission and 19th St	San Francisco	Bus stop	87
Broadway and 13th St	Oakland	Bus stop	68
First St and Santa Clara	San Jose	Bus stop	61
San Pablo Ave and University Ave	Berkeley	Bus stop	57
Bay Fair BART	San Leandro	BART	56
South Hayward BART	Hayward	BART	53
Foothill Blvd and High St	Oakland	Bus stop	52
Eastridge Transit Center	San Jose	Bus stop	47
Fremont BART	Fremont	BART	44
Hayward BART	Hayward	BART	40
Bike Clinic, 2nd St	San Jose	Business/Public plaza	39
Cesar Chavez btw Valencia and Folsom	San Francisco	Day labor	39
12th St and Fruitvale Plaza	Oakland	Business/Public plaza	36
Berkeley Flea Market	Berkeley	Business/Public plaza	36
First St and Alma	San Jose	Bus stop	35
Alum Rock Transit Center	San Jose	Bus stop	35
International Blvd and 23rd Ave	Oakland	Bus stop	35
Fourth St and Hearst Ave	Berkeley	Day labor	33
South Hayward BART/Tennyson Ave	Hayward	Day labor	32
Home Depot/McDonald's	Oakland	Day labor	27
Laney College Flea Market	Oakland	Business/Public plaza	25
Fruitvale Village	Oakland	Business/Public plaza	24
Berryessa Flea Market	San Jose	Business/Public plaza	16
King and Alum Rock	San Jose	Bus stop	12
Capitol Expressway and Story Rd	San Jose	Bus stop	11
Valley Medical Center	San Jose	Business/Public plaza	11
23rd St and Clinton Ave	Richmond	Bus stop	8
Shorty Garcia Park	Union City	Business/Public plaza	8
Capitol Expy and Copperfield Rd	San Jose	Bus stop	7
Eastmont Transit Center	Oakland	Bus stop	7
Home Depot	El Cerrito	Day labor	7
N 6th St and Julian St	San Jose	Business/Public plaza	6
Alum Rock Ave and White Rd	San Jose	Bus stop	3
Mission and Cesar Chavez	San Francisco	Bus stop	3
White and Story	San Jose	Bus stop	2
Hesperian and A St	Hayward	Bus stop	1
International Blvd and 98th Ave	Oakland	Bus stop	1

ABBREVIATIONS AND ACRONYMS

BART	Bay Area Rapid Transit
CHTS	California Household Travel Survey

ENDNOTES

1. Migration Policy Institute, "U.S. Immigration Trends," 2015, http://www.migrationpolicy.org/programs/data-hub/us-immigration-trends.

2. Sandra L. Colby and Jennifer M. Ortman, "Projections of the Size and Composition of the U.S. Population: 2014 to 2060" (Washington, D.C.: U.S. Census Bureau, 2015).

3. Federal Highway Administration, "National Household Travel Survey," 2009, http://nhts.ornl.gov/.

4. Evelyn Blumenberg and Michael Smart, "Getting by with a Little Help from My Friends…and Family: Immigrants and Carpooling," *Transportation* 37, no. 3 (2010): 429–46, doi:10.1007/s11116-010-9262-4; Daniel G. Chatman, "Explaining the 'Immigrant Effect' on Auto Use: The Influences of Neighborhoods and Preferences," *Transportation* 41, no. 3 (2014): 441–61, doi:10.1007/s11116-013-9475-4; Daniel G. Chatman and Nicholas J. Klein, "Why Do Immigrants Drive Less? Confirmations, Complications, and New Hypotheses from a Qualitative Study in New Jersey, USA," *Transport Policy* 30 (2013): 336–44, doi:10.1016/j.tranpol.2013.10.002; Kristin Lovejoy and Susan L. Handy, "Transportation Experiences of Mexican Immigrants in California: Results from Focus Group Interviews," Research Report (Davis, CA: Institute of Transportation Studies, UC Davis, 2007), http://www.escholarship.org/uc/item/0jj8h2cf#page-1.

5. Evelyn Blumenberg, "Moving in and Moving Around: Immigrants, Travel Behavior, and Implications for Transport Policy," *Transportation Letters: The International Journal of Transportation Research* 1, no. 2 (2009): 169–80, doi:10.3328/TL.2009.01.02.169-180; Daniel G. Chatman and Nicholas Klein, "Immigrants and Travel Demand in the United States: Implications for Transportation Policy and Future Research," *Public Works Management & Policy* 13, no. 4 (2009): 312–27, doi:10.1177/1087724X09334633; Blumenberg and Smart, "Getting by with a Little Help from My Friends…and Family"; Michael J. Smart, "US Immigrants and Bicycling: Two-Wheeled in Autopia," *Transport Policy* 17, no. 3 (2010): 153–59, doi:10.1016/j.tranpol.2010.01.002; Chatman, "Explaining the 'Immigrant Effect' on Auto Use."

6. Evelyn Blumenberg and Alexandra Elizabeth Evans, "Planning for Demographic Diversity: The Case of Immigrants and Public Transit," *Journal of Public Transportation Research* 13, no. 2 (2010): 23–45; Gil Tal and Susan Handy, "Travel Behavior of Immigrants: An Analysis of the 2001 National Household Transportation Survey," Transport Policy 17 no. 2 (2010): 85–93.

7. Chatman, "Explaining the 'Immigrant Effect' on Auto Use."

8. Daniel G. Chatman and Nicholas Klein, "Immigrants and Automobility in New Jersey," in *Auto Motives*, ed. Karen Lucas, Evelyn Blumenberg, and Rachel Weinberger (Bingley, UK: Emerald Group Publishing, 2011), 253–76; Cathy Yang Liu and Gary Painter, "Travel Behavior among Latino Immigrants: The Role of Ethnic Concentration and Ethnic Employment," *Journal of Planning Education and Research* 32, no. 1 (2012):

62–80, doi:10.1177/0739456X11422070; Chatman, “Explaining the ‘Immigrant Effect’ on Auto Use.”

9. Abel Valenzuela, Lisa Schweitzer, and Adriele Robles, “Camionetas: Informal Transit Among Immigrants,” Transportation Research Part A: Policy and Practice 39, no. 10 (2005): 895–911.

10. Daniel G. Chatman and Nicholas J. Klein, “Why Do Immigrants Drive Less? Confirmations, Complications, and New Hypotheses from a Qualitative Study in New Jersey, USA,” *Transport Policy* 30 (2013): 336–44.

11. Kristin Lovejoy and Susan Handy, “Social Networks as a Source of Private-Vehicle Transportation: The Practice of Getting Rides and Borrowing Vehicles Among Mexican Immigrants in California,” *Transportation Research Part A: Policy and Practice* 45, no. 4 (2011): 248–57, doi:10.1016/j.tra.2011.01.007; Liu and Painter, “Travel Behavior among Latino Immigrants: The Role of Ethnic Concentration and Ethnic Employment”; Evelyn Blumenberg and Michael J. Smart, “Brother Can You Spare a Ride? Carpooling in Immigrant Neighbourhoods,” *Urban Studies* 51, no. 9 (2014): 1871–90, doi:10.1177/0042098013502825.

12. Michael J. Smart and Nicholas J. Klein, *A Longitudinal Analysis of Cars, Transit, and Employment Outcomes* (San José, CA: Mineta Transportation Institute, 2015).

13. California Department of Transportation, “2010-2012 California Household Travel Survey,” 2013, http://www.dot.ca.gov/hq/tpp/offices/omsp/statewide_travel_analysis/chts.html.

14. Brian D. Taylor, Douglas Miller, Hiroyuki Iseki, and Camille Fink, “Nature and/or Nurture? Analyzing the Determinants of Transit Ridership across US Urbanized Areas,” *Transportation Research Part A: Policy and Practice* 43 no. 1 (2009): 60–77.

15. Q. Shen, “Location Characteristics of Inner-City Neighborhoods and Employment Accessibility of Low-Wage Workers,” *Environment and Planning B: Planning and Design* 25, no. 3 (1998): 345–65, doi:10.1068/b250345; Evelyn Blumenberg and Michael Manville, “Beyond the Spatial Mismatch: Welfare Recipients and Transportation Policy,” *Journal of Planning Literature* 19 (2004): 182–205, doi:10.1177/0885412204269103; Joe Grengs, “Equity and the Social Distribution of Job Accessibility in Detroit,” *Environment and Planning: Part B* 39, no. 5 (2012): 785–785, doi:10.1068/b36097; Evelyn Blumenberg and Trevor Thomas, “Travel Behavior of the Poor After Welfare Reform,” *Transportation Research Record: Journal of the Transportation Research Board* 2452 (2014): 53–61, doi:10.3141/2452-07.

16. Smart and Klein, *A Longitudinal Analysis of Cars, Transit, and Employment Outcomes*.

17. John Pucher and John L. Renne, “Socioeconomics of Urban Travel,” *Transportation Quarterly* 57 no. 3 (2003): 49–77; Blumenberg and Thomas, “Travel Behavior of the Poor After Welfare Reform.”

18. Genevieve Giuliano, “Low Income, Public Transit, and Mobility,” *Transportation Research Record: Journal of the Transportation Research Board* 1927 (2005): 63–70.

19. Anastasia Loukaitou-Sideris, “Fear and Safety in Transit Environments from the Women’s Perspective,” *Security Journal* 27, no. 2 (2014): 242–56, doi:10.1057/sj.2014.9.

20. Asha Weinstein Agrawal et al., *Getting Around When You’re Just Getting By: The Travel Behavior and Transportation Expenditures of Low-Income Adults* (San José, CA: Mineta Transportation Institute, 2011).

21. Evelyn Blumenberg, “En-Gendering Effective Planning: Spatial Mismatch, Low-Income Women, and Transportation Policy,” *Journal of the American Planning Association* 70, no. 3 (September 30, 2004): 269–81, doi:10.1080/01944360408976378; Paul M. Ong et al., “Los Angeles County CalWORKs Transportation Needs Assessment,” Working Paper (Los Angeles, CA: UCLA, 2001), http://www.lewis.ucla.edu/publication/los-angeles-county-calworks-transportation-needs-assessment/.

22. Hindy Lauer Schachter and Rongfang (Rachel) Liu, “Policy Development and New Immigrant Communities: A Case Study of Citizen Input in Defining Transit Problems,” *Public Administration Review* 65 no. 5 (2005): 614-23.

23. Eva Heinen, Bert van Wee, and Kees Maat, “Commuting by Bicycle: An Overview of the Literature,” *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 1 (2010); John Pucher, Jennifer Dill, and Susan Handy, “Infrastructure, Programs, and Policies to Increase Bicycling: An International Review,” *Preventive Medicine* 50, no. Supplement 1 (2010).

24. Ann Forsyth and Kevin J. Krizek, “Promoting Walking and Bicycling: Assessing the Evidence to Assist Planners,” *Built Environment* 36, no. 4 (2010): 429–46; Eva Heinen, Bert van Wee, and Kees Maat, “Commuting by Bicycle: An Overview of the Literature,” *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 1 (2010): 59–96, doi:10.1080/01441640903187001; John Pucher, Jennifer Dill, and Susan Handy, “Infrastructure, Programs, and Policies to Increase Bicycling: An International Review,” *Preventive Medicine* 50, no. Supplement 1 (2010): S106–25, doi:10.1016/j.ypmed.2009.07.028.

25. Jennifer Dill, “Bicycling for Transportation and Health: The Role of Infrastructure,” Journal of Public Health Policy 30 (2009): S95–110, doi:10.1057/jphp.2008.56.

26. Eva Heinen, Bert van Wee, and Kees Maat, “Commuting by Bicycle: An Overview of the Literature,” *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 1 (2010); John Pucher, Jennifer Dill, and Susan Handy, “Infrastructure, Programs, and Policies to Increase Bicycling: An International Review,” *Preventive Medicine* 50, no. Supplement 1 (2010).

27. Forsyth and Krizek, “Promoting Walking and Bicycling: Assessing the Evidence to Assist Planners.”

28. Eva Heinen, Bert van Wee, and Kees Maat, “Commuting by Bicycle: An Overview of the Literature,” *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 1 (2010).

29. Xinyu Cao, Patricia L. Mokhtarian, and Susan L. Handy, “Examining the Impacts of Residential Self-Selection on Travel Behaviour: A Focus on Empirical Findings,” *Transport Reviews* 29, no. 3 (2009): 359–95; Forsyth and Krizek, “Promoting Walking and Bicycling: Assessing the Evidence to Assist Planners.”

30. John Pucher, Jennifer Dill, and Susan Handy, “Infrastructure, Programs, and Policies to Increase Bicycling: An International Review,” *Preventive Medicine* 50, no. Supplement 1 (2010).

31. Eva Heinen, Bert van Wee, and Kees Maat, “Commuting by Bicycle: An Overview of the Literature,” *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 1 (2010).

32. Jesus M. Barajas, “Built Environment and Demographic Predictors of Bicycle Access to Transit,” in *TRB 91st Annual Meeting Compendium of Papers* (Transportation Research Board 91st Annual Meeting, Washington, D.C., 2012).

33. Robert Cervero, Benjamin Caldwell, and Jesus Cuellar, “Bike-and-Ride: Build It and They Will Come,” *Journal of Public Transportation* 16, no. 4 (December 2013): 83–105, doi:10.5038/2375-0901.16.4.5.

34. John Pucher, Jennifer Dill, and Susan Handy, “Infrastructure, Programs, and Policies to Increase Bicycling: An International Review,” *Preventive Medicine* 50, no. Supplement 1 (2010).

35. Jan Garrard, Susan Handy, and Jennifer Dill, “Women and Cycling,” in *City Cycling*, ed. John Pucher and Ralph Buehler (Cambridge, MA: MIT Press, 2012), 211–32.

36. Ibid.

37. John Pucher and John L. Renne, “Socioeconomics of Urban Travel,” *Transportation Quarterly* 57, no. 3 (2003): 49–77.

38. Eva Heinen, Bert van Wee, and Kees Maat, “Commuting by Bicycle: An Overview of the Literature,” *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 1 (2010).

39. Andrew Keatts, “Memo to Cities: Most Cyclists Aren’t Urban Hipsters,” *The Urban Edge*, October 20, 2015, http://urbanedge.blogs.rice.edu/2015/10/20/memo-to-cities-most-cyclists-arent-urban-hipsters.

40. Smart, “U.S. Immigrants and Bicycling.”

41. U.S. Census Bureau, “American Community Survey 5-Year Estimates: 2009-2013,” accessed October 1, 2015, http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

42. Steinar Kvale, *InterViews: An Introduction to Qualitative Research Interviewing* (Thousand Oaks, CA: Sage Publications, 1996).

43. John W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 3rd ed (Thousand Oaks, CA: Sage Publications, 2009).

44. California Department of Transportation, “2010-2012 California Household Travel Survey.”

45. Diana Wofinden, “Non-Household Surveys,” in *Transport Survey Quality and Innovation*, ed. Peter Stopher and Peter Jones (Oxford, UK: Elsevier, 2003), 377–402.

46. Kelly J. Clifton, “Mobility Strategies and Food Shopping for Low-Income Families: A Case Study,” *Journal of Planning Education and Research* 23 no. 4 (2004): 402-413; Kristin Lovejoy and Susan Handy, “A Case for Measuring Individuals’ Access to Private-Vehicle Travel as a Matter of Degrees,” *Transportation* 35, no. 5 (2008): 601–12, doi:10.1007/s11116-008-9169-5.

47. Louis M. Rea and Richard A. Parker, *Designing and Conducting Survey Research: A Comprehensive Guide*, 3rd ed (San Francisco: Jossey-Bass, 2005).

48. U.S. Census Bureau, “American Community Survey 5-Year Estimates: 2009–2013.”

49. This name and all other names in this chapter are pseudonyms.

50. All quotes in this section are translated from Spanish, except for those from Carlos.

51. Rongfang (Rachel) Liu and Hindy Lauer Schachter, “Mobility Information Needs of Immigrants with Limited English Proficiency (LEP) in New Jersey,” *Journal of Immigrant & Refugee Studies* 5, no. 2 (2007): 89–108, doi:10.1300/J500v05n02_05; Kristin Lovejoy and Susan L. Handy, “Transportation Experiences of Mexican Immigrants in California: Results from Focus Group Interviews,” Research Report (Davis, CA: Institute of Transportation Studies, UC Davis, 2007), http://www.escholarship.org/uc/item/0jj8h2cf#page-1.

52. Susan Handy et al., “Travel Behavior of Mexican and Other Immigrant Groups in California,” *Berkeley Planning Journal* 21 (2008): 1-24; Agrawal et al., *Getting Around When You’re Just Getting By*.

53. U.S. Department of Health and Human Services, “Poverty Guidelines,” 2015, http://aspe.hhs.gov/poverty-guidelines.

54. U.S. Census Bureau, “American Community Survey 5-Year Estimates: 2009–2013.”

55. Steven Ruggles et al., *Integrated Public Use Microdata Series: Version 6.0 [Machine-Readable Database]* (Minneapolis: University of Minnesota, 2015).

56. Ruggles et al., *Integrated Public Use Microdata Series: Version 6.0 [Machine-Readable Database]*.

57. Lovejoy and Handy, "A Case for Measuring Individuals' Access to Private-Vehicle Travel as a Matter of Degrees."

58. Metropolitan Transportation Commission and Association of Bay Area Governments, *Plan Bay Area: Draft Equity Analysis Report* (Oakland, CA, 2013).

59. Chatman, "Explaining the 'Immigrant Effect' on Auto Use."

60. Smart, "US Immigrants and Bicycling."

61. Sungyop Kim, Gudmundur F. Ulfarsson, and J. Todd Hennessy, "Analysis of Light Rail Rider Travel Behavior: Impacts of Individual, Built Environment, and Crime Characteristics on Transit Access," *Transportation Research Part A: Policy and Practice* 41 no. 6 (2007): 511-22.

62. A. Loukaitou-Sideris, R. Liggett, and H. Iseki, "The Geography of Transit Crime: Documentation and Evaluation of Crime Incidence on and around the Green Line Stations in Los Angeles," *Journal of Planning Education and Research* 22 no. 2 (2002): 135-51.

63. U.S. Census Bureau, "American Community Survey 5-Year Estimates: 2009-2013."

64. Metropolitan Transportation Commission, "Lifeline Transportation Program," 2015, http://www.mtc.ca.gov/planning/lifeline/

65. Kirk Johnson, "Targeting Inequality, This Time on Public Transit," *The New York Times*, February 28, 2015.

BIBLIOGRAPHY

Agrawal, Asha Weinstein, Evelyn Blumenberg, Sarah Abel, Gregory Pierce, and Charles N. Darrah. “Getting Around When You’re Just Getting By: The Travel Behavior and Transportation Expenditures of Low-Income Adults.” San José, CA: Mineta Transportation Institute, 2011.

Barajas, Jesus M. “Built Environment and Demographic Predictors of Bicycle Access to Transit.” In *TRB 91st Annual Meeting Compendium of Papers*. Washington, D.C., 2012.

Blumenberg, Evelyn. “En-Gendering Effective Planning: Spatial Mismatch, Low-Income Women, and Transportation Policy.” *Journal of the American Planning Association* 70, no. 3 (September 30, 2004): 269–81. doi:10.1080/01944360408976378

———. “Moving in and Moving Around: Immigrants, Travel Behavior, and Implications for Transport Policy.” *Transportation Letters: The International Journal of Transportation Research* 1, no. 2 (2009): 169–80. doi:10.3328/TL.2009.01.02.169-180.

Blumenberg, Evelyn, and Alexandra Elizabeth Evans. “Planning for Demographic Diversity: The Case of Immigrants and Public Transit.” *Journal of Public Transportation Research* 13, no. 2 (2010): 23–45.

Blumenberg, Evelyn, and Michael Manville. “Beyond the Spatial Mismatch: Welfare Recipients and Transportation Policy.” *Journal of Planning Literature* 19 (2004): 182–205. doi:10.1177/0885412204269103

Blumenberg, Evelyn, and Michael Smart. “Getting by with a Little Help from My Friends…and Family: Immigrants and Carpooling.” *Transportation* 37, no. 3 (2010): 429–46. doi:10.1007/s11116-010-9262-4

Blumenberg, Evelyn, and Michael J. Smart. “Brother Can You Spare a Ride? Carpooling in Immigrant Neighbourhoods.” *Urban Studies* 51, no. 9 (2014): 1871–90. doi:10.1177/0042098013502825

Blumenberg, Evelyn, and Trevor Thomas. “Travel Behavior of the Poor After Welfare Reform.” *Transportation Research Record: Journal of the Transportation Research Board* 2452 (2014): 53–61. doi:10.3141/2452-07

California Department of Transportation. “2010-2012 California Household Travel Survey,” 2013. http://www.dot.ca.gov/hq/tpp/offices/omsp/statewide_travel_analysis/chts.html

Cervero, Robert, Benjamin Caldwell, and Jesus Cuellar. “Bike-and-Ride: Build It and They Will Come.” *Journal of Public Transportation* 16, no. 4 (December 2013): 83–105. doi:10.5038/2375-0901.16.4.5

Chatman, Daniel G. “Explaining the ‘Immigrant Effect’ on Auto Use: The Influences of Neighborhoods and Preferences.” *Transportation* 41, no. 3 (2014): 441–61. doi:10.1007/s11116-013-9475-4

Chatman, Daniel G., and Nicholas Klein. “Immigrants and Automobility in New Jersey.” In *Auto Motives*, edited by Karen Lucas, Evelyn Blumenberg, and Rachel Weinberger, 253–76. Bingley, UK: Emerald Group Publishing, 2011.

———. “Immigrants and Travel Demand in the United States: Implications for Transportation Policy and Future Research.” *Public Works Management & Policy* 13, no. 4 (2009): 312–27. doi:10.1177/1087724X09334633

Chatman, Daniel G., and Nicholas J. Klein. “Why Do Immigrants Drive Less? Confirmations, Complications, and New Hypotheses from a Qualitative Study in New Jersey, USA.” *Transport Policy* 30 (2013): 336–44. doi:10.1016/j.tranpol.2013.10.002

Clifton, Kelly J. “Mobility Strategies and Food Shopping for Low-Income Families: A Case Study.” *Journal of Planning Education and Research* 23, no. 4 (June 1, 2004): 402–13. doi:10.1177/0739456X04264919

Colby, Sandra L., and Jennifer M. Ortman. “Projections of the Size and Composition of the U.S. Population: 2014 to 2060.” Washington, D.C.: U.S. Census Bureau, 2015.

Creswell, John W. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 3rd ed. Thousand Oaks, Calif: Sage Publications, 2009.

Dill, Jennifer. “Bicycling for Transportation and Health: The Role of Infrastructure.” *Journal of Public Health Policy* 30 (2009): S95–110. doi:10.1057/jphp.2008.56.

Federal Highway Administration. “National Household Travel Survey,” 2009. http://nhts.ornl.gov/

Forsyth, Ann, and Kevin J. Krizek. “Promoting Walking and Bicycling: Assessing the Evidence to Assist Planners.” *Built Environment* 36, no. 4 (2010): 429–46.

Garrard, Jan, Susan Handy, and Jennifer Dill. “Women and Cycling.” In *City Cycling*, edited by John Pucher and Ralph Buehler, 211–32. Cambridge, MA: MIT Press, 2012.

Giuliano, Genevieve. “Low Income, Public Transit, and Mobility.” *Transportation Research Record: Journal of the Transportation Research Board* 1927 (2005): 63–70.

Grengs, Joe. “Equity and the Social Distribution of Job Accessibility in Detroit.” *Environment and Planning: Part B* 39, no. 5 (2012): 785–785. doi:10.1068/b36097

Handy, Susan, Evelyn Blumenberg, Moira Donahue, Kristin Lovejoy, Caroline Rodier, Susan Shaheen, Kimiko Shiki, and Lily Song. “Travel Behavior of Mexican and Other Immigrant Groups in California.” *Berkeley Planning Journal* 21 (2008): 1–24.

Heinen, Eva, Bert van Wee, and Kees Maat. “Commuting by Bicycle: An Overview of the Literature.” *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 1 (2010): 59–96. doi:10.1080/01441640903187001

Johnson, Kirk. “Targeting Inequality, This Time on Public Transit.” *The New York Times*, February 28, 2015.

Keatts, Andrew. “Memo to Cities: Most Cyclists Aren’t Urban Hipsters.” *The Urban Edge*, October 20, 2015. http://urbanedge.blogs.rice.edu/2015/10/20/memo-to-cities-most-cyclists-arent-urban-hipsters.

Kim, Sungyop, Gudmundur F. Ulfarsson, and J. Todd Hennessy. “Analysis of Light Rail Rider Travel Behavior: Impacts of Individual, Built Environment, and Crime Characteristics on Transit Access.” *Transportation Research Part A: Policy and Practice* 41, no. 6 (July 2007): 511–22. doi:10.1016/j.tra.2006.11.001

Kvale, Steinar. *InterViews: An Introduction to Qualitative Research Interviewing*. Thousand Oaks, CA: Sage Publications, 1996.

Liu, Cathy Yang, and Gary Painter. “Travel Behavior among Latino Immigrants: The Role of Ethnic Concentration and Ethnic Employment.” *Journal of Planning Education and Research* 32, no. 1 (2012): 62–80. doi:10.1177/0739456X11422070

Liu, Rongfang (Rachel), and Hindy Lauer Schachter. “Mobility Information Needs of Immigrants with Limited English Proficiency (LEP) in New Jersey.” *Journal of Immigrant & Refugee Studies* 5, no. 2 (2007): 89–108. doi:10.1300/J500v05n02_05

Loukaitou-Sideris, A., R. Liggett, and H. Iseki. “The Geography of Transit Crime: Documentation and Evaluation of Crime Incidence on and around the Green Line Stations in Los Angeles.” *Journal of Planning Education and Research* 22, no. 2 (2002): 135–51. doi:10.1177/0739456X02238443

Loukaitou-Sideris, Anastasia. “Fear and Safety in Transit Environments from the Women’s Perspective.” *Security Journal* 27, no. 2 (2014): 242–56. doi:10.1057/sj.2014.9

Lovejoy, Kristin, and Susan Handy. “A Case for Measuring Individuals’ Access to Private-Vehicle Travel as a Matter of Degrees.” *Transportation* 35, no. 5 (2008): 601–12. doi:10.1007/s11116-008-9169-5

———. “Social Networks as a Source of Private-Vehicle Transportation: The Practice of Getting Rides and Borrowing Vehicles Among Mexican Immigrants in California.” *Transportation Research Part A: Policy and Practice* 45, no. 4 (2011): 248–57. doi:10.1016/j.tra.2011.01.007

Lovejoy, Kristin, and Susan L. Handy. “Transportation Experiences of Mexican Immigrants in California: Results from Focus Group Interviews.” Research Report. Davis, CA: Institute of Transportation Studies, UC Davis, 2007. http://www.escholarship.org/uc/item/0jj8h2cf#page-1

Metropolitan Transportation Commission. “Lifeline Transportation Program,” 2015. http://www.mtc.ca.gov/planning/lifeline/

Metropolitan Transportation Commission, and Association of Bay Area Governments. *Plan Bay Area: Draft Equity Analysis Report*. Oakland, CA, 2013.

Migration Policy Institute. “U.S. Immigration Trends,” 2015. http://www.migrationpolicy.org/programs/data-hub/us-immigration-trends

Ong, Paul M., Douglas Houston, John Horton, and Linda L. Shaw. “Los Angeles County CalWORKs Transportation Needs Assessment.” Working Paper. Los Angeles, CA: UCLA, 2001. http://www.lewis.ucla.edu/publication/los-angeles-county-calworks-transportation-needs-assessment/

Pucher, John, Jennifer Dill, and Susan Handy. “Infrastructure, Programs, and Policies to Increase Bicycling: An International Review.” *Preventive Medicine* 50, no. Supplement 1 (2010): S106–25. doi:10.1016/j.ypmed.2009.07.028

Pucher, John, and John L. Renne. “Socioeconomics of Urban Travel.” *Transportation Quarterly* 57, no. 3 (2003): 49–77.

Rea, Louis M., and Richard A. Parker. *Designing and Conducting Survey Research: A Comprehensive Guide*. 3rd ed. San Francisco: Jossey-Bass, 2005.

Ruggles, Steven, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. *Integrated Public Use Microdata Series: Version 6.0 [Machine-Readable Database]*. Minneapolis: University of Minnesota, 2015.

Schachter, Hindy Lauer, and Rongfang (Rachel) Liu. “Policy Development and New Immigrant Communities: A Case Study of Citizen Input in Defining Transit Problems.” *Public Administration Review* 65, no. 5 (September 1, 2005): 614–23.

Shen, Q. “Location Characteristics of Inner-City Neighborhoods and Employment Accessibility of Low-Wage Workers.” *Environment and Planning B: Planning and Design* 25, no. 3 (1998): 345–65. doi:10.1068/b250345

Smart, Michael J. “US Immigrants and Bicycling: Two-Wheeled in Autopia.” *Transport Policy* 17, no. 3 (2010): 153–59. doi:10.1016/j.tranpol.2010.01.002

Smart, Michael J., and Nicholas J. Klein. *A Longitudinal Analysis of Cars, Transit, and Employment Outcomes*. San José, CA: Mineta Transportation Institute, 2015.

Tal, Gil, and Susan Handy. “Travel Behavior of Immigrants: An Analysis of the 2001 National Household Transportation Survey.” *Transport Policy* 17, no. 2 (2010): 85–93. doi:10.1016/j.tranpol.2009.11.003

Taylor, Brian D., Douglas Miller, Hiroyuki Iseki, and Camille Fink. “Nature And/or Nurture? Analyzing the Determinants of Transit Ridership across US Urbanized Areas.” *Transportation Research Part A: Policy and Practice* 43, no. 1 (2009): 60–77. doi:10.1016/j.tra.2008.06.007

U.S. Census Bureau. “American Community Survey 5-Year Estimates: 2009–2013.” Accessed October 1, 2015. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

U.S. Department of Health and Human Services. “Poverty Guidelines,” 2015. http://aspe.hhs.gov/poverty-guidelines

Valenzuela, Abel, Lisa Schweitzer, and Adriele Robles. “Camionetas: Informal Travel Among Immigrants.” *Transportation Research Part A: Policy and Practice* 39, no. 10 (2005): 895–911. doi:10.1016/j.tra.2005.02.026

Wofinden, Diana. “Non-Household Surveys.” In *Transport Survey Quality and Innovation*, edited by Peter Stopher and Peter Jones, 377–402. Oxford, UK: Elsevier, 2003.

ABOUT THE AUTHORS

JESUS M. BARAJAS

Jesus M. Barajas is a Ph.D. candidate at the University of California, Berkeley. His research focuses on questions of transportation equity, travel behavior, and active transportation. He holds a bachelor's degree in computer science from Penn State University and a master's degree in urban and regional planning from California State Polytechnic University, Pomona.

DANIEL G. CHATMAN

Dan Chatman is an Associate Professor at the University of California, Berkeley, appointed in the Department of City and Regional Planning. He conducts research on travel behavior and the built environment; residential and workplace location choice; and the connections among public transportation, immigration, and the economic growth of cities. His ongoing research projects include studies addressing the economic costs and benefits of smart-growth strategies; the effects of TOD-caused displacement on auto use; and the relationship of transit investments to firm births and agglomeration economies in U.S. cities.

ASHA WEINSTEIN AGRAWAL

Asha Weinstein Agrawal is Director of the MTI National Transportation Finance Center and also Professor in the Department of Urban and Regional Planning, both at San José State University. Her research agenda is guided by a commitment to the principles of sustainability and equity; she explores the planning and policy tools that communities can adopt to encourage environmentallyfriendly travel and improve accessibility for people struggling with poverty or other disadvantages. She has explored these issues most deeply through two substantive areas, transportation finance policy and the travel behavior of pedestrians, cyclists, and transit riders. Dr. Agrawal has a BA from Harvard University, an MURP from the London School of Economics and Political Science, and a Ph.D. from the University of California at Berkeley.

PEER REVIEW

San José State University, of the California State University system, and the MTI Board of Trustees have agreed upon a peer review process required for all research published by MTI. The purpose of the review process is to ensure that the results presented are based upon a professionally acceptable research protocol.

Research projects begin with the approval of a scope of work by the sponsoring entities, with in-process reviews by the MTI Research Director and the Research Associated Policy Oversight Committee (RAPOC). Review of the draft research product is conducted by the Research Committee of the Board of Trustees and may include invited critiques from other professionals in the subject field. The review is based on the professional propriety of the research methodology.

MTI FOUNDER

Hon. Norman Y. Mineta

MTI BOARD OF TRUSTEES

Founder, Honorable Norman Mineta (Ex-Officio)
Secretary (ret.), US Department of Transportation
Vice Chair
Hill & Knowlton, Inc.

Honorary Chair, Honorable Bill Shuster (Ex-Officio)
Chair
House Transportation and Infrastructure Committee
United States House of Representatives

Honorary Co-Chair, Honorable Peter DeFazio (Ex-Officio)
Vice Chair
House Transportation and Infrastructure Committee
United States House of Representatives

Chair, Nuria Fernandez (TE 2017)
General Manager and CEO
Valley Transportation Authority

Vice Chair, Grace Crunican (TE 2016)
General Manager
Bay Area Rapid Transit District

Executive Director, Karen Philbrick, Ph.D.
Mineta Transportation Institute
San José State University

Joseph Boardman (Ex-Officio)
Chief Executive Officer
Amtrak

Anne Canby (TE 2017)
Director
OneRail Coalition

Donna DeMartino (TE 2018)
General Manager and CEO
San Joaquin Regional Transit District

William Dorey (TE 2017)
Board of Directors
Granite Construction, Inc.

Malcolm Dougherty (Ex-Officio)
Director
California Department of Transportation

Mortimer Downey* (TE 2018)
President
Mort Downey Consulting, LLC

Rose Guilbault (TE 2017)
Board Member
Peninsula Corridor Joint Powers Board (Caltrain)

Ed Hamberger (Ex-Officio)
President/CEO
Association of American Railroads

Steve Heminger* (TE 2018)
Executive Director
Metropolitan Transportation Commission

Diane Woodend Jones (TE 2016)
Principal and Chair of Board
Lea+Elliot, Inc.

Will Kempton (TE 2016)
Executive Director
Transportation California

Art Leahy (TE 2018)
CEO
Metrolink

Jean-Pierre Loubinoux (Ex-Officio)
Director General
International Union of Railways (UIC)

Michael Melaniphy (Ex-Officio)
President and CEO
American Public Transportation Association (APTA)

Abbas Mohaddes (TE 2018)
CEO
The Mohaddes Group

Jeff Morales (TE 2016)
CEO
California High-Speed Rail Authority

David Steele, Ph.D. (Ex-Officio)
Dean, College of Business
San José State University

Beverley Swaim-Staley (TE 2016)
President
Union Station Redevelopment Corporation

Michael Townes* (TE 2017)
Senior Vice President
Transit Sector, HNTB

Bud Wright (Ex-Officio)
Executive Director
American Association of State Highway and Transportation Officials (AASHTO)

Edward Wytkind (Ex-Officio)
President
Transportation Trades Dept., AFL-CIO

(TE) = Term Expiration or Ex-Officio
* = Past Chair, Board of Trustee

Directors

Karen Philbrick, Ph.D.
Executive Director

Hon. Rod Diridon, Sr.
Emeritus Executive Director

Peter Haas, Ph.D.
Education Director

Donna Maurillo
Communications Director

Brian Michael Jenkins
National Transportation Safety and Security Center

Asha Weinstein Agrawal, Ph.D.
National Transportation Finance Center

Research Associates Policy Oversight Committee

Asha Weinstein Agrawal, Ph.D.
Urban and Regional Planning
San José State University

Jan Botha, Ph.D.
Civil & Environmental Engineering
San José State University

Katherine Kao Cushing, Ph.D.
Enviromental Science
San José State University

Dave Czerwinski, Ph.D.
Marketing and Decision Science
San José State University

Frances Edwards, Ph.D.
Political Science
San José State University

Taeho Park, Ph.D.
Organization and Management
San José State University

Diana Wu
Martin Luther King, Jr. Library
San José State University

MINETA
TRANSPORTATION INSTITUTE
MTI

SAN JOSÉ STATE
UNIVERSITY

Funded by U.S. Department of Transportation and California Department of Transportation