

DRAFT TECHNICAL PROPOSAL

Advancing Social Equity in Regional Transportation Planning

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January 31, 2013

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Table of Contents

Abstract	3
Introduction.....	4
Relevant Ongoing and Recent Work By Project Team Members	5
Objectives	6
Technical plan	7
Task 1: Review of the literature.....	7
Task 2: Analyze the extent and magnitude of gentrification due to transit and TOD	8
2.1 Sort census tracts into gentrification categories.....	8
2.2 Map neighborhood-level gentrification	10
2.3 Empirically analyze the influence of transit and TOD on gentrification.....	10
Task 3: Based on the Task 2 analysis, develop and test off-modeling methods for predicting gentrification as a result of transit investment and TOD	14
3.1 Spreadsheet Tool Design	14
3.2 Cross Validation Using Historical Data.....	15
3.3 Full Scenario Analysis for the San Francisco Bay Area.....	16
Task 4: Explore the benefits, barriers, and magnitude of impact of strategies to minimize the negative effects of TOD on low-income households.....	16
Task 5: Final Report.....	20
Data Management Plan	20
References	21
Project Schedule.....	25
Preliminary Cost Proposal	26
CVs of Key Scientific Personnel (2 pages each)	27

Abstract

Transit-oriented development (TOD)—high density, mixed-use development within close proximity of transit stations—is a key component of regional strategies in California to meet SB 375’s greenhouse gas emission reduction targets. Policymakers and neighborhood activists are concerned that such developments could lead to neighborhood changes that price low-income families out of transit-rich neighborhoods, forcing some of these families to move to more affordable but perhaps less desirable locations.

Despite this concern for the impacts of transit investment and transit oriented development on social equity, relatively little research addresses this topic. A wider literature on gentrification dynamics in general is abundant but ignores the role of transit-related investments. There is a body of research on how transit investments affect land values, but these studies leave out specific effects on low-income households. Finally, there is a small, but growing body of research on the equity effects of TOD. However, many of these studies use descriptive data and fail to isolate the specific effects of public transit investments and TODs on neighborhoods and low-income households.

To fill this gap, we will use multivariate statistics complemented by policy case studies to examine the following research questions:

1. What are the determinants of gentrification? In particular, what is the relationship between transit investments, transit-oriented development, and gentrification?
2. Given future transit and TOD plans, what factors predict where gentrification is likely to occur? How can regional planning agencies and their member local governments assess the potential for significant neighborhood change and for displacement that may follow planned investments in public transit and TOD?
3. In cases where gentrification may negatively affect outcomes for low-income households, what land use, transportation, housing and/or other strategies can minimize these effects?

The proposed project will use data for four California metropolitan areas—Bay Area, Los Angeles, Sacramento, and San Diego - and multivariate analysis to predict the determinants of gentrification focusing particular attention on the role of transit investments and TOD. These analyses will be developed from available statewide data and informed by an extensive literature review on gentrification, displacement, and TOD. Based on this analysis, we will then develop an off-model spreadsheet tool that will enable metropolitan planning organizations (MPOs) and other agencies to analyze the potential equity effects of development scenarios in their regions or service areas.

We will use the results of our empirical analysis to identify and develop a set of detailed case studies to document local indicators and dynamics of gentrification and displacement produced by transit investment and transit-oriented development and to examine potential strategies to minimize potential displacement impacts. Finally, drawing on all aspects of the research, our final report will offer guidance on the capacity of land use, housing, and other strategies to ameliorate the potential gentrification and displacement effects of transit investments and TOD.

Introduction

Motivated by the desire to create communities that are both environmentally sustainable and provide a high quality of life for residents, many urban planners have been encouraging dense developments that include “complete streets,” mixed land uses, and access to public transportation. When specifically located near transit stations, these developments are called transit-oriented development (TOD). Many urban residents welcome TODs into their cities and neighborhoods, excited about their potential to create safer streets and improved neighborhood vitality.

However, some policymakers and neighborhood activists are concerned that transit-oriented developments ultimately serve relatively wealthy households, and may lead to neighborhood changes that price out low-income residents, forcing some of these families to move to more affordable but less desirable locations. TODs may also hurt low-income families who remain in gentrifying neighborhoods by driving up rents and housing prices and straining already limited budgets.

Since the passage of Senate Bill 375 in 2008, the California Air Resources Board has become increasingly involved in land use and transportation planning. Under SB 375, the ARB is responsible for assessing whether the Sustainable Communities Strategy (SCS) for each region will successfully meet greenhouse gas emission reduction targets.

Transit-oriented development is a key component of these regional strategies – both because it is likely to be a good long-term strategy and because the law is written to promote TOD. Specifically, SB 375 encourages channeling development toward neighborhoods that are well-served by public transit (High Priority Transit Areas) by creating a streamlined process for these developments to comply with the California Environmental Quality Act (CEQA). However, if transit-oriented development displaces low-income households from transit-rich neighborhoods, this outcome would be an unfortunate unintended consequence of an environmental protection law.

Despite the widespread concern about the equity effects of TOD, there is relatively little scholarship on the topic. A U.S. literature dating back to the 1980s explores gentrification—its resurgence, causes, and displacement effects. Some of these studies find that gentrification may not necessarily result in displacement if it occurs through the normal neighborhood succession process—a process by which higher income households move into neighborhoods as lower-income households voluntarily move out (Ellen and O’Regan, 2010; Freeman, 2005, 2006; Freeman and Braconi, 2004a, 2004b; Vigdor, 2002). However, gentrification can have other negative effects on low-income households; as Vigdor (2002) notes, gentrification can reduce the quality of life of low-income households who remain in gentrifying neighborhoods. In contrast, other studies conclude that gentrification can contribute to the displacement of low-income households (Grier and Grier, 1980; LeGates and Hartman, 1981, 1986; Marcuse, 1986; Newman and Wyly, 2006; Schill and Nathan, 1983; Sumka, 1979).

A subset of this literature focuses on the role of urban policy in facilitating gentrification. However, the role of transportation investments is noticeably absent from much of this scholarship (Hackworth and Smith, 2002; Kennedy and Leonard, 2001; Wyly and Hammel, 1999). Conversely, there is a sizable and separate literature on the relationship between transit

services, TOD, and changes in the land values of adjacent properties.¹ While important, these studies do not examine the effects of transit investments and TOD specifically on outcomes for low-income households.

Finally, there is a small but growing body of research that centers on the relationship between transit investments, gentrification, and outcomes for low-income households (Association of Bay Area Governments, 2009; Chapple, 2009; Dominie, 2012; Kahn, 2007; Pollack et al., 2010; Southern California Association of Governments, 2012).

Thus far, the findings on the relationship between TODs and gentrification are mixed; and studies of the relationship between TOD and (a) displacement and (b) outcomes for low-income households who remain in gentrifying neighborhood are few. Moreover, with a few exceptions, equity studies of TOD tend to be descriptive and do not include statistical analysis to estimate the independent effects of TOD on gentrification.²

The aim of this study, therefore, is to fill this gap. We will use census-tract level data to quantify the determinants of gentrification and, in particular, to isolate the role of public transit investments in facilitating neighborhood change. In so doing, we will be able to predict neighborhoods in which low-income households may be vulnerable. If a state law such as SB 375 reduces the quality of life for low-income households, this is a serious problem and must be addressed. Drawing from our analysis of land use, transportation and housing strategies as well as from detailed case studies of transit-related neighborhood change, we will recommend policies to mitigate the potential negative effects of gentrification.

Relevant Ongoing and Recent Work By Project Team Members

The project team is well qualified to conduct research on this topic as they have been involved in numerous projects relevant to this research.

Evelyn Blumenberg's research focuses on the effects of urban structure--the spatial location of residents, employment, and services--on economic outcomes for low-wage workers. She is an expert on the travel and residential location patterns of low-income adult and has published numerous articles on this topic. She recently supervised student capstone projects on the topic of gentrification, TOD, and transit use in Los Angeles.

Deborah Salon's research considers the effects of transportation infrastructure, the built environment, and public policy on the choices that people make. One of her areas of focus has been the relationship between poverty, public transport, and economic development. Until recently, her work in this area has been studies outside of the U.S. She has looked specifically at the question of the relationship of transit to station area economic outcomes in Bogota, Colombia and Guangzhou, China. Salon and Blumenberg currently are engaged in a joint project investigating the spatial patterns of housing and transport affordability in Los Angeles County.

¹ See Cervero (2004) and Bartholomew and Ewing (2011) for literature reviews on this topic, and Mathur and Ferrell (2013) for a recent article focusing on the effect of TOD on property values.

² See, for example, Dominie (2012) and Kolko (2007).

Objectives

The relationship between transit-oriented development and neighborhood gentrification and displacement of vulnerable households has become an important research topic for the California Air Resources Board. In the new policy environment established by California's SB 375, transit-oriented development has emerged as an important strategy for helping to meet regional GHG reduction targets. The law calls explicitly for "changed land use patterns and improved transportation" as a means to achieve these targets, and asks MPOs in their Sustainable Communities Strategy (SCS) to "set forth a forecasted development pattern for the region, which, when integrated with the transportation network,...will reduce the greenhouse gas emissions" from cars and light trucks. Highlighting TOD's anticipated significance in this planning framework, SB 375 makes "transit priority projects" eligible for streamlined environmental review. Major MPOs in the state have plans to strongly channel new residential development toward High Priority Transit Areas in their Sustainable Communities Strategies (e.g. SCAG, MTC).

However, there is substantial concern among stakeholders that transit-oriented development could lead to displacement of the low-income households and communities that have historically called these neighborhoods home. This is certainly not the intended or desired outcome from the implementation of SB 375.

The overarching goals of this project are to better understand the relationship between transit-oriented development, gentrification, and the displacement of vulnerable households, and to identify the characteristics of neighborhoods in which additional public transport infrastructure and/or transit-oriented development is associated with gentrification. This information can then be used to identify vulnerable neighborhoods and to develop strategies to mitigate potential undesirable outcomes.

As such, the proposed project has the following four objectives:

1. Define and identify (map) neighborhoods that have experienced gentrification; define and identify (map) transit-rich neighborhoods that have experienced gentrification.
2. Identify the main factors that predict significant neighborhood gentrification in California's major urban areas. In this analysis, we will focus particular attention on the role of transit investments and transit-oriented development.
3. Develop and test a tool for use by MPOs and other agencies to predict the likelihood that particular neighborhoods will experience significant change as a result of transit-oriented development.
4. Identify and analyze the effectiveness of available land use, transportation, and housing strategies to minimize the effects of TOD on low-income families.

Technical plan

The proposed project includes five main tasks, as follows; we describe each of these tasks below.

- Task 1:** Review of the literature on gentrification, displacement, and transit-oriented development (Objectives 1, 2, & 4)
- Task 2:** Analyze the extent and magnitude of gentrification due to TOD. (Objectives 1 & 2)
- Task 3:** Based on the Task 2 analysis, develop and test off-modeling methods for predicting gentrification as a result of transit investment and TOD. (Objective 3)
- Task 4:** Examine the land use, transportation and/or housing strategies to minimize the negative effects of TOD on low-income households. (Objective 4)
- Task 5:** Write up our methods and results in a final report for this project.

Task 1: Review of the literature.

In this first task, we will conduct a thorough review of the existing literature and evidence in the following five areas:

1. the magnitude, causes, and effects of gentrification;
2. the relationship between transit investments, transit-oriented development, and outcomes for low-income residents;
3. the relationship between transit investments and land value;
4. the relationship between transit-area gentrification and transportation indicators such as car ownership and transit use³; and
5. the effectiveness of policy strategies to mitigate the negative outcomes of transit-oriented development on low-income residents.

Our review will draw from academic scholarship (e.g. Freeman, 2006; Hammel and Wyly, 1996), research produced from policy think tanks (e.g. Kolko, 2007; Levy et al., 2006a, 2006b), the work of advocacy organizations (e.g. Center for Transit-Oriented Development et al., 2009), and reports produced by public agencies (e.g. SCAG, 2012; ABAG, 2009). We will focus on the following dimensions of the current research:

- *Definitions:* How has the research community defined concepts such as gentrification and displacement?
- *Research design:* What types of data and methodological approaches have been used to test the relationship between TOD and gentrification? What are the strengths and weaknesses of these approaches?
- *Findings:* What are the current findings on this topic? In particular, what does the research tell us about the relationship between TOD and relevant outcome measures such as gentrification, displacement, and transit use? Where are the gaps in the literature on this topic?

³ While identifying this relationship is not specifically a goal of this project, it is a closely-related and important subtopic. There is some evidence that the neighborhood changes that are sometimes associated with transit-oriented development can lead to *reduced transit use* among neighborhood residents (e.g. Dominie, 2012 and Pollack, et al., 2010). If so, this perverse effect means that building new transit-oriented developments might actually be counterproductive to the goals of encouraging transit use and reducing greenhouse gas emissions.

- *Quality:* What is the relative quality of the studies in this area? In other words, how reliable are the current findings on this topic?

Task 1 will result in a literature review that effectively synthesizes and evaluates the current research on this topic. This document will be an important foundation for the implementation of Tasks 2-5 and a useful resource for others interested in this topic.

Task 2: Analyze the extent and magnitude of gentrification due to transit and TOD

In this task, we will examine the relationships between the presence of transit and transit-oriented development, and neighborhood change. Our analysis will focus on four metropolitan areas in California—Los Angeles, the Bay Area, Sacramento, and San Diego metropolitan areas. We will conduct our analysis at the census-tract level, using 1980, 1990, 2000, and 2010 U.S. Census data as the backbone of our dataset. In 2010 these four metropolitan areas included 4,440 census tracts across eleven counties.⁴

Gentrification is a process that occurs over time, and thus we must look at changes over time to measure it. For this project, we propose to look at the time period between 1980 and 2010, since most of the rail development in the state occurred over this period (Kahn, 2007). Our outcome variable is gentrification measured as neighborhood change over a specified time period. Therefore, we propose to conduct all parts of the analysis described here five times, each one looking to explain neighborhood change over a different portion of our time period of interest. The five time periods we will analyze are 1980-2000, 1980-2010, 1990-2000, 1990-2010, and 2000-2010. For our period of analysis, we will use the Neighborhood Change Database (compiled by GeoLytics) to ensure that we are using consistent census tract boundaries for all time periods.

This task is divided into three separate sub-tasks. They are, for each time period:

- 2.1 Sort census tracts into gentrification categories using readily-available, replicable data;
- 2.2 Produce maps of neighborhood-level gentrification, both at the scale of the metropolitan area and focusing in on station areas where appropriate;
- 2.3 Use ordered logistic regression analysis to isolate the influence of transit and transit-oriented development on neighborhood-level gentrification.

2.1 Sort census tracts into gentrification categories

Drawing on our literature review (Task 1), we will first identify a set of measurable variables that could be used to represent gentrification at the census tract level. Table 2.1 presents a number of candidate variables. These include indicators based on characteristics of the people who live in the tract: household incomes, educational attainment levels, and recent movers. They also include indicators based on the characteristics of the housing stock in the tract: home values, housing stock age, housing unit density, and housing unit size and type.

⁴ See Hammel and Wyly (1996), Heidkamp and Lucas (2006), Kolko (2007), Wyly and Hammel (2008) for other census-tract based analyses of gentrification.

Since - as highlighted above - gentrification is inherently a concept of neighborhood change over time, all of the candidate variables in Table 2.1 have a time component to them. The symbol Δ denotes “change over time.” Many of the indicators in Table 2.1 are expressed as the change in the indicator variable within the tract relative to the average change in the indicator variable in the region. This approach is a simple way to take into account - and control for - region-level market forces in both the housing market and the economy as a whole. Note that where dollar values are listed as indicators of gentrification, they will be deflated such that they are in constant dollars across all time periods.

Table 2.1. Potential Indicators of Tract-Level Gentrification (Sources: U.S. Decennial Census, American Community Survey)

Socioeconomic Measures
Δ Median Income in Tract / Δ Median Income in Metro Area
Δ % Households in Tract That are High Income for the Metro Area (e.g. in top income quartile)
Δ % Households in Tract Below Regional Median (or 40th Percentile) Income
Δ % of Workers in Managerial, Professional, or Technical Occupations in Tract
Δ Educational Attainment in Tract / Δ Educational Attainment in Metro Area
Housing Measures
Δ Median Home Value in Tract / Δ Median Home Value in Metro Area
Δ Median Contract Rent in Tract / Δ Median Contract Rent in Metro Area
Δ Number of Housing Units in Tract
Δ Rooms per Housing Unit in Tract
Δ % Single Family Homes in Tract
Δ % Housing that is Owner-Occupied
Δ % Housing Built in the Last 10 (or 20) Years in Tract / Δ % Housing Built in the Last 10 (or 20) Years in Metro Area
% in Time T who Moved to Tract in Last Five Years

Using data from the U.S. Census, we will use the following procedure to sort census tracts into categories of gentrification levels across each of our five time periods of interest. First, we will identify tracts for which gentrification is not a concern because they are already inhabited by wealthy households. Following Freeman (2005), we will remove from our analysis those census tracts with a median household incomes above the median for the metropolitan region in which they are located.

Second, we will employ k-means cluster analysis - possibly combined with factor analysis⁵ - to sort the remaining tracts into gentrification categories. Owens (2012) uses this approach to classify census tracts according to their level of socioeconomic ascent over time, and Salon (Co-PI on this proposal) has used this method to classify census tracts into land use categories as part of her work under agreement 09-343 for the ARB Research Division. Cluster analysis is a technique to group objects according to their similarity based on multiple individual attributes. It is useful in cases such as ours where we are trying to assign census tracts to categories according to their level of gentrification, which is inherently a multi-attribute concept. The attributes we propose to use for this analysis will be a subset of the variables in Table 2.1.

This method is attractive because it allows the data about the census tracts to speak, telling us how best to group the tracts based upon the attributes that we include in the analysis. For instance, using this method might yield groups of tracts that are not gentrifying, gentrifying slowly, gentrifying quickly, and experiencing decline. Alternatively, the analysis might yield groups of tracts where incomes are increasing, where educational attainment levels are increasing, and where both are increasing. As should be clear, either of these classifications is potentially useful for conducting an analysis of the factors that are associated with gentrification; using an approach that allows the data to tell us how to most appropriately classify the tracts will strengthen our subsequent analysis.

2.2 Map neighborhood-level gentrification

Visual inspection of data often leads to a better understanding of underlying processes than would be possible with other methods of examination. When studying neighborhood change and gentrification, maps may prove to be particularly useful. In this subtask, we will produce census tract level maps of gentrification using the classification scheme developed as part of this Task and described above. Additionally, we may produce maps of the individual variables that were used to create the classification scheme, should these prove useful. Finally, we will produce maps of selected station areas throughout California, highlighting gentrification in these neighborhoods.

2.3 Empirically analyze the influence of transit and TOD on gentrification

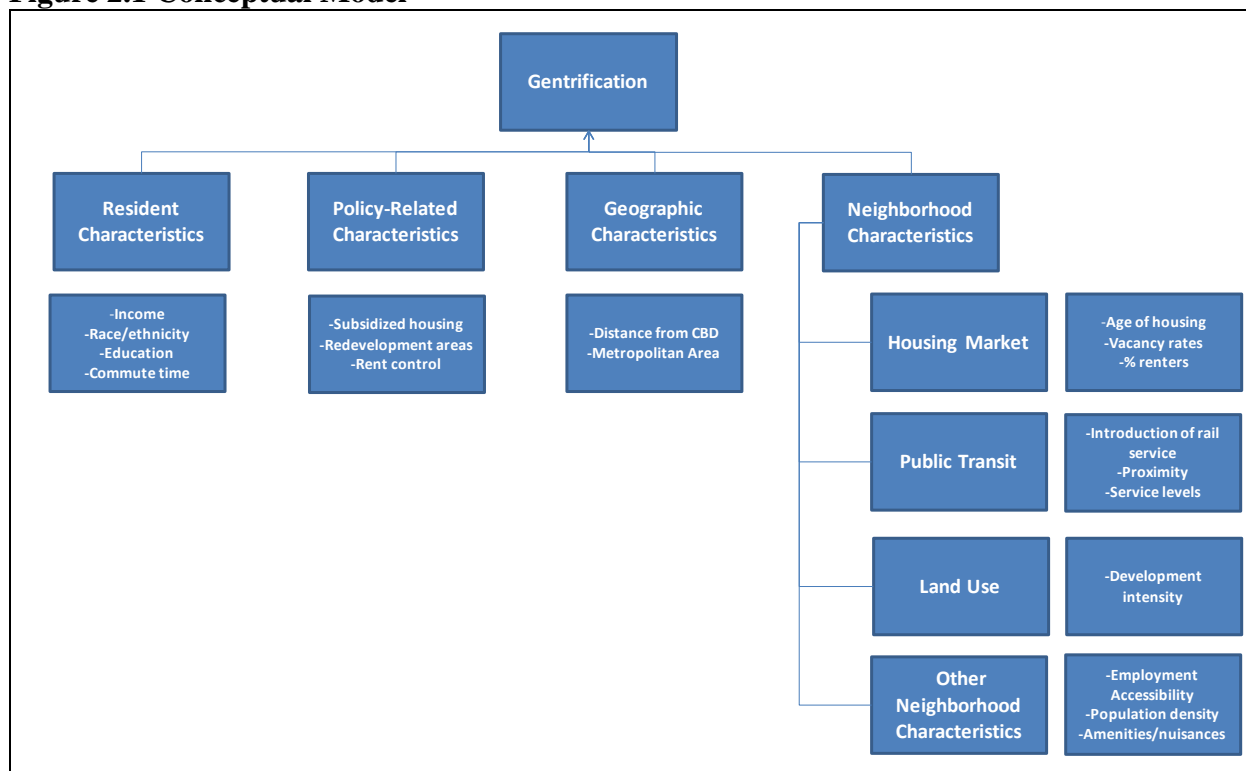
In order to shed light on whether and how both the presence of transit and transit-oriented development are related to gentrification, we will estimate ordered logistic regressions. The dependent variables in these analyses will be the gentrification categories developed as the first step (2.1) in this task for each of our five time periods.

The focal independent variables in the analyses will include indicators of transit access, indicators of development, and indicators of development in transit-rich neighborhoods. In addition, we plan to include a variety of control variables that we expect to influence whether or not a neighborhood gentrifies. The purpose of these control variables is to give us confidence that our results regarding the relationship between transit, development, and gentrification are not actually due to variation in other characteristics. Figure 2.1 lists potential variables of interest (transit, development, and TOD variables) as well as control variables drawn from a scan of the scholarly literature on the determinants of gentrification. We have chosen to be somewhat

⁵ Factor analysis is a method that transforms a group of correlated variables into another group of variables that is not correlated with one another. It can be useful to combine with cluster analysis when the attributes to be used in a cluster analysis are highly correlated with one another.

conservative in this initial compilation of potential variables to use in our analysis; we have listed only those variables that we are reasonably certain we can obtain for multiple time periods. The more extensive review of the theoretical and empirical literatures on gentrification that we will undertake in Task 1 of this project may suggest additional variables.

Figure 2.1 Conceptual Model



The variables of interest we propose include binary variables for the presence of both heavy rail and light rail service⁶ within or near the census tract, the number of years that each type of rail service has been operating, and an indicator variable for service quality (based on, for instance, peak headways and the fraction of regional jobs accessible through the rail system). We hypothesize that more frequent transit service on systems that provide high levels of accessibility as well as transit service that has operated longer will have a larger influence on gentrification than would new service or infrequent service.

We also propose to include variables that indicate the average development intensity of the census tract and the change over time in development intensity, based on the U.S. Geological Survey's National Land Cover Database (NLCD). This database classifies land cover into 21 categories at the resolution of 30 meter grid cells for the United States, and is currently available

⁶ Note that we do not specifically include the presence of Bus Rapid Transit stations in our analysis. This is not because we believe that BRT will not affect gentrification. Rather, it is because to measure the effect that BRT has on historical gentrification, we would need to include in our analysis a sizable number of census tracts that have BRT stations in or near them in a variety of contexts. However, in all of California, there are only two lines of fully-implemented BRT - both in Los Angeles - and they opened in 2006 (Orange Line) and 2009 (Silver Line). There is simply not enough variation in the existing historical data to separately look at BRT as a determinant of gentrification. That said, we would expect fully-implemented BRT to have a similar gentrification effect to light rail, given similar service and access characteristics.

for the years 1992, 2001, and 2006. We propose to mainly use the three of these categories that denote low, medium, and high levels of development intensity.

In addition, for our analyses of time periods that end in 2010, we will aim to include a series of binary variables for TOD-supportive policies such as upzoning and joint development. We are not certain that they will be available in a consistent way for all four of the major metropolitan areas in California. We do expect, however, that we will be able to include such information in - at the least - a supplementary analysis that focuses on only one or two of these metropolitan areas.

Our explanatory control variables include other factors that the larger literature suggests may contribute to neighborhood gentrification. These include variables related to the location of the neighborhood within the metropolitan area (we expect tracts closer to the central business district to be more likely to gentrify), the housing stock of the neighborhood (we expect tracts with older-but-structurally-sound housing stock to be more likely to gentrify), amenities in or near the neighborhood (we expect tracts near amenities like parks and waterfronts to be more likely to gentrify), nuisances in or near the neighborhood (we expect tracts near nuisances like power plants and industrial complexes to be less likely to gentrify), and characteristics (race/ethnicity, education level, income, etc) of the population living in the tract at the beginning of the time period of analysis (we expect that there will be threshold effects: tracts with residents that either are low income - as opposed to very low income - or are more mixed in terms of race, income, and education level to be more likely to gentrify). We will also include variables related to tract residential density and employment access, as well as a measure of how the tract's access to employment opportunities has changed over time. If available, we will also include indicators of neighborhood crime levels, local school quality, and the location of subsidized housing - though we are not confident that we will be able to put together consistent historical data on these variables for all four metropolitan areas.

Because gentrification is a spatial process that likely includes a spatially autoregressive component (i.e. gentrified neighborhoods likely increase the probability of nearby neighborhoods also gentrifying), we will include spatially autoregressive variables in our analysis. These variables might include the distance-weighted median income of neighboring census tracts, the change over time in neighboring census tracts' median income, or others. In addition, it may be that some of our explanatory variables affecting neighboring tracts (e.g. housing vacancy rate) will affect gentrification in a tract.

Table 2.2. Candidate Variables for Analyses of Tract-Level Gentrification (Potential Data Sources: Transit Agencies, National Land Cover Database 1992, 2001, and 2006; U.S. Decennial Census, American Community Survey, U.S. Economic Census)

<i>Neighborhood – Transit Variables</i>
Presence of Heavy Rail Service within Tract or within 0.25 Miles of Tract Border
Duration of Heavy Rail Service in Years in/near Tract
Indicator of Service Quality for Heavy Rail Service in/near Tract
Presence of Light Rail Service within Tract or within 0.25 Miles of Tract Border
Duration of Light Rail Service in Years in/near Tract
Indicator of Service Quality for Light Rail Service in/near Tract
Interaction of Transit Variables with Development
<i>Neighborhood – Land Use</i>
Δ in Average Development Intensity
Average Development Intensity
<i>Neighborhood -- Housing</i>
% Housing Built before 1945
% Housing Vacant
Distance-Weighted Neighboring Tract % Tract Population Rents Housing (spatially autoregressive)
<i>Neighborhood -- Quality</i>
Employment Access
Δ Employment Access
% of Local Employment that is “White Collar”
Population Density
Population Density in Tract / Population Density in Metro Area
Distance to Nuisances (e.g. power plant, major highway, industrial complex)
Distance to Nearest Waterfront amenity (River, Ocean, or Bay, depending on city)
Distance to Nearest (Major) City Park amenity
Local School Quality Indicator
Indicator of Neighborhood Crime Level
<i>Resident Characteristics</i>
Mean Household Size in Tract
Race/Ethnicity: % Tract Population that is African-American , Hispanic, Asian/Pacific Islander
Median Income in Tract
Distance-Weighted Neighboring Tract Income (spatially autoregressive)

Mean Commuting Time in Minutes
<i>Public Policy</i>
Presence of TOD-Supportive Policies (e.g. upzoning, joint development)
Presence of Major Subsidized Housing Development
<i>Geographic</i>
Distance in Miles from CBD (using Economic Census Definition of CBD)
Metropolitan Area Dummy Variables (possibly interacted with some of the above as well to obtain metro-specific effect estimates)

These analyses will provide us with a better understanding of the extent of gentrification in California's major metropolitan regions, the factors that contribute to whether or not a neighborhood gentrifies, and the extent to which transit access, development, and development in transit-rich neighborhoods each spur neighborhood change.

Task 3: Based on the Task 2 analysis, develop and test off-modeling methods for predicting gentrification as a result of transit investment and TOD

For Task 3, we will develop an easy-to-use tool to identify neighborhoods that are especially likely to gentrify if new transit and/or transit-oriented development are added. Our empirical analysis in Task 2 was specifically designed to facilitate this tool development.

Here, we first describe how our Task 2 analysis extends in a straightforward way to become the backbone of a simple spreadsheet tool. We then describe how we intend to test and demonstrate the use of this tool in two ways. First, we will cross validate our statistical model using historical data so that we can assess how well the tool predicts gentrification. As needed, we may refine our Task 2 analysis to improve these predictions. Second, we will work with MTC – the San Francisco Bay Area's MPO – to use our tool to conduct a predicted gentrification analysis for one development scenario for the entire region.

3.1 Spreadsheet Tool Design

Our Task 2 work will produce two main products. First, as described above, our empirical analysis will help us to understand better which characteristics of a neighborhood make it more likely to gentrify over time, and to what extent transit investment and the addition of transit-oriented development contribute to gentrification. Second, our Task 2 work will create an empirically-based statistical model that can be used to predict future likelihood of gentrification, given a set of current neighborhood characteristics and planned development. It is this second product that we will use to develop a spreadsheet tool. Although we will be conducting multiple empirical analyses for different time periods in Task 2, we expect to choose either the 1990-2010 analysis or the 2000-2010 analysis to be the basis for our spreadsheet tool.

Specifically, our empirical approach from Task 2 is an ordered logit construct in which the dependent variables are categorical classifications of the extent of gentrification that occurred in each census tract in each of five time periods. If one has data for all of the independent variables,

our logit model can be used to predict the likelihood that a particular census tract will be in each of our gentrification categories. For instance, the predictive output of a logit model could be:

$$f(\text{independent variables}) = \begin{cases} \text{Prob}(\text{not gentrifying}) \\ \text{Prob}(\text{slowly gentrifying}) \\ \text{Prob}(\text{quickly gentrifying}) \end{cases}$$

Because we will use an ordered logit construct for Task 2, the functional form of the relationship between the independent variables and the predicted probability that a census tract will gentrify is relatively simple and can be inserted into any basic spreadsheet software. This makes transforming our results from Task 2 into an easy-to-use scenario analysis tool straightforward.

The tool we plan to create will have 2010 census data embedded within it for all of the census tracts in the state. This data will be the default set of census-based independent variables, though users would be able to update it as newer data from the American Community Survey becomes available. Users will then be able to input one or more future transit investment and development scenarios. The tool will then use the likelihood function estimated in Task 2 to calculate the predicted probability of gentrification for each census tract in the user's area of interest for each scenario included. These results can then be linked to a GIS map so that users could see where gentrification is predicted to be most likely in each scenario.⁷

3.2 Cross Validation Using Historical Data

Before using the spreadsheet tool to predict future gentrification outcomes for California, we propose to conduct a series of cross validation exercises using the historical data upon which we based our Task 2 analysis. Cross validation is a method commonly used to ascertain how well a statistical model predicts outcomes in the real world. The basic method is to divide the data into two pieces, and estimate a statistical model using only one part of the full sample. Then, use the model estimated on the first part of the sample to predict the outcomes for each observation from the second part of the sample. Finally, compare the predicted outcomes to the actual outcomes for the second part of the sample. As such, cross validation will give us a clear idea of how well the empirical model developed in Task 2 performs in terms of predicting outcomes.

We will perform multiple cross validation exercises on our model, each time randomly selecting a different set of census tracts from our sample to be the estimation sample and the validation sample. To compare our ordered logit output to actual gentrification outcomes in our dataset, we will use the predicted probability of the chosen outcome for each census tract. For instance, in the case where our model predicts that the probability of a certain tract being in a “quickly gentrifying” category is 0.75, this means that our model would predict the outcome correctly for that tract 75 percent of the time. The average of the predicted probabilities of the correct outcomes across census tracts in the validation sample provides information about how well our ordered logit model will predict gentrification outcomes. Doing this multiple times and taking the average of this overall model prediction result ensures that our evaluation of the quality of prediction from our model is not dependent on a particular estimation subsample. Using this

⁷ To be clear, this GIS link would not be automatic – users would have to export the spreadsheet results manually to their GIS software environment. However, simple instructions on how to create the GIS link would be included with the spreadsheet tool.

method of evaluating their predictive accuracy, we may refine our ordered logit regression models to improve these predictions.

It is important to note that cross validation is different from both tests of statistical significance for particular parameter estimates and goodness-of-fit tests for the entire model - both of which we will be using to arrive at our results for Task 2 on which factors are the most important determinants of gentrification. Therefore, even if we do refine our statistical model for predictive purposes, we may not need or want to change our analysis from Task 2 because the goals of this part of our analysis are different.

3.3 Full Scenario Analysis for the San Francisco Bay Area

The tool developed as the product of this Task is meant to be used by Metropolitan Planning Organizations (MPOs) for full regional scenario analysis. Areas that are likely to gentrify could then be identified and targeted for complementary policy and investment strategies in order to reduce displacement of lower income households from these neighborhoods. Task 5 of this proposed project focuses on these complementary strategies.

As part of this Task, we propose to work with the Metropolitan Transportation Commission (MTC) – the San Francisco Bay Area MPO – to test the capacity of our tool to run an analysis of a full transit investment and development scenario. We have been in contact with MTC staff and they have confirmed their interest and willingness to work with us in this way. This will allow us to work through the challenges of transforming MPO scenario information about where new transit stations will be built and where they expect new development to happen into the inputs required for our spreadsheet tool. Through this process, we would almost certainly identify ways to revise the tool so that it is most useful for its intended users. It will also engage MPO staff in our project and in the development of the assessment tool we hope they will use once it is completed.

Working with MTC has an additional advantage in that MTC has a federal grant from the Department of Housing and Urban Development under their Sustainable Communities Partnership program, one goal of which is to conduct related work. This HUD-supported initiative is called the Bay Area Regional Prosperity Plan, and includes activities that aim to “increase access to regional prosperity for workers who cannot make ends meet, by creating middle-income jobs and developing and preserving affordable housing in transit-served communities” (SF Bay Area Regional Prosperity Plan Abstract, 2011).

Task 4: Explore the benefits, barriers, and magnitude of impact of strategies to minimize the negative effects of TOD on low-income households.

What role can policy play in minimizing potential displacement of low-income and vulnerable populations due to transit-oriented development and investment? In this task, we take up this question by identifying and evaluating the range of measures available to local governments and regional planning organizations to attenuate the possibility of gentrification and displacement, as well as highlighting state-level initiatives and legislation that could support such measures. This task will be informed by both the Task 1 literature review that considers gentrification and displacement dynamics, including potential antidotes, and the Task 2 statistical analysis of the determinants of gentrification in the presence of transit investment and transit-oriented development.

Existing studies suggest strategies that can be pursued to advance equitable development under gentrification scenarios in general (Kennedy and Leonard 2001; Levy, Comey, and Padilla, 2006a and 2006b). In this task we will examine policies that speak to the potential displacement effects associated more specifically with transit-oriented development and transit investments, as understood through Task 2.

The Task 2 census tract-based analysis will identify the types of transit investments and transit-oriented development strategies that are more likely to produce or exacerbate gentrification pressures, and in which contexts such effects are more likely. Building on this research, Task 4 will explore the gentrification-mitigation strategies that could accompany transit investment and transit-oriented development. It will assess the benefits of such strategies and the magnitude of those benefits, as well as barriers to their application and effectiveness. Table 4.1 includes a sample of gentrification mitigation strategies that may be included in this assessment.

Table 4.1. Select displacement mitigation strategies and their impacts on gentrification.

Strategy	Effect on Gentrification
Public education and involvement strategies	
Early gentrification risk assessment	Allows original residents to anticipate change
Community capacity building support	Educates residents about and equips them to capitalize on gentrification dynamics
Community planning and visioning processes	Can yield productive working relationships among stakeholders, making for more effective participation in the development process
Community benefits agreement	Contractual arrangement ensures original community residents benefit from development
Housing policies	
Rent controls	Slow the pace of rent increase
Expand / preserve subsidized housing	Increase / retain supply of affordable housing
Code enforcement	Retain supply of affordable housing
Relocation payments	Assists displaced renters
Land use policies	
Inclusionary zoning	Increase supply of housing

Asset-building strategies	
Housing trust funds	Increase supply of housing
Limited-equity housing co-ops	Increase supply of affordable housing
Location efficient mortgages	Increases affordability of homeownership with reduced borrowing costs
Community land trusts	Preserves home affordability by decoupling land ownership from and home ownership
Tax policies	
Remove tax breaks attracting investment and higher-income residents	Slow pace of high-income influx
Tax deferral for longtime homeowners	Retain lower-income original residents
Implement tax breaks for low-income	Attract/retain low-income residents
Tax-increment financing (TIF)	Keeps return on increased property values in the community and more available to current rather than future residents
Low-income tax credits	Attract/retain low-income residents
Split-rate taxes	Increase supply of housing by encouraging development of vacant property/lots

Case study has been the most commonly used method for assessing the impact of gentrification mitigation strategies (Levy, Comey, and Padilla, 2006a and 2006b; Mertz 2008; Pendall et. al. 2010). We propose to conduct between two and five case studies of metropolitan California neighborhoods affected by transit investment and TOD. These case studies will serve two purposes: (1) to document at a more granular level the indicators and dynamics of gentrification and displacement produced by transit investment and transit-oriented development; and (2) to examine potential strategies to minimize displacement impacts.

While the precise approach will be finalized with ARB input, our intent is to produce not simply a “best practices” guide to such mitigation strategies but a more empirically-grounded understanding of the context-specific circumstances that make some of the above-listed strategies more necessary and effective than others in particular instances of potential transit-associated gentrification. We may focus directly on land use, housing, and transportation strategies to ameliorate displacement, or consider a wider array of strategies including tax policies and community involvement programs.

Following a comparative case study approach and informed by results of our Task 2 analysis, case selection will identify both cases of pronounced gentrification, and cases where (perhaps surprisingly) little or modest evidence of gentrification and displacement has emerged. We aim

to capture a range of transit-related catalysts perceived to produce gentrification pressure. These include the addition of new transit lines or stations, significant improvements to existing transit services, and the development or redevelopment of transit-adjacent properties.

Whereas our Task 2 statistical analysis will use census tracts as the unit of analysis, the case studies are intended to define neighborhoods in a more organic way - more consistent with the way that residents perceive them. Data that we expect to use to develop our case studies include both quantitative and factual data as well as more qualitative perceptions of local stakeholders in these neighborhoods. Data in the first category will include neighborhood-scale aggregations of the census data used in Task 2, together with detailed information about transit investments, transit-oriented development, and any policy actions taken to mitigate negative outcomes for low-income households, identified through review of public agency documents and plans and of community-generated or journalistic reports discussing the same.

In addition to quantitative and factual data, we propose to use a semi-structured interview methodology to both document perceptions of investment-induced gentrification and displacement, and to uncover other complex context-specific factors that may influence gentrification and displacement. We will aim to interview a variety of stakeholders in each case-study neighborhood, including local officials, transportation and land use planners, civic associations, community groups serving established residents, business associations, and real estate experts familiar with neighborhood development activity.

We will pretest the interview guide; however, our questions will likely cover the following areas of interest:

- *Connection to neighborhood:* How long has the informant been familiar with the neighborhood? In what capacity or role?
- *Perceptions of neighborhood change:* What changes, if any, have you observed in the neighborhood during the period of your connection to the neighborhood? If you have observed changes, how would you describe them (no change/gentrification/decline) and how much?
- *Impact of neighborhood change:* How would you describe the impact of these changes on neighborhood conditions such as amenities, crime, traffic conditions, cost of living, access to desired destinations? Which impacts of neighborhood change if any have been positive? Which if any have been negative? (e.g. displacement, higher costs, congestion)
- *Displacement* (if the informant does not discuss displacement in response to the previous question): Are you aware of residents who have moved away from the neighborhood? How does the affordability of this neighborhood relative to other neighborhoods factor into moving choice?
- *Policy/planning intervention:* Are informants aware of efforts to (a) maintain or increase access to affordable housing or (b) provide assistance to original residents? Are these necessary? Have these efforts been successful? If so, how is success measured?

These case studies will provide a more detailed picture and a more nuanced story of the process of gentrification in the particular neighborhoods we study. They will also allow us to explore places where the local or regional governments have taken actions to protect low-income and otherwise vulnerable households from the potential negative consequences of gentrification, and

thereby gain a clear understanding of whether these actions have been successful and what made them so.

Task 5: Final Report

Finally, in Task 5 we will assemble all components of our analysis into a final report.

Data Management Plan

The data to be used in the proposed Task 2 statistical analyses of gentrification are all existing, public data; we do not expect to collect original data for this task. Rather, we expect to assemble our data set from a variety of sources (e.g. U.S. Census, transit agencies, U.S. Geological Survey, GIS maps of California's metropolitan areas).

To properly merge data from multiple sources as we plan to do, it is important that we make sure that all of our sources are reporting data for the same unit of analysis - in our case, the census tract. Where necessary, we may incorporate data that is reported at a different or larger geographic scale, such as the zip code, police precinct, or school district. In these cases, we will use GIS to match the boundaries of the different geographical units as best we can. In cases where a census tract lies completely within another district, we will simply assign the average value for the larger unit to the census tract. In cases where a census tract's area is split between districts, we will assign an average of the district values to the tract, weighted by the percent of the tract's area that lies in each of them.

The proposed case studies in Task 4 do require original data collection in the form of responses to semi-structured interviews. As described above, we will develop and pretest a stakeholder questionnaire before conducting the interviews in our case study neighborhoods. We will also follow a protocol that includes audio recording of the interviews (with the permission of the interviewees), and preserving the interviewee confidentiality. To do the latter, we will not share names of the people we interview (though we may share the organizations they represent), and we will not associate individual responses with particular organization representatives.

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Project Schedule

TASKS	MONTHS																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Task 1: Literature Review																								
Task 2: Gentrification analysis																								
2.1 Data Assembly																								
2.2 Develop gentrification categories																								
2.3 Produce gentrification maps																								
2.4 Multivariate analysis of gentrification																								
Task 3: Development of Off-Modeling Method																								
3.1 Develop tool																								
3.2 Cross Validation																								
3.3 Sacramento Scenario Analysis																								
Task 4: Policy Strategy Case Studies																								
Task 5: Final Report																								
5.1 Draft Report																								
5.2 Feedback and Revise Report																								
5.3 Submit Final Report																								

p = progress report

d=draft report

f=final report

Preliminary Cost Proposal

Tasks	Labor	Employee Fringe Benefits	Travel	Materials and Supplies	Administrative Support	Subtotal	Overhead (10%)	Total
Task 1: Literature Review	\$16,278	\$3,212		\$250	\$573	\$20,313	\$2,031	\$22,344
Task 2: Gentrification Statistical Analysis	\$48,833	\$9,637	\$1,500	\$250	\$1,719	\$61,938	\$6,194	\$68,132
Task 3: Development of Off-Modeling Method	\$40,694	\$8,031		\$250	\$1,433	\$50,407	\$5,041	\$55,447
Task 4: Policy Strategy Case Studies	\$40,694	\$8,031	\$2,500	\$250	\$1,433	\$52,907	\$5,291	\$58,197
Task 5: Final Report	\$16,278	\$3,212		\$250	\$573	\$20,313	\$2,031	\$22,344
Total	\$162,775	\$32,122	\$4,000	\$1,250	\$5,730	\$205,877	\$20,588	\$226,465

CVs of Key Scientific Personnel (2 pages each)

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Selected Work In Progress

A Spatial Analysis of Housing and Transportation Affordability in Los Angeles County (with Evelyn Blumenberg)
Investigating the land use impacts of a large bus rapid transit system: a case study in Guangzhou, China (with Sharon Shewmake and Jingyan Wu)
Quantifying the effect of local government actions on VMT (with Pat Mokhtarian, and Marlon Boarnet)

How much do Californians drive? Mapping VMT and fuel use across California (with Jon Cook, Ryan Miller, and Jeffrey Williams)

Sustainability policy at the local level: A survey of California cities (with Gian-Claudia Sciara)

Reducing greenhouse gas emissions through local government action: Case studies of California cities (with Sinnott Murphy and Mark Lubell)

Selected Recent Papers

Do public transit investments promote economic development? Evidence from Bogotá, Colombia. David Heres de Valle, Darby Jack, and Deborah Salon. Submitted to *Transportation*, Oct. 2012. ITS-Davis Research Report version available at www.its.ucdavis.edu.

Measuring the impacts of local land use policies on vehicle miles of travel: The case of the first big box store in Davis, CA. Kristin Lovejoy, Gian-Claudia Sciara, Deborah Salon, Susan Handy, and Patricia Mokhtarian. *Journal of Transportation and Land Use*, forthcoming.

How do local actions affect VMT? A critical review of the empirical evidence. Deborah Salon, Marlon Boarnet, Susan Handy, Steven Spears, and Gil Tal. *Transportation Research Part D*, 17(7), 495-508, 2012.

Inclusion of regional transit emissions in local GHG inventories: Comparison of methods with examples from Portland, OR and the San Francisco Bay Area, CA. Frank Gallivan, Elizabeth Sall, Eric Hesse, Deborah Salon, and Chris Ganson. *Transportation Research Record*, 2270, 142-151, 2012.

Opportunities for value capture to fund public transport: A comprehensive review of the literature with a focus on East Asia. Deborah Salon and Sharon Shewmake. Available on www.itdp.org.

Urban travel in Nairobi, Kenya: Analysis, insights, and opportunities. Deborah Salon and Eric Aligula. *Journal of Transport Geography*, 22(1), 65-76, 2012.

Mobility, poverty, and gender: Travel “choices” of slum residents in Nairobi, Kenya. Deborah Salon and Sumila Gulyani. *Transport Reviews*, 30(5), 641-657, 2010.

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Neighborhoods, cars, and commuting in New York City: A discrete choice approach. Deborah Salon. *Transportation Research Part A: Policy and Practice*, 43(2), 180-196, 2009.

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PRIOR POSITIONS:

Associate Professor, Community and Regional Planning Program, School of Architecture, University of
Texas at Austin, 1999 -2002. Assistant Professor 1993 - 1999.
Assistant Researcher, Institute of Transportation Studies, University of California Davis, 1992-1993.
Senior Transportation Analyst, Center for Urban Analysis, Santa Clara County, San Jose, CA, 1991-1993.
Assistant Planner, Metropolitan Transportation Commission, Oakland, CA, 1987-1990.
Transportation Analyst, Center for Urban Analysis, Santa Clara County, San Jose, CA, 1987.

CURRENT PROFESSIONAL APPOINTMENTS:

Associate Editor for Transportation, *Journal of the American Planning Association*, since 2008.
Member, Committee on Education and Training of the Transportation Research Board, since 2007, and
Member, Committee on Women's Issues in Transportation of the Transportation Research Board,
since 2005.

CURRENT RESEARCH GRANTS:

Principal Investigator, "Non-Motorized Travel: Analysis of the National Household Travel Survey
California Add-On Data," California Department of Transportation, 2011-2013.
Principal Investigator, "Trip-Generation Rates Spreadsheet for Smart-Growth Land-Use Projects,"
California Department of Transportation, 2009-2013.
Principal Investigator, "An Exploration into the Nature and Formation of Bicycling Preference and
Comfort," Sustainable Transportation Center, University of California Davis, 2009-2011.

SELECTED RECENT ARTICLES:

Lovejoy, K., G.C. Sciara, D. Salon, S. Handy, P. Mokhtarian. 2012. Measure the Impact of Local Land Use
Policies on Vehicle Miles of Travel: The Case of the First Big Box Store in Davis, CA. *Journal of
Transportation and Land Use* forthcoming.
Shavizadeh, K., R. Lee, D. Niemeier, T. Parker, and S. Handy. 2012. Evaluation of the Operation and
Accuracy of Available Smart Growth Trip Generation Methodologies for Use in California.
Transportation Research Record forthcoming.

SELECTED RECENT ARTICLES: continued

- Miller, J. and S. Handy. 2012. Factors influencing commute bicycling by university employees. *Transportation Research Record* 2314: 112-119.
- Tal, G. and S. Handy. 2012. Measuring non-motorized accessibility and connectivity in a robust pedestrian network. *Transportation Research Record* 2299: 48-56.
- Hoehner, C.M., S.L. Handy, Y. Yan, S.N. Blair, D. Berrigan. 2011. Association between neighborhood walkability, cardiorespiratory fitness and body-mass index. *Social Science and Medicine* 73: 1707-1716.
- Bao, S., D. Niemeier, and S. Handy. 2011. Linking Land Use, Transportation and Air Quality: Impact of Urban Growth Patterns on Vehicle Travel and Pollutant Emissions. *Journal of Transportation and Land Use* 4(3): 65-80.
- Tang, W., P.L. Mokhtarian, and S. Handy. 2011. The Impact of the Residential Built Environment on Work at Home Adoption and Frequency: An Example from Northern California. *Journal of Transportation and Land Use* 4(3): 3-22.
- Heinen, E. and S. Handy. 2011. Similarities in Attitudes and Norms and the Effect on Bicycle Commuting: Evidence from the Bicycle Cities Davis and Delft. *International Journal of Sustainable Transportation* 6(5): 257-281.
- Maiss, R. and S. Handy. 2011. Biking and Spatial Knowledge in Children: An Exploratory Study in Davis, CA. *Children, Youth, and Environment* 21(2): 100-117.
- Emond, C. and S. Handy. 2011. Factors Associated with Bicycling to High School: Insights from Davis, CA. *Journal of Transport Geography* 20: 71-79.
- Lovejoy, K. and S. Handy. 2011. Social networks as a source of private-vehicle transportation: The practice of getting rides and borrowing vehicles among Mexican immigrants in California. *Transportation Research A* 45: 248-257.
- Handy, S. and B. McCann. 2011. The Regional Response to Federal Funding for Bicycle and Pedestrian Projects. *Journal of the American Planning Association* 77: 23-38, 2011.
- Handy, S. and Y. Xing. 2011. Factors Correlated with Bicycle Commuting: A Study in Six Small U.S. Cities. *International Journal of Sustainable Transportation* 5(2): 91-110.
- Lovejoy, K., S. Handy, and P.L. Mokhtarian. 2010. Neighborhood satisfaction in suburban versus traditional environments: An evaluation of contributing characteristics in eight California neighborhoods. *Landscape and Urban Planning* 97: 37-48.
- Tal, G. and S. Handy. 2010. Travel Behavior of Immigrants: An Analysis of the 2001 National Household Transportation Survey. *Transport Policy* 17: 85-93.
- Handy, S., Y. Xing, and T. Buehler. 2010. Factors Associated with Bicycle Ownership and Use: A Study of Six Small U.S. Cities. *Transportation* 37: 967-985.
- Xing, Y., S. Handy, and P.L. Mokhtarian. 2010. Factors Associated with Proportions and Miles of Bicycling for Transportation and Recreation in Six Small U.S. Cities. *Transportation Research D* 15: 73-81.
- Pucher, J., J. Dill, and S. Handy. 2010. Infrastructure, Programs, and Policies to Increase Bicycling: An International Review. *Preventive Medicine* 50: S105-S125.
- Emond, C.R., W. Tang, S.L. Handy. 2009. Explaining Gender Differences in Bicycling Behavior. *Transportation Research Record* 2125: 16-24.
- Krizek, K., S. Handy, and A. Forsyth. 2009. Explaining Changes in Walking and Bicycling Behavior: Challenges for Transportation Research. *Environment and Planning B* 36: 725-740.
- Lubell, M., R. Feiock, S. Handy. 2009. City Adoption of Environmentally Sustainable Policies in California's Central Valley. *Journal of the American Planning Association* 75(3): 293-308.
- Cao, X, P. Mokhtarian, and S. Handy. 2009. Examining the Impacts of Residential Self-Selection on Travel Behaviour: A Focus on Empirical Findings. *Transport Reviews* 29(3): 359-395.

G I A N – C L A U D I A S C I A R A, P h D, A I C P

Urban Land Use and Transportation Center / ITS University of California, Davis One Shields Avenue • Davis, CA 95616	Office. (530) 752-4966 Mobile. (917) 715-6912 Email. sciara@ucdavis.edu
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AREAS OF RESEARCH

- Transport Policy, Planning, and Finance
- Metropolitan Planning Organizations and Regional Scale Planning
- California Transport Planning under SB375

EDUCATION

University of California, Berkeley, PhD, City and Regional Planning (2009)

Dissertation: *Planners and the Pork Barrel: Metropolitan Engagement in and Resistance to Congressional Transportation Earmarking.*

Distinction: 2010 Wootan Award, Council of University Transportation Centers
Best Ph.D. dissertation in transport policy and planning; national award.

University of California, Los Angeles, MA, Urban Planning (2000)

Columbia University, BA, Major: History, Major: German Studies, *cum laude* (1993)

ACADEMIC APPOINTMENTS

University of California, Davis, Urban Land Use and Transportation Center

Post-Doctoral Researcher (2010 - present)

Rutgers University, Edward J. Bloustein School of Planning and Public Policy

Visiting Lecturer (2009)

City College, The City University of New York, Department of Civil Engineering

Visiting Lecturer (2009)

University of California, Berkeley

Institute of Transportation Studies, Graduate Research Assistant (2003 - 2005)

Department of City and Regional Planning, Teaching Assistant (2004)

PEER-REVIEWED JOURNAL PUBLICATIONS

Lovejoy, K., Sciara, G.C., Salon, D., Handy, S. L., & Mokhtarian, P. (Forthcoming.) Measuring the Impacts of Local Land Use Policies on Vehicle Miles of Travel: The Case of the First Big Box Store in Davis, California. *Journal of Transportation and Land Use*.

Sciara, G. C. (2012). "Financing Congressional Earmarks: Implications for Transport Policy and Planning." *Transportation Research Part A: Policy and Practice*, 46(8), 1328-1342.

Sciara, G.C. (2012). "Peering Inside the Pork Barrel: A Study of Congressional Earmarking in Transportation." *Public Works Management and Policy*, 17(3), 217-237.

Sciara, G.C. (2012). "Planning for Unplanned Pork: The Consequences of Congressional Earmarking for Regional Transportation Planning." *Journal of the American Planning Association*, 78(3), 239-255.

PEER-REVIEWED JOURNAL PUBLICATIONS - *continued*

- Sciara, G.C. (2009) "Earmark Pursuit Practices of MPOs and Their Members." *Transportation Research Record*. no. 2119: 58-65.
- Sciara, G.C., and Wachs, M. (2007) "Metropolitan Transportation Funding: Prospects, Progress, and Practical Considerations." *Public Works Management and Policy* 12 (1), 378-94.
- Weinstein, Asha, and Sciara, G.C. (2006) "Unraveling Equity in HOT Lane Planning: A View from Practice." *Journal of Planning Education and Research* 26: 174-85.

NCHRP AND FEDERAL/LOCAL AGENCY REPORTS

- Sciara, G.C. (2005). *Metropolitan-Level Transportation Funding Sources*. Washington, D.C.: **National Cooperative Highway Research Program** Project 08-36 (49). (Available at [http://www.transportation.org/sites/planning/docs/NCHRP%208-36\(49\)%20Final%20Report.pdf](http://www.transportation.org/sites/planning/docs/NCHRP%208-36(49)%20Final%20Report.pdf))
- Weinstein, Asha and Sciara, G.C. "Assessing the Equity Implications of HOT Lanes." Report to the **Santa Clara Valley Transportation Authority**, November 2004, San Jose, CA. (http://www.vta.org/projects/hot_lanes/hot_equity.pdf)
- Hoover, J., McDowell, B., and Sciara, G.C.. "Transit at the Table: A Guide to Participation in Metropolitan Decisionmaking." Washington, D.C.: **Federal Transit Administration**, 2004. (Available at <http://www.planning.dot.gov/Documents/TransitAtTable.pdf>)
- Perez, B.G., and Sciara, G.C.. "A Guide for Hot Lane Development." Washington, D.C.: U.S. Department of Transportation, **Federal Highway Administration**, 2003. (Available at <http://www.ibtta.org/files/PDFs/HOTLaneDevelopmentGuide.pdf>)
- Perez, B.G., & Sciara, G. C. (2001). *Innovative Financing Clearinghouse*. **National Cooperative Highway Research Program** Project 20-24(13).

SELECTED PRESENTATIONS AND PROCEEDINGS

- "Supporting GHG Reduction with Metropolitan Planning and Discretion: Institutional Perspectives on California's SB375." Transportation Research Board Annual Meeting, January 14, 2013, Washington, D.C.
- "Regulations and the Evolving Roles of Metropolitan Planning Organizations." Transportation Research Board Annual Meeting, January 16, 2013, Washington, D.C.
- "Analyzing Regional Efforts to Nudge Local Land Use and Infrastructure Decisions toward GHG Reduction." Association of Collegiate Schools of Planning Annual Conference, November 4, 2012, Cincinnati, OH.
- "Meeting the Planning and Programming Challenges of Unplanned Pork." Making Progress: Transportation Planners and Programmers Turn Ideas into Reality. Conference of TRB's Statewide Multimodal Transportation Planning Committee. May 24, 2012, Denver, CO.
- "Measuring the Impacts of Local Land Use Policies on Vehicle Miles of Travel: The Case of the First Big Box Store in Davis, California." (with K. Lovejoy, D. Salon, S.L. Handy, & P. Mokhtarian) Transportation Research Board Annual Meeting, Jan. 25, 2012, Wash., D.C.
- "Metropolitan Transportation Planning: An Institutional Perspective." California Air Resources Board. November 7, 2011. Sacramento, CA.

Post-Doctoral Researcher and Lecturer
Department of Urban Planning
UCLA Luskin School of Public Affairs
3250 Public Affairs Building
Los Angeles, CA 90095-1656
Telephone: 917-292-9703
Fax: 310-206-5566
Email: msmart@ucla.edu

Home Address:
220 W 5th St #208
Los Angeles, CA 90013

Education

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- | | |
|------------|--|
| Sept. 2011 | <u>PhD, Urban Planning</u>
University of California, Los Angeles
Dissertation: "The Inward Focus of Ethnic Neighborhoods and Travel Behavior"
Committee Members: Evelyn Blumenberg (chair), Urban Planning; Brian D. Taylor, Urban Planning; Min Zhou, Sociology and Urban Planning; William A. V. Clark, Geography |
| 2006 | <u>MCP, City and Regional Planning</u>
University of Pennsylvania |
| 2000 | <u>BA, German Studies</u>
Yale University |

Research Positions

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- | | |
|--------------|--|
| 2011-present | <u>Lewis Center for Regional Policy Studies, UCLA</u> |
| 2006-11 | <u>Institute of Transportation Studies, UCLA</u> |
| 2006 | <u>Center for Transit-Oriented Development, Washington, D.C.</u> |
| 2005 | <u>Institute on Race and Poverty, University of Minnesota Law School</u> |

Publications

Journal Articles

-
- | | |
|--------------|---|
| 6 (refereed) | Iseki, Hiroyuki and Michael J. Smart. (2012) "How Do People Perceive Service Attributes at Transit Facilities?" <i>Transportation Research Record</i> , 2274: 164-174. |
| 5 (refereed) | Morris, Eric A. and Michael J. Smart (2012) "Expert versus Lay Perception of the Risks of Motor Vehicle-Generated Air Pollution" <i>Transportation Research Part D: Transport and Environment</i> 17(1): 78-85. |
| 4 (refereed) | Yoh, Allison, Hiroyuki Iseki, Michael Smart, and Brian D. Taylor (forthcoming 2011) "Hate to Wait: Effects of Wait Time on Public Transit Travelers' Perceptions." <i>Transportation Research Record</i> : Paper 11-3973. |
| 3 (refereed) | Blumenberg, E. and M. Smart (in press 2010). "Getting by with a little help from my friends... and family: Immigrants and Carpooling." <i>Transportation DOI</i> : 10.1007/s11116-010-9262-4. |
| 2 (refereed) | Smart, M. (2010). "US immigrants and bicycling: Two-wheeled in Autopia." <i>Transport Policy</i> 17(3): 153-159. |
| 1 (refereed) | Smart, Michael, Mark A Miller, and Brian D. Taylor. 2009. "Transit Stops and Stations: Evaluating Performance from the Operator's Perspective," <i>Journal of Public Transportation</i> 12(1), 59-77. |

Book Chapters

- 1 Blumenberg, E. and M. Smart (2011) "Migrating to Driving: Exploring the Multiple Dimensions of Immigrants' Automobile Use" in *Auto Motives*. Karen Lucas, Evelyn Blumenberg, and Rachel Weinberger, Editors. Emerald Books, Bradford, UK.

Honors, Fellowships, and Awards

- | | |
|------|--|
| 2012 | <u>Outstanding Doctoral Student Award</u> , Department of Urban Planning, University of California-Los Angeles |
| 2010 | <u>Graduate Division Dissertation Year Fellowship</u> , University of California, \$18,500 |
| 2010 | <u>Dissertation Grant</u> , University of California Transportation Center, \$20,000 |
| 2009 | <u>Graduate Summer Research Mentorship</u> , University of California-Los Angeles, \$6,500 |
| 2008 | <u>Leon Hoffman Prize</u> , University of California – Los Angeles, \$1,000
Awarded for promising transportation research |
| 2008 | <u>Graduate Summer Research Mentorship</u> , University of California-Los Angeles, \$6,500 |
| 2007 | <u>Eno Transportation Foundation Student Fellow</u> , Eno Center for Transportation
Awarded to young leaders in transportation research |
| 2007 | <u>Award for Student Projects in the category of Applied Research, American Institute of Certified Planners</u>
Project: <i>Changing of the Guard: A New Vision for Fort Monmouth</i> |
| 2006 | <u>Chancellor's Prize</u> , University of California, \$20,000 and Academic Fees
Multi-year offer to highly-recruited students |
| 2006 | <u>C. Britton Harris Award for Innovation in the Practice of Urban Planning</u> , University of Pennsylvania School of Design
Project: <i>Spatial Statistics Analysis of Bicycle Infrastructure in Minneapolis, Minnesota</i> |
| 2002 | <u>Fulbright Scholarship</u> , Fulbright Commission, EUR 18,000; approx. \$20,000
Research on immigration to Germany (Berlin, Germany) |

Research and Grants

- | | |
|-----------|---|
| 2012-2013 | Principal Investigator, "Shared Wheels in the Auto City: Evaluating Los Angeles' Bicycle Sharing Program," John Randolph Haynes and Dora Haynes Foundation, \$49,960. |
| 2012-2013 | Investigator, "Honey, Can You Pick-Up Groceries on Your Way Home? Analyzing Activities and Travel in Non-Traditional Households" with Brian D. Taylor (UCLA), University of California Transportation Center, \$42,641. |
| 2010-2012 | Co-Principal Investigator, "Strategies to Improve Immigrants' Access to the Planning of Public Transportation" with Nicholas Klein (Rutgers University). Federal Transit Administration Public Participation Pilot Program. \$74,440. |