

DRAFT PROPOSAL

***Social Equity and Transit Oriented Development:
Volatile Housing Markets and Competing Policy Objectives***

Principal Investigator:
Michael Reibel

Prepared for:

State of California Air Resources Board
Research Division
PO Box 2815
Sacramento CA 95812

Prepared by:

California State Polytechnic University Pomona
3801 West Temple Avenue
Pomona, California 91768
+1 909 869 2955

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Check if applicable:

Animal subjects _____

Human subjects _____

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ABSTRACT

In response to the California Air Resources Board 2013-2014 Annual Research Plan solicitation's request for proposals on advancing social equity in regional transportation planning, we have pooled our expertise (Demography, urban economics and GIS in the case of Dr. Reibel; transportation, urban land use and environmental planning in Dr. Willson's case) to design a comprehensive and innovative program of research that will provide powerful new evidence regarding displacement as a consequence of transit oriented developments (TODs).

We begin by noting the documented history of trade-offs and interactions between competing TOD policy objectives (reduced car trips, urban revitalization, social equity). We then begin to unravel the extreme complexity of causes and effects where TODs, local housing unit price change (aka gentrification) and displacement are concerned, and the consequent difficulties of performing valid and reliable empirical research on the topic. Next, the general framework of hedonic estimation of the covariates of house price change is introduced. A conceptual framework with graphic and outline components then sketches the causal pathways of displacement (direct, indirect and "opportunity cost" displacement) and the broad policy options for preventing and/or correcting displacement.

The section on specific aims begins to translate between the conceptual framework of the displacement process and the concrete analysis steps. Here, we point to the need for, and our approach to, a general model of local house price change to serve as a baseline above which the net effects of TODs hypothetically drive prices. Actual TOD displacement is then estimated as a consequence of these net TOD effects. We then propose to generalize from our analysis of observed displacement to a scenario model in which incrementally less expensive TOD housing displaces progressively fewer low and moderate income individuals and families.

The technical plan further refines and elaborates our research vision to a specific series of tasks. We explain the rationale for the selection of our study areas (Alameda and San Diego Counties, which together account for nearly half the recognized TODs in California), our selected time period for analysis (2009-2012), our pooled cross-sectional design that smoothes out the effects of housing market fluctuations over time, and the data we will require. The section on analysis tasks then explains in detail our plans for quantitative and qualitative analysis. On the quantitative side: secondary data acquisition and extraction, estimation of the baseline price change model, modeling residuals to determine which units were pushed above the threshold of affordability by TODs, estimating the number and size of families displaced, and estimating scenarios of reduced displacement. On the qualitative side, we will perform case studies of TOD development processes, interviewing and/or conducting focus groups of stakeholders to probe decision making and actions relevant to displacement. Final report drafting and revision concludes the list of tasks.

The section on facilities, equipment and quality protocols describes the facilities available for execution of the proposed research at Cal Poly Pomona, the institutional affiliation of the two senior investigators. Of particular importance is the Center for Geographic Information Systems Research, which will host the project and which will uniquely house all data collected or processed for the study on its secure access controlled network drives. Sources cited, a breakdown of costs by task, a timeline and curriculum vitae for the two senior investigators complete the package.

INTRODUCTION

Promoting social equity in regional plans requires a robust information base and effect strategies to manage the interactions of public investments, regulations, and private sector market forces. Such an approach requires empirical evidence on the level of direct and indirect displacement of low income residents and an analytic basis for prioritizing strategies to avoid displacement by rail station areas and bus corridor hubs.

The first round of transit-oriented developments (TOD) show mixed results in the social equity area, ranging from projects that displaced no residents and included affordable housing, to market rate projects that displaced existing residents. Now that TOD has become established from a regulatory and market standpoint, it is vital to consider how the next generation of TODs can be structured to better serve social equity.

Concerns that displacement is occurring with TOD development has a housing policy dimension and a transportation planning dimension. Given public investments in transit accessibility, locating affordable housing near those points of accessibility is wise housing policy, since it can reduce combined household expenditures on housing and transportation costs for those residents. From a transportation dimension, projected ridership relies in part on walkable transit-oriented, lower income residents near stations and stops.

The literature shows that social equity is a matter of concern. Pollack, Bluestone, and Billingham (2010) find that some TOD areas tracked metro trends but others showed a pattern of more expensive housing stock, wealthier residents, and high vehicle ownership. Neighborhoods that had a higher proportion of renters were more susceptible to these effects. Qualitative research has sought to understand how community efforts can avoid negative social equity effects (Pendall et al 2010), including station location planning, inclusionary zoning, and community engagement. Moving into the advocacy area, California-based *Policylink* (2008) developed a toolkit to prevent displacement effects, including inclusionary zoning, housing trust funds, community land trusts, prioritization of community based developers, and a host of other factors.

Cal Poly Pomona researchers have been part of a California effort to understand transit-oriented development. Lund, Willson, and Cervero (2004) studied TODs on commuter, light, and heavy rail systems across the state, identifying income, vehicle availability, occupation, race/ethnicity in transit-oriented development housing. This data provides a guide to those sites that have been successful in maintaining diversity in TOD housing. Lund and Willson (2005) continued those studies for the Pasadena Gold Line. Finally, Willson, O'Connor and Hajjiri (2012) examined how transit and land use indices affect vehicle availability in income-restricted affordable housing in San Diego, CA.

The literature points out the distinction between gentrification (which can be good or bad) and displacement. Displacement impacts occur when current low-income residents are forced out by rising rents and redevelopment of affordable housing sites. But the net social equity impact also depends on the type of TOD housing that is built, either in terms of subsidized affordable housing or unit size and tenure characteristics that are compatible with low income households. Finally, it is

important to recognize that direct and indirect displacement can be partially counteracted by providing affordable housing in a broader area.

From an empirical standpoint, parsing the effects of rail transit on gentrification and displacement from other forces is critical. Many non-TOD urban areas are currently experiencing gentrification without the effect of enhanced transit access. It is thus essential to the success of our project that we distinguish gentrification and displacement attributable to TODs from that which would have occurred without TODs. It is of course quite impossible to perform true controlled experiments with identical treatment and control groups; even quasi-experimental research designs using paired TODs would be impracticable due to their relatively small numbers and the difficulty of matching pairs along relevant covariates. Instead, we will follow precedent (Rosen, 1974) to statistically model all price changes in housing units for our chosen study areas as a function of factors and conditions co-vary with housing unit price change. This now-standard approach is known as *hedonic estimation*.

Hedonic estimation of the factors predicting housing price differentials or trends use some set of predictors falling into one or more of three sets (Bowes and Ihlanfeldt, 2001): the particular parcel or unit's characteristics, neighborhood scale characteristics including socio-economics, land use mix and the built environment, and specific local amenities. Among the latter rail/transit stations are often studied (Kahn, 2007; Debrezion, 2007; Gibbons and Machin, 2005; McMillen and McDonald, 2004). Because we wish to identify the *net effect* of TODs on housing unit price, we will not include rail station or TOD location in our baseline model. This allows us to treat the residuals of the baseline model for those units within range of one or more TODs relatively directly as a net TOD effect.

The analysis will thus use quantitative analysis of socioeconomic characteristics and land value/transaction for measurements of these effects. It is vital, however, to recognize institutional factors that are part of transit-oriented housing development. The first is local jurisdiction policies and regulations – affordable housing requirements and zoning code requirements that affect the size, tenure, and cost of housing provided (e.g., minimum parking requirements, density limitations, minimum unit size, etc.). The second is the decision making process of developers, designers, investors, and lenders in making decisions on the type of housing to be provided. We intend to use interviews of the public planners, elected officials, and private developer stakeholders involved in a series of housing developments to fully understand these dynamics.

Conceptual Framework: Displacement Caused by TODs and Potential Corrective Policies

Displacement as a consequence of TOD development can take several forms that vary principally in terms of the number of intervening causal mechanisms (Marcuse, 1985). The three possible forms displacement can take are:

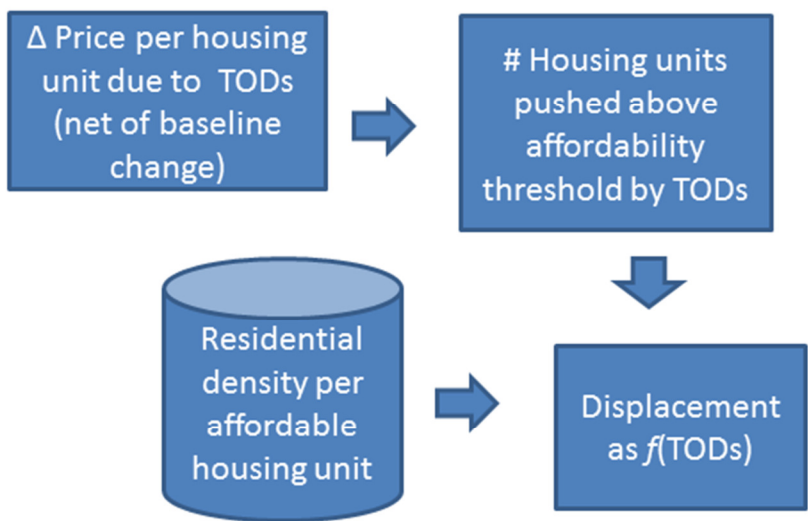
1. *Direct Displacement*: actual loss of affordable stock because of direct replacement by up-market TODs
2. *Indirect Displacement*: displacement due to TOD-driven gentrification of nearby properties (especially rentals). This can take the form of either rehab or replacement pushing available

units above the threshold of affordability, and may (but need not) be accompanied by an overall loss of units or available residential square feet

3. *Prevention Displacement (most indirect)*: displacement of potential low and moderate income in-movers because other (non-TOD) up-market units are built instead of lower-market units that might otherwise have been built locally. This might be termed “opportunity cost” displacement.

Theoretically all these types of displacement can be estimated simultaneously if one can first identify the number of residential parcels that will be pushed above the affordability threshold as a consequence of TOD development (i.e. net of otherwise expected parcel price change) and scale this quantity by the actual (observed) or expected (e.g. metropolitan average) residential density per affordable housing unit (see Figure 1):

Figure 1: Causal Diagram of Displacement Caused by TODs:



We may now consider corrective policies for displacement caused by TODs. These can take two possible forms: *preventing* displacement or *mitigating* displacement. *Preventing* any of the types of displacement defined above, while continuing to build TODs, can be accomplished via two mechanisms:

- Careful site location, i.e. building TODs in upscale locations to increase density according to the existing rules and incentives that inevitably make them expensive, or
- Changing the incentive structure (and possibly codes and regulations) for at least some TODs to push them down-market.

It should be noted that these approaches are not mutually exclusive; indeed, it might be ideal – if politically challenging – to create a two-track system for TOD development. Such a system would maintain the existing regulatory and incentive structure for TODs in existing upscale neighborhoods

while creating new incentives and (if possible) relaxing regulations to direct TOD investment to affordable areas with less or no displacement.

Mitigating (offsetting) the effects of any of the types of displacement defined above is an option that involves creating and/or subsidizing affordable housing for those who are displaced. Obviously this introduces additional expense and effort; particularly given the already acute shortage of affordable housing. Mitigation to a considerable extent would require either new publicly financed construction and/or large subsidies to place families in market-rate units. Mitigation is thus expected to be a less desirable overall social equity approach vis-à-vis TODs than prevention.

Finally, we should recall that social equity, in this context of preventing displacement, is inextricably linked with the transportation policy objectives of TOD development. Transportation agency data show that light rail use is much heavier on lines connecting and traversing lower income than higher income areas. Displacement thus comes at a direct additional cost in terms of mass transit ridership. This suggests that altering the governing mechanisms and incentives to drive down the cost of housing in TODs may be not only the most efficient way to pursue the goal of social equity but might also result in a stock of TOD housing that generates more mass transit use per unit.

OBJECTIVES, SPECIFIC AIMS AND POLICY VALUE

ARB has identified the social equity aspects of TODs, and particularly the anecdotally observed displacement of low and moderate income residents as a consequence of TODs, to be key areas of concern about which little or no comprehensive empirical research is available to support policy decisions. Related partial analyses have been performed; ARB notes SCAG's work tracking demographic change in key growth areas and ABAG's analysis of financially strained renters in similar areas. But the existing evidence falls far short of capturing the mechanisms and magnitude of TOD-related displacement.

Our overall objective is to address that gap in knowledge by means of a thorough and systematic program of research. Our study will have two main purposes: to directly model the estimated magnitude of displacement due to transit & TOD development, controlling for broader real estate market fluctuations, and to describe the consideration and treatment of potential displacement by stakeholders in the course of the TOD process. Our specific aims in this regard are:

Specific Aims

Actual Displacement Analysis

- 1) Estimate the observed home price impacts of actual TOD construction, net of otherwise expected local price changes. Note: it will not be necessary to separately estimate the price impacts of rail stations that do not anchor designated TOD projects, since rail stations will be included in the baseline price model as a local amenity.

2) Combining the estimates from Specific Aim 1 with known affordability thresholds and observed displacement due to price increases more generally, estimate the displacement of low- and moderate income households that can be attributed to actual TOD construction.

Displacement Modeling / Scenario Analysis

3) Estimate the expected home price impacts of various TOD construction scenarios, net of otherwise expected local price changes (scenarios vary according overall number of TOD units built in the metro area, average size of development and average unit price).

4) Combining the estimates from Specific Aim 3 with known affordability thresholds and observed displacement due to price increases more generally, estimate *variation in displacement* across a range of TOD construction scenarios: incremental cost, project size and overall volume effects plus non-linearities.

It should be noted that in addition to estimating overall changes in displacement under varying TOD scenarios, this analysis will also yield *specific local estimates* of expected displacement at the level of housing units under varying TOD scenarios for the selected study areas. The analysis can subsequently be replicated elsewhere to map the local risk of TOD-related displacement in other regions.

Policy Analysis

5) Using the results of Specific Aims 3 and 4, estimate the magnitude of trade-offs between the competing policy goals of TOD development and their unintended consequences (redevelopment vs. displacement, redevelopment vs. maximizing ridership)

6) Conduct qualitative research on the decision making considerations of stakeholders involved in TOD planning and implementation. Interviews and/or focus groups with stakeholders will provide necessary detail and context to inform our interpretation of quantitative findings concerning TODs and their social equity impacts. In other words, what are the perceptual and decision-making pathways that influence the nature of TOD, and given that, what types of policy levers can most effectively support social equity outcomes?

7) Derive conclusions and recommendations regarding TOD project size, relative unit price and market saturation to inform policy.

Policy Value to ARB

The quantification of displacement effects, the measurement of trade-offs between policy objectives and the discussion of policy implications of the findings, along with our associated policy recommendations, will be valuable to ARB as an empirical basis for considering modifications to TOD and land use/transportation policy.

TECHNICAL PLAN

Overview of the Research Design

The study will consist of an integrated system of statistical (econometric) models plus a qualitative component to provide context and validity. The system of models is largely nested, meaning that the results (estimates) that emerge from each step become input into the next step. This approach is necessary due to the complexity of the research problem discussed above. Figure 2 graphically shows the flow of tasks; the section on analysis tasks below explains each step in more detail. A summary of methods is also included which lists the major methodologies to be used.

Scale, Scope and Structure of the Study

The analysis must be reasonably representative of TOD processes across California. TODs are by their nature a phenomenon of large metropolitan areas; a representative selection of metropolitan counties in key areas of the state is needed in order for results to be more broadly generalizable to statewide processes of TOD related displacement. For this reason we have chosen San Diego County and Alameda County as our study areas. Together, these two counties account for nine of the twenty one TODs documented by CalTrans and include both light rail and heavy rail station areas. The selection of a northern and a southern county will also allow us, as an additional meta-analysis, to compare and contrast the results of each analysis task between these two counties in different regions of the state.

The units of analysis for the baseline price change analysis will be all housing units sold in the two counties during the specified time interval. A subset of these units that are within sufficiently close range of a TOD to be influenced by its effects will be used for the analytic tasks that seek to measure net TOD effects on housing unit prices locally. The time interval selected for the study is calendar 2009 through calendar 2012. It should be noted that volatility *over time* is inconsequential in this context. Our model design is pooled cross-sectional, meaning that models will be estimated at short time intervals (probably quarterly) to reflect the impact of changing market dynamics over time (and possibly new TOD construction). Because the models are re-estimated at such short intervals volatility over time is controlled for, and variability in local price changes *at that moment in time* can emerge.

Data Sources

- *Housing unit transactions* – all transactions in the two selected counties with detailed unit attribute data, to be purchased from DataQuick, inc. at the reduced academic rate of \$2500 for the four year study time interval
- *TOD data* – Comprehensive data on California TODs is available from CalTrans at <http://transitorienteddevelopment.dot.ca.gov/>. According to Caltrans nine of the twenty one

officially designated TODs in California are in the two selected counties (Alameda and San Diego).

- *Price covariates for the baseline hedonic model-*
 - *Individual Unit Characteristics:* Square feet, rooms, amenities, etc. are included in the DataQuick purchase
 - *Neighborhood Characteristics:* Socioeconomics and local housing stock characteristics are available from the U.S. Census American Community Survey
- *Household demography of low- and moderate income households* – At the metropolitan level, to estimate the actual human toll of displacement; available from the U.S. Census American Community Survey

Analysis Tasks

Task 1: Acquire and assemble data for quantitative analysis.

Task 2: Using spatially weighted hedonic estimation (see Bourassa et al., 2010, Can and Megbolugbe, 1997) - model the *baseline* expected parcel price/value change for each year for the entire study area (i.e. net of TOD impacts) based on the value covariates described in the data section (variables known to predict short-term price increases at both the metro and local scales).

Task 3: Using Geographic Information Systems software (GIS), create a *TOD zone extract* via spatial query. This is a subset of the units within the TOD impact zone geography, defined as walking distance (500m radius) from the transit station centroid of one or more TODs, at any time during the study time interval.

Task 4: For the TOD zone extract, compute the residuals of each unit's baseline price change predicted by the model in Task 1. This is the amount by which each parcel appreciates by more or less than the amount predicted by the model, which is interpreted as a measure of ***TOD price impact net of expected baseline change***

Task 5: Using Geographic Information Systems software (GIS), annually compute local TOD impact for each unit in the TOD zone extract as the number of TOD units within a 500m radius and the average price per TOD unit. Notes:

- A given parcel might be located in two or more TOD impact zones in very dense areas).
- The effects of new TOD construction within range will be included in the impact computation for each unit beginning the year the TOD starts occupancy

Task 6: determine which units in the TOD zone extract dataset were pushed above the Federal Department of Housing and Urban Development (HUD) threshold of affordability (30% of gross income) for low and moderate income residents due to net TOD price impact. We will use HUD thresholds for low and moderate income as determined for the study areas at time t_1 (December 2011). ***These are units from which low and moderate income residents were displaced or excluded by price.***

Task 7: Estimate the number and household demographics of the displaced population using the size of the units identified as newly exclusionary due to price to estimate the number of adults and children and the number and size of families displaced.

Task 8: Perform qualitative case studies of TODs. Conduct interviews and/or focus groups with public sector planners, elected officials, developers, and community groups regarding the factors that affect decision making concerning TODs and their social equity impacts.

Task 9: Evaluate and synthesize qualitative data collected in task 8.

Task 10: Model the residuals (i.e. the net TOD contribution to price increase locally) as a function of TOD development at actual local TOD unit housing costs. *This gives us an estimate of the net additional (marginal) price increase associated with each additional dollar of TOD unit price.*

Task 11: Using the coefficients from this model of TOD marginal unit price impacts on local unit prices within the TOD impact zone, estimate scenarios of reduced displacement if TOD unit costs were reduced system-wide by varying amounts (at a given level of TOD development = # of units in a given time period).

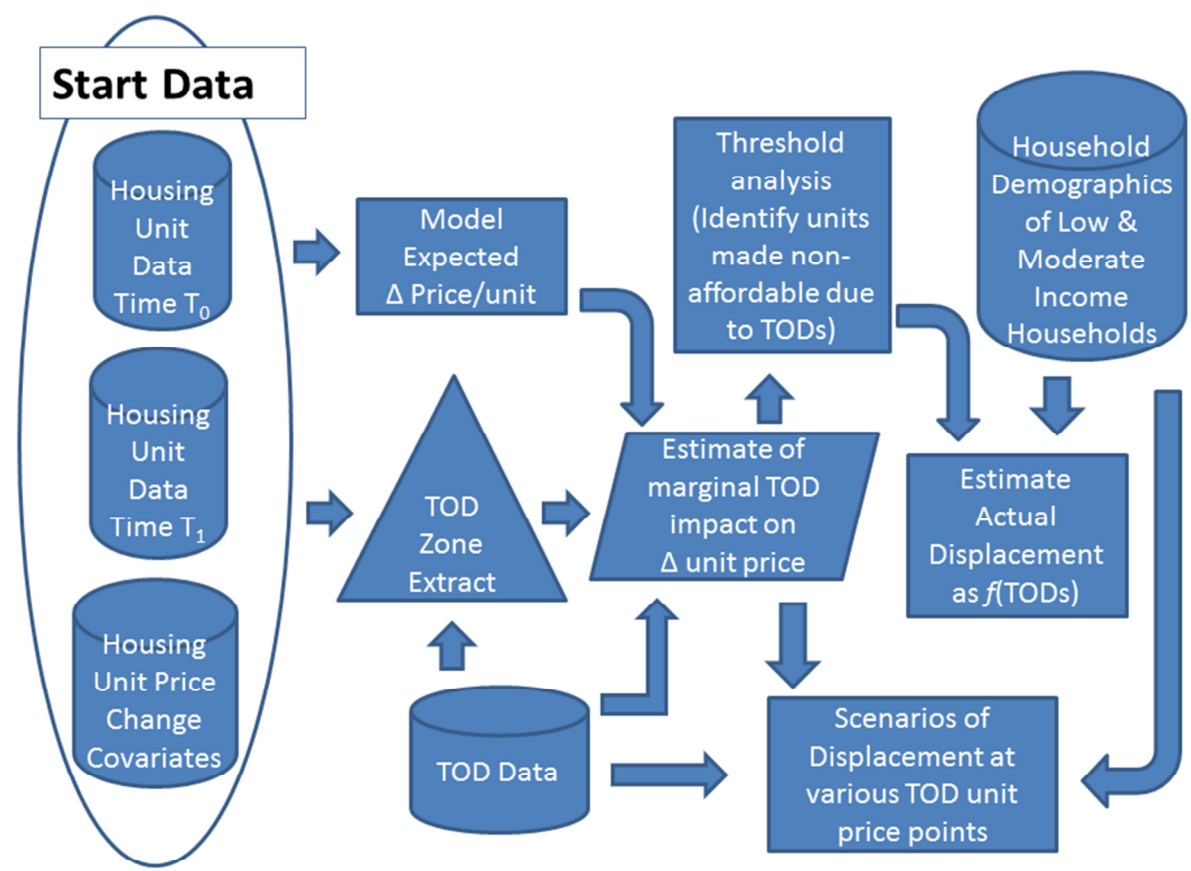
Task 12: Draft final report, present results and solicit comments from colleagues

Task 13: Revise final report

Summary of Methods

- Hedonic Estimation
- Spatial Regression
- Pooled Cross-sectional Analysis
- Threshold Analysis
- Modeling of Residuals
- Qualitative methods – interviews and/or focus groups

Figure 2: Schematic Diagram of Econometric Analysis Task Flow



FACILITIES, EQUIPMENT AND QUALITY PROTOCOLS

Facilities - California State Polytechnic University, Pomona (Cal Poly Pomona)

Cal Poly Pomona is a public university located in Pomona, California. The university is one of two polytechnic campuses in the 23-member California State University system. Founded in 1938, the university became independent from Cal Poly San Luis Obispo in 1966. Cal Poly Pomona offers 72 undergraduate programs, over 20 graduate programs and 13 teaching credentials/certificates in seven colleges and one professional school.

Nestled in 1,438 rolling acres on the eastern edge of Los Angeles County, Cal Poly Pomona covers the second largest area among the California State University’s 23 campuses. Ranked among the top public universities in the western United States, it is a national leader in polytechnic education. More than 3,000 faculty and staff support the education of 21,000 students.

University Computer Resources

Cal Poly Pomona provides comprehensive information technology services to all faculty, staff and students through its Division of Instructional and Information Technology (I&IT). I&IT maintains an intranet local area network with dedicated storage capacity for faculty, staff and student use, remote authenticated access via virtual personal networks, website hosting and support, email and 24/7 Internet access.

Available licensed software applications include office applications, specialized academic and social learning software (e.g., Blackboard), statistical applications such as SPSS and SAS, and Geographic Information Systems (GIS) software and supporting applications. Research data sets are available through the Inter-University Consortium for Political and Social Research (ICPSR); other data sources and scientific literature are electronically retrievable via the university library.

Center for Geographic Information Systems Research

The Center for Geographic Information Systems Research (CGISR) serves as Cal Poly Pomona's hub for geospatial analysis. Supported by five colleges—Environmental Design, Engineering, Letters, Arts and Social Sciences, Business and Science—the CGISR facility hosts interdisciplinary GIS instruction, research and projects in disciplines such as urban and regional planning, landscape architecture, biology, geography and anthropology, computer science, civil engineering and electrical and computer engineering. The CGISR is dedicated to bridging traditional investigative methodologies with GIS/Remote Sensing technologies for interdisciplinary research. The CGISR has a full time professional staff that maintains a state of the art instructional lab with 26 workstations and separate 10 station research geo-computation facility configured with ESRI's ArcGIS 10.1 and ERDAS Imagine GIS software. The CGISR maintains and manages Internet map service technologies including ESRI's ArcIMS and ArcGIS Server with SDE. The CGISR also provides and maintains a secure, access-controlled research network and storage facility which is available for use by the proposed CARB sponsored research project.

Quality Protocols

Reliability: Dr. Reibel will have primary responsibility for the quality and accuracy of quantitative research methods, procedures and findings. He has a long track record of peer reviewed publications and consulting, mostly based on collaborative research he managed at the CGISR, with no history of challenges, retractions or any other scientific or professional issues stemming from quality considerations. Dr. Willson will manage the qualitative research component; his record of successful, problem-free research in a collaborative setting is even longer.

Data management and security: All data purchased, collected, extracted, or otherwise used in the study will be exclusively housed on the secure, access-controlled network research drives of the Center for Geographic Information Systems Research.

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ESTIMATED COST BY TASK

<i>Task</i>	<i>Labor</i>	<i>Employee Fringe Benefits</i>	<i>Travel*</i>	<i>EDP (Data Purchase)</i>	<i>Subtotal Direct</i>	<i>Overhead</i>	<i>Task Total</i>
1	\$9,654	\$2,588		\$2,500	\$14,742	\$6,634	\$21,376
2	\$14,480	\$3,883			\$18,363	\$8,263	\$26,626
3	\$4,827	\$1,294			\$6,121	\$2,754	\$8,875
4	\$4,827	\$1,294			\$6,121	\$2,754	\$8,875
5	\$14,480	\$3,883			\$18,363	\$8,263	\$26,626
6	\$4,827	\$1,294			\$6,121	\$2,754	\$8,875
7	\$4,827	\$1,294			\$6,121	\$2,754	\$8,875
8	\$14,480	\$3,883			\$18,363	\$8,263	\$26,626
9	\$9,654	\$2,588			\$12,242	\$5,509	\$17,751
10	\$9,654	\$2,588			\$12,242	\$5,509	\$17,751
11	\$9,654	\$2,588			\$12,242	\$5,509	\$17,751
12	\$9,654	\$2,588	\$4,000		\$16,242	\$7,309	\$23,551
13	\$14,480	\$3,883			\$18,363	\$8,263	\$26,626
Total	\$125,496	\$33,649		\$2,500	\$165,645	\$74,540	\$240,185

* Note: travel will be required to present preliminary findings to colleagues (e.g. at conferences) and possibly for meetings with ARB by request and mutual arrangement.

PROJECT SCHEDULE *Note: Senior project personnel will meet with ARB representatives upon request and by arrangement.*

- Task 1: Acquire and assemble data for quantitative analysis.
- Task 2: Model the *baseline* expected parcel price/value change for all housing units in the study counties
- Task 3: Create TOD zone extract
- Task 4: Compute the residuals of price change as predicted by the model in Task 1
- Task 5: Compute local TOD impact for each unit in the TOD zone extract
- Task 6: Determine which units were pushed above the threshold of affordability
- Task 7: Estimate the number and size of families displaced.
- Task 8: Perform qualitative case studies of TODs
- Task 9: Evaluate and synthesize qualitative data collected in task 8.
- Task 10: Estimate marginal price increase associated with each additional dollar of TOD unit price
- Task 11: Estimate scenarios of reduced displacement
- Task 12: Draft final report, present results, and solicit comments from colleagues
- Task 13: Revise final report

	Month	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																									
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Milestones				p			p			p			p			p			d,p				f,p		p

p = Quarterly progress report d = Deliver draft final report f = Deliver final report

MICHAEL REIBEL

Department of Geography and Anthropology
California State Polytechnic University, Pomona, CA 91768
Tel: 909.869.3587 E-mail: mreibel@csupomona.edu

EDUCATION

University of Wisconsin-Madison: B.A. (Sociology) 1985; M.S. (Sociology) 1991

University of California, Los Angeles: Ph.D. (Geography) 1997

CURRENT APPOINTMENT

Professor of Geography, California State Polytechnic University – Pomona

SELECTED REFEREED PUBLICATIONS – *Click links to open .pdf format document*

Reibel, M. 2011. Classification Approaches in Neighborhood Research: Introduction and Review. *Urban Geography* 32:305-16.

Reibel, M. and M. Regelson. 2011. Neighborhood Racial and Ethnic Change: The Time Dimension in Segregation. *Urban Geography* 32:360-82.

Chernobai, E., M. Reibel and M. Carney. 2009. [Nonlinear Spatial and Temporal Effects of Highway Construction on House Prices](#). *Journal of Real Estate Finance and Economics*. Published online October 21, 2009.

Dawkins C., M. Reibel and D. Wong. 2007. [Further innovations in segregation and neighborhood change research](#). *Urban Geography* 28:513-515.

Wong, D., M. Reibel and C. Dawkins. 2007. [Segregation and neighborhood change: where are we after more than half a century of formal analysis](#). *Urban Geography* 28:305:311.

Reibel, M. and M. Regelson. 2007. [Quantifying neighborhood racial and ethnic transition clusters in multiethnic cities](#). *Urban Geography* 28:361:376.

Reibel, M. 2007. [Geographic information systems and spatial data processing in demography: a review](#). *Population Research and Policy Review* 26:601–618.

Reibel, M. and A. Agrawal. 2007. [Areal interpolation of population counts using pre-classified land cover data](#). *Population Research and Policy Review* 26:619–633.

Algert, S., M. Reibel and M. Renvall. 2006. [Barriers to participation in the food stamp program among food pantry clients in Los Angeles](#). *American Journal of Public Health* 96:8-10.

Reibel, M. and M.E. Bufalino. 2005. [A Test of Street Weighted Areal Interpolation Using Geographic Information Systems](#). *Environment and Planning A* 37:127-139.

Reibel, M. 2003. [Measures of Geographically Uneven Subpopulation Group Change and Local Group Transitions: Examples from Los Angeles](#). *Geographical Analysis* 35:257-71.

Reibel, M. 2000. “Geographic Variation in Mortgage Lending: Evidence from Los Angeles.” *Urban Geography*. 21:45-60.

Ellis, M., M. Reibel and R. Wright. 1999. “Comparative Metropolitan Area Analysis: Matching the 1980 and 1990 Census Public Use Microdata Samples for Metropolitan Areas”. *Urban Geography* 20:75-92

Wright, R., M. Ellis and M. Reibel. 1997. ["The Linkage Between Immigration and Internal Migration in Large Metropolitan Areas in the United States"](#). *Economic Geography* 73:234-254.

Fuguitt, G.V., C.L. Beale and M. Reibel. 1991. "Recent Trends in Metropolitan- Nonmetropolitan Fertility". *Rural Sociology* 56:475-486.

SELECTED OTHER PUBLICATIONS

Reibel, M. 2010. Sprawl fighting GIS tools to be developed by Cal Poly Pomona CGISR. *CSU Geospatial Review*, Spring 2010. California State University GIS Specialty Center, CSU San Francisco.

Reibel M, K Chan, R Willson, CP Trinh. 2009. Local Government GIS and Geospatial Capabilities: Suitability for Integrated Transportation and Land Use Planning (California SB375). Leonard Transportation Center, California State University, San Bernardino.

M. Reibel. 2006. Immigrants at Work. Chapter in C. Airriess and I Miyares, eds. *Contemporary Ethnic Geographies*. Lanham, Maryland: Rowman and Littlefield.

M. Reibel. 2004. *Changing Faces, Changing Places: Mapping Southern Californians* by James P. Allen and Eugene Turner. (Book Review). *Journal of American Ethnic History* 23:131-2

M. Reibel and D. Levitan. 2003. *Art, Commerce and the Metropolis: Revitalization in Downtown Pomona, 1992-2002*. Distributed in hard copy form and on-line (with additional color photos) at http://www.csupomona.edu/~mreibel/Pomona_Study/Pomona_study_home.htm

SELECTED RESEARCH GRANTS, CONTRACTS AND FELLOWSHIPS

United Network for Organ Sharing. Co-Investigator for Geography and Demographics, Deceased Donor Potential Study. 2011-2013.

South Coast Air Quality Management District. 2011-12. PI. Contract to interpolate estimated local populations from census areas to 4km square air monitoring grid cells. \$6,000.

Southern California Clinical and Translational Science Institute. 2011. Co-I. Patient Sociodemographic and Geographic Factors as a Source of Variation in Outcomes in a Los Angeles Pediatric Intensive Care Unit (PICU). \$40,000.

Leonard Transportation Center, CSU San Bernardino. 2008-2011. (PI) Grants to study GIS best practices for local transportation agencies and to develop GIS tools and trainings for integrated land use and transportation planning. \$173,609.

South Coast Air Quality Management District. 2010. (PI) Contract to develop custom sub-regions for the analysis of the differential social impact of air pollution. \$50,000.

Curriculum development grant, California State University GIS Specialty Center. Spring 2006. \$9,196. Teaching release time to develop instructional modules for site selection decision support using Business Analyst extension to ArcGIS software.

California Agricultural Research Initiative: Co-Principal Investigator with Susan Algert (Cal Poly Pomona Food and Nutrition Department) for *Geocoding of Pomona Food System as a Tool in Community Organizing to Improve Local Food Sources* (funded summer salary in 2004)

\$42,017 grant from John Randolph Haynes and Dora Haynes foundation to study revitalization in Downtown Pomona. 2001-2002.

SELECTED RECENT PRESENTATIONS AND PROCEEDINGS

Reibel, M. Dec 13, 2012. Geography, GIS and Contextual Effects in Public Health. Invited speaker, Los Angeles County Department of Public Health, Office of Health Assessment & Epidemiology

Reibel, M. October 1, 2012. Complex neighborhood effects and their implications for public health research. Healthy Communities by Design Summit, Loma Linda University (California).

Reibel, M. March 6, 2012. Deceased Donor Potential Study Data Subcommittee Report, DDPS National Stakeholder Meeting, Bethesda, MD.

Reibel, M. Feb. 27, 2012. Methodologies for Geographic Disparities in Donor Organ Recovery Rates. Association of American Geographers annual meeting, New York, NY.

Reibel, M. Feb. 28, 2012. Invited panelist for panel session *Frontiers in Spatial Demography*. Association of American Geographers annual meeting, New York, NY.

Reibel, M and Chan, K. October 24, 2009. GIS Tools for SB375 Planning. Poster Presentation at the annual meeting of the American Association of State Highway and Transportation Officials, Palm Desert, California.

Reibel, M and Regelson, M. June 13, 2009. Clusters and context in the neighborhood dynamics of race/ethnicity. Poster Presentation at Capturing Context: A Conference on Bridging Spatial & Network Analyses, Columbia University, New York.

Reibel, M. Feb. 18, 2009. Neighborhood classification and public health outcomes. Invited lecture, School of Community and Global Health, Claremont Graduate University.

Chan, K. and Reibel, M. Feb. 6, 2009. Regional planning and geospatial data issues relating to California's new climate change prevention laws. First Annual Leonard Transportation Center Transportation Research Conference, Cal State University San Bernardino.

Reibel, M., Chernobai, E. and Carney, M. April 17, 2008. [House Price Change and Highway Construction: Spatial and Temporal Heterogeneity](#). American Real Estate Society annual meeting (presented by E. Chernobai). *Awarded \$1000 prize for best modeling paper.*

PROFESSIONAL SERVICE

Editorial Board, *Urban Geography*.

Chair, University Research Council, Cal Poly Pomona 2007-2008. Member, 2006-2008.

Cal Poly Pomona Representative to the California State University (system wide) Social Science Research and Instructional Council (SSRIC)

Cal Poly Pomona Official Representative to the Inter-University Consortium for Political and Social Research (ICPSR), Ann Arbor, MI.

Referee for numerous peer-reviewed journals, books, and research proposals in the US and UK

CURRICULUM VITAE

RICHARD WILLIAM WILLSON, Ph.D. FAICP

Work:

Department of Urban and Regional Planning
California State Polytechnic University, Pomona
3801 West Temple Avenue
Pomona, CA 91768-4048
(909) 869-2701, FAX (909) 869-4688
rwillson@csupomona.edu
<http://www.csupomona.edu/~rwillson>

Home Office:

4249 Sea View Lane
Los Angeles, CA 90065
(323) 225-1851
FAX (323) 225-1742

EDUCATION

Ph.D. in Urban Planning, 1991. University of California, Los Angeles.

Master of Planning, 1983. University of Southern California, Los Angeles, California.

Bachelor of Environmental Studies, Honors Urban and Regional Planning, 1978. University of Waterloo, Canada.

ACADEMIC EXPERIENCE

Professor, Department of Urban and Regional Planning, California State Polytechnic University, Pomona.

Selected Recent Refereed Journal Articles and Book Chapters

“Parking Utilization in Affordable Housing: Results from San Diego, California.” *Forthcoming in Transportation Research Record: Journal of the Transportation Research Board.*(with Terri O’Connor and Samir Hajjiri).

“Parking Demand and Zoning Requirements for Suburban Multifamily Housing.” (2011) *Transportation Research Record: Journal of the Transportation Research Board*, No. 2245. Planning 2011, Volume 2: 49-55(with Michael Roberts).

“Beyond the Inventory: Planning for Campus Greenhouse Gas Reduction.” (2010) *Planning for Higher Education*. 39: Planning 2011, Volume 2: 49-55.

“Road Prioritization: The Way Forward for Los Angeles.” (2010) In A. Modarres (Ed.) *Los Angeles 2010: Annual State of the City Report*. (pp. 67-76). California State University Los Angeles: Pat Brown Institute.

“In-Class-Online Hybrid Methods of Teaching Planning Theory: Assessing Impacts on Discussion and Learning.” (2008) *Journal of Planning Education and Research*. 28: 237-246.

“Carbon Neutrality at the Local Level: Achievable Goal or Fantasy?” (2008) *Journal of the American Planning Association*. 74: 497-504. (with Kyle Brown).

“Commuter Parking Versus Transit-Oriented Development: Evaluation Methodology.” (2007) *Transportation Research Record: Journal of the Transportation Research Board*, No. 2021. (pp. 118-125) Transportation Research Board of the National Academies, Washington, D.C. (with Val Menotti).

“The Dynamics of Organizational Culture and Academic Planning.” (2006) *Planning for Higher Education*. April – June 2006, pp. 5-17.

“A Re-evaluation of Travel Behavior in California’s TODs.” (2006) *Journal of Architecture and Planning Research*. 23: 247-263 (with Hollie Lund and Robert Cervero).

“Parking Policy for Transit-Oriented Development: Lessons for Cities, Transit Agencies, and Developers.” (2005) *Journal of Public Transit*. 8: 79-94.

Selected Monographs

Local Government GIS and Geospatial Capabilities: Suitability for Integrated Transportation and Land Use Planning (California SB 375). (with Michael Reibel, lead author, Kelly Chan, and Cuong Phu Trinh) (2009) Center for Geographic Information Science Research, California State Polytechnic University, Pomona.

The Pasadena Gold Line: Development Strategies, Local Decisions, and Travel Characteristics along a New Rail Line in the Los Angeles Region. (with Hollie Lund, lead author) (2005) San Jose, CA: Mineta Transportation Institute.

Travel Behavior Impacts of Transit-Oriented Development in California. (with Hollie Lund, lead author, and Robert Cervero) (2004) Oakland, CA: Bay Area Rapid Transit District, Metropolitan Transportation Commission, and Caltrans.

Selected Conference Papers (Peer-reviewed)

“Parking Utilization in Affordable Housing: Results for San Diego, California. Paper #12-0694. Transportation Research Board Session, Washington, D.C. 2012. (with Terri O’Conner and Samir Hajjiri).

“When you can’t build your way out of the problem: Evaluating greenhouse gas reduction strategies for suburban activity centers.” 48th Annual Conference of the Association of Collegiate Schools of Planning. Milwaukee, Wisconsin. 2007 (with Kyle Brown).

“Commuter Parking Versus Transit-Oriented Development: An Access Methodology” Transportation Research Board Session 402, Washington, D.C. 2007.

“The Role of Parking Policy in Transit Oriented Development.” 45th Annual Conference of the Association of Collegiate Schools of Planning. Portland, Oregon. 2004.

“Planning and the Change Process in a Transit Agency.” Presenter. 83rd Annual Meeting of the Transportation Research Board. Washington D.C. 2004. (with Marianne Payne and Ellen Smith)

Grants and Research Funding (Principal Investigator Unless Otherwise Noted)

2009 Travel Behavior of Residents of Transit-Oriented Development in the Inland Empire. William and Barbara Leonard University Transportation Center, California State University San Bernardino. \$50,000

2008 Municipal GIS practices for Transportation Planning in the Inland Empire. Principle Investigator: Dr. Michael Reibel. William and Barbara Leonard University Transportation Center, California State University San Bernardino. \$70,000 total, Willson \$4,000

2007 California’s 2050 Transportation System: A Response to Peak Oil and Global Warming. William and Barbara Leonard University Transportation Center, California State University San Bernardino. \$5,000

2004 The Pasadena Gold Line: Development Strategies, Location Decisions and Travel Characteristics along a New Rail Line in the Los Angeles Region. Principal Investigator: Hollie Lund. Mineta Transportation Institute, San Jose State University. \$58,000 total, direct contract, Willson \$15,000

2002 Travel Characteristics of Transit-Focused Development in California, Grant submitted and administered through the Bay Area Rapid Transit District (FTA Section 5313(b) Principal Investigator Hollie Lund \$200,000 total, direct contract, Willson portion \$25,000; Willson wrote \$200,000 grant

2001 Case Studies of Communicative Rationality in Transportation Planning Research Scholarship and Creative Activity Program California State Polytechnic University, Pomona \$7,000

Selected Professional Reports

Parking Supply, Demand, and Management for the Anaheim Regional Transportation Intermodal Center. (2012) City of Anaheim.

A Parking In-lieu Fee for Access: Support for Transit Corridors in Los Angeles. (2010) Los Angeles, CA: Green Los Angeles.

Climate Action Plan: Pathway to Climate Neutrality. (with Kyle Brown, Cristina Halstead, Michelle McFadden, and Anne Pandey) (2009) Prepared on behalf of the Presidents Climate Commitment Task Force. California State Polytechnic University, Pomona.

Parking Management Study, Anaheim Regional Transportation Intermodal Center Draft Final Report. (2009, final draft) Anaheim, CA: City of Anaheim Department of Public Works.

Parking Demand Analysis for the Vista Canyon Ranch Transit-Oriented Development. (2008) Santa Clarita, CA: JSB - Development.

Parking Management Plan for the Irvine Transportation Center. (2006) Irvine, CA: City of Irvine.

Replacement Parking for Joint Development: An Access Policy Methodology. (2005) San Francisco: Bay Area Rapid Transit District.

Opportunities for Maximizing the Benefits of the Mission-Meridian Garage. (2005) Los Angeles, CA: Creative Housing Associates.

Review Paper: Planning and Implementation of BART's Parking Policy. (2003) San Francisco, CA: Bay Area Rapid Transit District.

Environmental Justice and BART. (2001) San Francisco, CA: Bay Area Rapid Transit District. Supervising author, with Ria Hutabarat, Lisa Young, and Dali Zheng.

Five and Ten Year Access Targets in Support of BART's Access and Management and Implementation Policy. (2000) San Francisco, CA: Bay Area Rapid Transit District.

Parking Management Toolkit: Strategies for Action in BART Station Areas. (2000) San Francisco, CA: Bay Area Rapid Transit District.

SELECTED CONSULTING

City of Anaheim Department of Public Works, Anaheim, CA. 2008 to present. Prepared parking demand and shared parking analysis for the proposed ARTIC multimodal transportation center to be located next to Angels Stadium. Advise city in design and development process. Peer reviewed opening day parking demand forecast. Led review of consultant products and produced summary report.

City of Temple City, CA. 2011-2012. (Subconsultant to RBF) Developing parking management plan for downtown Temple City.

City of San Diego, CA 2010-2011. (Subconsultant to Wilbur Smith Associates) Surveyed parking demand in affordable housing projects, develop a parking model to analyze demand, and made recommendations on parking requirements for future affordable housing.

KOH, LLC and ED LLC, Los Angeles, CA. 2011. Developed parking management plans and agreements for multi-family dwellings in the RiverPark Specific Plan area, a mixed use development in Oxnard California.

City of Santa Cruz, CA. 2010-2011 (Subconsultant to Wilbur Smith Associates) Conducted mixed-use parking demand model based on a field measurement of case studies and developed blended-rate parking requirement options for mixed-use districts.

City of Whittier, CA. 2010. (Subconsultant to PBS&J) Developed a comprehensive parking management plan for Uptown Whittier, including on-street parking pricing, adopted by Council.

FTC Acquisition LLC, San Diego, CA. 2010 Provided parking demand estimates for the Fullerton Transportation Specific Plan in Fullerton California. Developed researched based reduction factors for the transit-oriented development.

Caltrain, San Carlos, CA. 2009. (Subconsultant to PB Americas) Advised staff on the development of a Caltrain System-wide Access Policy, including the development of a “what if” model for assess alternative station access scenarios.

City of Denver, Denver, CO. 2008 - 2009. (Subconsultant to Wilbur Smith Associates) Contributing to the *City of Denver Parking Strategic Plan*, a comprehensive review of the City’s parking policy in terms of smart growth concepts and parking best practices. Develop new parking requirement rates, with adjustment factors for neighborhood characteristics.

Meals on Wheels Los Angeles, Los Angeles, CA. 2008. (pro bono) Wrote travel survey for employees and volunteers, analyzed survey results, and made recommendations to increase transit, carpool, bicycle, and walk access to the facility.

Liberty Hill Foundation, Los Angeles, CA. 2008 to 2010. (reduced rate non-profit consulting) Prepared white paper on the concept of a City of Los Angeles parking in-lieu fee that is dedicated to transit improvements. Project is part of the Green LA initiative.

JSB – Development, Santa Clarita, CA. 2008-present. Prepared shared parking analysis for the Vista Canyon Ranch transit-oriented development in the City of Santa Clarita and provided strategic advice on corridor-level land use and transportation planning for the Antelope Valley Metrolink line.

Bay Area Rapid Transit District (BART) and Bay Area Rapid Transit Consultants, Oakland, CA. 1998 to 2008. Developed methodology to support decision making concerning replacement parking at BART joint development sites.

Santa Clara Valley Transportation Authority, San Jose, CA. 2006 to 2009. (Subconsultant to Bottomley and Associates) Undertook commuter and TOD parking analysis to support 65% design of the BART extension to San Jose, including analysis of parking supply, replacement parking, and parking management techniques. Technical support for station access planning.

Titan Group, El Monte, CA. 2005 to 2007. Prepared trip generation and parking standards for a 65 acre mixed use development at the El Monte multimodal transit center in the City of El Monte. Provided technical support for infrastructure bond applications. Provide ongoing advice for transit-oriented development.

Urban Partners, LLC, Los Angeles, CA. 2005 to 2007.

- Prepared residential parking demand analysis for the University Gateway student housing project near the USC campus in Los Angeles, CA. Supported EIR team in response to comments and follow-up analyses.
- Prepared a shared parking analysis for the Washington/National TOD in Culver City.
- Prepared residential and restaurant parking demand analysis for a project in the Howard Hughes Center in Los Angeles, CA.

City of Irvine, Irvine, CA. 2006. Prepared a parking management plan for the Irvine Transportation Center; the plan supported the development of a new parking structure and other station access strategies.

Metropolitan Transportation Commission, Oakland CA. 2006 to 2007. (Subconsultant to Wilbur Smith Associates) Contributed to “Reforming Parking Policies to Support Smart Growth” project. Developed sections of the “best practices” report.

City of Pasadena, Pasadena, CA. 2006 to 2007. (Subconsultant to Nelson/Nygaard Consulting) Contributed research findings and peer review services to the Pasadena Traffic Reduction Strategies study completed for the Pasadena Transportation Commission.

Bay Area Rapid Transit District (BART), Oakland, CA. 2006 to 2007. (Subconsultant to Nelson/Nygaard Consulting) Refined and developed the Access and Joint Development assessment methodology developed previously for BART as part of the “A Line Access BART” study.

Pasadena Presbyterian Church, Pasadena, CA. 2006 to 2007. Undertook parking demand analysis to support sale of church property for development.

El Monte/South El Monte Chamber of Commerce, El Monte, CA. 2006 to 2007. Assessed economic development opportunities in five districts in the City of El Monte, conducted workshops with local stakeholders, and made presentation to the El Monte City Council. Effort funded by the Titan Group, LLC.

University of Southern California, Los Angeles, CA. 2005 Analyzed parking requirement and parking management issues in support of Campus Master Plan and regulatory practices with the City of Los Angeles.

PLANNING AGENCY EXPERIENCE

City Planner - Transportation, 1985 – 1986, *Transportation Planning Associate,* 1983 – 1985, Community Redevelopment Agency of the City of Los Angeles, Los Angeles, CA.

Senior Consultant, 1983, William C. Lawrence Company, Inc., Los Angeles, CA.

Planner, 1980 – 1981, Essex County Planning Department, Essex, Ontario, Canada

Planner, 1979 – 1980, Jean Montieth and Associates, Inc., London, Ontario, Canada.

TESTIMONY, PROFESSIONAL COMMITTEES, JURIES, ADVISORY PANELS AND SELECTION PANELS

Presentation to the Orangeline Development Authority, “TOD Version 2.0”. Paramount, CA. October 13, 2010.

Member, University Advisory Group, Southern California Association of Governments, 2010 – present.

Member, Planning Accreditation Board Site Visitor Pool, 2009 – present.

University Representative for Cal Poly Pomona, Transportation Research Board of the National Academy of Sciences, 2008 – present.

Keynote address, “TOD as a Tool for Urban Economic Revitalization”. Senate Select Committee on Urban Economies, State of California, El Monte CA, October 25, 2007.

HONORS AND AWARDS

Inducted as a Fellow of the American Institute of Certified Planners at the National Conference of the American Planning Association. Las Vegas, NV, 2008.

California Chapter APA Outstanding Planning Award for Leadership and Service/Academic. Award given based on the URP 431/432 class, “Transit Oriented Development along the Gold Line Corridor”. Yosemite, CA. 2005.

Academic Award, Los Angeles Section of the American Planning Association (with the students of URP 431/432) for the “Transit Oriented Development along the Gold Line Corridor” project. Los Angeles, CA. 2005.

American Institute of Certified Planners Student Award, University of Southern California. Los Angeles, CA. 1983.

California Planner's Foundation Student Award, California Chapter of the American Planning Association. Los Angeles, CA. 1982.

PROFESSIONAL SERVICE AND AFFILIATIONS

University Representative, Transportation Research Board. 2009 – present.

Fellow, American Institute of Certified Planners. 2008 - present.

Member, American Institute of Certified Planners. 1987 - 2008.

Member, American Planning Association. 1983 – present.

Editorial Advisory Board, *Journal of the American Planning Association*. 2001 - 2006

Vice Chair, Transportation Division of the American Planning Association. 2000 - 2002

Past Full Member, Canadian Institute of Planning