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February 27, 2015

Annalisa Schilla
Air Resources Board

Dear Ms. Schilla:

On behalf of the Regents of the University of California, I am pleased to submit for your consideration a proposal on behalf of Professor Paul Ong, titled "Tracking Changes in Land-Use and Spatial Access that Support Sustainable Communities Strategies". We request funds in the amount of $150,000 for the period of September 1, 2015 through March 1, 2017.

Please note that should a contract be issued in response to this proposal, we will be pleased to accept it based on mutually agreeable terms.

If you have any technical questions regarding this proposal, please contact Professor Ong at (310) 614-2458. Please contact me with any administrative questions at (310) 794-0259 or via email at mbailey@research.ucla.edu.

Sincerely,

Miesha Bailey
Contract and Grant Officer

ecc: Professor Paul Ong
Ms. Hien McKnight

Internal Ref. #20153586

DRAFT PROPOSAL

TRACKING CHANGES IN LAND-USE AND SPATIAL ACCESS THAT SUPPORT SUSTAINABLE COMMUNITIES STRATEGIES

Principal Investigator:

Paul Ong

Co-PIs
Michael Lens and Paavo Monkkonen

Prepared for:
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February 27, 2015

Check if applicable:
Animal subjects _____
Human subjects _____

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For Draft Proposal "Tracking Changes In Land-Use and Spatial Access That Support Sustainable Communities Strategies"

ABSTRACT

We propose to develop a baseline GIS monitoring system that captures land-use patterns by small geographic areas and spatial access indicators to employment, shopping and recreational/entertainment opportunities. The project has two major components. The first component is the development of a regional prototype using an extensive set of micro-level and aggregated data for Los Angeles County (including utilizing data for areas adjacent to the county). By limiting the geographic scope of the prototype to one region, we will be able to undertake intensive development and testing. The testing includes an assessment of relevant Sustainable Community Strategies (SCS) adopted by the Southern California Association of Government (SCAG) in 2012, and an assessment of recent changes in land-use activities (intensity of use, changes in use, and new developments). The second component is scaling the regional prototype to a statewide monitoring system, which is likely to be based on a subset of indicators because limitations on the data and analytical capacities available at some MPOs (determined by a survey and inventory of MPOs). The project will evaluate the performance of the statewide monitoring system to the L.A. monitoring system when applied to Los Angeles County. Scaling will require a survey and inventory of Metropolitan Planning Organizations (MPOs). The statewide system will be more limited in scope due to limitations on data availability and the capacities of MPOs to use the system. The project will evaluate the performance of the statewide monitoring system by comparing the results it produces for Los Angeles County to those generated by the regional Los Angeles prototype. In the future, the statewide system can be regularly updated to identify, track and monitor changes in land-use activities and spatial access. The information can be used to evaluate whether shifts in land-use regulations, plans and programs, and the location of new developments (housing, job generating, retailing and recreational/entertainment) are consistent with the intent of Senate Bill (SB) 375 through SCS. The bill's ultimate goal is to reduce greenhouse gas (GHG) emissions by reducing vehicle miles traveled (VMTs) through land-use patterns that facilitate shorter trips and by promoting alternative travel modes (e.g., public transit). The project builds on the expertise of the principal investigator and the two co-PIs, who have extensive academic and professional experience in analyzing spatial data. Collectively, they are national and international experts on the spatial urban structure of housing, transportation and economic activities.

INTRODUCTION

We propose to develop a baseline GIS monitoring system that tracks changes in land-use patterns and spatial access to major daily activities. The project has two major components: the development of a regional prototype, and the scaling of the prototype to a statewide monitoring system. The systems will be tested to evaluate its ability to assess Sustainable Community Strategies (SCSs) and recent changes in land-use activities (intensity of use, changes in use, and new developments). In the future, the statewide system can be regularly updated to identify, track and monitor changes in land-use activities and spatial access. The information can be used to evaluate whether shifts in land-use regulations, plans and programs, and the location of new developments (housing, job generating, retailing and recreational/entertainment) are consistent with the goal of Senate Bill (SB) 375 to reduce greenhouse gas (GHG) emissions by reducing vehicle miles traveled (VMTs) through land-use patterns that facilitate shorter trips and by promoting alternative travel modes (e.g., public transit).

This project brings together the expertise of three researchers with extensive knowledge and experience related to the tasks listed below in this proposal. Dr. Paul Ong will be the project leader, and Dr. Michael Lens and Dr. Paavo Monkkonen are co-PIs. They are professors in UCLA's Department of Urban Planning in the Luskin School of Public Affairs. The project's analytical design and methodological approaches are built on previous academic and professional publications, which are listed below. Technical details can be found in the listed publications.[1] To the degree possible, the project will align and leverage past and current work of the three researchers, including utilizing an existing data library.

Professor Ong is an expert on spatial, demographic and socioeconomic data from the U.S. Bureau of the Census. He served five years on the agency's Race and Ethnic Advisory Committee, participating in reviewing the development and testing of the American Community Survey (ACS), and in leading the effort to create a new reporting geography for Native Hawaiian Homelands. He has served on two national advisory committees on the use of ACS data for transportation and housing. He was a consulting for the LEHD (Longitudinal Employer and Household Dynamics) program, and worked on merging administratively based micro-level employment data with long-form census data. This required geocoded data for place of residence and place of work, and the analytical examination of spatial patterns. Below is a list of publications from that effort:

> Paul Ong and Matthew R. Graham, "Social, Economic, Spatial, and Commuting Patterns of Dual Jobholders, U.S. Census Bureau, Longitudinal Employer–Household Dynamics Technical Paper No., TP-2007-01, April 2007, 24 pages.

[1] Many of the techniques are also discussed in policy briefs written for the California Air Resource Board and posted at http://arb.ca.gov/cc/sb375/policies/policies.htm.

Matthew R. Graham and Paul Ong, “Social, Economic, Spatial, and Commuting Patterns of Informal Jobholders, U.S. Census Bureau, Longitudinal Employer–Household Dynamics Technical Paper No., TP-2007-02, April 2007, 24 pages.

Paul Ong and Matthew R. Graham, “Social, Economic, Spatial, and Commuting Patterns of Self-Employed Jobholders, U.S. Census Bureau, Longitudinal Employer–Household Dynamics”, Technical Paper No., TP-2007-03, April 2007, 31 pages.

He did seminal work on transportation mismatch, which hypothesizes that transportation mismatch (lack of access to personal vehicle and limited public transportation) compounds the problem of spatial mismatch (the growing geographic separation of minority workers trapped in the inner city from job growth concentrated in the suburbs). The research relied on geocoded data and spatial analysis. Below is a list of related publications:

Brian Taylor and Paul Ong, "Spatial Mismatch or Automobile Mismatch? An Examination of Race, Residence, and Commuting in the U.S. Metropolitan Areas," Urban Studies, 32(9):1453-1474, November 1995.

Paul Ong, "Work and Car Ownership Among Welfare Recipients," Social Work Research, 20(4):255-262, December 1996.

Paul Ong and Evelyn Blumenberg, “Job Access, Commute, and Travel Burden Among Welfare Recipients,” Urban Studies, 35(1):77-93, 1998.

Evelyn Blumenberg and Paul Ong, “Job Accessibility and Welfare Usage: Evidence from Los Angeles,” Journal of Policy Analysis & Management, 17(4):639-657, 1998.

Paul Ong, “Subsidized Housing and Work among Welfare Recipients,” Housing Policy Debate, 9(4):775-794, 1998.

Paul M. Ong, “Car Ownership and Welfare-to-Work,” Journal of Policy Analysis and Management, Vol. 21, No. 2, Spring 2002, pp 255-268.

Daniel Baldwin Hess and Paul Ong, “Traditional Neighborhoods and Auto Ownership,” Journal of the Transportation Research Board Record, no. 1805, 2002, pp. 35-44.

Professor Ong has made extensive use of spatial data and analyses for professional practices. He was the lead researcher for a massive project examining subsidized housing and fair housing in California, which was conducted by the California Department of Housing and Community Development (HCD). That project used geocoded micro-level and aggregated data from U.S. HUD (affordable housing and housing discrimination complaints), U.S. Bureau of the Census (American Community Survey, Longitudinal Employer and Household Dynamics), California HCD (affordable housing projects, local housing agencies, CDBG data), California Department of

Education (school performance and student/staff demographics), DataQuick (housing sales), and local transit agencies (routes and services). Below is the citation for the resulting report:

> California Department of Housing and Community Development, "Analysis of Impediments to Fair Housing (AI)," September 2012, 700+ pages. http://www.hcd.ca.gov/hpd/hrc/rep/fed/ai_web.html

Professor Ong is currently directing the data assembly and spatial analyses for the Los Angeles component of the ARB funded project on "Developing a New Methodology for Analyzing Potential Displacement." Additional support comes from The California Endowment and the California Community Foundation, which are interested in promoting affordable housing and community economic development for disadvantaged neighborhoods. In addition to using data sets listed for the above HCD AI, the project is collecting primary survey and field data for small geographies, "ground truthing" secondary data, reconciling spatial and temporal data, and examining the factors associated with neighborhood change.

Michael Lens has expertise in at least two areas of emphasis for this project. First, Dr. Lens has extensive experience conducting research using longitudinal data at small levels of geography in order to understand the complex factors that drive changes in land-use and associated outcomes. Examples of this research include investigations of how investments in subsidized housing affect crime and how changes to subsidized housing policies affect proximity to employment for low-income households. Two publications from these research projects received Best Paper awards from top journals in the planning and housing fields: Journal of the American Planning Association and Housing Policy Debate:

> Lens, Michael. 2014. "Job Accessibility Among Housing Subsidy Recipients." Housing Policy Debate, 24(4): 671-691.
>
> Lens, Michael. 2013. "The Limits of Housing Investment as a Revitalization Tool: Crime in New York City." Journal of the American Planning Association, 79(3): 211-221.

Second, Dr. Lens is an expert on housing markets and policy, with specific attention to land-use regulations. He has recently completed a paper (with Dr. Monkkonen) that examines the effect of land-use regulations on segregation by income. In 2014, Drs. Lens and Monkkonen were awarded a 3-year $610,000 grant from the MacArthur Foundation to study the effect of the housing boom and bust on local government finances.

Paavo Monkkonen is an expert in two core aspects of this project; evaluating and adapting new sources of GIS data for the study of urbanization and urban form, and the measurement of land-use regulations through the use of surveys. In the first area, his 2007 publication on urbanization in Mexico was one of the first to evaluate Google Earth

and other freely available sources of satellite imagery for their use in urban planning research applications. Additionally, he also undertook a study of urban sprawl in Mexico that involved new ways to measure density and urban spatial structure. Since then, he has incorporated several new sources of GIS data in domestic and international work on urbanization and land-use regulation. For example, in a project funded by the Global Development Network and forthcoming in an edited book from the University of Pennsylvania, he used slope and water layers in GIS to evaluate land availability in over 500 cities around the world. Below is a list of related publications:

> Monkkonen, Paavo, and Lucas Ronconi (Forthcoming). "Comparative Evidence on Urban Land-use Regulation Bureaucracy in Developing Countries." In Birch, E., Chattaraj, S., and Wachter, S. (eds.) Informal Real Estate Markets. Philadelphia, PA: University of Pennsylvania Press.
>
> Monkkonen, Paavo, Kelvin SK Wong and Jaclene Begley. 2012. Economic Restructuring, Urban Growth, and Short-term Trades: The Spatial Dynamics of the Hong Kong Housing Market, 1992-2008. Regional Science and Urban Economics, 42(3): 396-406.
>
> Monkkonen, Paavo. 2011. Are Mexican Cities Sprawling? Housing Finance and Changing Urban Spatial Structure. Urban Geography, 32(3): 406-423.
>
> Monkkonen, Paavo. 2008. Using Online Satellite Imagery as a Research Tool: Mapping Changing Patterns of Urbanization in Mexico. Journal of Planning Education and Research, 28: 225-236.

Additionally, Dr. Monkkonen has undertaken studies of land-use regulation and their impacts in multiple countries (e.g. Argentina, Indonesia), including the United States, all of which depend on a critical understanding of the use of surveys to evaluate the stringency of regulatory controls over land-use. He worked with John Quigley and Steven Raphael at the University of California Berkeley (in a project funded by the MacArthur Foundation) to survey the over 100 local jurisdictions in the San Francisco Bay Area. These survey data were used to assess the stringency of regulatory controls at the local level in order to test their impacts on land and housing prices. Internationally, he has pioneered the use of survey data from the World Bank's Doing Business project to study similar issues globally. Lastly, he is currently working with data on land-use regulation in cities across the US developed by researchers at the Wharton School of Business to assess the impact of various facets of regulation on socioeconomic segregation in metropolitan areas. Below is a list of related publications:

> Kok, Nils, Paavo Monkkonen and John M. Quigley. 2014. Land-use Regulations and the Value of Land and Housing: An Intra-Metropolitan Analysis. Journal of Urban Economics, 81(3) 136-148.
>
> Monkkonen, Paavo, and Lucas Ronconi. 2013. Land-Use Regulations, Compliance and Land Markets in Argentina. Urban Studies, 50(10): 1951-1969.

Monkkonen, Paavo. 2013. Urban Land-Use Regulations and Housing Markets in Developing Countries: Evidence from Indonesia on the Importance of Enforcement. 2013. Land-use Policy, 34: 255-264.

Monkkonen, Paavo, and Jeffrey Vincent. 2010. The Impact of State Regulations on the Costs of Public School Construction. Journal of Education Finance, 35(4): 313-330.

OBJECTIVES

The major objective of the proposed research is to develop a land-use monitoring system based on advanced spatial methods and a theoretical understanding of the relationship between land-uses, travel behavior and greenhouse gas (GHG) emissions. A second objective of this research is to bring together experts in the field to ensure the development of a practical system that will allow policymakers, planners and researchers to track metropolitan land-use and accessibility changes, and to analyze how SCSs are being implemented.

There are two major components to the proposed research. The first is to develop an extensive regional prototype monitoring system to assess land-use changes and spatial access to major activities. The geography for the prototype is the Los Angeles region (operationalized as Los Angeles County). The second major component is to expand the regional prototype to the state-level. Scaling the monitoring system will require using a subset of data sources and analytical techniques from the regional system. A key element of both components is to evaluate the performance of these systems and identify any possible weaknesses in the statewide model.

The results from the two sets of evaluation may provide some insights into the outcomes of regional and local planning efforts and help identify which generate changes to actual land development (e.g., identifying SCS areas where desired land-use changes are disproportionately concentrated). Understanding which efforts result in actual changes is crucial to ARB's ability to monitor the degree that land-use changes (intensity, type and developments) are consistent with (and therefore promotes) Sustainability Community Strategies, and thus contribute to travel (as measured by vehicle miles traveled or VMTs) and GHG emission reductions. The results can also provide information on how to improve policies, plans and implementation efforts.

The conceptual approach is based on an understanding that land-use patterns affect travel behavior (measured by VMT), which in turn are linked to GHG emissions. For summary of what is currently known empirically about the relationship between land-use, VMT and GHS, see "Senate Bill 375 - Research on Impacts of Transportation and Land-use-Related Policies." (http://arb.ca.gov/cc/sb375/policies/policies.htm)

Given the relationship between land-use and VMT, changes in the use of land will affect GHG. If the relationship between the three is purposefully influenced towards certain goals (e.g., higher density, mixed land-uses, access to public transit, improved regional

access), the results can be changes that may contribute to the reduction of GHG emissions. This is articulated in SB 375 as follows:

> "It will be necessary to achieve significant additional greenhouse gas reductions from changed land-use patterns and improved transportation." (Senate Bill No. 375, CHAPTER 728, 2008, page 4)
>
> "The council of governments may not limit its consideration of suitable housing sites or land suitable for urban development to existing zoning ordinances and land-use restrictions of a locality, but shall consider the potential for increased residential development under alternative zoning ordinances and land-use restrictions." (Senate Bill No. 375, CHAPTER 728, 2008, page 27)

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) requires MPOs to do more integrated land-use, transportation, and housing planning. In developing these plans, MPOs are also to adopt plans that preserve affordable housing units and encourage the construction of new affordable housing.[2] To meet its regional GHG reduction targets, each California MPO is required to model land-use, vehicle ownership and VMT in a way that is "consistent with statistical research" (Steinberg, Darrell, 2008, p. 5).

Now in its sixth year of implementation, the program has resulted in the development of SCS, which show that, if implemented, the major regions of California can reduce transportation-related GHG emissions compared to 2005 levels. By February 2015, all MPOs will have adopted their first SCS and several are already undergoing their second round of SCS planning as part of their Regional Transportation Planning effort.

In the "Update to the Scoping Plan", one of the recommended actions to achieve the State's post-2020 climate goals is to "ensure GHG emission reductions from approved SCSs are achieved or exceeded through coordinated planning." In addition to VMT and fuel usage data, tracking the effectiveness of land-use policies is an important element to verify the progress toward the goals outlined in SB 375. In particular, there is a need to understand the extent to which shifts in regional and local planning are resulting in actual changes in land-use across the State through time.

Although several years have passed since the inception of SB 375, land-use changes take time and detectable changes from business as usual may not be apparent for several more years. This is particularly true when factoring the likely impacts of the recent recession. However, this project will develop a framework and baseline to enable future tracking and evaluation of how land-use changes over time. Given that many

[2] For example, "Conserve and improve the condition of the existing affordable housing stock, which may include addressing ways to mitigate the loss of dwelling units demolished by public or private action," For new subdivisions, there should be efforts to "ensure the continued availability and use of at least 49 percent of the housing units for very low, low-, and moderate-income households with an affordable housing cost or affordable rent." And around transit projects, "ensure the continued availability and use of the housing units for very low, low-, and moderate-income households at monthly housing costs with an affordable housing cost or affordable rent."

factors influence change, this proposal does not intend to provide causational attribution to a single State policy or program.

As such, additional methodologies may be employed to help assess if SB 375 has contributed to any shifting of land-use development patterns in California, to the extent possible. Our approach will allow policymakers, planners and researchers to track metropolitan land-use and accessibility changes, and to analyze how SCSs are being implemented.

TECHNICAL PLAN

The proposed project has two major components. The first is to develop an extensive prototype monitoring system to assess land-use changes and spatial access to major activities for Los Angeles County. We have access to a rich set of spatial data for this region based on prior work, thus enabling us to align and leverage existing research to developing a robust spatial data base and set of indicators. The second is to adapt the regional data and analytical system to a statewide system based on the data and analytical capacity available at state agencies and other MPOs The indicators for the statewide system will be a subset of the indicators in the L.A. system.

Because of limited resources (funding level) we are proposing this two-step process to enable us to first develop a much more extensive monitoring systems for a single region, and then adapt the regional prototype to a system for all of California. Starting with a smaller geography enable us to assemble and assess more data sets, to develop and validate more indicators, and to do more assessments of the abilities of the prototype system to evaluate SCS policies and plans and to monitor land-use changes. We selected L.A. County for the following reasons. One, this region already has adopted SCS, via SCAG's 2012-2035 Regional Transportation Plan.

> "The SCS component focuses the majority of new housing and job growth in high-quality transit areas and other opportunity areas in existing main streets, downtowns, and commercial corridors, resulting in an improved jobs-housing balance and more opportunity for transit-oriented development." 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), Executive Summary, April 2012, SCAG, page 8

Two, the researchers have extensive experience with spatial data and analysis for this region. Much of the research and publications listed in the previous section is based on analyses of Los Angeles County. The researchers have developed an extensive library of spatial data for the region. Three, limiting the geographic region to the county will enable us to have comparable detailed spatial data for areas beyond its boundaries. Some of the proposed indicators required having information on activities in nearby counties, and including travel data (e.g., time-based origin and destination data) from SCAG. (The potential problem with "beyond the boundaries" precludes using the entire SCAG region for the prototype monitoring system because there potential problems with acquiring detailed and comparable spatial in areas adjacent to SCAG.)

Key elements of the monitoring system are an extensive and rich data base, a set of land-use and spatial access indicators, the ability to assess SCS policies and plans, and the ability to track changes in land-uses. We propose decomposing land-use changes to three elements: changes in intensity (e.g., increasing number of jobs within existing built environment), changes in usage (e.g., conversion from one type of activity to another within existing built environment), and changes in the built environment (e.g. through removal, new development and/or replacement).

Part I: Development of Prototype Monitoring System

Task 1: L.A. Data Assembly and Assessment.

The project will assemble spatial data from several sources including but not limited to the following: parcel level data (e.g., county assessor's records, DataQuick); U.S. Census data (primarily American Community Survey); business data (e.g., Dun&Bradstreet, Longitudinal Employer and Household Dynamics, and ES 202 from Employment Development Department); transit service (e.g., routes and ridership from Metro); building permit data (e.g., those from L.A. Department of City Planning, and Hanley-Wood's data on major housing projects[3]); affordable housing units and development (e.g., data from California Department of Housing and Community Development, data from U.S. HUD); schools (e.g., elementary schools from California Department of Education), and satellite and aerial imagery (e.g., LANDSAT and other multispectral products, SCAG's aerial photographs). The project will work with ARB to determine what additional data the agency is willing to purchase for this part of the project (e.g., the most recent Dun&Bradstreet records, and updated parcel records).

Assessment includes the following elements:

Temporal and geographic coverage (time period and areas covered);
Temporal resolution (how frequently data are available and timeliness);
Spatial resolution and boundaries (size and edges of objects, pixel meter);
Geocoding (how objects are or can be spatially referenced);
Level of content details (spatial attributes);
Consistency over time (spatial objects and attributes); and
Longitudinal linkage (ability to link cross-sectional spatial data).

The project will also assemble spatial data on land-use patterns and zoning (from SCAG and local jurisdictions), and on SCS areas (either specifically identified, or indirectly identified by attributes defined by policies and/or programs).

Task 2: Areal Indicators

[3] Preliminary discussion with Hanley-Wood indicates that the company covers and monitors only a limited set of construction activities.

Task 2A: Develop baseline areal indicators that are geographically consistent using the appropriate geographical unit of analysis (to be determined in coordination with ARB).

An areal variable indicator is used to characterize the land-use characteristics (attribute) for a given geographic space. The project will work with ARB to identify the most appropriate geographic reporting units (e.g., census tracts, traffic analysis zones, zip code areas) and develop key areal indicators.

A potentially major challenge is reconciling differences in how data are spatially reported from different sources. Clearly, some of the data sources will use the same geographic reporting units, thus those data will be simply incorporated. Working with point data (those with specific latitude and longitude) is relatively simple, because observations can be aggregated into the selected geographic reporting unit. There are likely to be data sources that use alternative spatial boundaries, we propose to use proportionate areal allocation of the data.

At a minimum, the project will develop indicators of the spatial density of four important activities: residential, employment, retailing and recreational/entertainment. Additional indicators (other activities or for subcategories within the listed four activities, such as single-family units and multi-unit buildings) may be developed, depending on resources.

The project will develop a second set of indicators that measure of mix land-uses. Examples of these includes the ratio of jobs (employment at work sites) to households in a geographic reporting unit (Jobs-Housing Balance), the ratio of jobs (employment at work sites) to the number of workers living within a geographic reporting unit (Job-Richness), and the ratio of income or wages to housing cost (housing burden). Similar indicators can be used to measure the ratio of retailing to potential customers (households), and entertainment/recreational to potential users. An entropy index will be used to measure overall heterogeneity of land-use and zoning types. (This is adapted from the widely used entropy measure of race/ethnic diversity for a given geographic place. Our method replaces population groups with land-use or zoning types weighted by their share of the area.)

The areal indicators measures can be used to assess whether the geographic location of new housing (including affordable units), retailing, and recreational/entertainment developments tend to promote SCS. The goal is to direct development to dense areas that have mixed land-uses.

The project will create GIS layers that identify infill opportunities (using a process similar to CA LOTS[4], and joint SCAG-UCLA project to identify vacant and under-developed parcels), open spaces, agricultural spaces, Greenfield spaces, transit services, and existing land-use patterns and zoning. These layers will be used in Task 4 (Use L.A. Land-Use Monitoring System to assess SCAG's SCS elements and recent changes in land-use.)

[4] For description, see http://164.67.52.33/scalotsdev/Master.cfm?CFID=290049&CFTOKEN=41030791. The project will actively consult with Norman Wong, the lead UCLA analyst on the new CA LOTS project.

The project will also create indicators of affordable housing units, including the availability of rental housing and rental units that are affordable to low-income households and very low-income households as defined by U.S. HUD.[5]

Task 2B: Map baseline areal indicators using Geographical Information Systems (GIS).

The project will use ARC GIS to map the baseline areal indicators.

Task 3: Regional Access Indicators

Task 3A: Construction of regional access indicators to employment, shopping , recreational/entertainment, and schools.

Spatial access is defined as the number of a given activity within a set of defined geographic distances. For example, the number of jobs within x miles or y commute time of a given place of residence, with closer jobs weighted more heavily because they are geographically more accessible. Greater access means a higher chance a person would be employed closer to home, thus reducing VMTs and GHS emissions. Greater spatial access to shopping, recreational/entertainment and schools would also lead to reductions. The project will use two methods: (1) a gravity model inversely weighted by distance, and (2) a gravity model inversely weighted by travel time between origin and destination (OD). OD information comes from regional transportation models.

We propose three access indicators based on the most frequent types of trips: access to employment, shopping, and recreation and entertainment. These trips typically account for roughly two-thirds of household VMT.[6] Thus, land-use changes that improve access also increase the chance to reduce VMT and GHG emissions.

The following is an example of how to produce a regional access indicator. This particular index measures accessibility of households to employment opportunities. We will begin with LEHD count of jobs in a location (e.g., census tracts, traffic analysis zone, or block group) in Los Angeles County .A simple distance based measurement of access may begin by summing the number of opportunities located within a certain distance (i.e. 15, 20, or 50 miles); however, this approach treats nearby and distant employment opportunities equally. To account for the fact that distant jobs are less desirable to workers because of higher direct and indirect commute cost, we propose an access indicator based on a gravity model that discounts opportunities farther away using the following distance decay function:

[5] For a definition, see http://www.huduser.org/portal/datasets/il.html

[6] A. Santos, N. McGuckin, H.Y. Nakamoto, D. Gray, and S. Liss, “Summary of Travel Trends: 2009 National Household Travel Survey,” U.S. Federal Highway Administration, FHWA-PL-ll-022, 2011. The 2009 NHTS is the most recent available survey.

$$A_{ki} = \sum_{j=1}^{N} O_{jt} \exp(\gamma d_{ij})$$

Methodologically, a straight line is drawn between the centroid of every residential location (i) and potential employment location (j) within 50 miles, and the distance between those two centroids is measured, denoted d_{ij}. O_{jt} is the number of jobs in location j in a given year, and γ_i is a distance decay parameter. The job accessibility index A_i, is the accessibility index of location i to jobs within the region. This calculation is repeated for all residential locations.

Straight-line distance, however, can be misleading because it is not perfectly correlated with travel time, which is more directly tied to commute burden. We propose a second access measure replacing distance with travel time in the gravity model:

$$A_{ki} = \sum_{j=1}^{N} O_{jt} \exp(\gamma t_{ij})$$

The variable $t_{ij}$is the estimated travel time between the two centroids, which comes from calibrated regional transportation models. While time weighting is preferred, it requires that an MPO has a fully functional transportation model. Moreover, a consistent statewide system requires that the same model and input data are used by all MPOs. The distance-based access indicator is relatively easier to implement (although it still requires considerable work).

We then replicate the measure for households-to-retail (shopping opportunities) and household-to-entertainment/recreational opportunities. (We will also develop an access to public transit using the common standard of acceptable walking distance of ¼ and ½ miles.) These indicators use the household or members of households as the reference point, that is, their access to activities. These access measures can be used to assess regional access for new housing developments, where greater regional access tends to promote SCS.

We will also replicate spatial access indicators where we measure the access to labor supply for employers, which can be used to evaluate the SCS implications of developing new job sites (economic development for the creation of new jobs). Similarly, spatial access indicators of retailing stores to customers, and recreational/entertainment to users can be used to evaluate the SCS implications of commercial and recreational/entertainment developments.

Task 3B: Map baseline access indicators.

The project will use a Geographical Information Systems (ArcGIS) to map the access indicators using the appropriate geographical unit of analysis to be determined in coordination with ARB.

Task 4:Testing the L.A. Land-Use Monitoring System

The project will test the capability of the L.A. system to assess spatial elements of Sustainable Community Strategies and changes in land-use, with the objective of determining whether they are consistent with the broader goals of SB 375. There will be two major components.

The first component evaluates adopted SCS policies and plans. This starts with mapping of map SCS areas (either specifically identified, or indirectly identified by attributes defined by policies and/or programs). To the extent possible, this will include SCS-related updates to General Plans and zoning ordinances, and specific plans, land-use or habitat conservation plans. The SCS areas are then overlaid on top of the areal and access indicators. The project will then conduct the following evaluations:

(1) determine the degree SCS areas are located in dense areas with mixed land-uses (or mixed zoning);
(2) identify any opportunity zones (high density with mixed land-uses, and infill opportunities) not covered by SCS;
(3) determine if open spaces and agricultural spaces are protected;
(4) determine the degree SCS areas are located in areas with high regional access; and
(5) identify any significant opportunity zones (high access areas) not covered by SCS.

The second component evaluates specific observed land-use changes. This start with mapping three elements of change: change in intensity of use (e.g., changes in household size, employment levels within existing built environment, and retailing activities within existing built environment as observed in ACS and LEHD data); changes in use type (e.g., conversion of warehouses to residential space as observed in longitudinal parcel data); and changes in the built environment (removals and new constructions as observed in permit and parcel data). The ability to track and monitor these changes will depend on the availability and timeliness of data as determined in Task 1.

The project will then conduct the following evaluations:

(1) determine the location of these changes relative to designated SCS areas;
(2) determine the location of these changes relative to density and land-use indicators;
(3) determine if these changes are located in with high regional access areas; and
(4) determine what are the changes to the affordable housing stock.

The results from the two sets of evaluation may provide some insights into which regional and local planning efforts are resulting in changes in actual land development (e.g., identifying SCS areas where desired land-use changes are disproportionately concentrated).

Part II: Development of Statewide Monitoring System

Many of relevant techniques for Part II are described in Part I, and the details of how the statewide system will be developed are contingent on what is discovered in Task 5, and thus will be specified as the project proceeds.

Task 5: Survey and inventory of MPOs and State Agencies.

The research team will survey the existing land-use monitoring efforts being conducted by MPOs and key state agencies, their access to data sources, and current analytical practices and capabilities. The survey will determine which of the data sets in the LA Land-Use Monitoring System are accessible to the MPOs, and what statewide data are available from state agencies. Attention will be given to current and future available, access to data, and cost burden. On the analytical side, the survey will collect information on current and planned transportation-modeling efforts.

A survey instrument will be developed with detailed questions about the above topics. In order to ensure clarity and comprehensiveness of the survey instrument, we will pilot the first instrument with contacts at California Association of Governments and a small MPO. In the implementation of the survey, we will use a two-pronged approach to get coverage of as many MPOs as possible with minimum resource expenditure. First, we will create the survey in an online format (such as surveymonkey.com) and email a link to this survey to the relevant staff of the different MPOs. After one or two reminder emails, the second step will be to follow up over the phone with those MPOs that did not respond. This will ensure the most complete coverage possible.

The project will work with ARB to identify relevant state agencies to contact, and work with ARB to determine what additional data that the agency is willing to purchase for this statewide part of the project (e.g., the most recent Dun&Bradstreet records, and updated parcel records).

Task 6: Modify LA Monitoring System based on results from Task 5

Because of likely data and analytical limitations for smaller MPOs, the statewide monitoring system will likely be a subset of the LA-based prototype monitoring system. The statewide system will to the extent possible be aligned or leveraged with the existing work by all MPOs and state agencies.

Task 7: Evaluate Performance of Statewide System.

Rerun Task 4 (Testing the L.A. Land-Use Monitoring System)with the more limited set of areal and access indicators, and compare the results in terms of ability to identify land-use changes. This will enable us to identify any possible weaknesses in the statewide monitoring system.

Part III: Report Production

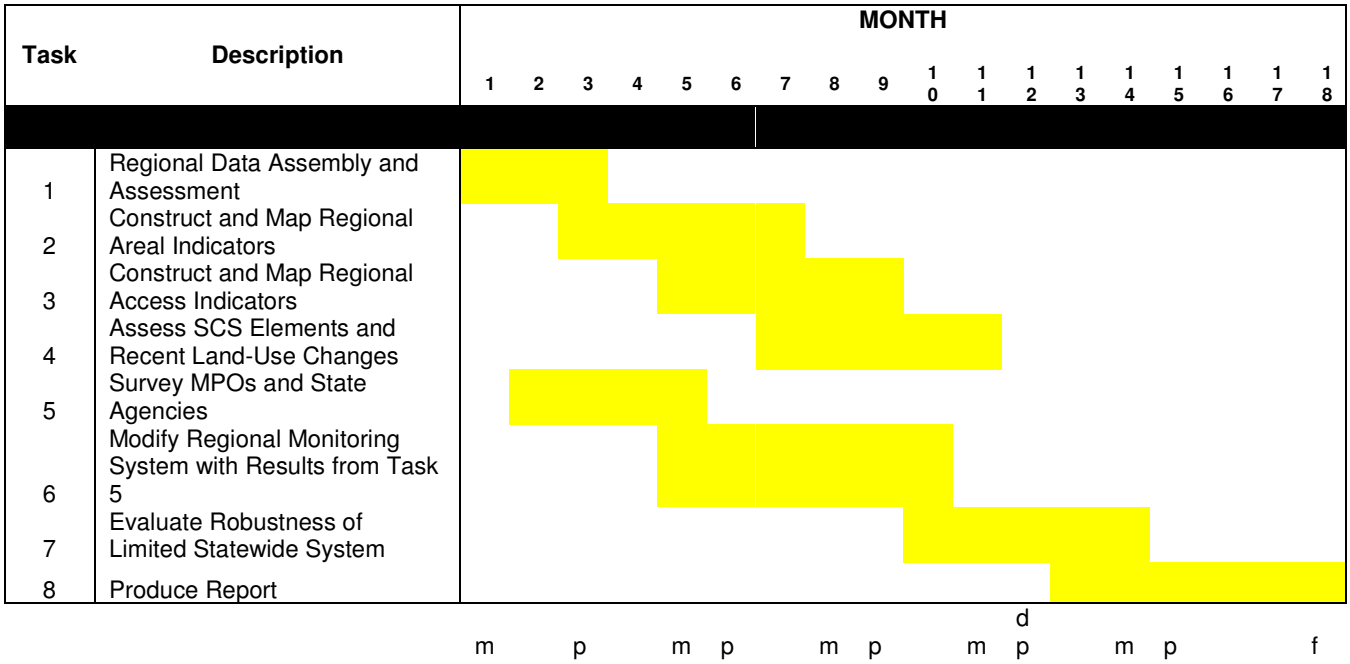
Task 8A: Work with ARB to develop report outline

Task 8B: Produce Draft Report for ARB review

Task 8C: Produce Final Report incorporating agreed upon revisions

PROJECT SCHEDULE

Task 1: Assemble and Assess LA Spatial Data
Task 2: Construct and Map Areal Indicators for LA
Task 3: Construct and Map Access Indicators for LA
Task 4: Use LA Monitoring System to Assess Recent Land-use Changes
Task 5: Survey of MPOs and State Agencies
Task 6: Construct Statewide Monitoring System
Task 7: Compare LA and Statewide Monitoring Systems
Task 8: Produce Report



p=Progress reports will be submitted for previous quarter

d=Draft final report due six months prior to contract expiration date.

f=Final report due three months after comments received on draft final report.

m=Meetings with ARB staff to be held quarterly or upon request.

DELIVERABLES

- Quarterly progress reports and conference calls;
- Draft final report;
- Final report and research seminar in Sacramento;
- All data and analyses generated through the course of this project, subject to any restrictions by originating sources;
- Additional deliverables to be determined in consultation with

ESTIMATED COST BY TASK

It is anticipated this project will be completed in 18 months from the start date. This allows 12 months for completion of all work through delivery of a draft final report. The last 6 months are for review of the draft final report by ARB staff and the Research Screening Committee (RSC), modification of the report by the contractor in response to ARB staff and RSC comments, and delivery of a revised final report and data files to the ARB. The estimated budget for this project is $150,000. See next page for estimated cost by task.

ESTIMATED COST BY TASK (Continued)

Task	Labor	Employee Fringe Benefits	Travel Subsist	EDP	Copy Print Supplies	Misc	Mail Phone Fax	Data	Subtotal	Overhead	Total
1	$17,561	$3,244	$200		$500	$320	$ 185	TBD	$22,010	$2,201	$24,211
2	$15,366	$2,839	$200		$100		$ 185		$18,690	$1,869	$20,559
3	$15,366	$2,839			$100		$ 185		$18,490	$1,849	$20,339
4	$8,781	$1,622	$200		$200		$ 185		$10,988	$1,099	$12,087
5	$13,171	$2,433			$500	$328	$ 185		$16,617	$1,662	$18,278
6	$16,464	$3,042	$200		$200		$ 185		$20,091	$2,009	$22,100
7	$12,074	$2,230			$100		$ 185		$14,589	$1,459	$16,048
8	$10,976	$2,028	$1,000		$400	$300	$ 185		$14,889	$1,489	$16,378
	$109,759	$20,277	$1,800	$ -	$2,100	$948	$ 1,480	$ -	$136,364	$13,636	$150,000

RESUMES

PAUL M. ONG
UCLA School of Public Affairs and Asian American Studies

EDUCATION

1973 B.S. University of California, Davis (Applied Behavioral Science)
1977 M.U.P. University of Washington, Seattle (Urban Planning)
1983 Ph.D. University of California, Berkeley (Economics)

ACADEMIC APPOINTMENTS

1994-	Professor of Urban Planning, UCLA
1997-	Professor of Social Welfare, UCLA
2005-	Professor of Asian American Studies, UCLA
Fall 2010, 2011	Thomas Tam Visiting Professor, CUNY Graduate Center
2011-	Affiliated Professor, UCLA Institute of the Environment and Sustainability
Fall 2011	Visiting Research Professor, NYU

ADMINISTRATIVE APPOINTMENTS

2007-09	Director, UC (System wide) AAPI Policy Multi-campus Research Program
2010-11	Vice Chair, Asian American Studies Department
2013-	Director, Center for the Study of Inequality

UNIVERSITY AND DEPARTMENT COMMITTEE APPOINTMENTS

2007-08	Chair, Director's Search, American Indian Studies Center
2007-08	Faculty Representative, Asian Am. Studies Dep't Executive Committee
2008-09	Chair, Director's Search, Asian American Studies Center
2010-11	Chair, Faculty Executive Committee, Department of Urban Planning
2011-12	Chair, Faculty Executive Committee, School of Public Affairs

COMMUNITY/PROFESSIONAL SERVICE (RECENT AND CURRENT):

Social Science Committee, Poverty and Race Research Action Council, W.D.C., 1993-
Member, Census Data for Transportation Planning, TRB and NRC, 2003-2005.
Technical Advisory Committee, South Coast Air Quality Management District, 2005-07
Advisory Committee, Southern California Association of Government, 2004-07
Research Advisory Committee, Asian Pacific American Legal Center, 2005-09
GAO Advisory Panel on HUD CDBG Allocation Formula, 2006-07
Advisory Committee, Asian Am. Survey, Ca. League of Conservation Voters, 2008-09
Advisory Committee, Public Opinion Survey, Committee of 100, 2008-09.
Member, Environment Justice Advisory Comm., SCAQMD, 2008-11

RESEARCH PROJECTS

Environmental Studies: The SES Impacts of Mobile Sources of Air Pollution (various UCLA sources, 2003-present); Urban Impact on LA River (various UCLA sources, 2006-07).

Urban Social Policy: Transportation Related Racial Inequality (2004-09, UCTC); Spatial Access to Health Care (2007-08, UCLA Center for Research, Education, Training, and Strategic Communication on Minority Health Disparities); Spatial Variation in the Market

for Used Cars (2006-07, UCTC); Housing, Transportation and Earnings (2006-08; UCLA Ziman Center for Real Estate); California's Housing Plan and Policy (2007-09, California Housing and Community Development); Equal Employment Opportunity, Analysis of Labor Availability (2007-09, California Community Colleges); California's Housing Needs to 2025 (2007-09, California Department of Housing and Community Development); Assessment of Impediments to Fair Housing (2010-12, California Department of Housing and Community Development).

Asian American Public Policy: Asian American Institutions and Asset Building (2007-08, Ford Foundation); The Future of Asian American Civic and Political Engagement (2006-08, Leadership Education for Asian Pacifics and Carnegie Foundation); Asian Americans and Contract Set Asides (2007-09, Asian American Justice Center and Ford Foundation); Asian American Lifelong Asset Building (2011-13, Ford Foundation).

PUBLICATIONS(Since 2005)

Journal Articles (Since 2005):

Jordan Rickles and Paul Ong, "The Integrating (And Segregating) Effect Of Charter, Magnet, And Traditional Elementary Schools: The Case of Five California Metropolitan Areas," Journal of California Politics and Policy, 9(1):16-38, June 2005.

Paul Ong, Matthew Graham, and Douglas Houston, "The Policy and Programmatic Importance of Spatial Alignment of Multiple GIS Data Sources," American Journal of Public Health, 96(3):499-504, 2006.

Douglas Houston, Paul M Ong, Jun Wu, and Arthur Winer, "Proximity of Licensed Childcare to Near-Roadway Vehicle Pollution," American Journal of Public Health, 96(9):1611-1617, 2006.

Ward Thomas and Paul Ong, "Race and Space: Hiring Practices of Los Angeles Electronics Firms," Journal of Urban Affairs, 28 (5), 511–526, 2006.

Paul Ong and Don Mar, "Differential Impacts of Immigrants on Native Black and White Workers," American Economic Review, Papers and Proceedings, 97(2):383-387, May 2007.

Paul Ong and Michael Stoll, "Redlining or Risk: A Spatial Analysis of Auto Insurance Rates in Los Angeles" Journal of Policy Analysis and Management, 26(4):811-829, Autumn 2007.

Spetz, Joanne, Jordan Rickles, Susan Chapman and Paul Ong, "Job and Industry Turnover for Registered and Licensed Vocational Nurses," Journal of Nursing Administration, 2008, vol. 38, no9, pp. 372-378.

Jun Wu, Douglas Houston, Fred Lurmann, Paul Ong and Arthur Winer, "Exposure of PM2.5 and EC from diesel and gasoline vehicles in communities near the Ports of Los Angeles and Long Beach, California," Atmospheric Environment, Volume 43, Issue 12, April 2009, pp 1962-1971.

Varisa Patraporn, Deirdre Pfeiffer, and Paul Ong, "Building Bridges to the Middle Class: The Role of Community-Based Organizations in Asian American Wealth Accumulation," *Economic Development Quarterly*, May 14, 2010

Paul Ong and Albert Lee, "Asian Americans and Redistricting: Empowering Through Electoral Boundaries," *AAPI Nexus*, Volume 8, Number 2, pp. 87-108, Fall 2010.

Douglas Houston, Paul Ong, Guillermo Jaimes, and Arthur Winer, "Traffic Exposure near the Los Angeles-Long Beach Port Complex: Using GPS-enhanced Tracking to Assess the Implication of Unreported Travel Locations," Journal of Transportation Geography, Volume 19, Issue 6, November 2011, Pages 1399–1409 (Peer Reviewed Research Article)

Douglas Houston and Paul Ong, "Neighborhood Determinants of Participation in Voluntary Sub-Municipal Governance," Nonprofit and Voluntary Sector Quarterly, August 2012 vol. 41 no. 4 686-703.

Chi-Kan Richard Hung and Paul Ong, "Sustainability of Asian American Nonprofit Organizations in U.S. Metropolitan Areas," Nonprofit and Voluntary Sector Quarterly. December 2012 vol. 41 no. 6 1136-1152 (Peer Reviewed Research)

Paul Ong, " Environmental Justice and Green-Technology Adoption," Journal of Policy Analysis and Management. Volume 31, Issue 3, pages 578–897, Summer 2012 (Peer Reviewed Research Article)

Douglas Houston and Paul Ong, "Arts Accessibility to Major Museums and Cultural/Ethnic Institutions in Los Angeles; Can School Tours Overcome Neighborhood Disparities?,"
Environment and Planning A, 2013, volume 45, pages 728 – 748. (Peer Reviewed Research Article)

Published Papers (since 2005):

Marjorie Kagawa Singer and Paul M. Ong, "The Road Ahead—Barriers and Paths to Improving AAPI Health," Message from the Editors, AAPI Nexus, Winter/Spring 2005.

Deborah Woo and Paul M. Ong, "AAPI Labor Market Status and Challenges," Message from the Editors, AAPI Nexus, Summer/Fall 2005.

Paul Ong, Marjorie Kagawa Singer and Deborah Woo, "Two Foci: 'Glass Ceiling?' and 'Health Data'," Message from the Editors, AAPI Nexus, Winter/Spring 2006.

Karen Umemoto and Paul M. Ong, "Asian American and Pacific Islander Youth: Risks, Challenges and Opportunities," Message from the Editors, AAPI Nexus, Summer/Fall 2006.

Doug Houston, Jun Wu, Paul Ong, and Arthur Winer A. (2006). Down to the Meter: Localized Vehicle Pollution Matters. Access, 29, Fall 2006.

Franklin Odo and Paul Ong, "Art & Cultural Institutions and AAPI Communities," Message from the Editors, AAPI Nexus, Winter/Spring 2007.

Paul Ong, “A Commitment to Building Bridges,” Message from the Editors, AAPI Nexus, Summer/Fall 2007, pp. v-vii.

Paul Ong, Melany Dela Cruz-Viesca, and Don Nakanishi, “Awakening the New ‘Sleeping Giant’?: Asian American Political Engagement,” AAPI Nexus, Spring 2008, pp. 1-10.

Paul Ong and Megan Emiko Scott, “Asian American civic and political engagement: Patterns, Challenges and Potentials,” Asian American Policy Review, Volume 18, 2009.

Varisa Patraporn, Paul Ong and Doug Houston, “Closing the Asian-White Wealth Gap?”, Asian American Policy Review, Volume 18, 2009.

Paul Ong, “Defensive Naturalization and Anti-Immigrant Sentiment: Chinese Immigrants in Three Primate Metropolis,” *Asian American Policy Review*, Volume 21, pp. 39-56, 2010-11.

Paul Ong, “Challenges in Analyzing and Tracking Asian American Pacific Islander Economic Conditions,” AAPI Nexus, Spring 2011, pp. 53-57. (Essay)

Books (Since 2005):

Paul Ong and Anastasia Loukiatou-Sideris, editors, Jobs and Economic Development in Minority Communities, Temple University Press, 2006.

Paul Ong and Anastasia Loukiatou-Sideris, “Jobs and Economic Development in Minority Communities,” pp. 1-12.

Douglas Houston and Paul M. Ong, “Impacts of the New Social Policy Regime, 40-62”

Ted Jojola and Paul Ong, “Indian Gaming As Community Economic Development, pp. 213-231.

Anastasia Loukaitou-Sideris and Paul Ong, “Lessons for Community Economic Development,” pp. 295-299.

Paul Ong, Editor. The State of Asian American: Trajectory of Civic and Political Engagement, Leadership Education for Asian Pacifics (LEAP) and UC AAPI Policy MRP, 2008.

Paul Ong and Megan Emiko Scott, “Introduction, Asian American Civic and Political Engagement,” pp. 1-27.

Chapters in Books (Since 2005):

Shannon McConville and Paul Ong, "The Trajectory of Poor Neighborhoods in Southern California, 1970-2000," in Alan Berube, Bruce Katz, and Robert E. Lang, editors, Redefining Urban and Suburban American, Brookings Institution Press, 2005, pages 173-194.

Paul Ong, “Trouble in Paradise: The Economic Marginalization of Native Hawaiians,” in Jessica Gordon Nembhard and Rhonda Williams, editors, Wealth Accumulation and Communities of Color in the U.S., University of Michigan, 2006, pp. 155-172.

Paul Ong and R. Varisa Patraporn, “Asian Americans and Wealth,” in Jessica Gordon Nembhard and Rhonda Williams, editors, Wealth Accumulation and Communities of Color in the U.S., University of Michigan, 2006, pp. 173-190.

Paul Ong and Veronica Terriquez, V., "Can Multiple Pathways Offset Inequalities in the Urban Spatial Structure?" in Oakes, J. & Saunders, M., (Eds)., Beyond Tracking: Multiple Pathways to College, Career, and Citizenship, Harvard Education Publishing, Cambridge, MA, 2008.

Jordon Rickles and Paul M. Ong, “Effects Of Wage And Hour Law Enforcement On Informal Work,” in Enrico Marcelli and Colin Williiams editors, Informal Work in Developed Nations, Routledge, 2010, 153-167.

Essays in Anthologies and Monographs (Since 2005):

Paul Ong, “Spatial Mismatch,” Roger Caves, editor, Encyclopedia of the City, U.K.: Routledge, 2005, pp. pp. 424-425.

Jordan Rickles, Paul Ong and Joanne Spetz, “California Policy Options: Supplying California’s Need for Nurses,” in California Policy Options 2005, edited by Daniel J. B. Mitchell, UCLA School of Public Policy and Social Research and UCLA Ralph and Goldy Lewis Center for Regional Policy Studies, 2005, pp. 101-116.

Kim Haselhoff and Paul Ong, “Southern California Survey 2006: Residents are Concerned About Environmental Quality,” in California Policy Options 2007, edited by Daniel J. B. Mitchell, UCLA School of Public Policy and Social Research and UCLA Ralph and Goldy Lewis Center for Regional Policy Studies, 2007.

Paul M. Ong And Kim Haselhoff, “Southern California Survey, 2005,” in Los Angeles 2005: The State of the City, Pat Brown Institute, CSU Los Angeles, 2006, pp. 1-6.

Paul Ong, “Brain Drain,” in Robertson, Roland and Jan Aart Scholte, editors, Encyclopedia of Globalization, New York: Routledge, 2007, pp. 104-106.

Sofya Bagdasaryan, Paul Ong, Melany Dela Cruz-Viesca, Cheol-Ho Lee, and Theresa Firestine, “California Community Colleges Availability Data Research Project,” California Community Colleges, 2008, 192 pages.

Paul Ong, Silvia Jimenez, Karissa Yee and Linda Hui, “Neighborhood Assessment of Park Mesa Heights,” UCLA School of Public Affairs, 2010, 101 pages.

Lead researcher, “Analysis of Impediments to Fair Housing (AI),” California Department of Housing and Community Development, September 2012, 700+ pages. http://www.hcd.ca.gov/hpd/hrc/rep/fed/ai_web.html

MICHAEL C. LENS

UCLA Luskin School of Public Affairs, Department of Urban Planning

CURRENT APPOINTMENTS

UCLA, Luskin School of Public Affairs, Department of Urban Planning

Assistant Professor, 2011 to present

UCLA, Luskin School of Public Affairs, Lewis Center for Regional Policy Studies

Associate Director, 2013 to present

UCLA, Ziman Center for Real Estate

Affiliated Faculty, 2012 to present

New York University, Furman Center for Real Estate and Urban Policy

Affiliated Faculty, 2011 to present

EDUCATION

New York University, Wagner Graduate School of Public Service

Doctor of Philosophy in Public Administration, 2011

Master of Philosophy in Public Administration, 2009

University of Michigan, Ford School of Public Policy

Master of Public Policy, 2003

Macalester College

Bachelor of Arts in Political Science, 2000

REFEREED PUBLICATIONS

Lens, Michael. 2014. "Job Accessibility Among Housing Subsidy Recipients." *Housing Policy Debate* 24(4): 671-691.

Best Paper of 2013-14, *Housing Policy Debate*.

Lens, Michael. 2014. "The Impact of Housing Vouchers on Crime in U.S. Cities and Suburbs." *Urban Studies* 51(6): 1274-1289.

Lens, Michael. 2013. "The Limits of Housing Investment as a Revitalization Tool: Crime in New York City." *Journal of the American Planning Association* 79(3): 211-221.

Best Paper of Volume 79*, Journal of the American Planning Association*.

Lens, Michael. 2013. "Safe, but Could Be Safer: Why Do Voucher Households Live in Higher Crime Neighborhoods?" *Cityscape* 15(3): 131-152.

Lens, Michael. 2013. "Subsidized Housing and Crime: Theory, Mechanisms, and Evidence." *Journal of Planning Literature* 28(4): 352-363.

Ellen, Ingrid Gould, Michael C. Lens, and Katherine M. O'Regan. 2012. "American Murder Mystery Revisited: Do Housing Voucher Households Cause Crime?" *Housing Policy Debate*, 22(4): 551-572.

Lens, Michael C., Ingrid Gould Ellen, and Katherine M. O'Regan. 2011. "Do Vouchers Help Low-Income Households Live in Safer Neighborhoods? Evidence on the Housing Choice Voucher Program." *Cityscape*, 13(3): 135-159.

RESEARCH GRANTS

Principal Investigator (with Tracy Gordon, Paavo Monkkonen, and Larry Rosenthal):"Irrational Exuberance at City Hall: Local Government Resilience During Housing Booms and Busts." Funded by The MacArthur Foundation, 2013-Present ($610,000, direct costs).

Principal Investigator: "Land-Use Regulation, Housing Market Dynamics, and Economic Segregation," Funded by UCLA Ziman Center for Real Estate, 2012-Present ($4,000, direct costs).

Principal Investigator:"Job Accessibility Among Housing Subsidy Recipients." Funded by UCLA Faculty Senate Council on Research, 2013-Present ($9,681, direct costs).

Principal Investigator: "Land-Use Regulation, Housing Market Dynamics, and Economic Segregation," Funded by UCLA Office of Diversity and Faculty Development, 2013-Present ($7,500, direct costs).

Principal Investigator: "Is Crime Bad for Business?" Funded by UCLA Ziman Center for Real Estate, 2012-2013 ($7,943, direct costs).

INVITED LECTURES

"Job Accessibility Among Housing Subsidy Recipients." University of Southern California Lusk Center Research Seminar, October 2013.

"Job Accessibility Among Housing Subsidy Recipients." University of Washington, West Coast Poverty Center Research Seminar, October 2013.

"Land-Use Regulation and Income Segregation." Stanford University Center for Poverty and Inequality New Scholars Conference, September 2013.

"Affordable Housing Production and Neighborhood Crime: Evidence from New York City." University of Southern California Lusk Center Research Seminar, October 2011.

"Affordable Housing Production and Neighborhood Crime: Evidence from New York City." UCLA Luskin Department of Urban Planning, February 2011.

"Affordable Housing Production and Neighborhood Crime: Evidence from New York City." MDRC, February 2011

"Affordable Housing Production and Neighborhood Crime: Evidence from New York City." Wayne State Department of Urban Studies, January 2011.

"Affordable Housing Production and Neighborhood Crime: Evidence from New York City." Cal Poly San Luis Obispo Department of Political Science, January 2011.

"Do Vouchers Help Low-Income Households Live in Safer Neighborhoods? Evidence on the Housing Choice Voucher Program." Urban Institute, December 2010.

"Do Vouchers Help Low-Income Households Live in Safer Neighborhoods? Evidence on the Housing Choice Voucher Program." Claremont Graduate University, December 2010.

"Do Vouchers Help Low-Income Households Live in Safer Neighborhoods? Evidence on the Housing Choice Voucher Program." Kansas University Department of Public Administration, November 2010.

UNIVERSITY TEACHING EXPERIENCE

UCLA Luskin School of Public Affairs, Department of Urban Planning, Quantitative Analysis in Urban Planning II (UP 220B), core required, Winter 2014**;** Housing Markets and Policy (UP 219), Spring 2012, Winter 2013**;** Introduction to Research Design (UP 208B), core required, Spring 2012, Spring 2013**;** Community Service Learning in Planning (UP 185SL), core required, Spring 2013

New York University, Wagner Graduate School of Public Service; Multiple Regression and Introduction to Econometrics, Summer 2007, Summer 2008, Summer 2009

University of Michigan, Ford School of Public Policy; South Africa Distance Learning Project, Spring 2003

CONFERENCE PRESENTATIONS

Association for Public Policy and Management Fall Annual Conference, 2009-2013

Urban Affairs Association Annual Conference, 2011, 2013

American Real Estate and Urban Economics Association, 2012

Association for Collegiate Schools of Planning Annual Conference, 2010-2011

North American Meetings of the Regional Science Association International, 2010

New York City Administration for Children's Services, 2007

Coalition for Juvenile Justice Annual Meeting, 2007

New York State Juvenile Justice Symposium, 2007

PROFESSIONAL ASSOCIATION MEMBERSHIP

Association for Public Policy and Management, 2008 - present

American Planning Association, 2011 - present

Urban Affairs Association, 2013 – present

PROFESSIONAL SERVICE

Ad-Hoc Reviewer: *Cityscape, Crime and Delinquency, Environment and Planning A, Housing Policy Debate, Housing Studies, International Journal of Comparative and Applied Criminal Justice, International Journal of Housing Policy, Journal of the American Planning Association, Journal of Urban Affairs, Journal of Policy Analysis and Management, Journal of Regional Science, Urban Affairs Review, Urban Studies*

PREVIOUS APPOINTMENTS

New York University, Furman Center for Real Estate and Urban Policy, Doctoral Fellow, 2008 to 2011

Vera Institute of Justice. Research Associate, 2005 to 2008

Community Health Association of New York State, Director of Planning and Development, 2004 to 2005

Texas Department of Health, Research Associate, 2003 to 2004

AWARDS AND FELLOWSHIPS

New York University Postdoctoral Transition Program for Academic Diversity Fellowship, 2010-2011

Doctoral Dissertation Research Grant, U.S. Department of Housing and Urban Development, 2009-2010

New York University, Doctoral Scholarship: Full Tuition, *Distinction in Comprehensive Examination: Policy*

University of Michigan, Rackham Masters Fellowship: Full Tuition and Stipend

Macalester College, St. Paul Companies Scholarship

PAAVO MONKKONEN

UCLA Luskin School of Public Affairs, Department of Urban Planning

EDUCATION

PhD in City and Regional Planning, The University of California, Berkeley, December 2009
Master of Public Policy, The University of California, Los Angeles, May 2005
BA in Classical Civilizations, The University of California, Berkeley, May 2000

ACADEMIC EXPERIENCE

Assistant Professor, Dept. of Urban Planning, UCLA (2012 – present)
Assistant Professor, Dept. of Urban Planning and Design, Hong Kong University (2009 – 2012)

REFEREED PUBLICATIONS

Kok, Nils, Paavo Monkkonen and John M. Quigley. 2014. Land-use Regulations and the Value of Land and Housing: An Intra-Metropolitan Analysis. *Journal of Urban Economics*, 81(3) 136-148.

Monkkonen, Paavo, and Xiaohu Zhang. 2014. Innovative Measurement of Spatial Segregation: Comparative Evidence from Hong Kong and San Francisco. *Regional Science and Urban Economics*, 47(3): 99-11.

Monkkonen, Paavo, and Joanna Li. 2014. The Value of Property Management Services: An Experimental Survey. *Property Management***,** 32(3): 213-223.

Monkkonen, Paavo. 2014. La deindustrialización y la cambiante estructura espacial de Hong Kong, China [Deindustrialization and the changing spatial structure of Hong Kong, China]. *INTERdisciplina*, 2(2): 179-204.

Monkkonen, Paavo, and Lucas Ronconi. 2013. Land-Use Regulations, Compliance and Land Markets in Argentina. *Urban Studies*, 50(10): 1951-1969.

Monkkonen, Paavo. 2013. Housing Deficits as a Frame for Housing Policy: Demographic Transition, Economic Crisis and Household Formation in Indonesia. *International Journal of Housing Policy*, 13(3): 247-267.

Monkkonen, Paavo. 2013. Urban Land-Use Regulations and Housing Markets in Developing Countries: Evidence from Indonesia on the Importance of Enforcement. 2013. *Land-use Policy*, 34: 255-264.

Monkkonen, Paavo. 2012. Housing Finance and Increasing Socioeconomic Segregation in Mexico. *International Journal of Urban and Regional Research,* 36(4): 757-772.

Monkkonen, Paavo. 2012. Medición de niveles y patrones de segregación en el sistema urbano de México [Measuring Levels and Patterns of Segregation in the Mexican Urban System]. 2012. *EURE - Revista Latinoamericana de Estudios Urbano Regionales*, 38(114): 124-146.

Monkkonen, Paavo, Kelvin SK Wong and Jaclene Begley. 2012. Economic Restructuring, Urban Growth, and Short-term Trades: The Spatial Dynamics of the Hong Kong Housing Market, 1992-2008. *Regional Science and Urban Economics*, 42(3): 396-406.

Monkkonen, Paavo. 2012. The Demand for Land Regularization: Theory and Evidence from Tijuana, Mexico. *Urban Studies,* 49(2): 270-287.

Monkkonen, Paavo. 2011. The Housing Transition in Mexico: Expanding Access to Housing Finance. 2011. *Urban Affairs Review*, 47(5): 672-695.

Monkkonen, Paavo. 2011. Are Mexican Cities Sprawling? Housing Finance and Changing Urban Spatial Structure. *Urban Geography*, 32(3): 406-423.

Monkkonen, Paavo, and Alex Schafran. 2011. Beyond Chapala and Cancun: Grappling with the Impact of American Migration to Mexico. *Migraciones Internacionales*, 6(2): 221-256.

Monkkonen, Paavo, and Jeffrey Vincent. 2010. The Impact of State Regulations on the Costs of Public School Construction. *Journal of Education Finance,* 35(4): 313-330.

Monkkonen, Paavo. 2008. Using Online Satellite Imagery as a Research Tool: Mapping Changing Patterns of Urbanization in Mexico. *Journal of Planning Education and Research,* 28: 225-236.

Dowall, David E. and Paavo Monkkonen. 2008. Dense and Expanding: Urban Development and Land Markets in Chennai, India. *International Real EstateReview,* 11(2): 142-165. (with)

Mukhija, Vinit and Paavo Monkkonen. 2007. What's in a Name? A Critique of 'Colonias' in the United States. *International Journal of Urban and RegionalResearch,* 31(2): 475-88. (with Vinit Mukhija)

Dowall, David E. and Paavo Monkkonen. 2007. Consequences of the Plano Piloto: Urban Land Markets in Brasília. *Urban Studies,* 44(12): 1871-1887.

Mukhija, Vinit and Paavo Monkkonen. 2006. Federal Colonias Policy in California: Too Broad and too Narrow. 2006. *Housing Policy Debate,* 17(4): 755-80.

BOOK CHAPTERS

Monkkonen, Paavo, and Lucas Ronconi (Forthcoming) Comparative Evidence on Urban Land-use Regulation Bureaucracy in Developing Countries. In Birch, E., Chattaraj, S., and Wachter, S. (eds.) *Informal Real Estate Markets*. Philadelphia, PA: University of Pennsylvania Press.

Monkkonen, Paavo, and John M. Quigley. 2012. The Spatial Consequences of Autarky in Land-Use Regulation: Strategic Interaction or Parallelism? In Frenkel, A., Nijkamp, P., and McCann, P. (eds.), *Societies in Motion: Regional Development, Industrial Innovation and Spatial Mobility*. Northampton, MA: Edward Elgar.

Bitran, Ricardo, Ursula Giedion, Rubi Valenzuela, and Paavo Monkkonen. 2005. Keeping Healthy in an Urban Environment: Public Health Challenges for the Urban Poor. In Fay, M. (ed.), *The Urban Poor in Latin America*, Washington, DC: The World Bank.

WORKING PAPERS

Monkkonen, Paavo, and Lucas Ronconi. 2012. Land-use Regulations and Urbanization in Asia and Latin America. Global Development Network Working Paper.

Monkkonen, Paavo. 2011. Public Housing and Unemployment: Skills and Spatial Mismatch in Postindustrial Hong Kong. Working Paper 2011-05, Institute of Urban and Regional Development, UC Berkeley.

REPORTS AND SHORT ARTICLES

Mexico 2015: Transforming Urban Policy & Housing Finance, OECD Urban Policy Review. (Contributing author)

Area Cartograms in Urban Planning Research: Visualizing Data in a High-Density City. 2011. *Planning and Technology Today,* 101, 4.

Editorial: Controversial Land Policies in China: The Concentration of Benefits and Costs. 2011. *Asia Pacific Network for Housing Research Newsletter*, December, 1-2.

Editorial: Housing Markets with Chinese Characteristics. 2011. *Asia Pacific Network for Housing Research Newsletter*, June, 2.

Getting Less but Paying More: Housing and Services for Low-Income Households in Indonesia. 2010. *Indonesia Economic Quarterly,* December, 31-34.

Editor's Note on a Special Issue: Las Californias. 2008. *Berkeley Planning Journal* 21, 5-11.

Measuring Land-use Regulation: A Report to the MacArthur Foundation. (with Corie Calfee, John M. Quigley, Stephen Raphael, Larry A. Rosenthal and Joseph Wright). 2007. Professional Report No. P07-002 Part 2, Berkeley Program on Housing and Urban Policy Professional Report Series.

RESEARCH GRANTS

Principal Investigator, "Irrational Exuberance at City Hall: Local Government Resilience during Housing Booms and Busts," funded by the John D. and Catherine T. MacArthur Foundation, 2013-2016 ($610,000)

Principal Investigator, "Where do Property Rights Matter More? Explaining the Variation in Demand for Property Titles in Mexico," Lincoln Institute of Land Policy, 2013-2014 ($28,000)

Principal Investigator, "Suburbanization and the Changing Geographic Scale of Spatial Segregation in Mexico," funded by the Regional Studies Association, 2013-2015 ($14,000)

Principal Investigator, "Economic Growth, Urbanization, and Household Formation: A Global Comparison," Funded by the Ziman Center at UCLA, 2013-2014 ($5,000)

Principal Investigator, "Empty Houses across North America: Explaining the Vacancy Crisis in Mexico," funded by the UCLA Council on Research, 2013-2014 ($8,700)

Principal Investigator, "Regulations and the Quality of Urbanization in Asia and Latin America: Housing, Productivity, and Human Capital," funded by the Global Development Network and the Inter-American Development Bank, 2012-2013 ($35,000)

Principal Investigator, “Urbanization, Demographic Change and Housing in Asia,” funded by the University of Hong Kong, Seed Funding for Basic Research, 2011-2012 ($8,000)

Principal Investigator, “Segregation or Sorting? The Causes and Consequences of Hong Kong’s Socio-Spatial Structure,” Hong Kong Public Policy Research Fund, 2010-2012 ($80,000)

Principal Investigator, “Land Markets in the Peripheries of Three Argentine Cities,” funded by the Inter-American Development Bank, 2010-2011 ($45,000)

Principal Investigator, “An Empirical Study of the Spatial Dynamics of the Hong Kong Housing Market,” funded by the University of Hong Kong, Seed Funding, 2009-2010 ($15,000)

Principal Investigator, “The Housing Transition in Mexico: Local Impacts of National Housing Policy,” funded by the UC MEXUS Dissertation Research Grant, 2008-2009 ($12,000)

PROFESSIONAL EXPERIENCE

Consultant, The World Bank. Analytical work on urban spatial structure and economic development for the Mexico Urbanization Review (Summer, 2014-Winter, 2015)

Consultant, The World Bank. Advising on the structure and content of an online course on land markets in developing countries (Summer, 2014)

Consultant, Organization for Economic Cooperation and Development (OECD). Report on vacant housing in Mexico (Winter, 2014)

Consultant, Airbnb. Review of housing market study and internal white paper on the housing market impacts of short-term rentals (Winter, 2014)

Consultant, The World Bank. A proposal for the Mexico Urbanization Review (Winter, 2014)

Consultant, The Asian Development Bank. Review of a report on urban sustainability (Winter, 2014)

Consultant, The World Bank. Preparation of a survey instrument for land and housing market analysis in Asia (Fall, 2012)

Consultant, The World Bank. A survey of housing finance in Asia (Fall, 2012)

Consultant, The World Bank. Advising the Government of the Philippines on low-income housing finance and slum redevelopment in Metro Manila (Fall, 2011)

Consultant, The World Bank. A study of housing affordability in China (Fall, 2011)

Consultant, The World Bank. Principal researcher on a study of the housing sector to support a national framework for housing policy in Indonesia (Spring, 2010–Fall, 2011)

Team Member, Community Project Workshop, The University of Hong Kong. Urban planning section of an Aspiration Study for the District Councils of Tsuen Wan and Kwun Tong (Fall, 2009)

Consultant, Energía Sustentable, Tijuana, México. Mapping and data analysis for the development of a wind energy project (2007-2008)

Local Consultant for Tijuana, Mexico,Urban Growth Management Initiative, World Bank and Williams College. Collection of basic data on urban development (Summer, 2005, and Spring, 2006)

Research Assistant, Institute of Urban and Regional Development, UC Berkeley. Various research projects (2005-2009)

Research Assistant, Department of Urban Planning, University of California, Los Angeles. Various research projects (2003-2005)

Summer Intern, The World Bank; Latin America and the Caribbean; Finance, Infrastructure and Private Sector Development. Various research and writing duties (Summer 2004)

Assistant Housing Advocate, The Arc San Francisco. Research and advocacy for housing and independent living of people with developmental disabilities (2000-2001)

AWARDS AND FELLOWSHIPS

Hellman Fellow, UCLA, 2014-2015 ($25,000)

Faculty Career Development Award, UCLA, 2014-2015 ($5,000)

Hiroshi Wagatsuma Memorial Fellowship, UCLA, 2013-2014 ($4,800)

David C. Lincoln Fellowship, Lincoln Institute of Land Policy, 2012-2013 ($28,000)

Aareal Award for Excellence in Real Estate Research, Best Dissertation, 2010 ($6,000)

Finalist, IPUMS Student Paper Award, University of Minnesota, 2009

Finalist, Charles Tiebout Student Paper Award, Western Regional Science Association, 2009

Benjamin Stevens Fellowship, Regional Science Association, 2008-2009 ($25,000)

Fullbright-Hays Dissertation Research Abroad, 2008-2009 ($12,000)

Michael B. Teitz Student Paper Award, UC Berkeley, 2007 ($2,000)

Graduate Division Summer Research Grant, UC Berkeley, 2007 ($3,000)

Tinker Latin American Studies Summer Research Grant, UC Berkeley, 2007 ($500)

Institute of Global Cooperation and Conflict Summer Fellowship, UCSD, 2004 ($3,500)

Hal E. Martin Fellowship, UCLA, 2003 ($11,000)

David and Marianna Fisher Fellowship, UCLA, 2003-2004 ($6,000)