

**RECENT DOCTORAL DISSERTATIONS****Local Government Roles in Water Conservation****by Caitlin Dyckman****Fall 2005****Abstract**

This dissertation focuses on the roles of local government in successfully mandating and implementing water conservation mechanisms. While water supply planning has been the traditional purview of water districts in many states and countries, a number of factors are converging to thrust water supply responsibility on local government. This research explores the following questions: (1) what role(s) have local governments effectively assumed in encouraging and/or causing water conservation within their jurisdictions? (2) How have local governments applied conservation to existing homeowners and how have homeowner associations impeded or assisted these efforts? (3) What effects do a household's landscape aesthetic, conservation knowledge, positions on market versus regulation, and environmental beliefs have on household water consumption levels? (4) What are the implications of current planning practices with respect to water conservation and where should there be improvements?

To answer these questions, the dissertation employs an economic and legal literature review; key informant interviews with planners, homeowner association boards, water districts, and developers in the case study areas of Santa Rosa, CA, the Irvine Ranch Water District service area and the Long Island Pine Barrens in New York; and an individual household-level survey administered in Santa Rosa, CA combined with associated household water consumption data. The research reveals that planners are playing an increasingly important role in water conservation because planning has the tools to both incentivize and to require water conservation as part of ongoing land use regulation.

Water conservation is being encouraged through an integrated program of semi-permanent water conserving hardware and fixtures, lot size constraints, and landscape designs that minimize outdoor water use. The individual choice to conserve is influenced by landscape aesthetic ("lawn lust"), income, demographics, the homeowner's ethics, and whether the home is part of a homeowners association. Well-crafted plans and ordinances can integrate measures and strategies in locally-appropriate amalgamations that allow planners to guide their communities toward a healthy future despite water constraint. It is recommended that future planning efforts

integrate public education, incentives and regulations with a particular focus on outdoor water use and conservation options.

## **The Effects of Teleshopping on Travel Behavior and Urban Form**

**by Christopher Ferrell**  
**Fall 2005**

### **Abstract**

This dissertation employs structural equation modeling (SEM) techniques to explore the tradeoffs people make when engaging in teleshopping activities from home. Using the Bay Area Travel Survey (BATS) 2000 this dissertation performs an activities analysis to investigate these relationships. Time use variables are included that predict the amount of time each individual spends during the day on work, maintenance, discretionary, and shopping activities, both in and outside of the home. These activities are used to predict the amount of shopping travel each person undertook. Results suggest that people substitute home teleshopping time for shopping travel time, and teleshoppers take fewer shopping trips and travel shorter total distances for shopping purposes. However, these effects are mainly “indirect” and appear to be mediated through two time-use variables – In-Home Maintenance and In-Home Discretionary activities. Home teleshoppers tended to spend more time on In-Home Maintenance and less on In-Home Discretionary activities than non-home teleshoppers.

Variables constructed to represent the degree to which people are “time-starved” from the demands of their work and maintenance activities revealed that female heads of households tend to home teleshop more, make more shopping trips and shopping trip chains, shop out-of-home more, and shop travel for longer periods than the rest of the survey population. A variable constructed to measure each survey participant household’s accessibility to shopping opportunities suggests that people who live in high retail accessibility areas tend to home teleshop slightly (but statistically significantly) more, take more shop trips, make more shop trip chains, and travel shorter total distances for shopping purposes than those who live in lower accessibility neighborhoods.

These results suggest that home teleshopping is primarily used as a tool to restructure a person’s daily activities participation, which in turn, restructures a person’s shop travel behavior. The degree to which someone is time-starved – particularly, female head of households – appears to play a role in determining the propensity to home teleshop as does a person’s

relative accessibility to retail opportunities. While confirmatory analysis is necessary, these results suggest that activity-based travel demand models would benefit from the inclusion of home teleshopping, time-starved, and retail accessibility variables.

## **The Making and Un-Making of the San Francisco–Oakland Bay Bridge: A Case in Megaproject Planning and Decisionmaking**

**by Karen Frick**  
**Fall 2005**

### **Abstract**

After over a decade of debate, construction of the San Francisco–Oakland Bay Bridge’s eastern span finally began in 2002 at a current approximate cost estimate of \$6 billion. The intense and controversial debate ranged from whether the bridge should be seismically retrofitted or replaced, how it should be designed, where it should be located, and how it should be funded. Decisions on these issues provided fertile ground for a highly contested process as public agencies at every level of government and mobilized groups and citizens participated and significantly altered the decisionmaking process. The design process also signified a fundamental change in how state and regional agencies plan and manage projects of this magnitude. This dissertation provides a detailed history and analysis of the new span’s state and regional decisionmaking processes.

To guide this case study of a major transportation infrastructure project (also known as a “megaproject”), the research questions addressed are: What are the key characteristics and issues of debate for a major infrastructure project, such as the new Bay Bridge, and how do these impact policy decisions and project outcomes? These questions were designed to set the Bay Bridge case within a larger theoretical context while at the same time allowing the analysis to be of practical interest. This research contributes to the literature by knitting together the themes of megaproject planning, problem definition, agenda setting and policy implementation, as well as the “technological sublime,” which details how large scale projects capture the public’s attention and imagination. For the analysis, a megaproject typology and a conceptual framework focusing on megaproject characteristics and results are developed and applied to the Bay Bridge case. Lastly, several recurring themes throughout the bridge’s development process are examined, including substantial conflicts over the project’s purpose and definition; varying perceptions of crisis; and, disputes over accountability for cost overruns and delay that impeded the project’s implementation.

## **Low-Income Communities in the Information Age: Technology, Development and Community Practice**

**by Blanca Gordo**  
**Fall 2005**

### **Abstract**

The digital divide reflects the difference between institutional-level Websites and the individual-level exclusions from opportunities to participate, compete and prosper in today's knowledge-based economies. As the ability to manipulate this information technology becomes more crucial, the negative result for those excluded is digital destitution. More solid theoretical frameworks and socio-economic metrics are needed to assess the effects of the digital divide and civic interventions for public policy. Special attention is given to the collective organization of community technology agents, which seek to support public access to modern social and technical infrastructures as a safety net to ensure competence and fairness. This is an empirical in-depth case study about the strategy, work process and governance structure of the "Plugged In" experiment in the poorest part of the Silicon Valley—a model for development with public and private funding support. The public services that it provides are aimed at low-income communities at the grassroots level in East Palo Alto, an urban pocket of poverty in the region. This project works towards preparing populations to meet social and market demand within a high technology metropolis. Innovative programs afford these users the opportunity to experiment and develop expertise to overcome conditions of poverty and inequality. A culture of innovation is one factor that contributes to the community-based organization's success in attaining funds despite high levels of competition and uncertainty. Reciprocal network relations are critical when resources are few.

This dissertation discusses and interrelated problem with three topic areas: 1) A new form and process of inequality begins in digital destitution caused by technology disparity, and seen in unequal ownership rates in society, which arise with the integration of network technology into the productive functions of society in the knowledge economy; 2) The type of community-level strategies underway and their specific roles in addressing the "digital divide"; 3) One community-level governance structure which has the potential to sustain efforts that address and may reverse the negative externality of this social problem.

The thesis posits that the community technology development agency is able to create a complex set of technology based social services, designed to support the development goals of the community it serves, through an

innovative and organized collective of agents for positive social change. The Plugged In experiment maintains its competitive edge and advances under economic recession that runs alongside institutional crisis because it employs a cycle of innovation that continuously refines community technology development programs that meet economic and social demand of end users. This strategic network partnership, whose work process and productive relations are sustained by technology related efficiency, across space, is maintained by a shared culture of innovation, collaboration, reciprocity and flexibility.

The contribution of this study is the drawing of a theoretical framework with concepts for socio-economic metrics that can lead to the collection of information data by institutions to help assess the effects of public policy programs and in so doing, refine social systems of public intervention.

## **A Case Study of Pedestrian Space Networks in Two Traditional Urban Neighborhoods, Copenhagen, Denmark**

**by Neil Hrushowy  
Spring 2006**

### **Abstract**

Most pedestrian environment and behavior research has applied concepts of connectivity and access uniformly at the neighborhood scale. Actual pedestrian networks rely on a limited number of routes to provide intra- and inter-neighborhood pedestrian connections, suggesting the need to focus research. Also, much of the literature has proposed improvements to the built environment that have little relation to the planning system's ability to implement them.

This research aims to assess the applicability of a network approach to pedestrian planning. It includes two case studies of comparable neighborhoods in Copenhagen, Denmark. One neighborhood has a robust pedestrian space network rich with choice, while the other has a fragmented network that limits pedestrian route choice.

A randomized survey of 600 households collected data on walking behavior and perceptions of the pedestrian environment. Also, 17 in-person interviews were conducted with residents to understand how attitudes and pedestrian opportunities influenced walking behavior.

This research also explored the role of Copenhagen's political culture of planning in building and maintaining robust pedestrian space networks. The theme of state-market balance of power and its relevance to pedestrian

policy implementation was explored through over 20 interviews with planners, politicians and private developers, as well as a detailed study of planning documents.

Survey results found that residents living in a robust pedestrian space network walked to a greater number of local destinations and a broader range of destination types. The relationship held for optional trips to social destinations. Residents living in a more robust pedestrian environment had a larger social network, suggesting neighborhood design can influence social interaction.

The in-person interviews illustrated how residents chose routes through their neighborhood, what constituted a barrier to pedestrian movement, and how social barriers affected the desirability of destinations that seemingly meet standard urban design criteria.

The political culture research demonstrated that economic constraints place stress on any planning system. A planning system that enjoys consistent political and financial support from elected officials, however, was found to have a superior ability to respond to collective challenges and develop innovative solutions. Further, the enhanced ability to implement policy appears associated with a more reflective approach to planning that encourages planners to enhance their skills and knowledge over time.

## **Great Neighborhoods: The Livability and Morphology of High Density Neighborhoods in Urban North America**

**by Michael Larice**

**Fall 2005**

### **Abstract**

Alongside sustainability, the concept of livability is one of the driving visions of early 21<sup>st</sup> Century city planning. The term is widely used in practice but lacks convergence on a single definition due to its relativistic nature and its use as an ensemble concept that aggregates a variety of ideas about place-based quality of life. This dissertation explores the concept of livability through a grounded theory approach to use of the term in practice. Further than theory creation, grounded theory was useful in identifying definitional attributes, which could then be operationalized as a method of assessing the livability and morphology of neighborhoods in the United States and Canada. After thematic coding of historic, academic, theoretical and practical literature on the topic of urban livability, a set of definitional attributes was determined that could then be used to

focus attention on local challenges in improving livability in dense urban neighborhoods. These livability attributes included: sufficient density to support services, walkability, balanced transportation modes, mixed land uses, housing choice and affordability, well-programmed leisure space amenities, a sense of place, and a locally relevant means for addressing neighborhood challenges and threats. The research adopted a place-based approach in assessing unique neighborhood contexts, and found that issues of everyday life and the functioning of place for diverse needs are at the heart of livability practice.

Comparative multi-case study work was undertaken to test the operationalization of these livability attributes. Analyzing urban gross densities longitudinally from 1940-2000 in the 50 most populous cities in the US, and GIS mapping the distribution of housing densities from the 1990 census helped in the identification of case study neighborhoods. After scoping possible cases, twelve dense neighborhoods were selected and grouped historically into two groups of six: traditional neighborhoods that were initially developed prior to the introduction of land use planning, and planning-era neighborhoods of the 20<sup>th</sup> Century. Each neighborhood was selected for its ability to offer various livability lessons, but also as an example of regional, temporal and morphological difference. A number of general research findings came forth, suggesting the value of history in shaping neighborhoods and the numerous ways that livability can be achieved. Most of the neighborhoods were able to meet a great number of livability attributes. Neighborhoods perceived to be less livable offered more limited choice in housing, retail, transportation and leisure space amenities – or conversely were not able to meet physical, social and economic challenges that threatened, or made vulnerable, everyday life practices. The research suggests that livability in contexts of high-density housing could be reached through a variety of urban form models, and that the eight defined livability attributes were a useful method of focusing attention on local neighborhood livability and everyday life needs.

## **Cluster Adaptability Across Sector and Border: The Case of Taiwan's Information Technology Industry**

**by Chuan-Kai Lee**

**Spring 2006**

### **Abstract**

The dissertation explores the adaptability of Taiwan's IT industry in the transformation from the personal computer sector to the handset sector and the transplantation from Taiwan to the Yangtze River Delta region (YRD),

China. It proposes a systematic approach from the bottom-up perspective, which on the one hand transcends the limited scope of existing approaches offered to explain Taiwan's late development, and on the other hand, rejects the rigid framework of the global production network (GPN) approach that is flagship-centric, exogenously-driven, market-oriented and power-static, with the intention of embracing the multi-faceted dimensions of the processes involved in the transformation and transplantation of Taiwan's decentralized industrial system.

Based on two fieldwork trips in both Taiwan and the YRD region in which more than sixty interviews were conducted, this dissertation has three main findings.

First, at the systematic level, the adaptability of Taiwan's IT industry came from the multiplicity of coordination mechanisms embedded in the industrial system, which provided interconnected and interdependent actors in this system with a variety of ways to respond flexibly and collaboratively to technological, organizational and geographical change. The restructuring of the handset global production networks (GPN) set up a backdrop for the flexible adaptation of Taiwan's IT industry to take place. By way of decentralized collaboration, Taiwan's IT industry not only built up capabilities rapidly around handset manufacturing by grasping opportunities in the value chain, but also was able to upgrade rapidly by taking advantage of tensions in the structure.

Second, at the sectoral level, the decentralized collaboration was at work simultaneously at three different scales. At the global scale, it was a structural coupling between the handset GPN and Taiwan's PC industrial system that triggered the transformation. Although due to different sectoral characteristics, there were substantial differences between these two systems, and the interactive process has had mixed results. At the cluster level, three coordination mechanisms were in play to facilitate the adaptation. First, the intra-and inter-firm networks allowed firms to redirect and reorganize resources and capabilities within and outside the firm boundary. Second, the state offered a helping hand in supporting the transition through state-funded R&D projects, talent training and the improvement of the economic infrastructure. Third, the technical community acted as a vehicle for brain circulation across sector and border. At the firm level, the emphasis was mainly put on the learning process, in which five channels were used alternately: technology transfer, merge and acquisition, reverse engineering, training programs, and scaling up. Although these are strategies common to firms all over the world, however, due to rapid brain circulation, the knowledge and expertise had been diffused among all major players within only a few years.

Third, at the spatial level, the decentralized collaboration was at work in the process of mutual institutional building. The ecological fit between Taiwan and Suzhou should be regarded as a collaborative initiative jointly promoted by both parties rather than an imperative driven by exogenous force or by local state activism only. In this process, the relationship between the Taiwanese managerial communities and Chinese local cadres was most worthy of investigation because these two groups of actors were indeed the “visible hands” behind the transplantation. The close collaboration between Taiwanese firms and Chinese local states explained why Taiwan was so successful in tapping into Chinese local resources where Taiwanese investment was prominent, not only in scale but also in scope.

## **Children’s Travel: Patterns and Influences**

**by Noreen McDonald**

**Spring 2005**

### **Abstract**

Childhood obesity has doubled in the last thirty years. At the same time, youth travel patterns have changed greatly. In 1969 42% of students walked or biked to school; now 13% do. These two trends have caught the attention of policymakers who have identified walking to school as a way to reintroduce physical activity into children’s lives. However, these policies have been made without much knowledge of children’s travel – an area which has been understudied by transportation researchers. This dissertation seeks to fill this knowledge gap and provide information to design better policies by asking three questions: 1) What are the current patterns of children’s travel? 2) What factors have the greatest influence on children’s mode choice for school trips, particularly for walk trips? and 3) How can land use planning affect walking to school?

All analyses identify the spatial distribution of students and schools as the primary reason for the low rates of walking to school. For example, in 1969 45% of elementary school students lived less than a mile from their school; today fewer than 24% live within this distance. The simple fact is that most children do not live within a walkable distance of their schools. When children do live close to school, substantial numbers walk. However, current policies aimed at increasing walking to school focus on improving trip safety rather than changing distance to school.

To encourage large numbers of children to walk to school, planners will need to coordinate land use and school planning. Including children’s distance from school as a planning criterion could be an effective way to change community design and encourage walking. This coordination is

most necessary in moderate and high density areas where neighborhood schools are a possibility. However, even in low-density areas, planners can optimize school and housing placement so that a large portion of students live within a walkable distance of their school.

## **Doing Well by Doing Good: The Case of Interface and its Journey Towards Sustainability**

**by Peter Melhus**  
**Fall 2005**

### **Abstract**

Organizational decision-making literature tells us that profit maximization is such a predominant factor influencing decisions within for-profit organizations that it would be difficult, even if theoretically possible, to integrate into the organization a long-term environmental sustainability ethic.

In this dissertation I study Interface, Inc., a \$900 million, publicly traded manufacturer of broadloom and carpet tile for commercial buildings. I present a case that demonstrates that Interface has internalized an environmental sustainability ethic and I illustrate how it was done. The means by which Interface instituted this organizational cultural change may serve as an exemplar for other organizations.

My methodology was a combination of exploratory and explanatory. I interviewed key people involved in the decision-making process within Interface and supplemented this with my own observations of the decision making processes. I reviewed official company records, such as training manuals, performance review programs and compensation packages. Along with publicly available financial materials I used this information to analyze and explicate the extent to which the economic and non-economic factors identified in the academic literature explain the decisions made.

I studied the scholarly-described economic and non-economic influences on Interface's decision makers. Economic influences include direct cost-benefit of projects and individualized financial incentives, such as salary and incentive pay. Non-economic influences include the mission, culture and history of the organization, clarity of goals and their internal translations, the way things 'really work,' the rigor and frequency of performance reviews, and so on. I ascertained that decision-makers were sufficiently compelled by non-economic influences to make decisions that might result in lower personal economic returns.

I conclude that the combination of leadership, vision and internal incentive systems, supplemented by the development and maintenance of a corporate culture that supports the simultaneous consideration in decision-making of environmental sustainability and profitability, has enabled Interface to achieve an organization in which environmental and financial influences on decision-making are at parity. Like employees in other for-profit organizations, Interface's associates are expected to make money for the company. But they are expected to do more. They are also expected to deliver environmental returns on investment in conjunction with financial returns.

## **Multinational Research and Development Labs in China: Local and Global Innovation**

**by Xiaohong Quan**  
**Fall 2005**

### **Abstract**

Multinational corporations (MNCs) began to locate research and development (R&D) in developing countries like China and India in the 1990s. This thesis, which focuses on the location of MNC R&D labs in Beijing, documents an emerging spatial division of labor in R&D based on the increasing specialization of R&D activities.

A 2004 survey of MNC R&D labs in information technology industries in Beijing found that these MNC R&D labs are not just providing technical support, product localization, or product development for the local market; rather, they are increasingly innovating for the global market. Considering MNCs' concerns about weak intellectual property right (IPR) protection in China, this study suggests that a 'hierarchical modular R&D structure' can be an effective way for MNC R&D labs to protect their IP in weak IPR regime countries. This 'hierarchy' includes 'core R&D' and 'peripheral R&D', based on two dimensions—technology value-added, desire and ease of IP protection. While 'core R&D' is mostly done in developed countries, 'peripheral R&D' is conducted in developing countries. My study suggests that this hierarchical modular R&D structure facilitates the global configuration of MNC R&D labs.

At the regional level, this thesis provides in-depth analysis of the interaction between MNC R&D labs and local innovation actors in Beijing. It appears from my interviews and surveys that direct forms of technology transfer and spillover are limited; however, institutional learning by local firms and universities contributes to local innovation capability in the long

term. Furthermore, technologies on core components and system architecture are crucial for any region's technology advancement; however, my analysis shows most local Chinese firms do not possess such knowledge. Based on my research, it is also clear that MNCs establish R&D labs in China specifically for local resources, especially low cost R&D labor, not for the 'thickness' of local institutions. In-depth case studies are presented, and strategic suggestions for MNC management and host countries are recommended.

## **Location Choices of California Businesses and Households during the 1990s**

**by Michael Kaston Reilly**

**Fall 2005**

### **Abstract**

During the 1990s, the pattern of urban development in California was the result of varied household and firm location choices. This research highlights the factors that drove spatial choices for particular subsets of the state's diverse population and economy. The dissertation consists of three parts: the growth of employment centers, the residential location choices of households, and the overall pattern of residential density change resulting from new development.

The first section examines the spatial dynamics of business establishments in the state's largest metropolitan areas with an emphasis on estimating net agglomerative and congestion effects for particular industries. The dependent variable is either a static count of business establishments at an employment location or the change in the count of establishments at a location. Poisson regression is used to model these counts for subsets of establishments expected to demonstrate similar spatial strategies as a function of regional and local agglomerative/congestion effects and subcenter characteristics. As expected, the agglomerative variables were generally strongest for businesses emphasizing face-to-face contact and weakest for population-serving businesses.

The second portion of the dissertation investigates the residential behavior of the state's varied sub-populations. California's major metropolitan areas are divided into four Urban Morphological Types (UMTs) based on their regional location, employment density, and housing age: central city, inner suburb, outer suburb, and exurb. Multinomial logit models of choice of UMT and nested multinomial logit models of choice of a Public-Use Micro-

Sample Area and UMT are fit for each major ethnic group. Some trends held for all ethnic groups while others varied in direction or intensity.

The final section of the dissertation combines insights from the earlier work to build a tractable cell-based urban modeling system for the entire state. Upward changes in housing unit density class are modeled using the multinomial logit model as a function of physical, accessibility, socio-demographic, and land supply factors. While the first two sections provide deeper insight into the spatial dynamics of California's metropolitan areas, the final section provides a useful tool for modeling very large regions with limited information while retaining the fundamental dynamics of urbanization.